

Initial List of Issues and Gaps Water Policy Scoping and Issue Identification

Prepared for

**Policy Issues and Gaps Project Team
Alberta Water Council**

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Introduction

The [Alberta Water Council](#) has committed to ensuring that comprehensive and integrated policies are in place at the provincial and municipal levels of government to support effective water management systems in Alberta. One of the Council's responsibilities is to align policy, legislation and resources in order to implement the *Water for Life Strategy*.¹

The Council established a [Policy Issues and Gaps Project Team](#) which initiated this project to prepare an initial list of policy issues and gaps related to implementation of the *Water for Life Strategy*. The people involved in this project are listed in Appendix A. The scope of work and the approach used are described in Appendix B.

It was recognized from the outset that this document could not cover all issues given the time and resources available. In reading this document, you may find other issues, information, or options that you feel should be added. You may also want to express your views on how to deal with the issues. If so, let the Project Team know by e-mailing them at Andy.Ridge@gov.ab.ca.

In particular think about the options you want considered. The *Water for Life Strategy* is designed to deal with today's concerns, problems such as increased competition for water, an uncertain future water supply, greater pressure on aquatic environments, and rising demand by the public to be involved in the decision-making process.

To deal with these concerns, the *Strategy* sets out a series of ambitious outcomes:

Safe, Secure Drinking Water Supply

- Alberta has a comprehensive strategy to protect Albertans' drinking water
- Albertans have full and complete knowledge of drinking water issues
- Albertans have real-time access to information about drinking water quality in their community
- Alberta's drinking water infrastructure meets emerging standards and is managed for long-term sustainability
- Albertans have the knowledge, tools, and motivation to implement actions that will maintain or improve the province's water resources

Healthy Aquatic Ecosystems

- Efforts to protect aquatic ecosystems in critical areas are underway
- Water management objectives and priorities for sustaining aquatic ecosystems are established through watershed plans
- Water is managed and allocated to sustain aquatic ecosystems and ensure their contribution to Alberta's natural capital and quality of life is maintained
- Albertans have the knowledge and tools to implement actions to maintain or improve Alberta's water resources
- Communities are demonstrating leadership in watershed management

Reliable, Quality Water Supplies for a Sustainable Economy

- A broad range of water management tools and techniques are implemented
- Albertans understand the value of water to the economy and quality of life

¹ Government of Alberta, *Water for Life: Alberta's Strategy for Sustainability*, 2003
(<http://www.waterforlife.gov.ab.ca/docs/strategyNov03.pdf>)

- Water management objectives and priorities to support sustainable economic development are established through watershed plans
- All sectors are demonstrating best management practices and improving efficiency and productivity associated with water use
- Water is managed and allocated to support sustainable economic development and the strategic priorities of the province
- The overall efficiency and productivity of water use in Alberta has improved by 30% from 2005 levels by 2015 (firm targets to be determined by the Provincial Water Advisory Council)
- Albertans have the knowledge, tools and motivation to implement actions that will maintain or improve the province's water resources

However, the policy instruments used in water management (the policies, laws, programs, etc.), are based on a history that stretches back over a hundred years. To achieve the outcomes in the *Strategy*, some policy instruments may need to change and Albertans may need to find new ways to use the other ones.

This report begins with the list of issues and gaps. The list will allow you to find issues of interest. You can explore an issue that interests you by following the links to a brief description of existing policy instruments and their advantages and disadvantages.

In consultation with the Project Team, the descriptions of issues were organized into seven sections:

- Protection of Existing and Future Users and Uses
- Linkages Between Water, Air, and Land Use Decisions
- Compliance
- Long-Term Water Supply
- Lower Impact Development
- Watershed Planning
- Issues Related to the *Water for Life Strategy*

The first six sections are based on focusing questions that were used to guide the project work, while the last section deals with specific aspects of interpreting the outcomes from the *Strategy*.

A Glossary is provided at the end of the report to help with terms that may not be familiar.

Initial List of Issues and Gaps

This list of issues and potential gaps will be used by the Alberta Water Council to set priorities and make recommendations on implementation of the Alberta Government's *Water for Life Strategy*.

In reviewing a draft of this list, the dominant comment that people made was that the list is overwhelming. There are many issues to consider in deciding if current policy instruments are adequate to implement the *Water for Life Strategy*. The Alberta Water Council recognizes this challenge and will be using this list to identify priority areas to receive more focused attention in the future.

The Council considers this list as what it is, an initial list. It recognizes that the list, the description of issues, and the options are a beginning and not definitive. They will seek information and advice to strengthen and make more complete the foundation provided here.

The order in which issues are listed in this document does not reflect any judgement about the priority or importance of issues. All issues are of equal importance at this point whether they are listed at the beginning, middle, or end of the list. If there are issues that you feel are more important than others, please let the Council's Project Team know by e-mailing them at Andy.Ridge@gov.ab.ca.

The second most common observation of people reviewing the draft list was that the grouping of issues could have been improved. In particular, they felt that there are better ways to organize the issues and that more attention could have been paid to the overlaps and linkages among issues.

These concerns reflect the complexity of water management. However, issues needed to be tied to the outcomes in the *Water for Life Strategy* to ensure the Council's task of providing advice on implementing the *Strategy* remained front and center. To address overlaps and linkages, the Council will be identifying the connections among issues when it sets priorities. In the meantime, an index has been provided in this report to help identify linkages among issues.

To aid in navigating through this report, links have been provided in the document to help you move from the list of issues to the description of an issue and back again. The links are shown in **blue**. Activate the link by clicking the left button on your mouse. If you are using a printed copy of this report, page numbers have been included next to the links to help in moving back and forth between the list and the descriptions.

Potential policy gaps are indicated with a red triangle (▲). A potential gap was defined as a possibility that policy instruments, procedures, or knowledge might be missing that would significantly affect implementation of the *Water for Life Strategy*.

The potential options included in this report are designed to give the Project Team and the Council a starting point if they feel alternatives to current policy instruments should be explored. The options were gathered from a variety of sources, including the comments received on the draft list. The options are by no means complete or detailed.

Issues Common to All Outcomes

Issues		
Public Notice of Applications for Approvals and Licences (page 24)	Role of the Directly Affected (page 30)	Promoting Integration of Water, Air, and Land Management (page 39)
Joint Management of Surface and Ground Water (page 41)	Factual Justification for Integration of Water, Air, and Land (page 44)	Contribution of the Monitoring and Compliance System (page 52)
Capability and Capacity to Ensure Compliance (page 56)	Funding (page 58)	Inclusive, Comprehensive, and Forward-Thinking Water Management (page 62)
The Same Issues Keep Coming Up (page 63)	Ownership of the <i>Water for Life Strategy</i> (page 65)	Evaluation of Water Management Programs (page 81)
Empowerment of Municipalities (page 83)	Development Patterns and Choices Among Solutions (page 85)	Risk Management (page 86)
What is an Activity? (page 90)		Responsibility, Authority, and Support (page 114)

Safe, Secure Drinking Water Supply

Issue Common to All Drinking Water Outcomes		
	<p>Healthy Aquatic Ecosystems vs. Water Treatment Technology (page 117)</p>	

Outcome: Alberta has a comprehensive strategy to protect Albertans' drinking water

Issues		
<p>Integration of Water, Air, and Land Under the <i>Canadian Environmental Quality Guidelines</i> (page 36)</p>	<p>Integration of Laws and Other Policy Instruments (page 37)</p>	<p>Pollution Minimization and Source Water Protection (page 38)</p>
<p>Guidelines or Standards for Raw Water (page 53)</p>		<p>Breadth and Realism of Outcome (page 118)</p>

Outcome: Albertans have full and complete knowledge of drinking water issues

Issues		
<p>Guidelines for Canadian Drinking Water Quality (page 14)</p>	<p>Application of the Guidelines for Community Water Supplies (page 15)</p>	<p>Minimum Requirement for Water and Wastewater Treatment (page 16)</p>
<p>Knowledge, Tools, and Motivation for the Unreasonable and Uninformed (page 54)</p>		<p>Effectiveness of the Outcome (page 118)</p>

Safe, Secure Drinking Water Supply (continued)

Outcome: Albertans have real-time access to information about drinking water quality in their community

Issue		
	Need for Real-Time Access (page 119)	

Outcome: Alberta's drinking water infrastructure meets emerging standards and is managed for long-term sustainability

Issues		
Identifying Emerging Standards (page 66)	Perspectives, Strategies, and Priorities for Long-Term Water Supply (page 67)	Outcome's Applicability to Watersheds and Other Infrastructure (page 120)

Outcome: Albertans have the knowledge, tools and motivation to implement actions that will maintain or improve the province's water resources

Issues		
Integration of Knowledge on Water, Air, and Land Issues (page 48)	Proactive Monitoring and Compliance (page 59)	Knowledge and Tools to Lower the Impact of Development (page 82)

Healthy Aquatic Ecosystems

Issues Common to All Aquatic Ecosystem Outcomes		
<p>Definition of Aquatic Ecosystem (page 120)</p>		<p>Broad Range of Tools and Techniques to Protect Aquatic Ecosystems (page 121)</p>

Outcome: Efforts to protect aquatic ecosystems in critical areas are underway

Issues		
<p>Application of the Strategy for the Protection of the Aquatic Environment (page 105)</p>		<p>Emphasis on Protection of Aquatic Ecosystems in Critical Areas (page 122)</p>

Outcome: Water management objectives and priorities for sustaining aquatic ecosystems are established through watershed plans

Issues		
<p>Integrating Water, Air, and Land Issues in a Watershed Approach (page 34)</p>	<p>Criteria for Setting Priorities in the <i>Framework for Water Management Planning</i> (page 47)</p>	<p>Contribution of Watershed Plans to Lowering Impacts (page 88)</p>
<p>Is Watershed Planning Necessary? (page 106)</p>	<p>The Step-By-Step, Long-Timeframe Approach for the <i>Water for Life Strategy</i> (page 108)</p>	<p>Constraints and Flexibility for Water Management Planning (page 108)</p>
	<p>The Watershed Approach (page 123)</p>	

Healthy Aquatic Ecosystems (continued)

Outcome: Water is managed and allocated to sustain aquatic ecosystems and ensure their contribution to Alberta's natural capital and quality of life is maintained

Issues		
First Nation Water Rights (page 17)	Time-Limited Approvals (page 19)	Legal Requirements for Licence and Transfer Decisions (page 19)
Alternatives to Water Conservation Objectives (page 25)	Managing Aquatic Ecosystems for Their Own Sake (page 27)	Decisions on Proposed Transfers of Licensed Allocations (page 28)
Cancellation Procedures (page 29)	Defining Instream Needs (page 42)	Determining the Bed and Shores of a Water Body (page 42)
Managing Watersheds to the Same Standard (page 44)	Responsibility for the Full Life Cycle of Each Natural Resource Project/Activity (page 51)	Meaning of Sustainability (page 67)
Measuring Sustainability (page 70)	Responsibility for Achieving Sustainability (page 71)	Adaptive Management (page 72)
Legal Requirements in Plans (page 75)	First-in-Time, First-in-Right Principle (page 77)	Bans on Export of Water, Inter-Basin Transfer, and New Licence Applications in the Bow and Oldman River Basins (page 79)
Investment in Infrastructure, Administrative, and Cost-Sharing Programs (page 80)	Impacts on Environmental and Aquatic Health (page 88)	Codes of Practice (page 89)
	Natural Capital (page 123)	

Healthy Aquatic Ecosystems (continued)

Outcome: Albertans have the knowledge and tools to implement actions that will maintain or improve Alberta's water resources

Issues		
Motivation to Protect Aquatic Ecosystems (page 124)		Self-Interest in Protecting Aquatic Ecosystems (page 125)

Outcome: Communities are demonstrating leadership in watershed management

Issues		
Watershed Management Plans (page 112)	Authority for Public Consultation and Approval and Adoption of Water Management Plans (page 113)	Leadership Provided by Elected Officials and Administrators (page 125)
	Roles Communities Play in Management (page 126)	

Reliable, Quality Water Supplies for a Sustainable Economy

Issues Common to All Sustainable Economy Outcomes		
Quality of Water Supplies to be Achieved (page 126)		Role of Communities in Providing Leadership and Management (page 127)

Outcome: A broad range of water management tools and techniques are implemented

Issues		
The Term Water Management (page 127)		Implementation of Tools and Techniques (page 127)

Outcome: Albertans understand the value of water to the economy and quality of life

Issues		
	Economic Instruments and Affordability of Water (page 91)	

Reliable, Quality Water Supplies for a Sustainable Economy
(continued)

Outcome: Water management objectives and priorities to support sustainable economic development are established through watershed plans

Issues		
<p>Integrating Water, Air, and Land Issues in a Watershed Approach (page 34)</p>	<p>Criteria for Setting Priorities in the Framework for Water Management Planning (page 47)</p>	<p>Contribution of Watershed Plans to Lowering Impacts (page 88)</p>
<p>Is Watershed Planning Necessary? (page 106)</p>	<p>The Step-By-Step, Long-Timeframe Approach for the Water for Life Strategy (page 108)</p>	<p>Constraints and Flexibility for Water Management Planning (page 108)</p>
	<p>The Watershed Approach (page 123)</p>	

Outcome: All sectors are demonstrating best management practices and improving efficiency and productivity associated with water use

Issues		
<p>Other Areas for Best Management Practices (page 128)</p>		<p>Making the Best Good (page 128)</p>

Reliable, Quality Water Supplies for a Sustainable Economy (continued)

Outcome: Water is managed and allocated to support sustainable economic development and the strategic priorities of the province

Issues		
First Nation Water Rights (page 17)	Time-Limited Approvals (page 19)	Legal Requirements for Licence and Transfer Decisions (page 19)
Alternatives to Water Conservation Objectives (page 25)	Managing Aquatic Ecosystems for Their Own Sake (page 27)	Decisions on Proposed Transfers of Licensed Allocations (page 28)
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	Natural Capital (page 123)	

Reliable, Quality Water Supplies for a Sustainable Economy
(continued)

Outcome: The overall efficiency and productivity of water use in Alberta has improved by 30% from 2005 levels by 2015 (firm targets to be determined by the Provincial Water Advisory Council)

Issues		
The Alberta Water Council's Role (page 129)		Market Mechanisms (page 130)

Outcome: Albertans have the knowledge, tools and motivation to implement actions that will maintain or improve the province's water resources

Issues		
Ability to Deal With Changes in Long-Term Water Supply (page 80)	Watershed Management Plans (page 112)	Authority for Public Consultation and Approval and Adoption of Water Management Plans (page 113)
Leadership Provided by Elected Officials and Administrators (page 125)		Roles Communities Play in Management (page 126)

Description of Issues

This section summarizes advantages, disadvantages, and options related to water management issues in Alberta.

Since the intent is to create an initial list of policy issues and gaps, it is inevitable that not all topics and issues have been covered. Instead, criteria and priorities were jointly established with the Project Team to guide the work. See Appendix B for more information on the criteria and priorities.

1.0 Selected Topics

1.1 Protection of Existing and Future Users and Uses

FOCUSING QUESTION

How are existing and future water users and uses² protected with existing policy instruments?

1.1.1 Outcome: Alberta has a comprehensive strategy to protect Albertans' drinking water

1.1.1.1 Guidelines for Canadian Drinking Water Quality

Should drinking water guidelines be based on science or a combination of science and other practical concerns?

Are the guidelines for Community Water Supplies protective enough? ▲

Discussion: The guidelines for Community Water Supplies³ are developed using risk analysis that combines science with financial, social, and technological considerations.⁴ This makes the guidelines practical to implement and allows the development of a comprehensive strategy that incorporates the values of Albertans.

However, the process of negotiation in setting drinking water guidelines creates safety criteria that may be compromised by feasibility, priorities, and other values. The guidelines are not a

² The term "uses" for this project, is considered synonymous with "needs" and "purposes" of both people and the environment.

³ Canadian Council of Ministers of the Environment, *Canadian Environmental Quality Guidelines*, 2006 (http://www.ccme.ca/publications/ceqg_rcqe.html), Chapter 2

⁴ The Honourable Dennis R. O'Connor, *Report of the Walkerton Inquiry*, Part Two: *A Strategy for Safe Drinking Water*, Queen's Printer for Ontario, 2002, Chapter 5 (http://www.attorneygeneral.ius.gov.on.ca/english/about/pubs/walkerton/part2/Chapter_5.pdf), pp. 151-156 and Federal-Provincial Subcommittee on Drinking Water, *Canadian Drinking Water Guidelines Development Process*, 1999 (http://www.iigr.ca/pdf/documents/1057_Canadian_Drinking_Water.pdf)

scientific “gold standard” and a comprehensive strategy based on them may increase risk to consumers of water.

Often people assume that ground water is cleaner than surface water and needs little if any treatment to make it potable. Policy instruments may need extra care in their development and application to ensure that ground water is protected from contamination and that ground water users are aware of the risks.

Potential options:

- Continue the current practice of using scientific, financial, social, and technological considerations in developing drinking water guidelines.
- Review current practice to determine how well it protects consumers of drinking water.
- Determine if policy instruments require a different approach in terms of dealing with ground water quality.
- Apply financial, social, and technological considerations only if there is scientific proof that they protect consumers of drinking water.
- Use only scientific information about drinking water quality in developing the guidelines.

[Return to List of Issues \(page 5\)](#)

1.1.1.2 Application of the Guidelines for Community Water Supplies

Should the guidelines for Community Water Supplies be applied consistently across Alberta? ▲

Should the guidelines for Community Water Supplies become standards?

Discussion: The guidelines for Community Water Supplies are not standards because they must be able to be adapted to suit the circumstances of particular provinces, territories, and localities. They allow a drinking water strategy to be comprehensive enough to take into account financial, technological, and other limitations within a community.

Using guidelines instead of standards may reduce compliance capability, create confusion for service providers and the public, and lead to unsatisfactory health outcomes in areas with lower treatment ability. As a result, a comprehensive strategy based on them may not provide the same level of protection for consumers in all parts of Alberta.

Potential options:

- Keep the guidelines as guidelines.
- Continue to apply the guidelines depending on the circumstances of particular localities.
- Review the guidelines and their application to determine how well they protect consumers of drinking water.

- Keep the guidelines as guidelines and apply them according to circumstances only if there is scientific proof that doing so protects consumers of drinking water.
- Apply the guidelines consistently regardless of circumstances.
- Make the guidelines into standards.

[Return to List of Issues \(page 5\)](#)

1.1.1.3 Minimum Requirement for Water and Wastewater Treatment

Should there be a legislated minimum requirement for water and wastewater treatment for all communities? ▲

Discussion: The *Rural Development Strategy* includes the principle that “All Albertans should have access to a minimum level of essential services.”⁵ A comprehensive strategy for drinking water will need to address this issue for water treatment facilities. It will also need to consider a minimum level for wastewater facilities since the quality of water discharged from those facilities can affect the ability to treat water in downstream locations.

As outlined in the *Rural Development Strategy*, a minimum level for water and wastewater treatment would require increased funding, a long-term capital development fund, support to expand training, and increased testing. This would be expensive. A key issue would be who pays.

A minimum level for water and wastewater treatment might not be compatible with conserving water and encouraging more efficient settlement patterns – if those are desired outcomes – since a minimum requirement could result in increased water use, less careful water use, and elimination of constraints that discourage more dispersed development.

A legislated minimum requirement could also apply to the location and use of septic systems and their interaction with wells used for drinking water. If so, this could result in communities with septic field problems moving to communal or municipal water and/or wastewater systems.

Potential options:

- Do not legislate a minimum requirement for water and wastewater treatment.
- Legislate a minimum standard and fund its implementation through the provincial government.
- Legislate a minimum standard and fund its implementation through local and regional governments or agencies.
- Legislate a minimum standard and fund its implementation through user fees.

⁵ Alberta Government, *A Place to Grow: Alberta's Rural Development Strategy*, 2005 (<http://www.rural.gov.ab.ca/strategy/grow-feb2005.pdf>)

[Return to List of Issues \(page 5\)](#)

1.1.2 Outcome: Water is managed and allocated to sustain aquatic ecosystems and ensure their contribution to Alberta's natural capital and quality of life is maintained
Outcome: Water is managed and allocated to support sustainable economic development and the strategic priorities of the province

1.1.2.1 First Nation Water Rights

What are the water rights of First Nations in Alberta? ▲

Discussion: The water rights of First Nations in the prairie region of Canada are not clearly defined. Like many other aspects of laws governing First Nations, the issue is complex and has not, in the view of most First Nations, been resolved in a definitive manner.⁶

The issues surrounding First Nation water rights are:

- **The effect of treaties:** The treaties signed with First Nations in the prairie region of Canada usually did not deal directly with water. First Nations may have signed over the water rights they had or those water rights may have been protected by treaty or left out of the treaty altogether. The key unknowns are the potential for water rights related to habitat for fish and wildlife, the development of reserve land, and control or ownership of water based on pre-colonial (aboriginal) rights.
- **Water rights prior to government control of water:** The *North-West Irrigation Act* is the legislation that, in 1894, introduced the allocation system that today, in modified forms, governs water use on the Canadian prairies. In 1895 (retroactive to 1894), an amendment to the *Act* also laid the claim for government ownership of water.

The *North-West Irrigation Act* contained exemptions for certain types of water rights that existed prior to the *Act* coming into force. These pre-existing rights might include an exclusive right or privilege based on a land grant or a right based on length of use. It would have to be proven that a right existed prior to the legislation and has not been forfeited.

- **The Winters doctrine:** In the western United States, native tribes have a right to water, established through a 1908

⁶ For a brief discussion of First Nations rights, see *Introduction to Aboriginal Law in Canada*, Treaty 8 First Nations of Alberta (http://www.treaty8.ca/upload/documents/T8_info_Legal_Introduction.pdf)

court decision,⁷ to ensure that their reservations can support them as “a pastoral and civilized people.” This is not a right that was written into treaties, but instead an interpretation of what was required for native people to abandon a nomadic existence and settle on reservations in areas with limited precipitation. Canadian courts and governments have not adopted this precedent.

- **The federal role:** There are lands in the Prairie Provinces that are administered by the federal government. These federal lands include national parks, military reserves, and First Nation reserves. It is not known to what extent the federal government can and would use its authority in the area of First Nation water rights. The extent to which provincial law applies to lands administered by the federal government is a matter of debate.

The lands for First Nation reserves are held in trust by the federal government for the use of First Nation bands. These lands border on or contain rivers, lakes, and other water bodies. It is a matter of debate as to whether the land held in trust by the federal government includes the bed and shores of these water bodies – particularly rivers flowing through a reserve – and whether the federal government has the authority to grant water licences or in other ways manage the water.

The Government of Alberta's position on First Nation water rights has been summarized as follows:⁸

Aboriginal water rights and ownership of river beds are subjects of continuing review and consideration from a legal and constitutional point of view. These issues, in various forms, are before the courts in Alberta and other parts of Canada. The position of the Crown in right of Alberta is that such alleged water rights and alleged rights to river beds, if they ever existed, were extinguished by competent legislation of, and executive action by, the Crown in right of Canada.

The Crown in Right of Alberta further takes the position that by the provisions of the *Constitution Act, 1930* and the *Alberta Natural Resources Amendment Act, 1938*, the water rights and rights to river beds passed to Alberta along with the constitutional jurisdiction over such rights. Such rights are now subject to the provisions of the [*Alberta Water Act*], and the *Alberta Public Lands Act*.

⁷ *Henry Winters, et. al. v. United States of America* 207 U.S. 564 (1908)

⁸ Alberta Environment, *Aboriginal Water Issues*, Background Paper, Volume 3, Challenges for the Future, 1991, p. 1

Potential options:

- Continue current practice of consultation, negotiation, litigation, and granting of provincial water licences to First Nation bands.
- Evaluate the different positions and make recommendations.
- Establish a joint federal-provincial-First Nations task force to resolve the issue.

Aquatic Ecosystems: [Return to List of Issues \(page 8\)](#)
Sustainable Economy: [Return to List of Issues \(page 12\)](#)

1.1.2.2 Time-Limited Approvals

Are time-limited approvals the best way to protect current and future users and uses? ▲

Discussion: Time-limited approvals for wastewater disposal systems allow regular review and, where required, upgrading of infrastructure, operations, and maintenance to maintain or improve protection of human health and aquatic ecosystems. Time-limited approvals more equitably share the cost of increased demand to use aquatic ecosystems for wastewater disposal and the cost of higher regulatory standards. Time-limited approvals are compatible with three of the four components of a systems approach: define conditions, evaluate performance, and adapt.

Time-limited approvals do not provide certainty and preferential treatment for older approvals for which substantial investments have already been made. The time delays and government-led regulation that are inherent in time-limited approvals may discourage more responsive, more innovative, and market-based approaches to protecting human health and the aquatic environment. The legislation does not set performance measures for wastewater approvals, the fourth component of a systems approach.

Potential options:

- Continue current practice.
- Review time-limited approvals to determine how they protect current and future users and uses.
- Implement a "first-in-time, first-in-right" approach for allocating and managing priorities for wastewater disposal.

Aquatic Ecosystems: [Return to List of Issues \(page 8\)](#)
Sustainable Economy: [Return to List of Issues \(page 12\)](#)

1.1.2.3 Legal Requirements for Licence and Transfer Decisions

Should the Director have additional legal requirements to meet in making licence and transfer decisions to ensure that current and future users and uses are protected? ▲

In exercising discretion (e.g., to resolve conflicts or protect current and future users and uses), should the Director be accountable to the local Watershed Planning and Advisory Council (WPAC)? ▲

Should WPAC recommendations be binding on the Director? ▲

Discussion: Alberta Environment's policy is that "Directors must make decisions on an unfettered basis, using information available to them. In other words, direct instructions cannot be given, but recommendations can be made." However, Alberta Environment is willing to incorporate a diversion plan into a licence to make the plan legally binding.⁹

In making licensing and transfer decisions, the Director has extensive discretion in terms of the issues considered and the ways in which water licences are crafted. This discretion allows flexibility for the Director to deal with the uncertainties and complexities of each individual application.

Unlike in western U.S. states, there are no legal requirements for protecting existing water users and aquatic environments when a water licence is issued and only minimal requirements for approving transfers.¹⁰

Constrained by time, money, and the lack of direction that comes with discretion, decision-makers generally only do what is required. Applicants for licences and transfers expect decision-makers to do nothing more.

As in the business world, requirements create the incentive for decision-makers to be more efficient in getting the job done and to ensure that decisions are in the public interest.

Except for approval of allocation transfers, the legislation does not identify how the four components of a systems approach will be implemented or achieved. (The four components are: define conditions, set targets, evaluate performance, and adapt.) Discretion also opens the door for arbitrary decisions and lack of clarity for municipalities and industry.

The discretion allowed the Director is based on the assumption that decisions on approvals, licences, and other aspects of environmental regulation are technical matters. However, these decisions are inherently "moral or social, not scientific judgments"

⁹ *Alberta Environment Response to the Recommendations of the Highwood Public Advisory Committee for the Highwood Diversion Plan, 2006*, pp. 2 & 10. These policy statements were in response to Public Advisory Committee, Highwood Water Management Plan, Phase 1, *Final Report: Volume 1 - Report and Recommendations for Highwood Diversion Plan, 2006*. The response included acceptance of the recommendation to give the Highwood Diversion Plan legal status by incorporating it as an operation plan into licences for the Women's Coulee and Little Bow Diversion licences (*Report and Recommendations*, p. xviii).

¹⁰ Bob Morrison, "What Really Matters – Part 2: Long-Term, Short-Term, and Changed Water Rights," *Moving Beyond Now*, v. 1, no. 2 (May, 2003), pp. 1-11

about, for example, health risks of pollutants and the relative value of water vs. the additional oil that it can be used to extract.¹¹

The wide discretion allowed the Director does not provide much latitude for turning down licence applications for water uses that are not beneficial – however “beneficial” is defined. The *Water Act* does allow the Minister, if a diversion of water or transfer is not in the “public interest,” to direct that an application not be accepted or that no licence be issued or transfer approved.¹² The Director does not have similar authority. It is still true, as was noted about the old *Water Resources Act*, that “if water is available, it is difficult for officials to justify the denial of an application unless the proposed use is clearly contrary to some specific policy.”¹³

In the case of oilfield injection, additional legal requirements have been created for the Director to meet in making decisions on licence and transfer applications.

Although the Advisory Committee on Water Use Practice and Policy was unable to determine how much water should be allowed to be withdrawn for oilfield injection, it did make recommendations designed “to achieve significant water conservation gains in a manner that is fair (i.e. respects the rights of water licence holders) without creating unacceptable economic impacts that could affect Albertans.” Its recommendations for a ten-year plan included:¹⁴

- that Alberta Environment “create a single policy document addressing water allocation for underground injection” and “identify specific (and stringent) requirements and environmental and economic criteria, which should be incorporated into a new regulatory process (‘decision tree’)”
- as part of the provincial Water Conservation Plan, “specific targets for reduction or elimination of injection of non-saline water”¹⁵
- water management plans “to determine priority locations within watersheds where every reasonable effort should be made to minimize or eliminate underground injection of non-saline water” and “identify specific requirements about alternative sources and other issues related to underground injection, which should be considered by Alberta Environment approvals managers”

¹¹ Michael M. Wenig, “The Democracy Deficit in Canadian Environmental Policy Making,” *LawNow*, August/September, 2004 (<http://www.ucalgary.ca/~cirl/pdf/2004dAugSepWenig.pdf>)

¹² *Water Act*, RSA 2000, c. W-3 (<http://www.qp.gov.ab.ca/documents/Acts/W03.cfm?fm isbn=0779727428>), s. 34. The “public interest” is not defined.

¹³ David R. Percy, *Framework for Water Rights Legislation in Canada*, Canadian Institute of Resources Law, 1988, p. 14

¹⁴ Advisory Committee on Water Use Practice and Policy, *Final Report*, 2004 (http://www.waterforlife.gov.ab.ca/docs/Final_Recommend_Online.pdf), pp. 18-20

¹⁵ This has been misinterpreted as a “target ... to eliminate” oilfield injection as a use of water. (Beverly Yee, *Alberta's Strategy for Sustainability*, 2005, video (http://www.iisd.org/natres/water/pwps_presentations.asp), 19:24)

- Approval processes “co-ordinated and synchronized” between Alberta Environment and the Energy and Utilities Board with the requirement that any non-saline water use be approved by Alberta Environment before an EUB approval is given

The Alberta Government has adopted the Committee's recommendations and developed a new policy and guideline for allocating water for oilfield injection.¹⁶ The policy and guideline include:

- elimination of “(on a case-by-case basis) the use of non-saline water in ER [enhanced recovery] where reasonable and feasible alternatives exist”
- voluntary review by licensees of their licence
- consideration of ground and surface water in the same documents
- evaluation by applicants of “the combined effects of their proposed water use and other water diversions in the area,” assessment of environmental risks, and “economic evaluation of alternatives” to non-saline water which balances economic costs “against environmental impacts and the benefits of water conservation efforts”
- less stringent evaluation requirements for projects that have, in the past, demonstrated reductions in use of non-saline water of more than 30% or increased resource productivity and efficiency¹⁷ of more than 30%
- more stringent approval criteria for projects in existing or potentially water-short areas.

Four inconsistencies exist in the policy and guideline:

- applications and renewals for oilfield injection are subject to more stringent requirements than other water uses
- use of ground water is limited by specific criteria, while the criteria for use of surface water are discretionary
- the designation of water short areas classifies the upper portions of the Red Deer, Bow and Oldman Rivers and their watersheds as “potentially water-short” and the lower portions as “water-short” (an illogical proposition since a water short situation in the lower end of a river basin is the cumulative impact of all water withdrawals)
- saline ground water is exempt from licensing requirements

The policy and guideline have not resolved the following issues:¹⁸

¹⁶ Alberta Government, *Water Conservation and Allocation Policy for Oilfield Injection*, 2006 (http://www.waterforlife.gov.ab.ca/docs/Oilfield_Injection_Policy.pdf) and Alberta Government, *Water Conservation and Allocation Guideline for Oilfield Injection*, 2006 (http://www.waterforlife.gov.ab.ca/docs/Oilfield_Injection_GUIDELINE.pdf)

¹⁷ “‘Resource productivity and efficiency’ is the volume of water use relative to the volume of oil (hydrocarbons) produced.” (*Water Conservation and Allocation Guideline for Oilfield Injection*, *Ibid*, p. 10)

¹⁸ Based in part on Environmental Law Centre, *Comments on the Preliminary Report of the Advisory Committee on Water Use Practice and Policy*, 2004

- the conflict that occurs between the needs of an oil producer for which non-saline water is the only feasible option and the needs of a watershed which is already experiencing shortages
- the debate surrounding whether it is appropriate for the provincial government to not require a licence for produced water (saline or non-saline)
- whether exemptions for small uses of water should continue to be available for oilfield injection
- whether the results of "decision-tree analysis" should be available to the public
- the role economic instruments (in particular, transfers and compensation) should play in reducing water use for oilfield injection
- whether voluntary reductions will be "backstopped" by regulatory measures if voluntary reductions do not achieve targets

There appears to be a significant split between the public and business organizations on the issue of whether the use of water for oilfield injection should be eliminated.¹⁹ On one hand, 71% of those who responded to a questionnaire from the Advisory Committee on Water Use Practice and Policy "agreed the committee should propose long-term elimination of injection of non-saline water," while "57 per cent did not see why immediate elimination is not feasible."

On the other hand:

Industry and business organizations who responded did not support this goal because they felt that universal "elimination" is unlikely to be a feasible goal. They support increased protection of the resource and of other high priority users, but question why an economically valuable use of water would be eliminated in situations where it is not creating a problem.

This discussion has been more detailed than most and examines one specific water use that may be best dealt with in other multi-stakeholder forums. However, it illustrates a number of aspects of the issue of Directorial discretion, the key ones being:

(<http://www.elc.ab.ca/ims/client/upload/Comments%20on%20Water%20Use%20Practice%20and%20Policy1.pdf>) and Mary Griffiths and Dan Woynilowicz, *Oil and Troubled Waters*, Pembina Institute for Appropriate Development, 2003 (<http://www.pembina.org/pdf/publications/OilandTroubledWaters.pdf>). For a discussion of the exemptions, see Hydrogeological Consultants Ltd., *Use of Water by Alberta's Upstream Oil and Gas Industry*, Canadian Association of Petroleum Producers, 2002 (<http://www.capp.ca/raw.asp?x=1&dt=NTV&e=PDF&dn=56487>), pp. 3-5 to 3-12. The small uses exempted are 6,250 m³ per year from a naturally-filled dugout not in a watercourse, lake, or wetland and, in the Green Area, 5,000 m³ per year if in accordance with the surface disposition.

¹⁹ Advisory Committee on Water Use Practice and Policy, *supra* n. 14, Appendix 1: "Brief Summary of Public/Stakeholder Response to Preliminary Recommendations," p. A1-3

- the provincial government can provide requirements for the Director to meet, including through the acceptance of a plan
- ground water and surface water can be jointly managed despite the absence of reliable data on their interactions
- policy development can create double standards (desirable or not) such as more stringent requirements for one use and not others, greater regulation of ground water, and two sets of criteria for different parts of the same watershed.

In terms of giving WPACs decision-making authority or making the Director accountable to WPACs, WPACs are constituted differently from watershed to watershed, representation is inconsistent, and decision-making processes vary. Although they might be a vehicle for allocating limited water resources among competing uses, WPACs are not necessarily equipped to assure that environmental protection plays a role in their deliberations.

Potential options:

- Continue with the current discretion/requirements.
- Evaluate the current discretion/requirements to determine how they protect current and future users and uses.
- Identify questions and management parameters that require clarification concerning the current water management approach.
- Determine the extent to which and how generic standards or other abstract rules are currently being used in *ad-hoc* water management decisions.
- Revise the discretion/requirements to ensure that Directors' decisions protect current and future users and uses.
- Require a Director to consult with and/or be accountable to the local WPAC when exercising discretion to resolve conflicts or protect current and future users and uses.
- Adopt a decision-making framework (e.g., like the Clean Air Strategic Alliance) that requires the government with input from the public to go through a deliberate process of considering options to eliminate or mitigate environmental impacts of proposed projects.
- Make it mandatory that a Director comply with WPAC recommendations.

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1.1.2.4 Public Notice of Applications for Approvals and Licences

Should the procedures be changed for notifying the public about applications for approvals and licences? ▲

Discussion: The *Water Act* and the *Environmental Protection and Enhancement Act* contain provisions that require an applicant for an approval or licence to notify the public that the application is being considered for approval by Alberta Environment. This

provides an opportunity for the public to review the application, comment on it, and – if a person is considered to be directly affected – submit a statement of concern that will be considered by the Director responsible for making a decision on the application.

People who have responded to public notices in the past have raised concerns about the efficiency and effectiveness of the process for public notice. Among the concerns raised are:

- the period for providing a response is too short to allow adequate consideration of an application and its consequences
- public notices are not provided in ways that are consistent (e.g., always in a newspaper, always in one place in a newspaper) and accessible – particularly within the time allowed for public comment
- public notices provide very little information and sometimes inaccurate or not commonly understood information (e.g., who to contact, location of project)
- obtaining additional information from the applicant sometimes produces incomplete/inaccurate information or is impossible within the time allowed for public comment
- public notice of a water-related application or the need for one is not provided during municipal approval processes
- public notice happens toward the end of the decision-making process (often just before a decision is to be made) rather than when the application is received.

Potential options:

- Continue with the current process of public notice of applications.
- Evaluate the current public notice process to determine how it achieves the outcomes in the *Water for Life Strategy*.
- Revise the public notice process to make it more efficient and effective for the public.
- Revise the public notice process to ensure it achieves the outcomes in the *Water for Life Strategy*.

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1.1.2.5 Alternatives to Water Conservation Objectives

Should water conservation objectives (WCOs) be replaced or supplemented by other forms of legal protection for the aquatic ecosystem? ▲

Should aquatic ecosystem health be protected by a scientifically arrived at level or through the watershed planning process and the use of water conservation objectives? ▲

Discussion: WCOs provide protection for the aquatic environment while ensuring that human needs can be met.

Unlike the demands incorporated into water withdrawal licences, WCOs are a compromise and do not necessarily include the amount of water needed to sustain the aquatic ecosystem. Unless applied to a licence issued to the provincial government, WCOs are currently used as a condition in withdrawal licences or operating plans and do not have the same legal protection as a licence.

Under the *Water Act*, a water conservation objective is “the amount and quality of water ... necessary for the

- (i) protection of a natural water body or its aquatic environment, or any part of them,
- (ii) protection of tourism, recreational, transportation or waste assimilation uses of water, or
- (iii) management of fish or wildlife.”²⁰

Alberta Environment's position is that WCOs “provide direction for the ecological and economic outcomes desired from a river. In most cases, the outcome is a balance between leaving water in the river for the environment and diverting it for use.”²¹ This appears to be in conflict with the purpose of WCOs as set out in the *Water Act*.

Potential options:

- Continue existing uses of WCOs.
- Identify how water conservation objectives and other flow and water quality restrictions have been applied to licences, approvals, operations, and compliance.
- Evaluate the use of WCOs as a compromise between instream and withdrawal needs to determine if the practice is in compliance with the *Water Act*.
- Evaluate the benefits of WCOs in terms of sustaining aquatic ecosystems through management and allocation.
- Use WCOs only for the operation of government-owned diversions that pre-date the establishment of instream needs for a water body.
- Apply instream needs instead of WCOs as conditions on withdrawal licences – where allowed.
- Replace WCOs with scientifically-defined objectives for the aquatic environment.
- Allow licences for WCOs to be issued to those outside the provincial government.
- Issue licences that incorporate instream needs using the *Water (Ministerial) Regulation*.²²

²⁰ *Water Act*, supra n. 12, s. 1(1)(iii)

²¹ Alberta Environment, *Water Conservation Objectives*, Information Sheet (http://www3.gov.ab.ca/env/water/regions/ssrb/pdf/InfoSheet_WCOs.pdf)

²² *Water (Ministerial) Regulation*, A.R. 205/908 (http://www.qp.gov.ab.ca/documents/Regs/1998_205.cfm?frm_isbn=0779737342), s. 11 (h)-(n)

- Apply WCOs to approvals under the *Environmental Protection and Enhancement Act*.

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1.1.2.6 Managing Aquatic Ecosystems for Their Own Sake

Should water be managed to sustain aquatic ecosystems for their own sake in addition to managing them to provide benefits to people? ▲

Discussion: Some policy instruments emphasize the importance of managing aquatic ecosystems to provide benefits to people.²³ This ensures that Alberta's natural capital continues to be used to maintain the economy and quality of life in the most efficient manner.

Other policy instruments also see a benefit in managing ecosystems because of their intrinsic value.²⁴ This ensures that scientific information has a greater opportunity to be considered and provides a greater degree of environmental protection for maintaining natural capital, the economy, and quality of life.

Potential options:

- Continue with different approaches to managing aquatic ecosystems.
- Evaluate the different approaches to determine how they contribute to managing and allocating water to sustain aquatic ecosystems.²⁵
- Revise policy instruments to better integrate the different approaches.
- Adopt a unified approach to managing aquatic ecosystems.

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²³ For example:

- The wildlife and fisheries resources "will be utilized in a manner which contributes the most benefit to the citizens of Alberta." (Alberta Energy and Natural Resources, Fish and Wildlife Division, *Fish & Wildlife Policy for Alberta*, 1982, pp. 9 & 16)
- "... this policy will contribute directly to the management of human use of the biosphere, so that it may yield the greatest environmentally sustainable economic benefit to mankind." (Fisheries and Oceans Canada, *Policy for the Management of Fish Habitat*, 1986 (http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/legislation-lois/policies/fhm-policy/pdf/policy_e.pdf), p. 1)

²⁴ For example:

- "The goal of this policy is to maintain and enhance the health and diversity of Canada's wildlife, for its own sake and for the benefit of present and future generations of Canadians." and a guiding principle: "Wildlife has intrinsic, social, cultural, and economic values." (Canadian Wildlife Service, *A Wildlife Policy for Canada*, 1982 (http://www.cws-scf.ec.gc.ca/publications/pol/cont_e.cfm))
- "A key assumption of ecosystem management is that carrying out land use activities and water management in ways that approximate the effects of natural disturbances, and that maintain the natural variability of ecosystem conditions, will in turn ensure ecosystem sustainability and conserve biodiversity." (Alberta Environmental Protection, *Sustaining Alberta's Biodiversity* (<http://www.environment.gov.ab.ca/info/library/5852.pdf>), p. 6)
- G. Kasey Clipperton, C. Wendell Koning, Allan G. H. Locke, John M. Mahoney, and Bob Quazi, *Instream Flow Needs Determinations for the South Saskatchewan River Basin, Alberta, Canada*, 2003 (http://www3.gov.ab.ca/env/water/regions/ssrb/pdf_phase2/IFN/IFN%20Full%20Report.pdf)

²⁵ To decide if the different approaches should continue or be reconciled, you need to determine if either approach makes a significant difference in the results achieved. (See Michael M. Wenig, "Facing Up to the Roots of Environmental Disputes," *LawNow*, October/November, 2003 (<http://www.ucalgary.ca/~cirl/pdf/2003eOctNovWenig.pdf>))

1.1.2.7 Decisions on Proposed Transfers of Licensed Allocations

When a proposed transfer of a licensed allocation is being considered, should the Director be required to collect information on whether the rights have been exercised and there is a reasonable prospect they will be exercised? ▲

Should the Director be required to limit a transfer to the historical diversion if less than the licensed amount? ▲

Should existing water users and the aquatic environment receive more or less protection when a transfer decision is made?

Discussion: Current transfer requirements provide protection for existing water users and the aquatic environment. The authorization of the ability to transfer as set out in an approved water management plan also allows criteria to be developed for the Director to consider. A licence must be in good standing before any of its allocation can be transferred.

The requirements for transfers only protect existing water users against impairment and the environment against significant adverse effects. As well, existing water users are protected against impacts on exercising their rights, not against impacts on the rights themselves.²⁶

The Director is not required to meet any criteria for transfers set out in a water management plan.

The *Water Act* does not define "a licence in good standing." The criteria for determining if a licence is in good standing are set out in the *Administrative Guideline for Transferring Water Allocations*.²⁷ These criteria do not include the "non-use" provisions set out in the *Water Act*.²⁸

The non-use provisions of the *Water Act* are key to ensuring that the "first-in-time, first-in-right" principle is applied fairly and effectively. There will be a financial windfall for a licensee if an unused allocation can be transferred to someone else. It will also mean increased withdrawal of water at a higher priority that may reduce the amount of water available to other users and the aquatic environment.

Potential options:

- Continue current practice in administering transfers.

²⁶ *Water Act*, *supra* n. 12, s. 82(3)

²⁷ Alberta Environment, *Administrative Guideline for Transferring Water Allocations*, 2003 (http://www3.gov.ab.ca/env/water/legislation/Guidelines/Transfer_Guidelines.pdf)

²⁸ *Water Act*, *supra* n. 12, s. 55(1)(f). The factors that are considered in determining non-use include whether diversion of water has occurred, rights have been exercised, and the rights have a reasonable prospect of being resumed.

- Evaluate how current legal requirements and administrative procedures contribute to supporting sustainable economic development and the strategic priorities of the province.
- Revise legal requirements and administrative procedures for transfers to ensure that decisions support sustainable economic development and the strategic priorities of the province.

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1.1.2.8 Cancellation Procedures

Should cancellation procedures be applied equally to all? ▲

Should a Director be required to consider “diversion to avoid cancellation” as non-use? ▲

Should a Director be required to cancel a licence if no response is received in a specified period? ▲

Should “extraordinary” cancellation be considered for unforeseen significant adverse effects on other users? ▲

Should licences issued prior to the *Water Act* be considered for “extraordinary” cancellation? ▲

Discussion: Action by Alberta Environment to cancel licences is subject to available resources and priorities.²⁹

Administrative procedures have been developed for cancelling licences because of non-use. These procedures are considered by Alberta Environment to be fair to licensees, help the Director target high priority problems, and give the Director discretion to deal with special circumstances.

The procedures include³⁰

- Licences are cancelled when unused licence allocations can “prevent new water applicants from receiving a licence” and “unused water with a senior priority contributes to uncertainty in the community.”
- If the “Director is of the opinion a licensee is diverting water where there is no actual use other than to prevent the cancellation, the Director may regard this diversion as non-use.”
- “If no response is received to the written notice of cancellation, the licence may be cancelled after 30-days (or the time specified in the written cancellation notice).”

²⁹ Response to the Recommendations of the Highwood Public Advisory Committee, *supra* n. 9, p. 11

³⁰ Alberta Environment, *Water Licence Cancellations for Non-Use of Water Allocated by a Licence* (<http://environment.gov.ab.ca/info/library/5845.pdf>) and *Water Act*, *supra* n. 12, s. 55(2)

- A licence issued under the *Water Act* may be cancelled if “a significant adverse effect on the aquatic environment occurred, occurs or may occur that was not reasonably foreseeable at the time the licence was issued and compensation may be payable.”

The cancellation procedures are not applied equally to all, only in watersheds that are or perceived to be heavily allocated. The Director is not required to consider a diversion to avoid cancellation as a non-use or to cancel a licence if the licensee does not respond within the specified time period.

The “extraordinary” power to cancel a licence because of unforeseen circumstances does not protect existing water users against unforeseen circumstances. The extraordinary power only applies to licences issued under the *Water Act*.³¹

Potential options:

- Keep cancellation procedures as they are.
- Evaluate current procedures to determine how they protect current and future users and uses.
- Apply cancellation procedures equally to all.
- Require the Director to consider “diversion to avoid cancellation” as a non-use and to cancel a licence if no response is received in the specified period
- Extend the “unforeseen circumstances” cancellation power so it applies to significant adverse effects on other users.
- Extend the “unforeseen circumstances” cancellation power so it applies to licences issued prior to the *Water Act*.

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1.1.3 Outcome: Albertans have the knowledge, tools and motivation to implement actions that will maintain or improve the province’s water resources

1.1.3.1 Role of the Directly Affected

Who should be eligible to participate in water management decisions? ▲

Should people who are directly affected by a proposal have different privileges from those who are not directly affected? ▲

Discussion: There are several key stages in the decision-making process where public involvement either occurs now or could occur in the future (Table 1).

³¹ *Water Act, supra* n. 12, s. 55(2)

Table 1 Summary of Public Involvement at Key Stages of Alberta Environment's Decision-Making		
Stage in the Decision-Making Process	Public Involvement	Considerations
Adoption of Laws and Regulations	<ul style="list-style-type: none"> • Extensive public involvement in development of <i>Environmental Protection and Enhancement Act</i> and <i>Water Act</i>. • Limited public involvement in development of regulations and other legal instruments (i.e., Legislature committees, "task forces," targeted consultation with affected parties) 	<ul style="list-style-type: none"> • In cases where recommendations are developed with or by the public, decisions remain with Alberta Government. • Different from more inclusive opportunities for comment on federal environmental regulations in Canada and the general practice in the United States.
Adoption of Water Management Plans	<ul style="list-style-type: none"> • Inclusive approach 	<ul style="list-style-type: none"> • Recommendations are developed by the public and/or based on consideration of public input. Decisions remain with Alberta Environment.
Adoption of Non-Legal Policy Documents	<ul style="list-style-type: none"> • Inclusive approach generally 	<ul style="list-style-type: none"> • Recommendations are developed by the public and/or based on consideration of public input. Decisions remain with Alberta Environment.
Consideration of Applications for Approvals and Licences	<ul style="list-style-type: none"> • Director required to consider matters and factors in an approved water management plan • Director required to consider only statements of concern from those directly affected 	<ul style="list-style-type: none"> • Different from the general practice of more inclusive involvement of public in the United States. • Lack of clear guidance on what it takes to demonstrate direct effect. • No administrative recourse to correct shortcomings in proof of direct effect (prior to EAB appeal). • Given complexity of what "directly affected" means, for an administrator to be duly diligent is quite burdensome and expensive. • Determination of directly affected may be ad-hoc or inconsistent.
Appeal of Decisions to the Environmental Appeals Board	<ul style="list-style-type: none"> • Only those directly affected can appeal decisions on approvals and licences. 	<ul style="list-style-type: none"> • The criteria for "directly affected" are complex and, in some cases, unclear and conflicting. • Uniform and consistent application of the criteria may not occur.

Within certain constraints, the *Environmental Protection and Enhancement Act* and *Water Act* contain provisions allowing those directly affected by a proposal (e.g., an application to withdraw water or discharge wastewater) to submit statements of concerns.³² If proper procedures are followed, those directly affected are also granted the right to be notified about decisions and to appeal decisions to the Environmental Appeals Board.

³² *Environmental Protection and Enhancement Act*, RSA 2000, c. E-12 (<http://www.gp.gov.ab.ca/documents/acts/E12.cfm>), e.g., s. 44, 46, 73, 74, 91, & 127 and *Water Act*, *supra* n. 12, s. 109, 111, & 115

Alberta's Commitment to Sustainable Resource and Environmental Management provides that³³

- “Decisions should be made after consultation with Albertans, giving particular attention to people and industry that are directly affected by the decision ... This includes:
 - Ensuring decisions on resources and environmental management are taken in a provincial context, considering broad public interest, and involve input from those communities and industries that will be most directly affected by them.”

It is believed that the intent of limiting participation in some aspects of decision-making is to encourage the most efficient and effective use of time and resources. It is also considered by some to allow a more “place-based” approach.

Those not directly affected may submit comments on a proposal. The Director is only obliged to read and consider submissions from those directly affected. However, while determining whether a person is directly affected, the Director has the discretion to read all submissions and identify any issues that require his or her consideration.

Alberta's Commitment to Sustainable Resource and Environmental Management does not direct decision-makers to exclude people from being consulted. Instead, it emphasizes the need to focus on the concerns of those directly affected while ensuring that decisions are “taken in a provincial context, considering broad public interest.”

A number of judicial and administrative decisions have addressed the question of who is or is not directly affected. This has resulted in a variety of issues that decision-makers must examine to determine who is directly affected by a proposal (Table 2). It is debatable if there is a significant difference between someone who is directly affected and someone who is not, whether making that distinction promotes good decision-making, and whether the efficiency of decision-making is improved.

The restrictions on participation of those deemed not to be “directly affected” reduce the likelihood the Director will consider and act upon relevant issues that go beyond the very localized geographic area in which a project is located. In particular, the determinations of “directly affected” people tend to preclude considerations of regional cumulative effects and changes to the environment which affect everyone in the province or even in a

³³ Government of Alberta, *Alberta's Commitment to Sustainable Resource and Environmental Management*, 1999 (<http://www.srd.gov.ab.ca/info/sustainable.pdf>), pp. 6-7

Table 2
Principles for Determining Whether a Person is Directly Affected

1. The issue of whether a person is directly affected is a preliminary issue to be decided before the merits are decided.
2. The decision must have an effect on the person.
3. The effect must be directly on the person.
4. The word "directly" requires the person to establish – where possible to do so, on a balance of probabilities, and on a *prima facie* basis – a direct personal or private interest (economic, environmental, or otherwise) that will be impacted or proximately caused by the approval.
5. Direct impacts are changes in environmental components and processes that result immediately from a project action or activity; there is a clear link between an activity or action and the impact. Indirect impacts are changes in environmental components and processes that are consequences of direct impacts.
6. It is irrelevant that a person does not require federal or provincial permits to conduct business in an area or that he or she does not own property or live in the area.
7. It is irrelevant that previous approvals have been issued or that the impacts of the proposed approval may be similar.
8. When the merits are being considered, if there are small impacts that can be mitigated sufficiently to not worsen an already affected environment, this does not mean that a person is directly affected.
9. The cumulative effects of a project are insufficient to form the basis for direct effect.
10. The standard of proof of direct effect may vary depending on whether the approval is at a stage either prior to or during consideration of the merits. At a preliminary stage, this is to avoid inequities where proof of causation is not possible due to lack of information and proof to a level of scientific certainty must be made.
11. The purpose of the directly affected test with respect to the *Statement of Concern* process and the Director's decision is to promote good decision-making taking into account a broad range of interests. The process that the Director is engaged in is non-adversarial information collection; collecting information regarding the views and concerns of a broad range of parties to assist in making his or her decision.
12. A more inclusive approach to directly affected by the Director, for the purposes of his or her decision, is entirely appropriate, is to be encouraged, and is in keeping with the purposes of the Act.
13. The Director is required to take into account all of the environmental circumstances in which the proposed activity is to take place prior to issuing an approval. Under the *Environmental Protection and Enhancement Act*, this is consistent with the purposes of the integrity of ecosystems and the principles of sustainable development, the *Statement of Concern* process requesting the involvement of local stakeholders in decision-making, and the requirements to consider the impacts of an activity on the environment and site suitability.
14. In unique (one of a kind) environments, the Director must consider whether standard procedure is applicable, delve deeper into the issue, and answer the question as to how applying the standard procedure, without considering the impacts of other activities, is appropriate.
15. To make an informed and fair decision, the Director should know the permitted levels of impact and should be able to tell potential approval holders, as well as the public, what levels of impacts will be used to determine the feasibility of a project.
16. There must be an unbroken causal connection between the effect of the approval and the impact on the person.
17. The effect must be actual or imminent, not speculative.
18. The person need not prove, by a preponderance of evidence, that he or she will in fact be harmed or impaired by the approved project. The person need only prove a potential or reasonable probability for harm. The potential effect must be within reason and plausible.
19. Economic factors are one way in which a person can be directly affected.
20. The person must show that the approved project will harm a natural resource that he or she uses or will harm his or her use of a natural resource.
21. The more unique the effect, the more likely the person is directly affected.
22. The Legislature did not intend for any member of the public to be allowed to appeal.
23. The effect must be something more than the generalized interest that all Albertans have in protecting the environment.
24. The person need not prove that the personal effects are unique or different from those of any other Albertan or even from those of any other user of the area in question.
25. The severity of the effect may be a consideration in determining if a person is directly affected, but the effect does not have to be "significant."
26. A legal right that is injured is not the only way in which a person can show a proximity between his or her use of resources and the project.
27. The person is more readily found to be "directly affected" if the interest in question relates to one of the policies underlying the Act, i.e., the person's interest is supported by the statute in question.
28. There must be some flexibility and the determination of directly affected will be governed by the particular circumstances of each case.

SOURCES: Preliminary Motions: *Gadd v. Director, Central Region, Regional Services, Alberta Environment* re: *Cardinal River Coals Ltd.* (8 October 2004), Appeal Nos. 03-150, 03-151 and 03-152-ID1 (A.E.A.B.), pp. 15-25, *Court v. Director, Bow Region, Regional Services, Alberta Environment*, re: *Lafarge Canada Inc.* (31 August 2002), Appeal No. 01-096-D (A.E.A.B.), pp. 53-73, and, as cited in these documents,

Alberta Environmental Appeals Board, "Rules of Practice," s. 29, *Bildson v. Acting Director of North Eastern Slopes Region, Alberta Environmental Protection*, re: *Smoky River Coal Limited* (19 October 1998), Appeal No. 98-230-D (A.E.A.B.), *Court v. Alberta (Director, Bow Region, Regional Services, Alberta Environment)* (2003), 1 C.E.L.R. (3d) 134 at paragraphs 67-71 & 75, 2 Admin. L.R. (4d) 71 (Alta. Q.B.), *Kostuch v. Alberta (Director, Air and Water Approvals Division, Environmental Protection)* (1995), 17 C.E.L.R. (N.S.) 246 at paragraphs 28, 33-35, & 38-39 (Alta. Env. App. Bd.), "sub nom. *Martha Kostuch v. Director, Air and Water Approvals Division, Alberta Environmental Protection*" [23 August 1995], Appeal No. 94-017 (A.E.A.B.), *Mizera et al. v. Director, Northeast Boreal and Parkland Regions, Alberta Environmental Protection*, re: *Beaver Regional Waste Management Services Commission* (21 December 1998), Appeal Nos. 98-231-[sic]98-234-D (A.E.A.B.), D.J. Mullen, *Administrative Law*, (Toronto: Irwin Law, 2000), at page 116, *Quimet et al. v. Director, Regional Support, Northeast Boreal Region, Regional Services, Alberta Environment*, re: *Ouellette Packers (2000) Ltd.* (28 January 2002), Appeal 01-076-D (A.E.A.B.), *Paron et al. v. Director, Environmental Service, Northern East Slopes, Alberta Environment* (1 August 2001), Appeal Nos. 01-045, 01-046, 01-047-D at paragraphs 22 & 24 (A.E.A.B.), *Ross v. Director, Environmental Protection* (24 May 1994), Appeal No. 94-003 (A.E.A.B.), *Vetsch v. Alberta (Director of Chemicals Assessment & Management Division)* (1997), 22 C.E.L.R. (N.S.) 230 (Alta. Env. App. Bd.), (sub nom. *Lorraine Vetsch et al. v. Director of Chemicals Assessment and Management, Alberta Environmental Protection*) (28 October 1996), Appeal Nos. 96-015 to 96-017, 96-019 to 96-067 (A.E.A.B.), and *Fred J. Wesley v. Director, Alberta Environmental Protection* (2 February 1994), Appeal No. 94-001 (A.E.A.B.)

Source: Environmental Appeals Board, *Judicial Reviews* (<http://www3.gov.ab.ca/eab/judicial.htm>)

local community. These determinations do not allow people “to think locally and act locally” let alone “act globally.”³⁴

The statement of concern and the determination of directly affected have become linked. As a result, it is unclear what outcomes are to be achieved by statements of concern. Is the purpose to ensure the Director is fully informed about potential issues before making a decision? Or is the purpose to act as a “ticket” to allow some people to participate in the decision-making process?

Potential options:

- Retain the provisions for those directly affected.
- Evaluate the provisions for those directly affected to determine how the provisions make decision-making efficient and effective and protect current and future users and uses.
- Evaluate the provisions for those directly affected to determine if they are achieving the outcomes in *Alberta's Commitment to Sustainable Resource and Environmental Management*.
- Evaluate methods of involving the public in the development of laws and regulations.
- Revise the provisions for those directly affected to improve the efficiency and effectiveness of decision-making and protection of current and future users and uses.
- Eliminate the provisions for those directly affected.
- Change policy instruments to be clear on the purpose of statements of concerns.
- Require the Director to consider all statements of concern received.
- Develop a clear, consistent set of policy instruments for the involvement of the public in regulatory decisions.

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1.2 *Linkages Between Water, Air, and Land Use Decisions*

FOCUSING QUESTION

How are water, air, and land use decisions linked by existing policy instruments?

1.2.1 **Outcome: Water management objectives and priorities to support sustainable economic development are established through watershed plans**

1.2.1.1 Integrating Water, Air, and Land Issues in a Watershed Approach

³⁴ For a different approach to the issue of who has “legal standing,” see Michael M. Wenig, “Can Environmental Law Really Help? An Update from the Trenches,” *LawNow*, February/March, 2006 (<http://www.ucalgary.ca/%7Ecirl/pdf/2006aFebMarWenig.pdf>). The article discusses a recent U.S. court case that allowed people to challenge government actions by showing risks of geographically widespread ecological harms and without having to prove particularized harm to specific people.

Is a watershed approach adequate to integrate water, air, and land issues? ▲

Discussion: It is not clear if a watershed approach is adequate to integrate water, air, and land issues.

A watershed approach encourages people to think about the connections between land and water use decisions. However, as typically conceived, a watershed approach provides general direction. It relies heavily on consultative mechanisms and intensive, sometimes expensive data collection and analysis. Adequate consultation and data collection/analysis may not occur because of the time and expense involved. Consultation and science may also occur at the expense of the other.³⁵

Taking into account land use practices is not automatically part of a watershed plan. Consideration of land use practices must be made a requirement if they need to be covered. Consideration of airborne impacts is seldom required.

A watershed approach does not necessarily result in recommended changes to increase protection and help with enforcement. As well, local-level protection measures and placed-based recommendations for regulatory changes may not result in recognition and action from senior levels of government.

Potential options:

- Do not evaluate the adequacy of a watershed approach in terms of integrating water, air, and land issues.
- Evaluate the adequacy of a watershed approach in terms of integrating water, air, and land issues.
- Establish a watershed approach that will ensure that water, air, and land issues are integrated.
- Require agencies responsible for water and land use decision-making at the federal or provincial level to incorporate considerations of cumulative impacts on air, land, and water.
- Require municipalities to incorporate water and air into their land use planning and decision-making.
- Require provincial agencies responsible for water and land use decision-making to work with stakeholders to initiate and implement placed-based regulations to support watershed management.
- Approach watershed management in terms of biodiversity and integrate water, air, and land decisions on that basis.

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³⁵ Consultation that leads to consensus can help bridge the gap between what we know and what we need to know (see, for example, Upper Elbow River Instream Objectives Working Group, *Report*, 1999). However, there are potential conflicts between consultation and scientific work. Consultation can divert attention, effort, resources, and expectations away from scientific issues and activities. (For a note on soon to be released results in this area, see Conference Board of Canada, *Sustainability : A Winning Merger of Growth and the Environment*, 2006 (<http://www.conferenceboard.ca/boardwiseii/signin.asp>).) As well, science, even if done and explained well, may be so complex, uncertain, or disturbing that it can delay, disrupt, or destroy consensus-building.

1.2.2 Outcome: Alberta has a comprehensive strategy to protect Albertans' drinking water

1.2.2.1 Integration of Water, Air, and Land Under the *Canadian Environmental Quality Guidelines*

Do the *Canadian Environmental Quality Guidelines* integrate water, air, and land? ▲

Discussion: The *Canadian Environmental Quality Guidelines*³⁶ are a combination of measures designed to protect atmospheric, aquatic, and terrestrial resources. They were developed in recognition of the need to protect components of the ecosystem in a more holistic manner and can be valuable tools for addressing bioaccumulative substances and other cumulative effects on the environment.

The *Guidelines* try to address the linkages between water, air, and land, but do not address climate change or cumulative impacts. This is difficult since existing policy instruments such as the *Federal Water Policy*, *Canadian Environmental Protection Act*, and *Environmental Protection and Enhancement Act* do not provide clear direction or regulations to measure and regulate land use/water use/air use in a systematic, cumulative way.

As well, climate change is still an "emerging issue" in Alberta and sufficient progress may not have been made on definitions and targets to allow integration of land and water with climate change issues.³⁷

Potential options:

- Keep the *Guidelines* as they are.
- Determine how the *Guidelines* are being applied in practice in issuing approvals and approving development (e.g., are they used as guidelines or standards, are they used consistently).
- Evaluate the *Guidelines* to determine how effective they are at addressing the linkages between water, air, and land.
- Determine how and to what extent climate change and cumulative effects can be incorporated into the *Guidelines*.

³⁶ *Canadian Environmental Quality Guidelines*, supra n. 3

³⁷ Alberta Environment's position on this issue is: "Climate and streamflow records in Alberta are generally less than 100 years in length. This is a very short time period, relative to the age of the earth. It can be difficult, using this short period of data to characterize how things might compare to the past, whether significant trends can be detected, and if recently observed patterns are driven primarily by natural phenomena or perhaps by human activity. The presence of cycles ranging from roughly decadal (about 10-20 years) to scales of thousands of years can be interpreted from recent and paleo-geologic records. The drivers of these cycles are complex and not well understood. The world's climate has always been changing and it will continue to do so. The current debate over climate change can be better characterized as a focus on whether humans are contributing to an apparent warming trend that has been observed in some places, including Alberta." (Alberta Environment, *Climate Change and Water in Alberta*, 2004 (http://www3.gov.ab.ca/env/water/GWSW/quantity/learn/influence/IF3_climchange.html))

- Revise other policy instruments to provide clear direction or regulations to measure and regulate land use/water use/air use in a systematic, cumulative way.
- Revise the *Guidelines* to include criteria related to climate change and cumulative effects.

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1.2.2.2 Integration of Laws and Other Policy Instruments

Are the laws and other policy instruments well enough integrated to be able to effectively manage water, air, and land issues?

Discussion: There is a wide assortment of laws and other policy instruments and several overlapping jurisdictions to deal with when integrating water, air, and land issues.³⁸ Water quantity and point-source pollution are regulated by a relatively cohesive set of policy instruments, however, the management of non-point pollution does not have a well-defined and unified regulatory framework.³⁹ In particular, there is little integration among the various laws.

In terms of issues such as stormwater and regulation of confined feeding operations, municipalities do not play a direct role in designing and overseeing federal and provincial policy instruments even though they are expected to provide stormwater and support infrastructure and deal with the impacts on the watershed. This limits integration and may reduce the ability to achieve the outcomes in the *Water for Life Strategy*.

Demands on water, air, and land resources are becoming more complex. So are the policy instruments to deal with the demands (e.g., growth management strategies and measures for preservation and protection). It is important to determine who is best able – either in isolation or together – to manage the elimination or reduction of impacts.

It was been suggested that the watershed, airshed, and landscape trilogy is really a diagram of the water cycle and the resulting interconnectedness will need much more attention if outcomes are to be met.

Potential options:

- Keep the current policy instruments as they are.
- Evaluate policy instruments for non-point pollution to determine how effective they are at integrating water, air, and land issues.

³⁸ The laws include the *Agricultural Operation Practices Act*, *Canadian Environmental Protection Act*, *Environmental Protection and Enhancement Act*, *Fisheries Act*, *Forests Act*, *Irrigation District Act*, *Municipal Government Act*, *National Parks Act*, *Public Health Act*, *Public Lands Act*, *Safety Codes Act*, and *Water Act*.

³⁹ See, for example, Alberta Environment, *How is Water Quality Protected* (<http://www3.gov.ab.ca/env/water/swa/#Back4>)

- Evaluate the advantages and disadvantages of the involvement of multiple jurisdictions in water management.
- Revise and better integrate laws and other policy instruments to ensure integration of water, air, and land issues.
- Require management and control to be based on a water cycle model of regulation.
- Provide explicit linkages to climate change issues and targets within an Alberta context so more appropriate management strategies and decision-making can be achieved.
- Define and better integrate shared or overlapping jurisdictions.

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1.2.2.3 Pollution Minimization and Source Water Protection

Do policy instruments minimize pollution at the source and provide sufficient levels of source water protection? ▲

Are existing policy instruments able to address cumulative impacts of point source and non-point source pollution on aquatic health and drinking water safety? ▲

Discussion: Policy instruments such as the *Environmental Protection and Enhancement Act* and the Alberta Government's *Land Use Policies*⁴⁰ are available for use in minimizing pollution at the source. However, they usually do not address source water protection directly because they do not deal with behaviors that may have adverse effects on or about the source. When "source water protection" does occur, the control of behavior is often achieved through devices and technologies which are market-driven. This is an economic consideration and usually has little to do with environmental policy or law.

The *Public Lands Act* prohibits⁴¹

- "any act on public land that may injuriously affect watershed capacity"
- "the disturbance of any public land in any manner that results or is likely to result in injury to the bed or shore of any ... body of water or land in the vicinity of that public land"
- "the creation of any condition on public land which is likely to result in soil erosion"

These prohibitions do not appear to be actively used. There are also significant legal and practical limitations to their application. They could, however, be a tool used for watershed protection.⁴²

⁴⁰ Alberta Municipal Affairs, *Land Use Policies*, 1996 (<http://municipalaffairs.gov.ab.ca/ms/pdf/landusepoliciesmga.pdf>)

⁴¹ *Public Lands Act, RSA 2000*, c. P-40 (http://www.qp.gov.ab.ca/documents/Acts/P40.cfm?frm_isbn=077974764X), s. 54(d)-(f)

⁴² Michael M. Wenig, "The 'Sleeping Giant' of Watershed Protection," *LawNow*, April/May, 2006 (<http://www.ucalgary.ca/~cirl/pdf/2006bAprMayWenig.pdf>). See also Arlene J. Kwasniak, *Alberta Public Rangeland Law and Policy*, Environmental Law Centre, 1993.

Where public land is being used for or is believed to be affected by an activity, it is necessary to have a clear definition of the boundaries of the land and the physical, biological, and human influences on the land.

The effectiveness of measures to control non-point pollution has received a significant amount of attention. It is unclear how policy instruments are or can be translated into effective and sustainable action "on the ground."

Potential options:

- Keep policy instruments as they are.
- Evaluate how current policy instruments, market mechanisms, and other options deal with the behaviors that affect water, air, and land use decisions.
- Determine how policy instruments promote or discourage actions by governments, other organizations, and individuals that make the impact of non-point pollution sustainable.
- Evaluate the advantages and disadvantages of policy instruments for segregating lightly contaminated wastewater from highly contaminated wastewater.
- Revise or supplement policy instruments, including the use of economic instruments, so that minimizing pollution at the source is more effective.
- Develop a market-based approach to managing impacts on watersheds.
- Develop a system of incentives and regulatory measures for controlling impacts on watersheds.

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1.2.3 Outcome: Albertans have the knowledge, tools, and motivation to implement actions that will maintain or improve the province's water resources

1.2.3.1 Promoting Integration of Water, Air, and Land Management

Are policy instruments that promote integration of water, air, and land management sufficiently explicit, financed, realistic, informative, preventative, and followed-up? ▲

Can water pollution (point and non-point source) be dealt with by Alberta Environment as the sole or primary agency responsible? ▲

Discussion: It is unclear if policy instruments are robust enough to give Albertans the knowledge, tools, and motivation to implement actions that will integrate water, air, and land use decisions. The language in policies and other documents is often not explicit and the same words can mean different things.

Coordination between the *Water for Life Strategy* and the *Land Use Framework* will be important. One of the key messages that has emerged from the *Framework's* consultation so far is the need

for integration of the management of water, air, and land.⁴³ Details are not available on how coordination and collaboration between the two initiatives will occur.

Coordination between the *Water for Life Strategy* and the Clean Air Strategic Alliance is also important.

The complexity of water issues may have exceeded the ability of some policy instruments to keep up. Policy instruments also cover different aspects of a problem and, as a result, information cannot be found all in one place. This makes it difficult for the public to become informed and motivated.

The “why” behind policies, laws, etc. are often not well-known or, in some cases, are misunderstood in their interpretation and application. Some policy instruments avoid the problem of when motivation should be “imposed” and when it should come from within. Adequate financing is an ongoing concern.

A recent enforcement action in the Two Hills area⁴⁴ raises the question of why there is not sufficient integration of the processes for managing water and land use to catch problems before they occur. Is it due to a deficiency in policy, application of policy, or perhaps a flawed approval process that does not bring out the necessary technical information required to make a reliable, informed decision? Watershed groups struggle with the need to address mitigation measures to offset the cumulative negative impacts of past decisions, most notably in floodplain and riparian areas. While there are improvements that can be made in water policy, implementation of policy through a diligent and rigorous approval process supported by expert-defined quality assurance/quality control (QA/QC) environmental standards is an essential ingredient in avoiding or reducing environmental damage.

Potential options:

- Retain the current implementation of policy instruments.
- Evaluate current policy instruments to determine where factors ranging from vague language to the complexity of issues are inhibiting the ability of Albertans and policy instruments to provide the knowledge, tools, and motivation necessary to implement actions that will maintain or improve the province's water resources.
- Evaluate the decision-making and regulatory burden of Alberta Environment to determine where responsibility, authority, and resources can be shared or re-assigned to assist in better integrating water, air, and land issues.

⁴³ Alberta Water Council, *Summary Report: Meeting #12*, September 14, 2006 (<http://www.waterforlife.gov.ab.ca/awc/docs/AWCsummaryReportMeeting12.pdf>), pp. 5-6

⁴⁴ Alberta Government, “Alberta Environment orders company to restore flow to altered creek” (<http://www.gov.ab.ca/acn/200609/20576F5A1271E-0A7C-FB62-1F3C3ABEF9B236DA.html>). For recent examples of enforcement activity, see Alberta Environment, *Enforcement of the Environmental Protection and Enhancement Act and Water Act: 1 Jul 2006 – 30 Sep 2006* (http://www3.gov.ab.ca/env/protenf/compliance/pubs/Quarterlyreport_Jul-Sept2006.pdf)

- Develop a concise and accurate glossary of terms.
- Establish total impact criteria (e.g., total maximum daily [pollution] load) for judging the cumulative impacts of decisions and activities.
- Revise policy instruments to ensure that they promote and do not inhibit Albertans from having the knowledge, tools, and motivation to implement actions that will maintain or improve the province's water resources.

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1.2.4 Outcome: Water is managed and allocated to sustain aquatic ecosystems and ensure their contribution to Alberta's natural capital and quality of life is maintained

1.2.4.1 Joint Management of Surface and Ground Water

Should surface and ground water be managed together? ▲

Discussion: In Alberta, ground water is managed separately from surface water unless it is proven that there is a direct hydraulic connection between the aquifer and a surface water body.

Treating ground water separately reduces administrative costs, because administrators can make decisions about surface water without having to analyze aquifers that do not have a direct hydraulic connection. Ground water use is a relatively small use of water in the province and there is currently limited scientific information for evaluating the way ground water use is administered. As a result, existing provincial government decisions are based on the assumption that ground water without a direct hydraulic connection to surface water can safely be managed separately.

Because of the extensive knowledge elsewhere about the interactions between surface and ground water,⁴⁵ the lack of scientific information about ground water in Alberta would be justification, under the precautionary principle, for assuming, until proven otherwise, that ground water is connected to surface water.

Using this assumption, it would not be the government's responsibility to determine that there is a direct hydraulic connection to surface water. Instead, it would be the applicant's responsibility to prove that ground water is not connected to surface water.

If there is not a connection between ground water and surface water, then ground water would be a non-renewable resource, that is, not receiving water from the surface. Ground water could

⁴⁵ See, for example, Thomas C. Winter, Judson W. Harvey, O. Lehn Franke, and William M. Alley, *Ground Water and Surface Water: A Single Resource*, U.S. Geological Survey, Circular 1139, 1998 (<http://pubs.usgs.gov/circ/circ1139/>)

then be treated differently from surface water – although probably with more stringent restrictions because the water in the aquifer would not be replenished.

Potential options:

- Continue to manage surface and ground water separately.
- Evaluate the benefits and risks of managing surface and ground water separately or together.
- Revise policy instruments to manage surface and ground water together.

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1.2.4.2 Defining Instream Needs

Have we gone far enough in defining instream needs? ▲

Discussion: Past efforts to define instream needs have focused on defining flow requirements. More recent methods take a broader approach but, in the absence of comprehensive monitoring and modeling, do not adequately account for contamination that is not flow-dependent (e.g., salts, nutrients, pesticides). These types of pollutants are usually the result of land use practices.

The analysis of instream needs has, among other things, considered the impact of water flow on the land (e.g., the flow needed to support cottonwoods). However, in determining instream needs, less attention has been paid to the impact on flow and water quality of land and its uses (e.g., the impact of reduced vegetative cover on flow and water quality, particularly in riparian zones).⁴⁶

Potential options:

- Continue identifying instream needs based on flow-dependent pollutants.
- Evaluate comprehensive monitoring and modeling techniques to determine if and under what circumstances they are adequate to identify instream needs related to pollutants that are not flow dependent.
- Develop procedures for identifying instream needs related to pollutants that are not flow dependent.
- Develop methods for determining instream needs related to loss of health of riparian lands.

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1.2.4.3 Determining the Bed and Shores of a Water Body

⁴⁶ A fair amount of work has been done on the impact of timber harvesting on flows. This work has focused on the short-term increase in high flow (usually during the spring in places like Alberta) that results when trees are removed. This work may not have accounted for a smaller, but extended decline in flow during other portions of the year that appears to result from timber harvesting. (Alberta Environment, *Assessment of Vegetation Removal as a Water Management Option*, Pekisko-Stimson Water Management Study, 1987)

Should a person qualified in assessing vegetative and soil conditions make the determination of the bed and shores of a water body? ▲

Should the provincial government define terms such as "permanent" and "naturally occurring" in reference to wetlands and other bodies of water? ▲

Discussion: Surveyors currently determine the bed and shores of water bodies. This is less expensive and less cumbersome than alternate methods. As a result, determining the bed and shores may not be done by a person qualified in the assessment of aquatic vegetation and soils.

The bed and shores definition does not take into account the extent of what a water body can include, e.g., a riparian area, a floodplain.

The provincial government owns the bed and shores of permanent and naturally occurring bodies of water, but not the bed and shores of non-permanent or intermittent bodies of water such as some wetlands. These different definitions of what a water body is cause grey areas in legislative jurisdiction and authorization. This, in turn, can create problems in protecting specific wetlands or other water bodies when there is damaging development planned for or near the water body.

Clearly identifying the extent and legal status of water bodies is a key element in determining the public interest and the impact of proposals and activities on people and the environment.

Potential options:

- Continue to have surveyors determine the bed and shores.
- Train surveyors in evaluating vegetative and soil conditions.
- In areas of significant degradation, re-evaluate the demarcation of the bed and shores using environmental criteria.
- Define the terms "permanent" and "naturally occurring."
- Prepare an inventory of provincially-owned bodies of water.
- For proposed activities that need approval, require that the bed and shores be identified based on vegetative and soil conditions.
- For new surveys and re-surveys, require that the bed and shores be determined based on vegetative and soil conditions.
- Begin a program of re-surveying water bodies to either determine the bed and shores based on environmental criteria or establish criteria (e.g., for rivers and streams) that will be applied to claims for Crown ownership of the bed and shores.
- Establish riparian land and equivalent functions that must be protected as provincial resources.
- Align the legal bank definition with the common law definition of natural boundary based on the ordinary high water mark.

- Adopt a definition compatible with the definition of water body in the *Water Act*.⁴⁷

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1.2.4.4 Managing Watersheds to the Same Standard

Should all portions of a watershed be managed to the same standard? ▲

Discussion: Policy instruments tend to treat a watershed as if one size fits all. Yet, the upstream portion of a watershed will have different natural conditions from the downstream end. As well, in the implementation of policies, laws, etc. the condition of a watershed usually deteriorates as you move downstream due to the cumulative impacts from people's activities.

Potential options:

- Keep the current situation as it is.
- Examine policy instruments and their implementation to determine how they result in management or allocation decisions that treat portions of watersheds the same or differently.
- Evaluate policy instruments and their implementation to determine if they are compatible with a watershed approach and contribute to maintaining Alberta's natural capital and quality of life.
- Revise policy instruments and their implementation to create the right mix of criteria for treating different parts of watersheds equally or unequally.

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1.2.4.5 Factual Justification for Integration of Water, Air, and Land

The factual justification for policy instruments that integrate water, air, and land issues needs clarification. ▲

Discussion: Integrating water, air, and land issues is a desirable goal. The connections between water, air, and land, however, need to be clearly understood or integration will remain unachievable. There may not be sufficient information to know what integration of air, land and water issues might or should look like.

Table 3 shows definitions of integrated resource management (IRM) used by the federal and provincial governments. Each definition stresses that IRM will improve management by reducing conflict and being more efficient or effective. Each also stresses that economic and social issues must be considered.

⁴⁷ The *Water Act* (*supra* n. 12, s. 1(1)(hhh)) defines a water body [with some exclusions for irrigation works] as "any location where water flows or is present, whether or not the flow or the presence of water is continuous, intermittent or occurs only during a flood, and includes but is not limited to wetlands and aquifers."

Table 3	
Definitions of Integrated Resource Management	
Government of Canada ⁴⁸	The management of two or more resources in the same area; commonly includes water, soil, timber, grazing land, fish, wildlife and recreation. With this approach, managing each resource together in an integrated way is far more efficient than managing each resource separately, as the management of one resource will affect the management of another in the same area. Social and economic issues are taken into consideration as well.
Government of Alberta ⁴⁹	<p>A way of using and managing the environment and natural resources to achieve sustainable development. Using an IRM approach means that environmental, social and economic issues are considered, while finding ways for all uses to exist together with less conflict.</p> <p>How we manage or use one resource affects the management or use of other resources in an area. Managing each use or resource by itself is less effective than managing all of them in an integrated way.</p> <p>IRM is based on: cooperation, communication, coordination, consideration of all values, and involvement of those potentially affected before action.</p>

The provincial definition stresses that the foundation of IRM is “cooperation, coordination, consideration of all values, and involvement of those potentially affected.” It also notes that those things should occur before action is taken.

The need for integrated management outcomes is supported in many provincial documents.⁵⁰

IRM has been practiced for almost sixty years in Alberta, dating back to the days when the federal and provincial governments established the Eastern Rockies Forest Conservation Board.⁵¹ Integrated management of water with fish, wildlife, and land issues began in the mid-1970s.⁵²

IRM has continued up until the present in various forms. Its application and effectiveness has not been as consistent as advocates would have liked. Various explanations have been offered for its limited success including pressures from individual sectors of society, conflict among those sectors, lack of political support, deregulation, lack of funding, downsizing, lack of follow-up planning, limited use of performance measures to resolve conflict, and lack of clear, integrated policy (with the exception of the *Eastern Slopes Policy*).⁵³

⁴⁸ Environment Canada, “Integrated Resource Management,” *Glossary* (<http://www.ec.gc.ca/cppic/En/glossary.cfm?view=details&id=345>)

⁴⁹ Alberta Environment, *Integrated Resource Management* (<http://www3.gov.ab.ca/env/irm/index.html>)

⁵⁰ Kim Lalonde, *Sustainable Resource and Environmental Management: An Inventory of Provincial Outcome Statements-Final Report*, Alberta Environment, 2006.

⁵¹ Steven A. Kennett, “Reinventing Integrated Resource Management in Alberta: Bold New Initiative or ‘Déjà Vu All Over Again’?” *Resources*, no. 77 (Winter, 2002), Canadian Institute of Resources Law (<http://www.ucalgary.ca/~cir/pdf/Resources77.pdf>), pp. 1-7

⁵² Bow River Basin Council, *Guidebook to Water Management*, 2002 (<http://www.brbc.ab.ca/pdfs/Guidebook.pdf>), p. 251

⁵³ Based on Kennett, “Reinventing Integrated Resource Management,” *supra* n. 51, Steven A. Kennett, “A Checklist for Evaluating Alberta’s New Land-Use Initiatives,” *Resources*, no. 95 (Summer, 2006), Canadian Institute of Resource Law (<http://www.ucalgary.ca/~cir/pdf/Resources95.pdf>), pp. 1-8, and Daniel Farr, Steven Kennett, Monique M. Ross, Brad Stelfox, and Marian Weber, *Al-Pac Case Study Report – Part 2: Regulatory Barriers and Options*, National Round Table

A 2001 Alberta workshop on regional strategies⁵⁴ identified a wide variety of needs related to IRM, including the need for a policy and legislation gap inventory.

If IRM initiatives produce operational rather than policy-level improvements they need to clearly identify how policy instruments are being translated into effective action on the ground and demonstrate how integration produces not just more consistent and coordinated efforts, but better results.

IRM is based on key assumptions:

- collaboration rather than competition among interests is the appropriate process
- institutional fragmentation and incrementalism in decision-making are contributing to unintended and undesirable outcomes
- multiple use is a desirable and achievable goal
- the primary concern is the use and management of resources
- adequate information exists or can be developed for integration to occur
- information is essential to integration.

While these assumptions are worthwhile in theory, they may not be valid when IRM is put into practice. Instead, they must be evaluated in comparison to other assumptions that may be more relevant and integrative for water management. Examples of alternate assumptions are:

- competition (e.g., in the marketplace) and fragmentation (e.g., among interest groups, governments, and agencies) allow choices to be more clearly defined
- incrementalism or "muddling through" is effective because it better integrates planning into day-to-day decision-making and produces results that are relevant and timely⁵⁵
- allocation of resources to a single or dominant use is easier to manage and easier on the environment
- the primary concern is the social and economic needs behind the demand for resources
- information is always inadequate
- common values are the key to integration.

The factual justification is neither conclusive nor clearly defined for either set of assumptions.

on the Environment and the Economy, 2004 (http://www.nrtee-trnee.ca/eng/programs/Current_Programs/Nature/Boreal-Forest/Documents/200407-AIPac-Case-Study/Part2-Regulatory-Barriers/200407-AIPac-CS_Part2_E.pdf)

⁵⁴ Alberta Environment, *Outcomes and Follow-Up From Workshop on Regional Strategies*, 2001 (http://www3.gov.ab.ca/env/irm/docs/Key_messages_of_RS_Workshop_Oct%2026.pdf)

⁵⁵ For an introduction to incrementalism, see Charles Lindblom, "The Science of Muddling Through," *Public Administration Review*, v. 19, no. 2 (1959), pp. 79-88

Potential options:

- Do not clarify the justification for integration of water, air, and land issues.
- Ask subject matter experts where the linkages between water, air, and land are significant enough for integration to be needed and productive.⁵⁶
- Examine policy instruments to determine if they promote integration where it is needed and, at the same time, determine where integration has limited value.
- Revise policy instruments to emphasize or de-emphasize integration of water, air, and land issues.

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1.2.5 Outcome: Water management objectives and priorities to support sustainable economic development are established through watershed plans

1.2.5.1 Criteria for Setting Priorities in the *Framework for Water Management Planning*

Should the *Framework for Water Management Planning*⁵⁷ be more explicit about the criteria to be used in setting planning priorities? ▲

Discussion: The criteria for planning priorities in the *Framework*⁵⁸ provide a list of issues to guide planning. In terms of pressure on the resource, however, the criteria do not include explicit consideration of resource commitments, air and land issues, economic and social issues, provincial and national concerns, and human health. As a result, the *Framework's* priorities may not be compatible with the *Water for Life Strategy*.

⁵⁶ It is anticipated that among the areas where integration is justified are shoreland protection (including lakes, wetlands, riparian areas), management of contaminated sites (including those that will become contaminated), forest management, subdivision development, confined feeding operations, and acid rain.

⁵⁷ Alberta Environment, *Framework for Water Management Planning* (http://www3.gov.ab.ca/env/water/legislation/Framework_Text_Only.pdf - this is the text only version), p. 9 The criteria for setting planning priorities are:

Pressure on the Resource

- What are the present and anticipated demands for water?
- What are the current and projected issues in terms of water quantity, quality, aquatic and riparian (bank or shoreline) habitat and species?
- What is the extent or impact of the pressure:
 - long term or short term;
 - local or regional; or
 - isolated or cumulative?

Public Concern

- Are there human health concerns?
- Are there environmental, economic or social concerns?
- Are the concerns international, national, provincial, regional or local?
- How urgent are these concerns?

Relationship with Other Resources and Initiatives

- Are there other related resource issues?
- Are there other related resource commitments?

⁵⁸ The *Framework* is being revised by Alberta Environment "to incorporate watershed management planning (that is, land management as it affects water quantity and quality)." (*Response to the Recommendations of the Highwood Public Advisory Committee, supra* n. 9, p. 14)

Potential options:

- Keep current criteria.
- Review the criteria to determine to what extent they are compatible with the *Water for Life Strategy*.
- Revise the criteria to ensure compatibility with the *Strategy*.

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Sustainable Economy: [Return to List of Issues](#) (page 11)

1.2.6 Outcome: Albertans have the knowledge, tools and motivation to implement actions that will maintain or improve the province's water resources

1.2.6.1 Integration of Knowledge on Water, Air, and Land Issues

Lack of integration among water, air, and land issues may be due to a lack of integration of knowledge. ▲

Discussion: It may be that knowledge of the linkages among water, air, and land issues and the need for integration are not translated into decision-making practices. For example, knowledge may be lacking about how stakeholders are affected by policies and how planning and decision-making that is not integrated is affecting achievement of outcomes.

There are different aspects of knowledge and how it is used (Table 4). Determining whether knowledge is integrated is not simply about acquiring knowledge. It is about how that knowledge is understood, weighed, and factored into a decision. Lack of integrated decision-making may be due to certain kinds of knowledge being promoted or discounted in ways that hinder the capability to coordinate and strengthen decisions.

How much knowledge is enough is one question that is often answered based on "cultural" attitudes rather than the knowledge itself. A decision-maker may judge that a certain level of knowledge is sufficient because the risks of not making a timely decision outweigh the uncertainty of what is not known. In contrast, an expert on a particular topic may find the same knowledge to be insufficient because the principles of his or her profession are based on a greater degree of accuracy and precision.

The Alberta Government's *Water Research Strategy* identified the following strengths and weaknesses in the Alberta water research system:⁵⁹

⁵⁹ Alberta Science and Research Authority (in collaboration with the Alberta Water Council), *Water Research Strategy*, 2006 (http://www.asra.ab.ca/resources/publications/pdf/2006_water_strategy.pdf), Appendix 1, p. 9

Table 4

Some Aspects of Knowledge

- Knowledge is not just about facts, but about values.
- All knowledge has value.
- Knowledge is managed by groups and individuals.
- Knowledge is managed to serve a role in shaping decision-making, behavior, and resource allocation.
- Knowledge is constructed, validated, and applied within a social context (organization, profession, duty, issue, history, etc.)
- Certain values inform the decision-making process at the expense of others.

Source: Adapted from Dean Nieuwma, *Environmentally Just Disaster Planning: Integrating Whose Knowledge?* Environmental Justice Response Paper, 2006, (http://www.ndsciencehumanitiespolicy.org/katrina/meetings/march%20readings/Nieuwma_EJ_response.pdf) and Tom Schuller, *Integrating Human/Knowledge Capital and Social Capital*, (<http://www.oecd.org/dataoecd/47/36/2074416.pdf>), 2002

Strengths

- investment in the Alberta Ingenuity Center for Water Research
- some world-class researchers, including six Canada Research Chairs
- high participation of Albertan researchers in the Canadian Water Network
- diverse natural laboratory with alpine, boreal forests, woodlands, and semi-arid prairies
- high interest among undergraduate students in environmental engineering and sciences
- creation of the Alberta Water Council
- strong water consulting industry
- extensive on-farm monitoring of environmental conditions

Weaknesses:

- lack of competitive intelligence on new water technologies and best practices in water management
- insufficient long term funding for water research
- limited information on the water research system in Alberta
- lack of co-ordination of the water research system
- weak linkages and poor communication between water researchers, water stakeholders and resource managers
- segmentation of water research by industry
- limited interdisciplinary research
- no comprehensive water science information system
- weak knowledge management and transfer

Policy instruments can be evaluated as to whether they enhance these strengths and reduce the weaknesses.

One of the challenges in environmental decision-making is understanding the interaction between different components of the environment. For example, in agriculture achieving better

understanding requires continuous monitoring, collaboration on data bases and products, development of common standards, and studying the relationship between biodiversity and agriculture.⁶⁰ One way of improving knowledge has been through the National Land and Water Information Service website.⁶¹

Many factors such as globalization, decentralization, and greater access to information make decision-making complex. To achieve integration and effective outcomes, decision-makers need to transcend the specific policies and responsibilities of individual agencies or governments. "One window" approaches do not necessarily achieve integration since their primary purpose is often to increase efficiency.

The Alberta Government has recognized a need for more integrated decision-making. It has shifted from a focus on "command and control" towards more participatory strategies. It uses three horizons to judge its progress: Cross-Government, Regional, and Local Community.⁶²

To address the complexity and unpredictability of the long-term effects of decisions, conclusive scientific evidence is often required, but not available. The provincial government has, at times, involved stakeholders with an eye to pooling different perspectives and developing the knowledge and consensus to proceed with a decision.

The Alberta Government has recognized that, by involving all sectors of society, greater capacity can be developed to move in a more sustainable direction.⁶³ The question is will policy instruments, resources, and the management of knowledge within the decision-making culture enable that to happen.

Potential options:

- Do not look at how knowledge affects decision-making on water, air, and land issues.
- Examine policy instruments to determine where a lack of understanding may be contributing to a lack of integration in decision making.
- Evaluate how knowledge is used in decision-making to determine the processes through which information is analyzed and valued.
- Revise policy instruments to ensure adequate understanding of linkages among and integration of water, air, and land issues.
- Develop effective mechanisms to ensure that existing policies are integrated, consistent, and implemented.

⁶⁰ Agriculture and Agri-Food Canada, *Department Performance Report (2004-2005)* (http://www.tbs-sci.gc.ca/rma/dpr1/04-05/AAFC-AAC/AAFC-AACd4501_e.asp)

⁶¹ Agriculture and Agri-Food Canada, *On-line agri-environmental data, information, tools and expertise to support land-use decision-making*, National Land and Water Information Service (http://www.agr.gc.ca/nlwis-snite/index_e.cfm)

⁶² Keith Leggat, *Shared Environmental Governance*, Alberta Environment Conference, 2006 (<http://www.environment2006.com/PDFs/session33a.pdf>)

⁶³ Beverly Yee, *Alberta's Approach to Community Governance*, Pollution Probe National Water Policy Workshop, 2006 (<http://www.pollutionprobe.org/Happening/pdfs/waterpolicyworkshops/workshop1/byee.pdf>)

- Build skills and resources to strengthen integrated knowledge, planning and decision-making capabilities.

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1.2.7 Outcome: Water is managed and allocated to support sustainable economic development and the strategic priorities of the province

1.2.7.1 Responsibility for the Full Life Cycle of Each Natural Resource Project/Activity

Will water, air, and land use decisions be better integrated under the proposal to “assign the responsibility, authority and accountability for the full lifecycle of each natural resource project/activity to a single regulator”?⁶⁴

Discussion: A single regulator approach may reduce complexity and improve transparency and accountability. There may be more streamlined, efficient and effective delivery of regulatory processes. There may also be improved delivery of regulations, an improved business climate, reduced cost of regulatory requirements over time, and maintenance of Alberta's environmental standards. A single regulator approach may encourage development of cross-ministry policy and appears compatible with improved public involvement.

It is unclear how regulation of projects affecting multiple resources will improve. There is no responsibility identified for management of air issues or proposals affecting private land.

The Environmental Appeals Board would be replaced with three unintegrated appeal processes managed by decision-making agencies.

If the proposal is a significant departure from current coordination, integration of water, air, and land issues may be reduced because development of policy within individual agencies is strengthened and “collaboration” replaces the competition that identifies conflicts that require improved direction from deputy ministers, Cabinet, or the Legislature.

The proposal is based on the premise that the provincial government is committed to “sound environmental protection”⁶⁵

⁶⁴ Vance MacNichol, *A Proposal for Regulating Resource Development*, 2002 (<http://www3.gov.ab.ca/env/dept/reports/RegReviewReport.pdf>). The need for this reform has been recognized by Alberta Environment, but is currently being held in abeyance. As a follow-up to this report, the Alberta Government's Ministries of Energy, Sustainable Resource Development, and Environment have embarked on the *Sustainable Resource and Environmental Management* (SREM) initiative to strengthen the ways they work together and take joint responsibility to achieve agreed-upon natural resource and environmental outcomes (<http://www.srem.gov.ab.ca/index.html>). SREM projects are the *Upstream Oil and Gas Policy Integration Project* (http://www.srem.gov.ab.ca/oil_and_gas.html), the provincial government's *Land Use Framework* (<http://www.srem.gov.ab.ca/luf.html>), and the *Information-Sharing Initiative* (http://www.srem.gov.ab.ca/info_sharing.html).

rather than the clearer and more stringent principles that “the use of Alberta’s natural resources shall be sustainable” and “Alberta’s environment shall be protected.”⁶⁶

Potential options:

- Continue to hold the proposal in abeyance as regulatory reform is looked at in “a much broader and more strategic context.”⁶⁷
- Evaluate the proposal to determine how it supports integration of water, air, and land issues, sustainable development, and the strategic priorities of the province.
- Develop a clearer, more operational definition of “sustainable natural resource use” to ensure that water is managed and allocated to sustain economic development.
- Adopt the proposal.
- Discard the proposal.
- Revise the proposal to ensure it supports integration of water, air, and land issues, sustainable development, and the strategic priorities of the province.

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Sustainable Economy: [Return to List of Issues](#) (page 12)

1.3 Compliance

FOCUSING QUESTION

How does compliance happen with existing policy instruments?

1.3.1 Outcome: All Outcomes

1.3.1.1 Contribution of the Monitoring and Compliance System

Should the contribution of the monitoring and compliance system to achieving the outcomes in the *Water for Life Strategy* be explored? ▲

Discussion: Watersheds with good water use records and anticipatory compliance may be able to sustain a higher level of water use or wastewater discharge without suffering undesirable consequences. It is unclear to what extent existing policy instruments for compliance and monitoring contribute to or inhibit achieving the higher level of reliable, quality water supplies anticipated in the *Water for Life Strategy*.

⁶⁵ MacNichol, *supra* n. 64, p. 5

⁶⁶ *Alberta’s Commitment to Sustainable Resource and Environmental Management*, *supra* n. 33, p. 4

⁶⁷ Alberta Environment, *How we will continue to be a leading edge jurisdiction for the 21st century* (http://www3.gov.ab.ca/env/dept/strat_direction.html)

Potential options:

- Do not examine the contribution of the monitoring and compliance system.
- Quantify the expectations for a higher level of reliable, quality water supplies as outlined in the *Water for Life Strategy*.
- Evaluate current policy instruments to determine if monitoring and compliance are capable of achieving those expectations.
- Conduct an independent audit of the monitoring and compliance system.
- Revise the *Strategy* or policy instruments to ensure that monitoring and compliance will be able to succeed.

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1.3.2 Outcome: Alberta has a comprehensive strategy to protect Albertans' drinking water

1.3.2.1 Guidelines or Standards for Raw Water

Should guidelines or standards be developed for the quality of raw water⁶⁸ that is withdrawn for human consumption? ▲

Discussion: No federal or provincial guidelines or standards are in place for raw water that is withdrawn to be used for human consumption.⁶⁹ The *Canadian Environmental Quality Guidelines* provide criteria for water quality after it is treated, but do not provide criteria for water quality before treatment.

Criteria for the quality of water in rivers, lakes, and other water bodies are valuable to be able to anticipate and prevent problems before they occur. Criteria for the quality of raw water also allow trade-offs to be made between eliminating sources of pollution vs. upgrading treatment capability before a watershed changes to the point where upgrading treatment is the only option.

If guidelines or standards for raw water are considered, it is important to decide what would happen if the guidelines or standards are not met.⁷⁰

Potential options:

- Do not develop drinking water guidelines or standards for raw water supply.

⁶⁸ Raw water is the water in rivers, lakes, reservoirs, canals, aquifers, and other water bodies before it is diverted and treated for people to use.

⁶⁹ Some guidelines that relate to raw water exist to ensure that the proper level of treatment is implemented (e.g., see United States Environmental Protection Agency, *Guidance Manual for Compliance With the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources*, 1991). In one case, a public advisory committee recommended to Alberta Environment that instream water quality objectives for municipal water supply be adopted for the upper Elbow River. (See Upper Elbow River Instream Objectives Working Group, *supra* n. 35, Appendix B.)

⁷⁰ In the case of the upper Elbow River, the recommended objectives were designed to identify developing problems and, if warranted, result in immediate action to remedy the situation.

- Evaluate the benefits of developing or not developing guidelines or standards for raw water.
- Develop guidelines or standards that will ensure that problems are anticipated before they occur and alternatives to upgrading treatment capability can be evaluated and, if necessary, acted upon.
- Require that watershed plans develop guidelines or standards for raw water.
- Develop source water protection plans.

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1.3.3 Outcome: Albertans have full and complete knowledge of drinking water issues

1.3.3.1 Knowledge, Tools, and Motivation for the Unreasonable and Uninformed

Should a focus of policy instruments for drinking water protection be on how they provide knowledge, tools, and motivation for the unreasonable and uninformed?⁷¹ ▲

Discussion: The latest report of the Auditor General of Alberta emphasizes the need for better compliance in providing safe drinking water.⁷² The Auditor General found that Alberta Environment's systems for safe drinking water are well-designed. Improvements are needed in the areas of:

- integrating the goals of the *Water for Life Strategy* into the existing drinking water program by, among other things, making sure policy instruments support the *Strategy*
- better use of systems so they operate as designed, including
 - more rigor in approval writing such as greater standardization across the province, more training, more quality assurance, and ensuring that short-term approval conditions are followed-up
 - more risk-focused inspections with more consistent and prompt documentation and reporting, better documentation including follow-up work needed, and all *Environmental Protection and Enhancement Act* drinking water facilities inspected as frequently and thoroughly as municipal waterworks facilities

⁷¹ The phrase "unreasonable and uninformed" is used here because reasonable and informed people – although they may make mistakes – will be trying to do the right thing. As was evident after the Walkerton tragedy, it is the unreasonable or uninformed who are the most dangerous. (See Bob Morrison, "Indentured Servants, Proof of Innocence, and Mark Twain's Cat: Lessons from the Walkerton Tragedy," *Moving Beyond Now*, v. 1, no. 5 (August, 2005), p. 17). What is "reasonable" is something for society to determine through government, the market, schools, religious organizations, or other means. (See Bob Morrison, "Civilized Ill-Will, Self-Evident Rationality, Faith-Based Consent, and Selfless Authoritarianism: Definitions of Decision-Making," *Moving Beyond Now*, v. 1, no. 3 (July, 2004), pp. 4-5 and "Aesop's Fables, Informed Consent, and Social Engineering: The Trouble With Risk Analysis," *Moving Beyond Now*, v. 1, no. 2 (May, 2003), pp. 13-16)

⁷² *Annual Report of the Auditor General of Alberta: 2005-2006* (<http://www.oag.ab.ca/pdf/ar2005-06volume1.pdf>), pp. 25-61

- expanded communication with municipalities, regional health authorities, and (on federal land) Health Canada
- encouraging training of more certified waterworks operators for small towns and rural areas
- updating operator certification exams
- improving the ease in using the department's information management system to eliminate the numerous small information systems that administrators have developed

Although Alberta has a different regulatory system, several of the operational factors noted by the Auditor General are similar to the elements that played a role in the Walkerton tragedy. Among those elements were: lack of training, quality assurance, and short-term follow-up, lack of frequent, risk-focused inspections, poor documentation and communication with operators, municipalities and health authorities, unqualified operators, and a cumbersome information management system.⁷³

Managing water quality presents many engineering and technological challenges. However, knowledge is a dominant concern in water quality management. Water quality programs and infrastructure need answers to fundamental questions such as:

- How does a contaminant affect people and the environment?
- What are the acute and chronic thresholds of contamination?
- What are the cumulative effects of combinations of contaminants?
- What level of risk or, conversely, level of safety should be built into standards and guidelines?
- Can unacceptable levels of contamination be measured?
- Can it be determined, among the causes of contamination, which ones should and can be controlled?
- Can people (experts or otherwise) be adequately educated to understand the consequences of their actions, implement corrective action, and know beforehand who will be affected if something goes wrong?

Potential options:

- Do not consider the impact of policy instruments on the unreasonable and uninformed.
- Determine which changes are being made to Alberta Environment's drinking water systems.

⁷³ The Honourable Dennis R. O'Connor, *Report of the Walkerton Inquiry, Part One: The Events of May 2000 and Related Issues*, Queen's Printer for Ontario, 2002, (http://www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/part1/WI_Chapter_09.pdf) and Part Two, *supra* n. 4

- Evaluate the changes to determine how they will assist in achieving the outcomes of the *Water for Life Strategy* and safe drinking water for Albertans.
- Implement changes to policy instruments to ensure that the *Strategy's* outcomes and safe drinking water are achieved.

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1.3.4 Outcome: Water is managed and allocated to sustain aquatic ecosystems and ensure their contribution to Alberta's natural capital and quality of life is maintained

1.3.4.1 Capability and Capacity to Ensure Compliance

Does the water management system have the capability and capacity to ensure compliance in water management and in other areas of resource management such as air and land use management? ▲

Discussion: Alberta Environment has decided to move from “being a traditional regulator to taking a strategic approach to managing the environment.” This entails five strategic shifts:⁷⁴

- government-wide vision and shared implementation across ministries (shared goals and integrated environmental policies)
- shared responsibility (work collaboratively)
- place-based approaches⁷⁵ (integrate demands on resources, take into account cumulative effects in decision-making and choose management practices based on environmental boundaries, the best place for making decisions is in the watershed)
- more comprehensive, flexible regulatory and non-regulatory tools and incentives (encourage, support and reward effective environmental performance)
- continuous improvement in environmental performance and accountability (continuously monitor and improve all environmental standards, practices and outcomes).

It is thought that regulatory changes alone will not solve the challenges faced by Alberta Environment. The reasons for the strategic shifts are⁷⁶

- continued economic and population growth

⁷⁴ *How we will continue to be a leading edge jurisdiction for the 21st century*, supra n. 67 and Alberta Environment, *Business Plan 2005-08* (<http://www.finance.gov.ab.ca/publications/budget/budget2005/envir.pdf>), p. 217. Along with Alberta Environment, the Ministries of Energy and Sustainable Resource Development have agreed to similar principles. See *Our Commitment to Sustainable Resource and Environmental Management, 2006* (http://www.srem.gov.ab.ca/pdf/Signed_Charter1.pdf) and Yee, *Alberta's Strategy for Sustainability*, supra n. 15

⁷⁵ For a discussion of place-based approaches, see Michael M. Wenig, “Making Sense of New Terms,” *Law Now*, October/November, 2005 (<http://www.ucalgary.ca/~cirj/pdf/2005dOctNovWenig.pdf>)

⁷⁶ *How we will continue to be a leading edge jurisdiction for the 21st century*, supra n. 67 and Yee, *Alberta's Strategy for Sustainability*, supra n. 15

- increasing complexity of environmental issues
- rising public expectations
- need for better information
- ability to control environmental outcomes⁷⁷
- traditional systems
- unsustainable staff workloads.

It is unclear what these strategic shifts mean in theory or in practice.⁷⁸ It is unclear what a traditional regulator is and what not being one means. It is unclear if (or to what extent) Alberta Environment will continue being a traditional regulator. It is unclear how the strategic shifts increase the ability to deal with the pressures and thereby improve management and allocation to protect people and sustain aquatic ecosystems and economic development. Initiatives similar to the strategic shifts have been in place for a number of years.⁷⁹ The reasons for the strategic shifts are not new.⁸⁰ The common denominator underlying the need for the strategic shifts would seem to be lack of funding.

Traditional deterrence-based compliance of fines, penalties, etc. is generally more effective than voluntary compliance. Voluntary compliance can work well when rewards are provided for good behavior and where the primary obstacle to compliance is people's lack of knowledge about how to meet requirements.⁸¹

Potential options:

- Continue with the strategic shifts.
- Clarify what the strategic shifts mean (shift from conceptual ideas to specific decision-making frameworks)
- Clarify how the strategic shifts will improve management and allocation to protect people and sustain aquatic ecosystems and economic development.
- Determine how compliance activities have changed and will change and evaluate the effectiveness of the changes.
- Evaluate the reasons for the need to implement the strategic shifts.

⁷⁷ Alberta Environment estimates that it only regulates 70% of the activities that affect water (Yee, *Alberta's Strategy for Sustainability*, supra n. 15)

⁷⁸ For a discussion of the related concept of smart regulation, see Michael M. Wenig, "What's Smart about Ignoring Cumulative Environmental Effects?" *LawNow*, April/May, 2005 (<http://www.ucalgary.ca/~cirl/pdf/2005bAprMayWenig.pdf>). For a review of and proposal on smart regulation prepared for the federal government, see External Advisory Committee on Smart Regulation, *Smart Regulation: A Regulatory Strategy for Canada*, 2004 (<http://www.regulatoryreform.com/pdfs/Canada%20Smart%20Regulation%20Report%20Sept%202004.pdf>)

⁷⁹ See as examples, *Alberta's Commitment to Sustainable Resource and Environmental Management* [Government-wide vision & shared implementation], Alberta Government, *Alberta's Environment: Toward the 21st Century* (c. 1991) [shared responsibility], *Water Act (1999)*, *Environmental Protection and Enhancement Act (1992)*, & *Framework for Water Management Planning* (c. 2000) (and predecessors) [place-based approaches], *Water Act (1999)* & *Environmental Protection and Enhancement Act (1992)* [more flexible regulatory & non-regulatory tools & incentives], and all programs [continuous improvement].

⁸⁰ For example, "The need for monitoring and inventory programs in Alberta is increasing due to a strong economy and prosperity in the province. Government will meet this significant challenge through continued data collection, monitoring and assessment as well as through continued collaboration and partnerships." ("Strategy for the Protection of the Aquatic Environment," *Framework for Water Management Planning* (http://www3.gov.ab.ca/env/water/legislation/Framework_Text_Only.pdf), p. 24)

⁸¹ *Report of the Walkerton Inquiry*, Part One, supra n. 72, Chapter 9, pp. 324-327 and Terri Breitman, David Clarke, Wayne Jackson, Neil McNeil, and Bob Morrison, *Scoping of Non-Storage Options*, Highwood Management Plan, 2001, p. 27

- Abandon the strategic shifts.
- Revise the strategic shifts and the regulatory role of Alberta Environment to ensure that management and allocation protect people and sustain aquatic ecosystems and economic development.

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1.3.4.2 Funding

How has funding changed? ▲

Is funding adequate? ▲

Discussion: It is a challenge to provide accurate and precise information on how funding for water management has changed and whether or not funding is adequate.

A preliminary effort was made for this project to identify how funding has changed since 1991.⁸² The methodology is explained in Appendix E. All data are estimates.

Information was gathered from annual reports, the Municipal Financial Information System, and, in a few cases, other sources.

In most cases, it was not possible to separate expenses on water management from other environmental management expenses.

The indicators that would allow funding to be evaluated directly are:

- willingness of Albertans (as water users, taxpayers, etc.) to pay for goods or services provided by the provincial government in the areas of water and environmental management
- the amount of money required to provide water and environmental goods and services at specified levels of quantity, quality, and timeliness
- outcomes that can be related to year-by-year expenditures.

Information to develop these indicators could not be gathered during the time frame for this project.

Instead, more general and indirect indicators were developed. These are change in:

- provincial population
- inflation
- government revenue

⁸² Data prior to that year were not adequate to obtain a realistic and consistent comparison of expenses. Even then some data corresponding to Fiscal Year 1991-1992 were not available.

- the provincial economy

The results are summarized in Table 5. Funding has been lower than would have been expected based on the indicators. This result can be interpreted different ways. A definitive answer would depend on being able to develop one or more of the direct indicators mentioned above.

Potential options:

- Do not continue with this analysis.
- Refine the data on expenses.
- Develop direct indicator(s) for evaluating the adequacy of expenses.

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1.3.5 Outcome: Albertans have the knowledge, tools and motivation to implement actions that will maintain or improve the province's water resources

1.3.5.1 Proactive Monitoring and Compliance

Is water use monitoring and compliance proactive enough to protect current and future users and uses? ▲

Should it be a requirement that the Director can only issue an approval or licence or approve a transfer if the monitoring and compliance system has the ability to protect current and future users and uses by delivering immediate, fact-based resolution of water use conflicts? ▲

Discussion: "Enforcement of provincial environmental legislation is the duty and responsibility of Alberta Environment. This it does to the best of its ability, subject to available resources and priorities ... Community involvement and support is essential in identifying unauthorized water use."⁸³

Alberta Environment's current monitoring and compliance efforts target the highest priority problems. This reduces costs and encourages shared responsibility with Albertans. Intensive monitoring and compliance targeted at trouble spots is consistent with a watershed approach because it addresses the highest priority problems. Efforts are made in collecting and verifying water use and wastewater discharge data to reduce administrative costs and the paperwork burden on licensees and administrators.

Relying to a large extent on complaints is not proactive. It allows problems to develop rather than nipping them in the bud. Low priority on data collection and verification does not produce sound scientific data or allow decision-makers to make informed

⁸³ Response to the Recommendations of the Highwood Public Advisory Committee, *supra* n. 9, p. 8

		Total Funding as a Proportion of Extrapolated Funding Based on Indicator Rate		
Component	Period	Indicator: Population Growth (low Indicator)	Indicator: Growth in Gross Domestic Product (high Indicator)	Notes
		Annual Growth Rate 1.7%	Annual Growth Rate 8.1%	
Functions currently within Alberta Environment	Fiscal Year 1991/92 to Fiscal Year 2005/06	.75	.46	Funding fluctuates noticeably from year- to-year.
Functions currently within Alberta Sustainable Resource Development (excluding forest protection and wildfire suppression)	Fiscal Year 1991/92 to Fiscal Year 2005/06	.59	.37	Forest protection and wildfire suppression excluded because of uncertainty about wildfire suppression expenses.
Parks and protected areas functions	Fiscal Year 1991/92 to Fiscal Year 2005/06	.79	.49	
Provincial grants to municipalities for water management infrastructure	1992-2005	.84	.54	
Irrigation Rehabilitation Grants to Irrigation Districts	1991-2005	.92	.57	

decisions about compliance tools and techniques. Basins or aquifers with good water use records and anticipatory compliance/watermastering may be able to sustain a much higher level of water use and wastewater discharge.

The need for monitoring and compliance is reduced if those responsible for monitoring and compliance are involved well before an approval or allocation is granted.

This is particularly true in terms of protecting people's health. The Regional Health Authorities (RHAs) are responsible for enforcing the *Public Health Act* in circumstances where the public's health is at risk, e.g., with water borne outbreaks. The RHAs' roles need to be clearly articulated in all processes that may impact on ground water, wells, and watersheds. Even though other agencies may have lead roles in approvals and operations, an RHA becomes the lead in managing water borne disease events. RHAs would benefit from better involvement in decisions that could lead to health problems so those problems can be avoided.

Effective monitoring and compliance requires reliable information on actual water use.⁸⁴ Water licences provide information on the

⁸⁴ There are also concerns about the reliability of information on wastewater and contaminants. However, it was not possible to examine that issue within the time constraints for this project.

maximum volume of water that can be diverted, but not all licensees use their full entitlement in any given year. There is good information on actual water use by most large water users such as irrigation districts, large cities, and major industrial users. However, information on the amount of water withdrawn and consumed is limited for most licensees, registrants, and other water users.

While Alberta Environment recently implemented a system of electronic reporting of all licensed water users, this data base contains limited data on current water use and does not include historical records. In addition, monitoring of return flows by water users is usually restricted to large users and some water users regulated under the *Environmental Protection and Enhancement Act*. In light of data limitations, attempts to estimate water use are fraught with assumptions and imprecision.⁸⁵

The lack of reliable water use records even affects our estimates of surface water supply. Called "natural flow,"⁸⁶ surface water supply is calculated after the fact by, among other things, adding the amount of water thought to be consumed to the amount of water measured in a water body.

The calculation of natural flow can usually be done fairly accurately for a large watershed such as the South Saskatchewan River Basin since water use by large users is normally well monitored. However, in smaller watersheds, the estimate of water supply varies depending on the assumptions that must be made in the absence of data on actual use. For example, natural flow will be overestimated, likely by a significant amount, if water consumption is calculated using licensed volumes. The variation in water supply estimates is typically most dramatic during the most critical time of year – late summer when flow is low and demand is high.

There is only rudimentary understanding of how changing behavior by water users, particularly in reaction to policy instruments, will affect monitoring and compliance. For example, water allocation transfers may put additional strain on the system of monitoring and compliance by breaking up larger licences into many smaller allocations. Measurement and enforcement would be more complex and labor-intensive.⁸⁷

⁸⁵ For a discussion of the data base on water use, see Watrecon Consulting, *People to Water, Water to People*, Alberta Institute of Agrologists, 2005, pp. 12-13. For examples of the difficulties involved in estimating water use with existing data, see Hydroconsult and Canadian Resource Economics, *South Saskatchewan River Basin: Non-Irrigation Water Use Forecasts*, Alberta Environment, 2002, Alberta Environmental Protection, *Consumptive Demand Analysis: Highwood River Diversion Plan*, 1993, Joe Lennon, *Highwood and Sheep Rivers: Estimation of Historical Consumptive Water Use: 1950-1988*, Alberta Environmental Protection, 1993, and Alberta Environment, *Milk River Basin Study: Consumptive Use of Water – Methodology Update*, 1990

⁸⁶ Natural flow is the amount of water that would have been in a river, lake, or other water body if there had been no diversion or addition of water by people.

⁸⁷ Watrecon, *supra* n. 85, p. 19

Where data on water use are not reliable it is difficult for the Director to determine if a decision to issue a licence or approve a transfer will have undesirable consequences. As well, those responsible for monitoring and compliance may not be able to deliver efficient regulation because of the combination of lack of data, reliance on complaints, and limited understanding of people's responses – particularly during a shortage.

Potential options:

- Continue current practice.
- Determine how current monitoring and compliance protect current and future users and uses.
- Modify current monitoring and compliance practices to ensure protection of current and future users and uses.
- Determine if current policy instruments allow the Director to evaluate the capability and capacity of monitoring and compliance and base a decision on that capability/capacity.
- Modify policy instruments to ensure that the Director can base a decision on the capability/capacity of monitoring and compliance.
- Require the Director to evaluate the capability and capacity of monitoring and compliance before a decision is made.

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1.4 Long-Term Water Supply

FOCUSING QUESTION

How does existing policy deal with potential long-term water supply changes?

1.4.1 Outcome: All Outcomes

1.4.1.1 Inclusive, Comprehensive, and Forward-Thinking Water Management

The capability of water management to be inclusive, comprehensive, and forward-thinking needs to be examined in terms of identifying and dealing with potential long-term water supply changes. ▲

Discussion: Surface water supply is variable and difficult to predict.
Knowledge about ground water supply is generally poor.

Potential options:

- Do not examine this issue.
- Review what is known about estimated long-term change in water supply.
- Examine how policy instruments enable decision-makers and others to be inclusive, comprehensive, and forward-thinking in their efforts to cope with the uncertainty of future water supply.

- Revise policy instruments to ensure that water management is sufficiently inclusive, comprehensive, and forward-thinking to be able to identify and deal with long-term water supply changes.
- Require water supply projections on the potential impact of climate change to be incorporated into decision-making.

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1.4.1.2 The Same Issues Keep Coming Up

Is it inevitable that the same issues keep coming up? ▲

Discussion: In the early 1990s, Alberta Environment began the *Challenges for the Future* initiative to develop new water management policies and legislation. The initiative led to the passage of the *Water Act*.

A wide variety of issues were considered at that time (see Appendix D). To a large extent, those issues are the same as the issues identified in this document.⁸⁸

In reading through the list of issues in Appendix D, it is apparent that many of them influenced the provisions that were included in the *Water Act*. The *Water for Life Strategy* has also been influenced by the same issues. In particular, the *Strategy* has created a series of partnerships for dealing with outstanding issues. This includes the Alberta Water Council.

Although the *Water Act* and the *Water for Life Strategy* were influenced by the same issues, there are still concerns that the issues remain contentious and unresolved in terms of, among other things, Alberta's ability to cope with long-term water supply changes.

People want clear, firm direction on how water should be managed. Yet there is significant uncertainty surrounding fundamental policy instruments such as drinking water guidelines, the concept of sustainability, economic instruments, watershed plans, the watershed approach, floodplain management, the definition of the aquatic ecosystem, and the definition of who is directly affected.

This uncertainty, in part, can be traced back to a lack of consensus on issues. Although people want clear, firm direction on how water should be managed, they differ on what that direction should be.

⁸⁸ *Challenges for the Future* provides examples of issues that re-occur. Other initiatives that dealt with similar issues could also be cited such as Canadian Water Resources Association, Alberta Branch, *Building a National Freshwater Strategy: Alberta's Perspective*, 2000 (http://www.cwra.org/About_CWRA/CWRA_Branches/Alberta/Alberta_Events/Alberta_CWRA_2000_Report.pdf), the Task Force on Future Environmental Directions for Alberta (1993-1995), Bow River Water Quality Task Force (1990-1991), Environmental Legislation Review Panel (1991), Inquiry on Federal Water Policy (1984-1985), and South Saskatchewan River Basin Planning Program (1980-1984).

Numerous efforts have been made to involve the public in finding mutually advantageous ways to achieve greater certainty.⁸⁹ These efforts have produced results, but uncertainty still remains.

The partnership framework established under the *Water for Life Strategy* offers much promise for being able to create greater consensus and certainty. However, the inclusion of watershed planning and advisory councils and watershed stewardship groups was not new, but rather official recognition by the provincial government of the roles that were already being played by groups at the local and regional level. As well, the Alberta Water Council is filling a niche once filled by the Alberta Water Resources Commission and the Environment Council of Alberta, both of which were disbanded.

Trying to reach consensus about managing water is an attempt to define what is in the public interest.⁹⁰ This is not an easy task.

In the United States, a "public trust doctrine" is often used in making water management decisions.⁹¹ Under that doctrine, some natural resources are held in trust for all citizens, must be managed in the interests of all, and, in some cases, can not be privately owned.

The uses of water and land that are protected by the public trust doctrine vary from state-to-state. They can include rights to navigation, commerce, fishing, hunting, swimming, and having land left in its natural state. The application of the public trust doctrine in water management varies from state-to-state and is not universal.⁹²

Cooperative management can be a way of arriving at a common view of the public interest. Cooperative management involves joint action (acting in concert) and/or joint administration (administering "interests, rights, responsibilities, and risks in a unified

⁸⁹ Examples of these public involvement efforts are the *Water for Life Strategy, Challenges for the Future*, Environmental Legislation Review Panel, Task Force on Future Environmental Directions for Alberta, *Water Management Plan for the South Saskatchewan River Basin*, South Saskatchewan River Basin Planning Program, Bow River Water Quality Task Force, and the Highwood Management Plan (Phase 1) Public Advisory Committee.

⁹⁰ The public interest often depends on the situation and the trade-offs involved. There are some general aspects of the public interest which do not change. The definition of the public interest used here is "the protection and promotion of a community's goals through rule-based resolution of conflict while respecting human rights." (Morrison, "Civilized Ill-Will," *supra* n. 71, p. 3)

⁹¹ For a brief discussion of the public trust doctrine, see *Public Trust Doctrine* (http://en.wikipedia.org/wiki/Public_trust_doctrine)

⁹² For example, in California, the State Water Resources Control Board is required "to perform a balancing test to weigh the potential value to society against the impact on trust resources of a proposed or existing diversion. The action which will feasibly protect public trust values must be implemented." (*Information Pertaining to Water Rights in California* – 1990 (http://www.waterrights.ca.gov/application/forms/infobook.htm#_Toc442697738)). In contrast, Colorado "does not have a 'public trust doctrine,' like some states, nor is 'the public interest' a factor considered in adjudicating a water right." (Jim Lochhead and Avra Morgan, "Statutory Framework for Drought Management in Colorado," *Drought & Water Supply Assessment*, Colorado Water Conservation Board, Chapter 5 (http://cwcb.state.co.us/Conservation/Drought/Drought_Water/pdf/Chapter%205.pdf), p. 2)

manner"). The ingredients that can make for effective cooperation are:⁹³

- "a disaster or crisis
- financial stress
- shared values
- a 'political constituency for cooperation'
- financial or technical assistance programs designed to build capacity
- early and continuing support by local officials and community leaders
- clear advantages of participating
- 'policy entrepreneurs' who promote partnerships
- early focus on visible and effective strategies
- emphasis on 'collaborative skills-building'
- an integrated view of the system
- respect, trust, high standards, and realistic expectations."

Potential options:

- Continue with current policy instruments.
- Evaluate current and past policy instruments to determine how they contribute to a water management "culture" that is successful at resolving issues.
- Revise policy instruments to ensure that water management issues are successfully resolved so that, among other things, long-term water supply changes can be managed effectively.
- Extend the shared responsibility, outcome-based, and collaboration principles in the *Water for Life Strategy* to include principles of shared authority, science-based, and consensus.

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1.4.1.3 Ownership of the *Water for Life Strategy*

Who should the *Water for Life Strategy* belong to?

Discussion: The *Water for Life Strategy* sets out the Alberta Government's desired outcomes and its approach for achieving those outcomes. It relies heavily on partnerships and shared responsibility to make the *Strategy* a success.

People have praised the *Strategy* and support its implementation through their activities. However, the *Strategy* only "belongs" to the provincial government. Without a strategy that all interests have bought into, the ability to accomplish what the provincial government wants may be inhibited. Moreover, others may not have the opportunity to "raise the bar" to influence what the provincial government can do. This is a significant concern for the efficiency and effectiveness of water management, particularly in

⁹³ Breitman, et. al., *supra* n. 81, pp. 14-20

the area of dealing with potential long-term water supply changes.

Potential options:

- Keep the *Water for Life Strategy* as a provincial government document.
- Have other organizations create their own “water for life strategies.”
- When the *Water for Life Strategy* is revised, require it to be a strategy agreed to by the public and the provincial government.
- Adopt an approach to “owning” the *Water for Life Strategy* that is similar to the Clean Air Strategic Alliance which sets priorities and agrees on initiatives for air quality management.⁹⁴

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1.4.2 Outcome: Alberta’s drinking water infrastructure meets emerging standards and is managed for long-term sustainability

1.4.2.1 Identifying Emerging Standards

How are emerging standards identified? ▲

Discussion: Traditionally, the provincial government has identified new standards by examining and comparing its standards to what other jurisdictions, most notably the United States and other provinces, are doing.⁹⁵ Alberta Environment, however, has committed to being a leading-edge jurisdiction.⁹⁶ This will require taking the initiative rather than reacting to what others are doing in many areas including dealing with the impacts of a changing climate and with pollutants such as pharmaceuticals and their by-products.

Potential options:

- Continue the tradition of identifying new standards by examining what other jurisdictions are doing.
- Determine what is required to be a jurisdiction that develops new standards, particularly in terms of dealing with potential changes in long-term water supply.
- Evaluate current policy instruments to determine how they contribute to identifying emerging standards and developing new ones.
- Revise policy instruments to ensure efficient and effective identification of emerging standards and development of new ones.

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⁹⁴ Clean Air Strategic Alliance (<http://www.casahome.org/>)

⁹⁵ See, for example, Alberta Environmental Protection, *A Comparison of Alberta’s Environmental Standards to Those of Other North American Jurisdictions*, 1999 (http://www3.gov.ab.ca/env/protenf/documents/enviro_standards99.pdf)

⁹⁶ *How we will continue to be a leading edge jurisdiction for the 21st century*, supra n. 67

1.4.2.2 Perspectives, Strategies, and Priorities for Long-Term Water Supply

If changes in long-term water supply or other factors change our perspective to a greater emphasis on watershed management or managing growth, will existing policy instruments be capable of dealing with that type of change? ▲

Do policy instruments provide a consistent, comprehensive, and comprehensible strategy for dealing with potential changes in long-term water supply? ▲

Do existing policy instruments make long-term water supply for people and aquatic ecosystems an objective and priority? ▲

Discussion: In terms of drinking water and most aspects of supply management, the dominant concern in the past has been infrastructure and its cost. If the emphasis shifts to watershed management or limiting growth, current policy instruments may not be broad or adaptable enough to cope effectively.

Potential options:

- Do not evaluate this issue.
- Evaluate current policy instruments to determine how effective and efficient they are at dealing with watershed management or managing growth (as opposed to building, maintaining, and operating infrastructure).
- Revise policy instruments to ensure that they can efficiently and effectively deal with the options of watershed management and managing growth.

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1.4.3 Outcome: Water is managed and allocated to sustain aquatic ecosystems and ensure their contribution to Alberta's natural capital and quality of life is maintained

1.4.3.1 Meaning of Sustainability

What does sustainability mean? ▲

Discussion: Whether you are talking about ecosystems, the economy, or quality of life, sustainability requires a number of things, including a desired level of performance, long-term maintenance of that performance under normal circumstances, and the capability to bounce back from undesirable events. There is not a complete nor commonly accepted definition of sustainability in policy instruments (Table 6).

Sustaining an ecosystem may mean "re-sizing" rivers because people's activities have significantly altered the flow. In some cases, this could mean a smaller river channel that provides desirable features such as good water quality, a viable aquatic

and riparian ecosystem, and resistance to invasion of exotic species. In other cases, this could mean a larger river channel that still provides stable banks, healthy fish and wildlife habitat, assimilation of nutrients and other pollutants, etc.

Table 6	
Definitions of Sustainability	
Policy Instruments	Definition of Sustainability
<i>Vision of Sustainable Development</i> ⁹⁷	<ul style="list-style-type: none"> ▪ Vision: "Alberta, as a member of the global community, is a leader in sustainable development, ensuring a healthy environment, a healthy economy, and a high quality of life in the present and the future." ▪ Vision elements: <ul style="list-style-type: none"> ◆ "The quality of air, water, and land is assured." ◆ "Alberta's biological diversity is preserved – Biogeographical areas, habitat, and wildlife are protected. Aesthetically attractive areas are set aside for recreational, cultural, and spiritual needs." ◆ "We live within Alberta's natural carrying capacity." ◆ "The economy is healthy." ◆ "Market forces and regulatory systems work for sustainable development." ◆ "Urban and rural communities offer a healthy environment for living." ◆ "Albertans are educated and informed about the economy and the environment." ◆ "Albertans are responsible global citizens." ◆ "Albertans are stewards of the environment and the economy."
<i>Alberta's Commitment to Sustainable Resource and Environmental Management</i> ⁹⁸	<p>"The use of Alberta's natural resources shall be sustainable. This means:</p> <ul style="list-style-type: none"> ▪ Renewable resources shall be managed to ensure their long-term viability and future use potential. ▪ Non-renewable resources shall be managed in a manner to maximize benefits to Albertans."
<i>A Fish Conservation Strategy for Alberta</i> ⁹⁹	<ul style="list-style-type: none"> ▪ "Achieving sustainability of fish stocks and other aquatic resources requires that these resources, and the ecosystems that support them, be managed in such a way that their long-term viability and productivity are maintained for the benefit of future generations."
<i>Framework for Water Management Planning</i> ¹⁰⁰	<ul style="list-style-type: none"> ▪ "Water must be managed and conserved to meet current and evolving needs without compromising the ability of future generations to meet their own needs."
<i>Our Waters, Our Future: Strategic Plan 2005-2010</i> ¹⁰¹	<ul style="list-style-type: none"> ▪ Sustainable development: "... to support the building of a strong economy while protecting Canada's natural environment ... development is essential to satisfy human needs and improve the quality of life, but must be based on the efficient and environmentally responsible use of all of society's scarce resources – natural, human and economic."
Alberta Environment, <i>Business Plan 2002-05</i> and Alberta Environment, <i>Business Plan 2003-06</i> ¹⁰²	<p>"Sustainable development refers to a development path that provides for the needs of the present generation while ensuring the opportunity of future generations to have choices. At a basic level, Albertans want to continue what they do into the future and increase the ability of their children and their children's children to meet their own needs."</p> <p>"Sustainability draws attention to the need to ensure future generations also have a high quality of life and choices to meet their environmental, economic and societal aspirations."</p>

⁹⁷ Alberta Legislative Assembly, *Vision of Sustainable Development*, 1993 in Alberta Environmental Protection, *Sustaining Alberta's Biodiversity* (<http://www.environment.gov.ab.ca/info/library/5852.pdf>), p. 5

⁹⁸ *Alberta's Commitment to Sustainable Resource and Environmental Management*, supra n. 33, p. 4

⁹⁹ Alberta Sustainable Resource Development, *Fish Conservation Strategy for Alberta: 2006-2010*, 2006 (<http://www.srd.gov.ab.ca/fw/fishing/pdf/Fish%20Conserv%20Strategy%202006.pdf>), p. 7

¹⁰⁰ *Framework for Water Management Planning*, supra n. 57, p. 6

¹⁰¹ Fisheries and Oceans Canada, *Our Waters, Our Future: Strategic Plan 2005-2010*, 2005 (http://www.dfo-mpo.gc.ca/dfo-mpo/plan/plan_e.pdf), p. 9

¹⁰² Alberta Environment, *Business Plan 2002-05* (<http://www.finance.gov.ab.ca/publications/budget/budget2002/envir.html#1>) and Alberta Environment, *Business Plan 2003-06* (<http://www.finance.gov.ab.ca/publications/budget/budget2003/envir.html#1>)

Table 6	
Definitions of Sustainability	
Policy Instruments	Definition of Sustainability
<i>Alberta's Environment: Toward the 21st Century</i> ¹⁰³ (incorporated into the <i>Environmental Protection and Enhancement Act</i>) ¹⁰⁴	"Albertans are dedicated to achieving sustainable development which ensures that the utilization of resources and the environment today does not impair prospects for their use by future generations."
Environment Canada ¹⁰⁵	"Sustainable development [means] implementation of a process that integrates environmental, economic and social considerations into decision making. This reinforces the World Commission on Environment and Development's conclusion that development should be sustainable for the benefit of current and future generations." "
Other Documents	Definition of Sustainability
World Commission on Environment and Development ¹⁰⁶	"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."
The Canadian Commission on Conservation (1915) ¹⁰⁷	"Each generation is entitled to the interest on the natural capital, but the principal should be handed on unimpaired."
Canada's National Task Force on Environment and Economy ¹⁰⁸	"Development which ensures that the utilization of resources and the environment today does not damage prospects for their use by future generations."
<i>Challenges for the Future</i> ¹⁰⁹	"Sustainable water management means that water must be managed fairly to meet current needs without compromising the ability of future generations to meet their own needs."
Task Force on Future Environmental Directions for Alberta ¹¹⁰	The World Commission on Environment and Development definition of sustainability "dictates that growth can only be sustainable if it is environmentally sound."
Environmental Legislation Review Panel ¹¹¹	"The principle of sustainable development, which ensures that the adverse impact on the environment by economic activity is minimized so as to sustain the environment's overall integrity, should be applied to allow the development of Alberta's economy in an environmentally responsible manner and to integrate protection of the environment into economic decisions at the earliest possible stages."
International Institute for Sustainable Development ¹¹²	"For development to be sustainable it must integrate environmental stewardship, economic development and the well-being of all people – not just for today but for countless generations to come."
World Summit on Sustainable Development ¹¹³	"We recognize that poverty eradication, changing consumption and production patterns and protecting and managing the natural resource base for economic and social development are overarching objectives of and essential requirements for sustainable development."

¹⁰³ Alberta Government, *Alberta's Environment: Toward the 21st Century* (c. 1991)

¹⁰⁴ *Environmental Protection and Enhancement Act*, *supra* n. 32, s. 2(c), "utilization" was changed to "use." The *Water Act* does not include a definition of sustainability. Instead, it includes the principle of "recognizing the need to manage and conserve water resources to sustain our environment and to ensure a healthy environment and high quality of life in the present and future" (*supra* n. 12, s. 2(a)).

¹⁰⁵ *Environment Canada's Sustainable Development Strategy (1997-2000)* (http://www.ec.gc.ca/sd-dd_consult/final/SDG13_E.HTM)

¹⁰⁶ World Commission on Environment and Development, *Our Common Future*, 1987

¹⁰⁷ "Defining Sustainability," The Sustainability Report (<http://www.sustreport.org/background/definitions.html>)

¹⁰⁸ *Ibid*

¹⁰⁹ Alberta Environment, *Water Management in Alberta: Challenges for the Future*, c. 1991, p. 4

¹¹⁰ Task Force on Future Environmental Directions for Alberta, *Ensuring Prosperity: Implementing Sustainable Development*, Environment Council of Alberta, 1995, p. 7

¹¹¹ Environmental Legislation Review Panel, *Report*, 1991, p. 7

¹¹² International Institute for Sustainable Development (<http://www.iisd.org/about/>)

¹¹³ United Nations, *Report of the World Summit on Sustainable Development*, 2002 (http://www.un.org/jsummit/html/documents/summit_docs.html - 2nd item in list), p. 2

Potential options:

- Retain different definitions of sustainability.
- Evaluate the different definitions to determine how they contribute to meeting the outcomes in the *Water for Life Strategy* and achieving good practice in water management.
- Determine which initiatives require a clear or common definition of sustainability to proceed.
- Revise definitions of sustainability so that, though different, they are compatible and contribute to meeting the outcomes in the *Water for Life Strategy* and achieving good practice in water management.
- Adopt one definition of sustainability.
- Adopt a different concept from sustainability that will be as or more effective, but can be more accurately and precisely defined.

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1.4.3.2 Measuring Sustainability

Once we figure out what sustainability means, how will we measure it? ▲

Discussion: A mutually acceptable and realistic definition of sustainability will be complex.¹¹⁴ Defining sustainability will require setting limits on the maximum acceptable levels of environmental disturbance and then setting performance measures to ensure that those limits will not be exceeded. To be effective, those measures must be expressed in clear and precise terms, and their achievement must be scientifically measurable, diligently monitored and enforced, and changed when monitoring shows that limits are not being achieved.¹¹⁵

Alberta Environment has developed measures and indicators that are a start towards performance measures that allow us to understand whether efforts at sustainability are succeeding or not.¹¹⁶ It is unclear how effective the measures and indicators¹¹⁷ are.

¹¹⁴ Understanding what a sustainable future looks like may be the key. "The greatest challenge for countries such as Canada is that [sustainable development] requires they take steps towards a destination they cannot currently imagine. In other words, while leaders from all parts of Canada can envision a prosperous economic future for the country, they cannot envision one that differs very much from the *status quo*." (Karen Clark, Jennifer McKay, and Anne Mitchell, *Sustainable Development in Canada: A New Federal Plan*, Canadian Institute for Environmental Law and Policy, 2001 (<http://cielap.org/pdf/sdreport.pdf>))

¹¹⁵ Wenig, "What's Smart," *supra* n. 78

¹¹⁶ *Alberta Environment's Performance Measures and Indicators - Levels 1 & 2: Environmental Indicators (&) Behavioural Indicators*, 2002 (<http://www3.gov.ab.ca/env/dept/reports/performance/perfmeasures.pdf>). Alberta Environment's annual business plans show how these performance measures and indicators are used. For example, see Alberta Environment, *Business Plan 2006-09* (<http://www.finance.gov.ab.ca/publications/budget/budget2006/envir.html#1>). For an overview of performance measures for sustainability, see Conference Board of Canada, *Sustainability: A Winning Merger of Growth and the Environment*, 2006 (<http://www.conferenceboard.ca/boardwiseii/signin.asp> - free document, but sign-in required to access). For a discussion of performance measures and other examples of performance measures previously used by Alberta Environment, see Breitman, et. al., *supra* n. 81, Appendix A.

¹¹⁷ The role of descriptive indicators is to raise awareness. It should not be expected that those indicators will create change in environmental conditions.

Other organizations ranging from federal and provincial agencies to municipal governments to community associations have also developed principles and performance measures on sustainability. It is unclear to what extent these principles and performance measures are compatible with Alberta Environment's approach to sustainability and whether compatibility is a necessary or desirable goal.¹¹⁸

Performance measures allow decision-makers to predict the benefits and costs of, for example, pursuing policy options, approving or rejecting a proposal, and considering changes to the management of flow patterns, water allocations, or wastewater discharge limits within a watershed.

The irrigation industry has developed criteria for assessing the consequences of increased or decreased water availability. Work on instream flow needs is also making progress on determining how changes in flow translate into changes in environmental quality.

Potential options:

- Continue with the current system of performance measures.
- Evaluate the system of performance measures to determine how they contribute to achieving sustainability and the outcomes in the *Water for Life Strategy*.
- Develop a more definitive, concrete, and comprehensive set of aquatic environment thresholds that can be applied across the board in all water and land management contexts and, if necessary, a clear generic framework for deciding when thresholds can be exceeded.
- Revise the system of performance measures to increase their contribution to achieving sustainability and the outcomes in the *Water for Life Strategy*.

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1.4.3.3 Responsibility for Achieving Sustainability

When we know what sustainability means and how to measure it, who will be responsible for achieving it? ▲

Discussion: Achieving sustainability will be a shared responsibility. However, to be effective, there will need to be clear assignment of responsibility for the different aspects of sustainability. During the public consultations leading up to the *Water for Life Strategy*, the public identified – through a ministerial forum, telephone survey, and submission of responses to questions in a workbook – some of the responsibilities they expected various participants in the water management field to assume. These responsibilities are shown in Table 7 with, in the public's view, the provincial government

¹¹⁸ For a discussion of incorporating statements and procedures on sustainability, see *Ensuring Prosperity: Implementing Sustainable Development*, *supra* n. 110, pp. 34-46, 57-58, 63, 65-67, 73-75 & 79-83

having full or partial responsibility for all but one of the roles identified.¹¹⁹

Potential options:

- Assume that everyone is in agreement about who is responsible for what.
- Determine if there is agreement on who should be responsible for what in terms of implementing sustainability.
- Revise policy instruments to ensure that they are compatible with a common understanding of who should be responsible.
- Revise policy instruments to ensure that responsibilities can be carried out effectively to achieve the outcomes in the *Water for Life Strategy*.

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1.4.3.4 Adaptive Management

Are existing policy instruments sufficient to allow adaptive management to succeed? ▲

Discussion: Alberta Environment has adopted adaptive management as one of its management strategies.¹²⁰ Adaptive management allows continuous improvement by learning from and responding to new issues and solutions.

Adaptive management has gained some credibility among environmental scientists¹²¹ and it might have value in Alberta's water management since, as environmental scientists conceive of it, it is designed for complex systems.

Managing complex systems requires that certain preconditions be met:¹²²

- **Sensitivity to initial conditions** – accurate definition of how things are and how they got to be that way
- **Coping with uncertainty:** - understanding where uncertainty exists and building in ways to pursue the probable while allowing room for the unpredictable

¹¹⁹ Table 7 shows the general responsibilities the public identified. The public also wanted the provincial government to be responsible for more specific tasks. See Equus Consulting Group, *Water for Life, Minister's Forum on Water: Summary of Advice Received*, Government of Alberta, 2002 (http://www.waterforlife.gov.ab.ca/docs/summary_report.pdf).

¹²⁰ Alberta Environment's definition of adaptive management is "project management that plans contingencies and actions to address uncertainty in environmental impacts, and variability in environmental conditions." (*Water Conservation and Allocation Guideline for Oilfield Injection*, *supra* n. 16, p. 56)

¹²¹ "Adaptive Management" (http://en.wikipedia.org/wiki/Adaptive_management). Note the inclusion of monitoring, iteration, process, decision-making, optimization, inference, and uncertainty reduction in contrast to Alberta Environment's definition.

¹²² Bob Morrison, "Can Chaos Theory Solve the Puzzles of Planning?" *Moving Beyond Now*, v. 1, no. 1 (August, 2002), pp. 13-15. Because of the complex nature of water management, adaptive management is a reality rather than a strategy. Instead, the issue may be more appropriately described as what strategies should be adopted to adapt. For example, according to the Conference Board of Canada, there are three phases to environmental management in the business world: ad-hoc, managing for compliance, and managing for sustainable development (cited in *Ensuring Prosperity*, *supra* n. 110, p. 77.). Each phase has different ways of adapting.

Table 7
Responsibility for Water Management
As Identified During Public Consultation Phase of the *Water for Life Strategy*

		Who Should Be Responsible?							
		Individuals	Corporations	Municipalities	First Nations	Provincial Government	Federal Government		
Responsibilities		Accountable leader in developing and implementing the water strategy					●		
		Leader and accountable party in implementing a water management system focused on each of the seven major water basins					●		
	Supply and Demand		Assess changes and help Albertans make important adjustments in the way water is used and strengthen existing practices					●	
			Long-term risk management approach, safety and sustainability of water, authoritative supply forecasts, and demand management					●	
			Security of prior allocations, improved allocation criteria, and flexibility to account for future needs and conditions					●	
			Requirements for water use that is not appropriate					●	
			Develop individual water supplies for rural residences	●					
			Develop pipelines and water-co-ops to deliver untreated water supply to individual rural residences	●				●	
			Develop regional water supply systems			●		●	
	Conservation		Motivate Albertans to use water wisely and place a higher emphasis on conservation					●	
			Establish water conservation incentives (e.g., tax rebates)					●	
			Explore ways to increase water conservation even if this increases costs to the person using the water					●	
			Implement improved water conservation practices	●	●	●	●	●	
	Water Quality		Ensure safe drinking water for all Albertans	●	●	●	●	●	
			Common, comprehensive definition of safe drinking water and clear legal notation that drinking water (for human consumption) is the highest priority of water use					●	
			Continue to prevent pollution and contamination					●	
			Monitor the quality and safety of the water supply for small municipal water systems			●		●	
			Investigate means to stimulate innovation in industry and agriculture for prevention of pollution and contamination					●	
			Increased role in assuring that municipal and private water supplies are safe					●	
	Aquatic Environments		Do not allocate water if it would potentially harm the aquatic environment					●	
		If there are shortages, put a higher priority on preserving natural aquatic environments					●		
		Assess aquatic environments and determine the water quantity and quality needed to maintain them and ensure that the allocation is maintained					●		
	Educate stakeholders and the public in water management planning and implementation					●			

SOURCES: From Waxwing Synthesis and Resolution Inc., *Assessment of Alberta's Draft Water Strategy*, 2003, pp. 9-10. Based on Equus Consulting Group, *Water for Life, Minister's Forum on Water: Summary of Advice Received*, Government of Alberta, 2002 (http://www.waterforlife.gov.ab.ca/docs/summary_report.pdf), covering letter & pp. 2-4. *Results from Random Telephone Survey: Summary Report*, Alberta Environment, 2002 (<http://www.waterforlife.gov.ab.ca/docs/telephone.pdf>), pp. 5-7, and *Results from Completed Workbooks: Data Tables*, Alberta Environment, 2002 (<http://www.waterforlife.gov.ab.ca/docs/1-bwbsummary.pdf>), pp. 4-6 – with analysis from Bob Morrison, "Measuring Two-Cents' Worth: The Benefits and Hazards of Gauging Public Views on Issues," *Moving Beyond Now*, v. 1, no. 1 (August, 2002), pp. 19-36.

- **Understanding interactions:** - determining how people and the watershed will react in response to changes in policy and physical conditions
- **Eliminating randomness:** - explaining behavior that appears haphazard.

A form of adaptive management has in the past been practiced by Alberta Environment in managing water. This has generally involved structural solutions (e.g., supply augmentation, treatment upgrades, flow regulation) and problem identification after water use management problems have already occurred.

It is unclear if existing policy instruments are capable of creating the preconditions that will allow adaptive management to succeed. This is of particular concern in terms of oilfield injection.

The multi-stakeholder committee which examined the issue of oilfield injection was unable to determine the significance of altering the hydrologic cycle by using water for oilfield injection. Instead, it focused on the effects on local watersheds of withdrawing water for oilfield injection and how changes could be made to achieve greater conservation.¹²³ This approach singled out a particular use of water without dealing directly with the fundamental concern – the impact of altering the movement of water within the hydrologic cycle.

As well, the committee only considered non-saline water.¹²⁴ Although saline water¹²⁵ is not desirable for human uses of water, it directly affects the hydrologic cycle if withdrawn from unconfined aquifers or surface water sources.

Adaptive management is designed for coping with changes in knowledge that require a significant change in policy or practice. In the example of oilfield injection, it is unlikely that adaptive management can succeed if there is a significant change. This is because, on one hand, the water will be “unavailable” for a long time if it turns out injection should not have been allowed. On the other hand, if the restrictions on injection turn out to have been unnecessary, then the cost of additional facilities and procedures

¹²³ Advisory Committee on Water Use Practice and Policy, *supra* n. 14, p. 4

¹²⁴ The Committee defined non-saline water as water with 4,000 milligrams or less of total dissolved solids per liter (p. 4). This limit does not take into account the potential for desalination of saline water and the potential future need for desalination in Alberta. For a list of reports on desalination, see <http://www.usbr.gov/pmts/water/reports.html>.

¹²⁵ There are two types of saline water to consider: “produced water,” water that is pumped out with the oil and “make up water,” water that is diverted from elsewhere to supplement the produced water that is injected. It is estimated that 83% of water used for oilfield injection is produced water, 13% is non-saline make up water, and 4% is saline make up water. (Advisory Committee on Water Use Practice and Policy, *supra* n. 14, p. 13)

Given the quantity and quality of data on water use, these should be considered rough estimates. For discussion of the water use data, see Hydrogeological Consultants Ltd., *supra* n. 18, Chapters 4 & 5, Geowa Information Technologies Ltd., *Water Use for Injection Purposes*, 2003 (http://www.waterforlife.gov.ab.ca/docs/geowa_report.pdf), pp. 6-22, and Griffiths and Woynilowicz, *supra* n. 18, pp. 25-27.

will be unrecoverable. Other aspects of water management such as dams, wastewater discharge, and water conservation objectives present similar dilemmas for making adaptive management workable.

Potential options:

- Continue with adaptive management as currently practiced.
- Evaluate existing policy instruments to determine if they are capable of
 - creating the necessary preconditions
 - encouraging anticipatory responses to issues
 - allowing consideration and implementation of the appropriate structural and non-structural solutions so that adaptive management can succeed.
- Revise policy instruments so that adaptive management can succeed.
- Require adaptive management responses to be predicted and evaluated prior to decisions being made.

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1.4.4 Outcome: Water is managed and allocated to support sustainable economic development and the strategic priorities of the province

1.4.4.1 Legal Requirements in Plans

Should plans developed using a watershed approach create legal requirements that a Director's decisions must meet? ▲

Discussion: An Alberta Environment Director must consider matters and factors in an approved water management plan. Having matters and factors identified in a single document allows the Director to efficiently identify community concerns and views.

A community's water management plan, although considered, can be overridden by the Director. As well, conventional wisdom is that a Director will consider any matter or factor in a plan whether the plan is approved or not.

Decisions are based on the Director's ability to interpret and respond to economic and social pressures, yet almost exclusively the only way these economic and social pressures are assessed in an open and accountable way is through a water management planning process.

The current advisory nature of water management plans does not encourage the Director to participate in open, accountable planning to ensure that the results support sustainable economic development and the strategic priorities of the province.

There is a risk that a community's watershed plan may not adequately account for regional, provincial, national, or international needs and priorities.¹²⁶ Although some policy instruments such as the *Master Agreement on Apportionment*,¹²⁷ *Water Act*, and *Framework for Water Management Planning* provide checks and balances on what a community can do, the federal and provincial governments may lack the science, performance measures, or policy direction to ensure that larger-scale issues are addressed and resolved.

As well, older policy instruments such as the *International Boundary Waters Treaty* and the *Master Agreement* focus on water withdrawals for human consumption. Provisions in those policy instruments for environmental protection may not be adequate to meet today's needs.¹²⁸

Resolution of the oilfield injection issue is an example of an international need that may not be adequately addressed, even if provincial or national issues receive proper attention. While local, regional, provincial, or national approaches to the oilfield injection issue are valid, the question of how much oilfield injection affects the hydrologic cycle is an international issue. Oilfield injection is practiced worldwide and, if there is a problem with its effect on the long-term availability of water, that effect can only be measured in a global context.

Potential options:

- Continue with current discretion.
- Evaluate the current discretion to determine how it supports sustainable economic development and the strategic priorities of the province.

¹²⁶ Michael M. Wenig, "Making Sense of New Terms," *supra* n. 75. One of the considerations when examining issues is the impact on Canada's national environmental interests of changing environmental policy instruments to be consistent with the standards of our trading partners (See, for example, Wenig, "What's Smart," *supra* n. 78).

¹²⁷ Government of Canada, Government of Alberta, Government of Saskatchewan, and Government of Manitoba, *Master Agreement on Apportionment*, 1969 (http://www.iigr.ca/pdf/documents/1348_Master_Agreement_on_App.pdf). Other extra-provincial policy instruments include Government of the United States and [Government of Canada], *International Boundary Waters Treaty Act*, (<http://laws.justice.gc.ca/en/i-17/245665.html>), and Government of Canada, Government of Saskatchewan, Government of Alberta, Government of British Columbia, Government of the Yukon, and Government of the Northwest Territories, *Mackenzie River Basin Transboundary Waters Master Agreement*, 1997 (http://www.mrbb.ca/document_details.asp?DID=3&File=WaterMaster.zip)

¹²⁸ Michael M. Wenig and Michael S. Quinn, "Off Course in Managing Transboundary Rivers," *LawNow*, September/October, 2006 (<http://www.lawnow.org/downloads/documentloader.aspx?id=3716>). Environmental protection provisions in the *Master Agreement* include consideration of water quality and ground water problems/recommendations (s. 6-6.1), the conditional minimum flow and annual volume requirements that Alberta must meet (Schedule A), and water quality objectives for interprovincial rivers (Appendix E). In the *Boundary Waters Treaty*, provisions that may be applicable to environmental protection include a prohibition against injury resulting from interference with or diversion of water (Article II), a prohibition against uses, obstructions, or diversions that affect the level or flow of water – without approval of the International Joint Commission (Article III), a prohibition against pollution causing injury to health or property (Article IV), a prohibition against injury to property because of the conveyance of St. Mary River water in the Milk River (Article VI), and no water use that conflicts with or restrains uses for domestic or sanitary purposes (Article VIII). These *Treaty* provisions apply to water bodies along the Canada-U.S. border (and in some cases, their tributaries) and to injury suffered in one country because of actions in the other. In most cases, they do not apply to water uses or infrastructure that existed prior to 1910.

- Revise the discretion to ensure that the Director's decisions support sustainable economic development and the strategic priorities of the province.
- Require the Director to consult with and be accountable to the local WPAC when exercising discretion to resolve conflicts or deciding how to make a decision that supports sustainable economic development and the strategic priorities of the province.
- Make it mandatory that a Director comply with the criteria included in water management plans.

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1.4.4.2 First-in-Time, First-in-Right Principle

For new allocations, should different requirements replace or supplement the principle of "first-in-time, first-in-right" (FITFIR)? ▲

For old allocations, should FITFIR be dependent on water conservation or other requirements to support sustainable economic development and the strategic priorities of the province? ▲

Discussion: The "first-in-time, first-in-right" principle is a clear method of rationing water during a shortage. Most, if not all, existing allocations are already based on FITFIR. FITFIR protects the substantial investment water users, including the Government of Alberta, have made in their projects.

The public has asked for decisions on new licences to be fairer and more beneficial than FITFIR.¹²⁹ FITFIR does not, in itself, encourage water conservation by senior (older) licensees. FITFIR also does not address factors such as fairness, ability to pay, or highest value use.

Some of these limitations may be reduced if, as has been done in the South Saskatchewan River Basin, a limit is placed on the amount of water that can be licensed in a watershed and a system for transferring water allocations is put in place. This makes a senior licence more valuable since it has first call on water during a shortage. If the money that can be made from a transfer is high enough, a senior licensee will be encouraged to conserve water so that the right to use the conserved water can be sold to someone else. As well, in the view of some, a fairer distribution of water will occur if water moves to higher valued uses rather than relying on the government to determine which uses are more important.

In the United States, application and effectiveness of FITFIR varies. Factors such as separate treatment of surface and ground water, lack of well-defined water rights, and diplomatic administrators

¹²⁹ For example, see Equus Consulting Group, *Minister's Forum*, *supra* n. 119, p. 3.

can result in loopholes to FITFIR. These loopholes, in some cases, make FITFIR “fairer” and therefore more acceptable.¹³⁰

Beyond FITFIR, Alberta Environment’s view is that other forms of rationing are the responsibility of licensees. Licensees can “act proactively in times of shortage to arrange assignments or transfers with others as a risk management tool.”¹³¹

Under the *Water Act*,¹³² the responsibility for enforcing priorities belongs to the licensees. In the past, Alberta Environment has, instead, used its discretionary authority to administer and enforce priorities. This practice has provided a “referee” with the necessary resources to provide an orderly and effective rationing of limited water supplies. Unless Alberta Environment discontinues this practice, it will be creating a situation where one form of rationing receives preferential treatment from the government.

Potential options:

- Continue current practice with FITFIR.
- Evaluate FITFIR to determine how it supports sustainable economic development and the strategic priorities of the province.
- Evaluate the effectiveness of Alberta Environment in playing a role in administering priorities and other forms of rationing.
- In each watershed, place limits on the amount of water that can be allocated and authorize the ability to transfer allocations of water.
- Apply FITFIR to new allocations in ways that ensure that the negative impacts on current and future users and uses are reduced to acceptable levels.
- As allowed by law, modify FITFIR for old allocations to reduce the negative impact on current and future users and uses.
- Replace FITFIR with a system such as is used for wastewater discharge approvals that allows, as necessary, regular upgrading of licence conditions and easier and fairer access to water for new users.
- Supplement or support FITFIR with other forms of rationing such as fixed allotments, percentage reduction in use, higher water rates, restriction of specific uses, rotation, conservation credits, and transferable rations.¹³³

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¹³⁰ W. H. Ellis, *Legal Constraints on Alberta Water Management*, Alberta Environmental Research Trust, 1984.

¹³¹ *Response to the Recommendations of the Highwood Public Advisory Committee*, *supra* n. 9, p. 8. The Public Advisory Committee’s recommendation was that Alberta Environment “administrators should be receptive to, and encourage water rationing and deficit sharing in times of deficits rather than strict adherence to [FITFIR].” (Public Advisory Committee, Highwood Water Management Plan, *supra* n. 9, p. xvi.)

¹³² *Water Act*, *supra* n. 12, s. 30

¹³³ Breitman, et. al., *supra* n. 81, pp. 4-5. For experiences with rationing, see Breitman, et. al., pp. 6-10 and Watrecon, *supra* n. 85, pp. 5-6.

1.4.4.3 Bans on Export of Water, Inter-Basin Transfer, and New Licence Applications in the Bow and Oldman River Basins

Should requirements be adopted for exemptions to the bans on export of water, inter-basin transfer, and new licence applications in the Bow and Oldman River Basins? ▲

Do the bans contribute to supporting sustainable economic development and the strategic priorities of the province?

Discussion: The legislated bans on inter-basin transfers and export of water and the Bow/Oldman licence application ban are considered clear and difficult to circumvent. They encourage people to manage water within the carrying capacity of their watershed.

Loopholes exist to the export ban,¹³⁴ while the ability to licence reserved water provides a method for circumventing the Bow/Oldman licence application ban. The inter-basin transfer ban has been overridden. Unlike in western U.S. states, there are no requirements that must be met when an exemption to an inter-basin or export ban is approved.¹³⁵ Decisions in Alberta are ad-hoc.

There are differing opinions on whether a ban on export of water can withstand legal challenges under international trade agreements. The differences are about issues such as whether water is a product, whether water is an exhaustible natural resource, and whether an export ban treats foreign investors fairly. If an export ban is determined to violate international trade agreements, then new requirements would be needed to maintain control over exports. For Albertans, these new requirements could include more stringent conservation measures, higher standards of environmental protection, and a clear rationale for why some water exports are allowed (e.g., municipal water).¹³⁶

Potential options:

- Continue current bans as they are.
- Determine the value of requirements for exemptions to the bans.
- Determine how the bans support sustainable economic development and the strategic priorities of the province.
- Adopt requirements for exemptions to the bans.
- Eliminate the bans.
- Modify the bans to ensure they support sustainable economic development and the strategic priorities of the province.

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¹³⁴ *Water Act, supra* n. 12, s. 46(3). The exemptions are for processed and municipal water.

¹³⁵ Morrison, "What Really Matters," *supra* n. 10, pp. 7-10

¹³⁶ Arlene Kwasniak, "Will Canada be forced to share its water supply?" *U*, Winter, 2006
(<http://www.ucalgary.ca/umagazine/issues/2006-02/departments/unleashed-opinion.html>)

1.4.4.4 Investment in Infrastructure, Administrative, and Cost-Sharing Programs

With our extensive investment in infrastructure, administrative, and cost-sharing programs, is long-term water supply a priority concern?

Discussion: Our existing policy instruments and the way they have been implemented may have positioned Alberta to be able to “ride out the storm” of potential changes in long-term water supply due to climate change, cycles of drought, growth, and other factors.

Potential options:

- Continue with the current approach to dealing with potential changes in long-term water supply.
- Evaluate policy instruments and their implementation to determine how the province would cope with changes in water supply.
- Revise the current approach to dealing with potential changes to long-term water supply based on the province’s ability to cope with change.

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1.4.5 Outcome: Albertans have the knowledge, tools and motivation to implement actions that will maintain or improve the province’s water resources

1.4.5.1 Ability to Deal With Changes in Long-Term Water Supply

Is this a realistic goal for something as complex as changes in long-term water supply?

In terms of whether to move water to people or people to water, how do current policy instruments benefit or detract from our ability to deal with changes in long-term water supply? ▲

Discussion: Substantial progress on these issues may not be possible unless the public is fully informed. The issues, though, are complex, uncertain, and influenced by global pressures. It may be unrealistic to expect water management policy instruments to deal effectively with changes in long-term water supply. As well, despite considerable publicity about such things as water supply, the quality of that supply, and climate change, important segments of the public remain unsupportive of efforts to deal with potential changes in long-term water supply and the consequences.¹³⁷

¹³⁷ For example,

- 51% of Albertans “do not believe greenhouse gases are heating up the planet” and only 35% of Canadians trust the federal government to “take the right and most reasonable steps to reduce Canada’s greenhouse gas emissions to protect against global warming” (“Tory trust on climate policy wanes,” *Calgary Herald*, October 2, 2006, A5)

Potential options:

- Keep the outcome as it is.
- Review this outcome to determine if it increases or decreases the efficiency and effectiveness of efforts to deal with changes in long-term water supply.
- Improve awareness efforts to ensure that Albertans have full and complete knowledge of changes in long-term water supply.
- Change the outcome to emphasize full and complete knowledge on the part of elected officials, business and community leaders, and administrators responsible for ensuring long-term water supply.
- Implement "strategic shifts" to move the government away from its traditional role of worrying about how water supplies will change to initiatives that link air and water issues so that the status quo in water supply is protected until such time as potential changes in water supply can be defined more precisely.
- Adopt a growth (or smart growth) management strategy for urban and/or rural areas.

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1.5 Lower Impact Development

FOCUSING QUESTION

How would lower impact development be implemented in an urban and rural municipal context using existing policy instruments?

1.5.1 Outcome: All outcomes

1.5.1.1 Evaluation of Water Management Programs

When and where is there a need to lower the impacts of development?

Should there be a systematic evaluation of water management programs to determine the extent to which they contribute to or inhibit lowering the impacts of development? ▲

Discussion: Development of the *Water Strategy* was based on the premise that the public should not be prejudiced by what had or had not been done in the past. The intention was to give the public a clean slate. To achieve this objective, Alberta Environment did not provide the public with an evaluation of its programs to identify

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- When told that water charges "are not high enough to pay for ensuring the safety of drinking water sources such as underground streams or above-ground lakes," just under 60% of Canadians said they would be willing to pay more. However, 43% of the respondents either were unwilling to pay anything (19%) or were unable to answer the question (24%). (Enviroics International, *Public Opinion on Environmental Education, Urban Sprawl, and Water Issues*, Sustainability Network, 2002 (<http://www.sustain.web.ca/cbt/research%20-%20July%202002.pdf>), p. 22)

their strengths and weaknesses. As a result, the public's views and the *Water for Life Strategy* were, for the most part, not explicitly linked to the past performance of water management programs.

Potential options:

- Continue with the activities already identified in the *Water for Life Strategy* that will produce information for evaluating programs.¹³⁸
- Consolidate and publicize the results of previous reviews and evaluations of water management programs.
- Document existing performance measures and develop new ones to evaluate water management programs.
- Develop a clear assessment of the pros and cons of different management approaches (e.g., "command and control," performance-based, market mechanisms), the overlaps among them, and the circumstances in which each is best suited.
- Prepare a Level 1 (preliminary assessment) of the effectiveness of each program.
- Expand the *Strategy's* independent, on-going review process to include detailed evaluation of the outcomes of all water management programs.

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1.5.1.2 Knowledge and Tools to Lower the Impact of Development

Do we have the knowledge and tools to determine the current impacts of development and whether those impacts are too high? ▲

Do we have the knowledge and the tools to evaluate to what extent lower impact development initiatives are beneficial? ▲

Discussion: Lower impact development is a desirable goal. It is an explicit or implicit goal in most policy instruments. However, actual decisions and the resulting impacts on people and the environment sometimes do not reflect our good intentions. Policy instruments may not be up to the challenge of creating the knowledge, analytical skill, and motivation to be able to lower the impact of development.

Potential options:

- Continue with current policy instruments and their implementation.
- Determine what levels of knowledge, analytical skill, and motivation are necessary to be able to make, implement, and enforce decisions that lower the impact of development.
- Evaluate current policy instruments to determine how they contribute to the knowledge, analytical skill, and motivation necessary to achieve lower impact development.

¹³⁸ Activities that will produce information for evaluating programs include the assessment of drinking water facilities, establishing grant criteria for regional water systems, establishing a system to monitor and report water use, establishing a public awareness and education program on water conservation, developing a system for monitoring and assessing aquatic ecosystems, and managing Alberta's water infrastructure for long-term sustainability.

- Revise policy instruments to increase the knowledge, analytical skill, and motivation related to lowering the impact of development.

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1.5.1.3 Empowerment of Municipalities

The empowerment of municipalities to reduce the impact of development on watersheds needs to be examined. ▲

Discussion: The *Water for Life Strategy* supports an active role for local communities in leadership and planning. The *Strategy* is not clear on the role local communities can and are expected to play in water management.

Municipalities have explicit powers that are granted by the provincial government, primarily through the *Municipal Government Act*. Provinces can grant municipalities considerable power and influence on environmental matters, including the ability to adopt requirements that are more strict than those used by provincial regulators (and even by federal regulators in fields where provincial regulatory authority is concurrent with federal authority).¹³⁹

One important concern for municipalities is management of riparian land. There are a variety of policy tools available for municipalities to influence and approve the use of riparian land including¹⁴⁰

- guidelines in the provincial government's *Land Use Policies*
- establishing development setbacks in the municipality's *Land Use Bylaw*
- the ability to establish direct control districts
- the power to obtain land for environmental and municipal reserve during the subdivision approval process.

These policy tools were not explicitly designed for riparian areas and may not provide efficient or effective methods of managing riparian land use.

Questions have been raised about the adequacy of the *Municipal Government Act*'s minimum six-meter buffer (or setback) around a water body during the subdivision approval process. The purposes

¹³⁹ See, for example, Michael M. Wenig, "Precautionary Principle Gains a Judicial Foothold," *LawNow*, August/September, 2003 (<http://www.ucalgary.ca/~cirl/pdf/2003dAugSepWenig.pdf>) which discusses the Supreme Court's decision concerning the ability of the Town of Hudson, Quebec to regulate pesticide use within its boundaries.

¹⁴⁰ *Land Use Policies*, *supra* n. 40 and *Municipal Government Act*, RSA 2000, c. M-26 (http://www.qp.gov.ab.ca/documents/Acts/M26.cfm?frm_isbn=0779748638), s. 639-641, 661, and 664.

for the buffer are prevention of pollution and/or provision of public access to and beside the bed and shores.¹⁴¹

Buffers make administration and regulation easier and may reduce the impact on water bodies. However, a review of the buffers used in other jurisdictions indicates that six meters is usually not considered sufficient for controlling the impacts of land uses near water bodies.¹⁴²

For management of riparian land to be effective, it must be based on a good understanding of how riparian areas function and change. For a river or stream, this means, among other things, taking into account the natural meandering or movement of the channel within its floodplain.

Effective management of riparian land also requires that knowledge about riparian areas is readily available on a timely basis to municipalities and other decision-making bodies. This can be accomplished by hiring qualified consultants or utilizing services such as the riparian health assessments offered through the Cows and Fish Program. It is unclear what role experts within the provincial government are expected to play and whether that role is sufficient to contribute to the success of the *Water for Life Strategy*.

Concerns have also been expressed about managing land use and stormwater in the watershed upstream from a municipality. The policy instruments of the provincial government (e.g., approvals, economic instruments, enforcement, regional systems) can be effective in lowering the impact of development, but municipalities can also take action by establishing regional partnerships that create a level playing field for developers while at the same time reducing impacts on the watershed.

Potential options:

- Do not examine this issue.
- Examine both the policy instruments that define the rights and responsibilities of municipalities and the opportunities for initiative, leadership, and management available to local authorities.
- Evaluate existing policy instruments to determine what encourages or discourages proactive measures from municipalities to reduce the impacts of development.
- Revise the *Strategy*, policy instruments, or their implementation to improve the contribution of municipalities to water management.

¹⁴¹ The six-meter buffer is for "environmental reserve." In addition to the six-meter buffer, environmental reserve can consist of a:

- a swamp, gully, ravine, coulee or natural drainage course
- land that is subject to flooding or unstable.

Municipalities have successfully obtained more land for environmental reserve than six meters and there are currently other tools for managing riparian lands (e.g., overlays, land-use bylaws) that are not being used.

¹⁴² Waxwing Synthesis and Resolution Inc., *Issues and Policy Recommendations: Nose Creek Watershed*, 2005 (http://www.airdrie.ca/Content/environment/nosecreek/images/Waxwing_Nose_Creek_Objective_2_Main_Report.pdf), p. 4

- Offer incentives or require municipalities to incorporate watershed management provisions into bylaws.
- Require municipalities to assess watershed issues at the beginning of and throughout the development process.
- In terms of riparian land management,
 - examine the benefits of current policy instruments including the use of voluntary and mandatory compliance
 - determine the roles the provincial government, municipalities, and others should play in ensuring that the *Water for Life Strategy* succeeds in protecting riparian areas
 - provide support and resources to ensure that riparian lands are managed effectively
 - define what pollution and public access mean in terms of establishing riparian land use buffers¹⁴³
 - design and implement land use buffer requirements that are based on riparian functionality.
- Provide better information and knowledge about management of watersheds.
- Create or revise mechanisms such as model bylaws, policies, regulations, guidelines, standards, and cost-sharing/grants that incorporate watershed issues and provisions into municipal decision-making in a timely and effective manner.

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1.5.1.4 Development Patterns and Choices Among Solutions

Development patterns are influenced by policy instruments in ways that may or may not support achieving outcomes in the *Water for Life Strategy*. ▲

Policy instruments influence water management solutions by encouraging or discouraging choices that lead to desirable outcomes. ▲

Discussion: There are many issues associated with the relationship between development and water management. Two prominent issues are

- the increased difficulty and expense involved in serving and regulating dispersed development
- finding the most efficient and effective solutions for managing water for the type of development that occurs.

Alberta Environment has identified regional water and wastewater systems as a key to sustainable water management. This is because of the perceived inability of small communities to keep up with drinking water standards (i.e., build, operate, and maintain systems) and the need for trained personnel.¹⁴⁴ Regional systems help sustain dispersed development and, therefore, may not be

¹⁴³ Municipalities do not need to invoke the environmental reserve power to establish riparian buffers and are therefore not held to the pollution prevention and public access provisions alone.

¹⁴⁴ Yee, *Alberta's Strategy for Sustainability*, *supra* n. 15

the most sustainable method of satisfying local needs for reliable water and wastewater systems.

Potential options:

- Do not evaluate this issue.
- Evaluate how policy instruments contribute to encouraging different patterns of development and finding the most efficient and effective solutions for managing water.
- Evaluate the concept of regional water and wastewater systems to determine their effectiveness in lowering the impact of development and in promoting sustainable development patterns.
- Revise policy instruments to ensure development patterns and water management solutions are compatible with the *Water for Life Strategy*.

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1.5.1.5 Risk Management

How are risks supposed to be managed?

Discussion: All decisions involve risks. Each policy instrument contains qualitative or quantitative direction (intended or not) on how to deal with risk. It is unclear to what extent the water management risks are understood and intentionally managed by decision-makers, the public, and the people responsible for implementing decisions. Of particular importance are situations where water and other resources are used for multiple, often conflicting purposes or where decisions are made about the allocation of money and other scarce resources.

Risk management uses scientific information, but is not a science. It involves value judgments about the desirability of harmful events. It places a heavy burden on society's institutions such as governments, courts, and religious organizations, sometimes in the role of risk-minimizers so risk-takers can operate successfully.¹⁴⁵

The burden of managing risks to society is today often shouldered by governments. Since governments sanction activities that – even when conducted within legal limits – may cause impacts on others or the environment, this can shift risk and any harm that results onto society. As a result, ignorance is no reliable excuse for administrators in applying due diligence.

In risk management, a distinction needs to be made between “life and death” issues of right and wrong and less important issues where the choice is which option is better. Each type of risk requires different approaches to informed consent and the social engineering that is the inevitable outcome of risk management.

¹⁴⁵ Morrison, “Aesop’s Fables,” *supra* n. 71

Risk management involves decisions on whether or not to apply the precautionary principle.¹⁴⁶ The principle has been addressed by the federal government and the Supreme Court, but it is not clear how it should or can be applied in water management decisions.¹⁴⁷

Although risk management must deal with problems of engineering and physical science, risk is primarily a problem of human desire and perception. Predicting how people will react to change, particularly change in government policy, is essential to successful risk management. This includes determining how to maintain a reduction in risk, rather than allowing people to “consume” the risk reduction by using the resulting increase in safety to engage in riskier behavior.¹⁴⁸

The ingredients for effective risk management include:¹⁴⁹

- “full and systematic consideration of alternatives”
- “clear understanding of needs and consequences”
- “open, fair, and effective public involvement”
- “fairness in allocating risks”
- “separation of risk (the probability of something happening) from uncertainty (not understanding an issue)”
- “consideration of market-based solutions”
- “cooperation among water users, operators, and other interests”
- being able to distinguish between science and expediency.

Potential options:

- Continue with current approaches to risk management.
- Determine how existing policy instruments define risk, the acceptable level of risk, and the appropriate method of managing risk.
- Evaluate existing policy instruments to determine how they contribute to lowering the risk of development.
- Revise or replace policy instruments to implement a cohesive, systematic, and sustainable approach to managing risk.

¹⁴⁶ “The precautionary principle does not have a specific meaning that would find consensus among its advocates. One of the better general definitions of the precautionary principle is ‘[w]hen an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.’” (Morrison, “Indentured Servants,” *supra* n. 71, p. 37. Definition from “Wingspread Statement on the Precautionary Principle” cited in Joel Tickner, Carolyn Raffensperger, and Nancy Meyers, *The Precautionary Principle in Action: A Handbook*, Science and Environmental Health Network (<http://www.biotech-info.net/handbook.pdf>), p. 19)

¹⁴⁷ Privy Council of Canada, *A Framework for the Application of Precaution in Science-based Decision Making about Risk* (http://www.pco-bcp.gc.ca/default.asp?Language=E&page=publications&doc=precaution/precaution_e.htm) and Wenig, “Precautionary Principle,” *supra* n. 139

¹⁴⁸ For a discussion of risk and consumption of risk reduction, see Malcolm Gladwell, “Blowup,” *The New Yorker*, January 22, 1996, pp. 32-36. An example of consuming risk reduction in water management is construction of a reservoir that is designed to reduce the risk of shortages, but instead makes the shortages worse because more people begin using water and the amount of water they use increases beyond what the reservoir can support.

¹⁴⁹ Breitman, et. al., *supra* n. 81, p. 3 and V. Klemeš, “Dilettantism in Hydrology: Transition or Destiny,” *Water Resources Research*, v. 22, no. 9 (August, 1986), pp. 1775-1885

[Return to List of Issues \(page 4\)](#)**1.5.2 Outcome: Water management objectives and priorities for sustaining aquatic ecosystems are established through watershed plans****1.5.2.1 Contribution of Watershed Plans to Lowering Impacts**

With existing policy instruments, how can watershed plans contribute to lowering impacts on the environment and people?

Discussion: Water management plans can provide guidance on objectives and hard (numerical) targets. These plans can range from policy plans developed by the provincial government (e.g., the *South Saskatchewan River Basin Water Management Plan*) to master drainage plans developed by municipalities. Each type of plan is important to the health of a watershed.

However, implementation plans are often not prepared. Past plans have also emphasized larger streams to the detriment of lower order streams and lower class wetlands and have done a poor job of integrating surface and ground water.

Potential options:

- Do not address this issue.
- Evaluate past plans to determine how they have contributed or not contributed to lowering the impact of development.
- Revise planning practice so that existing policy instruments can be fully utilized to lower the impacts on the environment and people.
- Develop incentives and regulatory controls that will encourage municipalities and others to develop, adopt, and implement measures to make watershed management plans effective.

Aquatic Ecosystems: [Return to List of Issues \(page 7\)](#)
Sustainable Economy: [Return to List of Issues \(page 11\)](#)

1.5.3 Outcome: Water is managed and allocated to sustain aquatic ecosystems and ensure their contribution to Alberta's natural capital and quality of life is maintained**1.5.3.1 Impacts on Environmental and Aquatic Health**

Do existing policy instruments address water quality and quantity impacts on environmental and aquatic health? ▲

To what extent should dilution be the solution to pollution?

How are mixing zones being managed? ▲

Discussion: Some policy instruments that affect environmental and aquatic health may not contain provisions that address or adequately address water quality and quantity impacts.

Dilution of contaminants in water bodies is used as a management tool, but the objectives and impacts of this approach are not clear. Similarly, mixing zones are an issue for which clear and consistent policy direction does not appear to have been articulated.

Potential options:

- Do not address this issue.
- Examine policy instruments that can affect environmental and aquatic health to determine if and how effectively they address water quality and quantity impacts in achieving the outcomes of the *Water for Life Strategy*.

Aquatic Ecosystems: [Return to List of Issues \(page 8\)](#)

Sustainable Economy: [Return to List of Issues \(page 12\)](#)

1.5.3.2 Codes of Practice

Should Codes of Practice¹⁵⁰ and their implementation be strengthened to ensure that environmental conditions are maintained or improved in a sustainable manner? ▲

Should Codes of Practice apply to the land, e.g., the 1:100 year floodplain or the riparian area? ▲

Discussion: Existing Codes of Practice deal with low-risk activities. They simplify approvals and reduce the regulatory, administrative, and financial burden on applicants and government. Provincial Codes of Practice provide a consistent set of standards that are more rigorous than the requirements in legislation.

However, Codes of Practice require post-project conditions to be comparable to existing conditions which, in practice, does not necessarily mean existing conditions are maintained. Codes of Practice do not allow the flexibility to require an improvement in environmental conditions where that is warranted.

Codes of Practice generally apply only to provincially-owned water bodies and their beds and shores. Codes of Practice also do not address cumulative impacts.

In monitoring activities conducted under Codes of Practice, there is typically insufficient time using the “notification” approach set out in the *Water Act* for Alberta Environment to determine ahead of time whether or not an activity will result in negative impacts. Instead, negative impacts are usually identified after the fact and

¹⁵⁰ Codes of Practice are identified here because of their unique nature. There are similar concerns with other forms of approval that are included in the discussion of other issues.

become an enforcement issue. The “registration” approach under the *Environmental Protection and Enhancement Act* may provide a better method of identifying and avoiding undesirable impacts.

Potential options:

- Continue using existing Codes of Practice.
- Evaluate Codes of Practice and their implementation to determine how they protect users and uses of the aquatic environment and contribute to lowering the impact of development.
- Revise Codes of Practice and their implementation to ensure that they protect users and uses of the aquatic environment and lower the impact of development.
- Extend Codes of Practice, for example, to the 1:100 year floodplain or the riparian area.

Aquatic Ecosystems: [Return to List of Issues \(page 8\)](#)
Sustainable Economy: [Return to List of Issues \(page 12\)](#)

1.5.3.3 What is an Activity?

When is an activity an activity?

Discussion: The *Water Act* and the *Environmental Protection and Enhancement Act* regulate activities. The definitions of an activity are detailed and specific, covering what appear to be the many ways in which water and the environment can be adversely affected.¹⁵¹ This allows seemingly insignificant undertakings to be reviewed for their potential to cause harm.

The definitions are so detailed, however, that it is possible for a particular activity to be proposed and considered without examining it as part of a larger project. This can lead to the approval of a larger project with significant adverse cumulative effects because the consequences of individual activities are not significant by themselves.¹⁵²

The focus on specific activities can also potentially lead to a situation where the impacts on water or the environment are viewed as unimportant. This issue often arises when municipal, provincial, and sometimes federal approvals are required for a development to proceed. The approval of the project usually proceeds from one level of government to another without all requirements being considered simultaneously.

¹⁵¹ *Water Act*, *supra* n. 12, s. 1(1)(b) and *Environmental Protection and Enhancement Act*, *supra* n. 32, s. 1(a) & “Schedule of Activities.”

¹⁵² For a discussion of a current Alberta example (under an analogous regulatory framework) where a smaller activity is being examined separately from a larger project (including its history), see Wenig, “Can Environmental Law Really Help?” *supra* n. 34

Potential options:

- Continue with current practices in terms of identifying and approving activities.
- Evaluate current practices to determine if they can achieve the outcomes in the *Water for Life Strategy*.
- Evaluate the criteria and procedures for approving projects involving multiple activities and requiring multiple approvals to determine their effectiveness in achieving the outcomes in the *Strategy*.
- Revise policy instruments and current practices to ensure that they achieve the outcomes in the *Strategy*.

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1.5.4 Outcome: Albertans understand the value of water to the economy and quality of life

1.5.4.1 Economic Instruments and Affordability of Water

Is it reasonable to collect royalties for water use? ▲

How can economic instruments be a tool to lower the impact of development? ▲

Are water pricing and other economic instruments effective methods of encouraging water conservation? ▲

How can we resolve the issue of water being valuable, but – when charged for – not affordable to everyone? ▲

How do economic instruments promote or discourage water being available for the most valuable uses? ▲

Is it reasonable for governments to provide or share in the cost of infrastructure for making water available for use or disposing of it following use? ▲

Discussion: Introduction

Effective use of economic instruments requires many things including:¹⁵³

- problem definition
- adequate legal, regulatory, and administrative arrangements
- clear objectives

¹⁵³ Government of Canada, *Economic Instruments for Water Demand Management in an Integrated Water Resources Management Framework*, Policy Research Initiative, 2005 (http://policyresearch.gc.ca/doclib/WaterSymposium_e.pdf), Marbek Resource Consultants Ltd. and Steven Renzetti, *Analysis of Economic Instruments for Water Conservation*, Canadian Council of Ministers of the Environment, 2005 (http://www.ccme.ca/assets/pdf/ei_marbek_final_rpt_e.pdf), Steven Renzetti and Diane Dupont, "An Assessment of the Impact of Charging for Provincial Water Use Permits," *Canadian Public Policy*, v. 25, no. 3 (1999) (<http://aed.econ.queensu.ca/pub/cpp/sept1999/Renzetti.pdf>), pp. 361-378, and Breitman, et. al., *supra* n. 81, pp. 33-52

- reliable data, particularly on benefits and costs (economic, social, and environmental)
- consideration of multiple economic methods and the use of non-economic measures such as education, regulation, and cooperative arrangements
- social and psychological as well as economic research, analysis, and evaluation
- public involvement.

In Alberta, several economic instruments are currently used in water management. They include:

- a fee for obtaining a licence
- fees charged for supplying water to customers
- fees charged for managing wastewater, including stormwater
- “water rentals” (like a royalty)
- cost-sharing and grant programs
- transfers of licensed allocations
- assignments of water
- fees for the use of the bed and shores of a water body
- flood insurance
- flood damage compensation programs

It should be noted that this “value of water” outcome refers to both the economic and quality of life aspects of value and that the *Water for Life Strategy* is, at least in the short term, focusing on the value of water to the provincial economy.¹⁵⁴ These things are important to keep in mind to ensure clarity in interpreting and achieving the outcome.

Discussion: Provincial Pricing

Alberta Environment currently charges a licence fee,¹⁵⁵ a water rental for water used in hydroelectric generation, and, in a few instances, a fee for the water supplied through provincially owned water infrastructure. There is not a policy on what outcomes Alberta Environment's current water pricing system is expected to achieve.

It is felt by some that Alberta Environment's current water pricing system protects the poor and others with limited financial means. As well, it is believed that the water pricing system is in line with pricing regimes in other jurisdictions, thus maintaining a level playing field for Alberta businesses, other non-government organizations, and local authorities.

¹⁵⁴ *Water for Life Strategy*, *supra* n. 1, p. 21

¹⁵⁵ Alberta Environment, *Approvals and Licences, Water Act Fact Sheet* (<http://www3.gov.ab.ca/env/water/Legislation/FactSheets/GeneralInfo.pdf>). Unlike allocation of rights to oil and gas, coal, and timber, the fee for a water licence or approval is nominal. For example, the fee in Alberta for a licence to divert up to 100 acre feet of water is less than \$2.00 per acre foot. It has been suggested that new licences in the South Saskatchewan River Basin should be issued to the provincial government which would then sell the licences on the water rights market. (see *Watrecon*, *supra* n. 85, p. 24)

In terms of charging a fee to those who benefit from Alberta Environment's water management projects,¹⁵⁶ those opposed to such a fee consider provincial water projects to be essential infrastructure (like roads) and that charging for the service would add an additional financial burden on beneficiaries and an additional administrative burden on the government, as well as on the beneficiaries. Those in favor of charging a fee for the water and/or flood protection provided by provincial projects believe that not charging a fee places a greater tax burden on others and creates a competitive disadvantage for those who have to pay for the water services they receive.

There are various reasons for charging a price for water¹⁵⁷ including to:

- pay for building, operating, maintaining, and upgrading infrastructure
- pay the cost of the system for monitoring, planning, and regulating water management
- encourage water conservation
- finance cost-sharing and grant programs
- compensate for externalities (costs not reflected in market transactions) such as impact on the aquatic environment

To determine whether a price should be placed on water, information on the value of water is needed.¹⁵⁸ The value of water is important because it can be used to determine people's willingness to pay, the trade-offs between different uses, and the ways in which economic instruments can be used to encourage water conservation.

Water is valuable. For water users, though, that is not the issue. The key issue is ability to pay. If the outcome of understanding the value of water leads to fees that water users can not afford, then this will lead to economic and social hardship and may harm the economy.

Economic theory and experience in other jurisdictions show that implementing pricing for water is complicated and results in

¹⁵⁶ As part of the *Water for Life Strategy*, Alberta Environment is studying "the full cost of water provided by Alberta's existing water management infrastructure." (Alberta Environment, *Report on Implementation Progress of Water for Life*, 2005 (http://www.waterforlife.gov.ab.ca/docs/WFL_ImplementationReport_Oct2005.pdf), p. 27)

¹⁵⁷ They are many varieties of charges for water including a royalty for the water itself, a fee for the right to use water, a fee for having it delivered, a fee for having it treated to an acceptable standard, a fee for having it disposed of (usually after treatment), and, in the case of drainage projects and flood protection works, a fee for either removing the water or keeping it away.

¹⁵⁸ As part of the *Water for Life Strategy*, the federal and provincial governments are conducting a study to determine the value of water for different purposes. The federal-provincial team conducting the study has produced a report called *The Basics of the Economic 'Valuation' of Water* which includes a discussion on what the value of water means. A definition of the "value of water" from that report is included in the Glossary. For a discussion of the value of water, see <http://www3.gov.ab.ca/env/water/Conservation/value.cfm>. For a summary of the study, see Alberta Water Council, *Summary Report of Meeting #8*, November 17, 2005 (<http://www.waterforlife.gov.ab.ca/awc/docs/AWCSummaryReportMeeting8.pdf>).

significant exemptions.¹⁵⁹ This may reduce some social, economic, or political inequities, but can also create new ones.

Pricing is considered to be one of the tools that can lead to greater conservation.¹⁶⁰ However, water users may not need pricing to be encouraged to conserve. They have an incentive to conserve water to minimize the cost of building, operating, and maintaining their facilities. They also have an incentive to invest in water-saving technology and procedures that reduce their costs and make more water available for use.

The ability of pricing to encourage water conservation has been questioned. As well, there are concerns about where “commodification” of water will lead.¹⁶¹

If increased prices cause people to use less water, water utilities and others who supply water may receive less revenue in total. As a result, increased prices to encourage water conservation can lead to further price increases if infrastructure can not be operated and maintained with reduced revenue.¹⁶²

If considering a change in the pricing system, it is important to understand how water users will react to changes in prices. In some situations, a small change in price may result in dramatic changes in behavior (desirable or undesirable), while in other cases a large change may have little effect. Pricing must also be considered in terms of how people will respond to pricing in combination with other initiatives such as education and regulation.¹⁶³

Water pricing in Canada generally does not cover the cost of federal, provincial, and municipal water infrastructure, much less cover the environmental costs of water use or the cost of lost opportunities.¹⁶⁴ In Europe, current pricing of water does not affect the competitiveness of industries because generally the rates are low and, when rates are higher, exemptions are provided for industries.¹⁶⁵

¹⁵⁹ For examples, see *Economic Instruments for Water Demand Management*, *supra* n. 153, pp. 13-18, 21-23, & 26-33, Marbek and Renzetti, *supra* n. 153, pp. 46-49 & 52-53, Stefan Speck, “Do European Water Abstraction Taxes Affect Competitiveness,” Government of Canada, Policy Research Initiative, Sustainable Development Briefing Note, 2005 (http://policyresearch.gc.ca/doclib/R1_BN%20EuroWater_E.pdf), and Randy Christensen and Simone Magwood, “Groundwater Pricing Policies in Canada,” in Linda Nowlan, *Buried Treasure: Groundwater Permitting and Pricing in Canada*, The Walter and Duncan Gordon Foundation, 2005, pp. 74 & 79

¹⁶⁰ See, for example, Alberta Environment, *Valuing Water: Pricing and Other Economic Instruments*, Water for Life backgrounder, 2004 (<http://www.waterforlife.gov.ab.ca/html/background4.html>)

¹⁶¹ See, for example, Ricardo Acuna, “Pricing our water not the answer,” *Calgary Herald*, October 28, 2006, p. A28

¹⁶² Jack A. Weber, “Integrating Conservation Targets into Water Demand Projections,” *Journal of the American Water Works Association*, v. 85 (August, 1993), pp. 63-70. An estimated 75% to 95% of a water utility’s costs are fixed and will not decrease as water use decreases.

¹⁶³ For discussion of the intricacies and pitfalls of pricing to achieve water conservation, see Marbek and Renzetti, *supra* n. 153. For discussion of the factors that affect changes in behavior, see Marbek and Renzetti, pp. 19, 21, 38-42, and 45-66

¹⁶⁴ *Ibid*, pp. 20-22 & 58-60 and Linda Nowlan, *Buried Treasure: Groundwater Permitting and Pricing in Canada*, The Walter and Duncan Gordon Foundation, 2005, pp. 69-70

¹⁶⁵ Speck, *supra* n. 159

If the pricing of water is set too high or too low, it will not allow decision-makers (private and public) to make a realistic comparison between the value of water vs. the value of other resources. This is one aspect of the debate over oilfield injection where free water “competes” against market-priced oil.¹⁶⁶

Changing the water pricing system would be difficult because of social and political implications. However, even if agreement can be reached that change is desirable, lack of information may be a major obstacle.

In order to assess the effects of a potential change in water prices, better information is needed on how water users will react to the change, how their actions might affect productivity – especially in the agricultural sector, and the fairest,¹⁶⁷ most effective way to implement the change. It has been noted that the mechanisms of improving information (e.g., installing water meters, surveying water users) should be carefully evaluated since, in some cases, they may be too expensive to make them worthwhile.¹⁶⁸

Current pricing for deep well wastewater disposal may pose a barrier to development and implementation of industrial treatment, re-use, and recycling.

Discussion: Cost-Sharing and Grant Programs

Cost-sharing and grant programs can be valuable tools to ensure that essential water management facilities such as water treatment plants and wastewater systems are properly built, operated, and maintained. Cost-sharing and grant programs can provide a level playing field in terms of the ability of local authorities to attract businesses, strengthen their tax base, reduce health risks, and maintain a good quality of life.

Cost-sharing and grant programs can also be effective in conserving water by supporting initiatives such as education, upgrading water treatment and delivery facilities, and subsidizing the purchase by consumers of more efficient products.¹⁶⁹

Cost-sharing and grant programs may encourage people to take water for granted and could discourage water conservation. It is unclear to what extent cost-sharing and grant programs are

¹⁶⁶ Michael M. Wenig, “Water for Oil – How much of a trade off makes sense?” *LawNow*, June/July, 2003 (<http://www.ucalgary.ca/~cirl/pdf/2003cJunJulWenig.pdf>)

¹⁶⁷ Fairness concerns include whether money for water management infrastructure and administration or for reducing the impacts of water use should be provided by water users or the general public (e.g., through a universal water fee or from other sources of revenue such as income tax).

¹⁶⁸ Watrecon, *supra* n. 85, pp. 20-21 and *Economic Instruments for Water Demand Management*, *supra* n. 153, pp. 21-23

¹⁶⁹ For example, in the agricultural sector, government cost-sharing has aided irrigation districts in their efforts to improve water use efficiency through the Irrigation Rehabilitation Program (see, for example, *Irrigation Rehabilitation Program 2004/2005 Status Report* ([http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/irr8555](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/irr8555)))

necessary and effective in producing advantages. Cost-sharing and grant programs may also encourage more dispersed settlement and development, thus increasing costs, reducing provincial competitiveness, and causing greater impact on the environment.

Cost-sharing and grant programs can be counter-productive if they do not provide consistent, long-term funding. For example, if a local authority requires assistance, but that assistance ends when a project is built then the project may deteriorate due to a lack of funds for maintenance and trained operators.

At present, water conserved as a result of provincial cost-sharing and grant programs may, within the limits of the law, be used, assigned, or its allocation transferred at the discretion of the licensee. This is considered standard practice under the *Water Act*. A policy does not appear to exist on whether the government considers this practice to be in line with the *Water for Life Strategy* or whether some of the water conserved using provincial funding should be available to the provincial government to achieve the outcomes in the *Strategy*.

Discussion: Transfer of Licensed Allocations¹⁷⁰

The ability to transfer an allocation of water from one location or use to another may encourage conservation and provide the opportunity for water to be re-allocated to uses from which higher economic value can be obtained. Water markets may also be a non-political way to resolve conflicts and reduce the need for planning and management.¹⁷¹

However, the market for transfers in Alberta is fragmentary. Except for hydroelectric water rentals, no royalties are charged by the government to reflect the value it places on water as the owner of the resource. Government cost-sharing and grants also influence the market. These factors may create disincentives to sell an allocation and an incentive to charge higher prices for transfers. Water management may become more expensive and less efficient.

Unlike markets for land and other commodities, there is currently not a reliable, public, inclusive, and centralized data base on water rights, actual water use, transactions, and prices. This impedes the open and efficient flow of information. Transactions can be hindered by uncertainty and the higher costs that result.

Water allocation transfers are a “transformational” form of economic instrument. A transformational instrument is usually complex and inconsistent with existing policies and practices,

¹⁷⁰ For additional discussion of water rights markets, see Watrecon, *supra* n. 85, pp. 13-14, *Economic Instruments for Water Demand Management*, *supra* n. 153, pp. 34-36, and Breitman, et. al., *supra* n. 81, pp. 57-60

¹⁷¹ *Economic Instruments for Water Demand Management*, *supra* n. 153, pp. 18-19

including administrative behavior. For allocation transfers to be effective, this means, among other things, changes in rules and regulations, more comprehensive and systematic data collection, improved communication and enforcement, and more dedicated staff. This is particularly important because of the high costs to buyers, sellers, other users, and the environment if the transfer system is not designed and implemented in an efficient and effective manner.¹⁷²

To assist in the transformation to greater reliance on allocation transfers, the Alberta Government has created a new set of rules¹⁷³ for transfers and is taking steps to improve its data collection system. It has also authorized the ability to transfer allocations in the South Saskatchewan River Basin and closed the basin to new licence applications. It is not known if those measures will be sufficient to allow transfers to achieve the outcomes in the *Water for Life Strategy*.

Assignments¹⁷⁴ of water (an alternative to transfers for existing licensees and registrants) have less stringent regulatory requirements, including no requirement for approval from Alberta Environment.¹⁷⁵

Discussion: Pricing for the Use of the Bed and Shores of Water Bodies

Nominal fees are charged for the use of the bed and shores of water bodies (e.g., for diversions, outfalls, water crossings, bank protection, "raising" of floodplains).

As with water pricing, this may provide protection for people with limited financial resources or who would be put at a competitive disadvantage. It may also have disadvantages in terms of not encouraging wise and efficient use of water bodies

Discussion: Flood Damage Reduction

The Flood Damage Reduction Program and the Disaster Assistance Program provide guidance to municipalities and the residents of floodplains and – at the discretion of the federal and provincial governments – can result in financial assistance being provided to the victims of floods. The programs are flexible because they do not guarantee that flood victims will be compensated for damage. As well, compensation is limited to basic needs.

¹⁷² Marbek and Renzetti, *supra* n. 153, pp. 31-36

¹⁷³ *Water Act, supra* n. 12, s. 81-83. These rules replace the previous provisions for transferring water from one use to another and to a different location (*Water Resources Act, s. 11, 14, & 23*).

¹⁷⁴ "Assignment means a licensee or registrant in good standing has temporarily contracted all or part of his/her water allocation with another licensee or registrant in good standing, who is able to access the same water as a result of the natural flow or natural presence of the water without adversely affecting other water users or the aquatic environment." (*Administrative Guideline for Transferring Water Allocations, supra* n. 27, p. 4) The *Water Act* does not require approval or mandatory reporting of assignments.

¹⁷⁵ For discussion of experience with assignments, see Watrecon, *supra* n. 85, pp. 5-6.

Floods are predictable both in terms of location and frequency.¹⁷⁶ Flood victims are subsidized if they are compensated for negative consequences of their decision to use land in a floodplain for personal and/or business reasons.

The current flexible approach leaves people in limbo, forcing them to make decisions with incomplete knowledge of how large their financial risks may be.

Discussion: *Alberta's Commitment to Sustainable Resource and Environmental Management*¹⁷⁷

Alberta's Commitment to Sustainable Resource and Environmental Management contains the following principles related to economic instruments:

"The use of Alberta's natural resources shall be sustainable. This means:

- Renewable resources shall be managed to ensure their long-term viability and future use potential.
- Non-renewable resources shall be managed in a manner to maximize benefits to Albertans."

"The management of Alberta's natural resources shall support and promote the Alberta economy. This is to ensure:

- Natural resources shall be developed to ensure that the optimum value for the resource is obtained and there will be a fair return to Albertans.
- Natural resources will be managed to continue to support Alberta's ability to provide Albertans with health, education and other social and economic benefits, now and in the future."

It needs to be determined how economic instruments for water management will meet the key components of these principles: sustainability, long-term viability, future use potential, maximum benefit, optimum value, fair return, and social and economic benefits.

Discussion: *Federal Water Policy*¹⁷⁸

A dominant theme in the *Federal Water Policy* is economic instruments, in particular the polluter pays principle and the use of realistic pricing to generate revenue to cover costs, reduce government investment, improve operating efficiency, and control demand.

¹⁷⁶ This does not mean flood frequency and location will be predicted accurately. Data, techniques, and expertise may be insufficient. See Klemeš, *supra* n. 149, pp. 181S-185S.

¹⁷⁷ *Alberta's Commitment to Sustainable Resource and Environmental Management*, *supra* n. 33, p. 4

¹⁷⁸ Environment Canada, *Federal Water Policy*, 1987 (http://www.ec.gc.ca/water/en/info/pubs/fedpol/e_fedpol.pdf)

Discussion: *Environmental Protection and Enhancement Act*

The purpose of the *Environmental Protection and Enhancement Act* "is to support and promote the protection, enhancement and wise use of the environment while recognizing" factors including¹⁷⁹

- "the need for Alberta's economic growth and prosperity in an environmentally responsible manner and the need to integrate environmental protection and economic decisions in the earliest stages of planning"
- "the responsibility of polluters to pay for the costs of their actions."

A key question is: Who is a polluter? Is it anyone who releases a contaminant onto the land or into the air or water? Or is it only someone who releases a contaminant without government approval? In the case of contamination allowed by the government, does making the polluter pay mean that the government should be responsible for paying some of the costs?¹⁸⁰

Discussion: *Water Act*

The purpose of the *Water Act* "is to support and promote the conservation and management of water, including the wise allocation and use of water, while recognizing" factors including¹⁸¹

- "the need for Alberta's economic growth and prosperity"
- "the need for an integrated approach and comprehensive, flexible administration and management systems based on sound planning, regulatory actions and market forces"

The ability of Alberta Environment to collect fees under the *Water Act* includes fees "for any service, material, function, or thing provided" under the Act.¹⁸² The meaning of this provision has not been tested, but appears to limit the government to charging a licensee rather than any of the licensee's customers.

Discussion: *Public Views*

Some of the views that have been expressed by the public on economic instruments are:

- **Environmental Legislation Review Panel**¹⁸³
 - **Overview of Public Comments:** "Albertans want polluters to be 'accountable at all costs.' Environmental costs must be borne by the 'polluting

¹⁷⁹ *Environmental Protection and Enhancement Act*, *supra* n. 32, s. 2(b) & (i)

¹⁸⁰ Michael M. Wenig, "Should the Polluter Pay?" *LawNow*, February/March, 2004 (<http://www.ucalgary.ca/%7Ecirl/pdf/2004aFebMarWenig.pdf>)

¹⁸¹ *Water Act*, *supra* n. 12, s. 2(b) & (c)

¹⁸² *Ibid.*, s. 168(1)(e)

¹⁸³ Environmental Legislation Review Panel, *supra* n. 111, pp. 59 & 61

individual, and collectively by society.' Shared responsibility must embrace financial responsibility and the legislation 'should provide the structure so that environmental costs are recognized, levied and distributed appropriately.'"¹⁸⁴

- **Panel Recommendations:**
 - ◆ "supports the use of security funds if there are risks of environmental damage related to the activity"
 - ◆ "Levies for waste collection based on the amount of waste collected should be encouraged through cooperation with local authorities"
 - ◆ "allow for the use of the full range of economic instruments, as appropriate (such as tradeable allowances and emission fees)"
 - ◆ "Older facilities should be required to upgrade to meet new standards over a reasonable period of time. One option would be to require payment of an emission fee until the new standards are met."
- **Water Management Review Committee**¹⁸⁴
 - **Public Views:**
 - ◆ "The public expressed a wide range of views on the provision [in the draft legislation]¹⁸⁵ to charge for water use ... the public has requested that the new water legislation should reflect [the Government's commitment not to impose an annual water charge]." "Many comments were received on this subject, with a majority of respondents indicating their strong opposition to any water use charges."
 - ◆ "Many Albertans viewed an annual charge for water use as a form of taxation that will place Alberta industries at a competitive disadvantage in world markets and significantly affect the profitability of those water uses that cannot pass higher costs onto consumers."
 - ◆ "some people supported using annual charges for water use as a means of encouraging water conservation ... Others suggested using water charges as a possible means of achieving water

¹⁸⁴ Water Management Review Committee, *Report*, 1995, pp. 68-71

¹⁸⁵ Alberta Environmental Protection, *Discussion Draft of Legislation*, Water Management in Alberta: Challenges for the Future, c. 1992, p. 19. The provision was to allow the Minister to "establish programs and other measures for the use of economic and financial instruments and market-based approaches, including without limitation

- (a) incentives,
- (b) subsidies,
- (c) fees,
- (d) differential levies, and
- (e) charges for water,

for the purposes of supporting and promoting the conservation and management of water, including the wise allocation and use of water, in a cost effective manner, and for providing methods for the financing of programs and other measures."

- management objectives, such as reducing the amount of potable water used for oilfield injection.”
- ◆ “There was general support for shifting more of the costs of water supply infrastructures from taxpayers to consumers.”
 - ◆ “There was general support for imposing fees in order to recover some of the administrative costs associated with licensing.”
- **Committee's Views:**
 - ◆ “the Government needs to take a long-term view on [the issue of economic instruments] and that in the future, there may be situations where economic instruments, such as a water charge, may be necessary.”
 - ◆ The Committee “cannot reach agreement on whether an enabling provision for charging for water should be included in the new water legislation, nor can agreement be reached on whether a charge should be imposed if such an enabling power were provided.”
 - ◆ The Committee “recommends that should the Government decide to ... at some future date change its policy decision on not charging for water, public discussions be held to determine to whom and how the charges should be applied, and where the revenue should be directed.”
 - ◆ The Committee “recommends ... the ability to collect fees to cover a reasonable portion of the costs associated with application processing and water services, such as water management planning and monitoring ... [but] ensure there are no fees relating to private infrastructures.”
 - ◆ The Committee “recommends a public process be developed to determine who are the direct and indirect users of [provincially owned water management infrastructures], the proportion of costs that should be borne by each, and the method by which each should pay.”
 - ◆ The Committee “recommends that subsidies ... not be included as an economic instrument.”
 - **Water for Life Public Consultation**¹⁸⁶
 - Just over 60% of the people who submitted workbooks supported allowing water licence transfers. “In the community workshops, the discussion was mixed. The

¹⁸⁶ Equus Consulting Group Inc., *Pooling Your Ideas: Summary of Consultation Results*, Water for Life, Government of Alberta (<http://www.waterforlife.gov.ab.ca/docs/consultationsummary.pdf>), pp. 12 & 16 and *Results from Completed Workbooks: Data Tables*, Water for Life, Government of Alberta, 2002 (<http://www.waterforlife.gov.ab.ca/docs/1-bwbsummary.pdf>), pp. 2 & 6. Percentages reported here are slightly lower, because they have been adjusted to account for people who submitted workbooks, but did not answer a particular question.

major concern raised was that if water rights can be sold, it creates a situation where individuals could profit from a public resource. Many participants raised the concern that water transfers would allow the accumulation of water rights by wealthy companies and individuals, while less affluent players would eventually lose their water rights."

"Others noted that water rights transfers are an incentive for water conservation because the potential to gain revenue from the transfer of water rights encourages efficient use of a water allocation. They also noted that with a 'first in time' allocation system in place, water rights transfers provide a way for new players to access water in fully allocated basins."

- Just under two-thirds of people who submitted workbooks supported establishing a price for water used by industrial and agricultural operations and establishing water conservation incentives (e.g., tax rebates). Just under half of those submitting workbooks favored establishing a price for water used by individual households, while a third opposed the idea.
- "Some participants at community workshops felt that pricing of water was a hidden form of tax."

"Participants at community workshops indicated that agriculture and industry need to be considered separately. Some felt that pricing water for industry would be passed on to consumers whereas this was not as easily done in agricultural operations. They also felt that agriculture and industry use water quite differently. Still others noted that price additions in Alberta could affect the competitiveness of both agriculture and industry."

Potential options:

Provincial Pricing

- Continue current provincial water pricing practices.
- Determine the true, long-term costs of our current water diversion, delivery, treatment and disposal infrastructure and practices.¹⁸⁷
- Determine how the current provincial pricing system contributes to lowering the impact of development.
- Determine the level of pricing that can be sustained without having a significant adverse effect on the international competitiveness of businesses and municipalities.
- Determine who the polluters are that the "polluter pays" principle is supposed to apply to.

¹⁸⁷ Determining the full cost of providing water through Alberta's water management infrastructure is included as a task in the *Water for Life Strategy* (*supra* n. 1, p. 11).

- Determine if pricing for deep well wastewater disposal is a barrier to development and implementation of industrial treatment, re-use, and recycling.
- Develop a system of pricing where (as is often done with multiple use projects) those who can afford to pay are charged higher fees, thus subsidizing other users.
- Eliminate all fees for water.
- Charge a single fee that everyone can afford.
- Implement pricing for disposal of wastewater (including stormwater).
- Charge market rates for water and allocations.

Cost-Sharing and Grant Programs

- Continue current cost-sharing and grant programs.
- Determine how cost-sharing and grant programs protect current and future users and uses and lower the impact of development.
- Determine what proportion of funding for cost-sharing and grants should go to structural solutions vs. non-structural solutions vs. protection of environmental assets such as wetlands, riparian areas, and the bed and shores of water bodies.
- Apply cost-sharing and grants according to a means test that ensures that only the truly needy receive funding.
- Eliminate cost-sharing and grant programs.
- Reduce or increase cost-sharing and grant programs.

Transfer of Licensed Allocations

- Continue the current water allocation transfer system.
- Determine how the current water allocation transfer system lowers the impact of development.
- Require actual water use and details (including price) for all transfers and assignments to be reported to a public or private entity responsible for maintaining a water rights data base.
- Eliminate all fees related to water allocation transfers.
- Eliminate the legal requirements related to water allocation transfers.
- Make the requirements for transfers and assignments the same.
- Have government (federal, provincial, or municipal) participate in the water market.

Pricing for the Use of the Bed and Shores of Water Bodies

- Continue nominal pricing for use of the bed and shores.
- Determine how nominal pricing for the bed and shores of water bodies lowers the impact of development.
- Eliminate all fees for use of the bed and shores.
- Charge market value for using the bed and shores.

Flood Damage Reduction

- Continue the current approach to flood damage reduction.
- Determine how the current approach to flood damage reduction lowers the impact of development.
- Implement an awareness program that ensures that people know the costs of flood damage and how having the government pay (or not pay) lowers the impact of development.
- Eliminate government flood damage compensation.

- Apply flood damage compensation according to a means test that ensures that only the truly needy receive funding.
- Make flood damage compensation mandatory.
- Make flood damage insurance mandatory.
- Reduce or increase government flood damage compensation.
- Develop a development rights pricing and transfer system to reduce flood damage to a sustainable level.

General

- Provide more assessment and investigation into economic instruments including water pricing, water quality trading, and water demand management options.
- Determine whether there is a need to reconcile the policy directions contained in *Alberta's Commitment to Sustainable Resource and Environmental Management*, the *Federal Water Policy*, the *Environmental Protection and Enhancement Act*, and the *Water Act*.
- Determine how current economic instruments meet *Alberta's Commitment to Sustainable Resource and Environmental Management*, the *Federal Water Policy*, the *Environmental Protection and Enhancement Act*, and the *Water Act*.
- Determine to what extent having development is more valuable than lowering its impact and vice-versa.
- Determine how economic instruments influence the pattern and intensity of development.
- Develop a method of comparing the pros and cons of different economic instruments and their application, including "do-nothing."
- Develop a large enough toolkit of economic instruments to solve water issues and achieve the outcomes of the *Water for Life Strategy*.
- Base pricing, cost-sharing, grants, and compensation on making water management financially self-sufficient.
- Base pricing, cost-sharing, grants, and compensation on the level of impact on current and future users and uses and the aquatic environment.
- Base pricing, cost-sharing, grants, and compensation on the principles set out in *Alberta's Commitment to Sustainable Resource and Environmental Management*, the *Federal Water Policy*, the *Environmental Protection and Enhancement Act*, and the *Water Act*.
- Revise pricing, cost-sharing, grants, and compensation to ensure they lower the impact of development.
- Create a unified pricing and assistance program for watershed management.

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1.6 Watershed Planning

FOCUSING QUESTION

To what extent will watershed planning options be enabled or constrained by existing policy instruments?

1.6.1 Outcome: Efforts to protect aquatic ecosystems in critical areas are underway

1.6.1.1 Application of the *Strategy for the Protection of the Aquatic Environment*¹⁸⁸

How is the *Strategy for the Protection of the Aquatic Environment* used in planning and decision-making? ▲

Has the *Strategy* improved planning and decision-making?

Should the *Strategy* contain requirements instead of guidelines? ▲

Discussion: The *Framework for Water Management Planning* requires that all provincial resource planning activities that affect the aquatic environment must consider the *Strategy for the Protection of the Aquatic Environment* and that objectives for protection of the aquatic environment must be understood and considered.¹⁸⁹ This ensures that key issues related to aquatic ecosystems are considered.

However, the *Strategy for the Protection of the Aquatic Environment* is primarily an information document with few guidelines concerning the planning of decisions.

Potential options:

- Keep the *Strategy for the Protection of the Aquatic Environment* as it is.
- Evaluate the *Strategy* to determine how it has been used and its effectiveness.
- Convert the guidelines in the *Strategy* to requirements.
- Revise or replace the *Strategy* to achieve the outcomes in the *Water for Life Strategy*.
- Expand the *Strategy* to govern decision-making by Alberta Environment.
- Suspend or cancel the *Strategy*.

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1.6.2 Outcome: Water management objectives and priorities for sustaining aquatic ecosystems are established through watershed plans

Outcome: Water management objectives and priorities to support sustainable economic development are established through watershed plans

¹⁸⁸ "Strategy for the Protection of the Aquatic Environment," *supra* n. 80, pp. 19-31

¹⁸⁹ *Framework for Water Management Planning*, *supra* n. 57, p. 4

1.6.2.1 Is Watershed Planning Necessary?

Is watershed planning necessary in achieving the outcomes in the *Water for Life Strategy*?

Have water management objectives and priorities to sustain aquatic ecosystems and economic development been translated into administrative plans and procedures for watersheds? ▲

How do existing policy instruments encourage or discourage implementation of objectives and priorities resulting from plans?

Discussion: Many factors make it debatable as to whether watershed planning can, from a practical point-of-view, add value to the efforts to sustain aquatic ecosystems and economic development. These factors include the complexity and uncertainty of water management, global pressures, existing investments in physical infrastructure, the fast-pace of development, and the ability of decision-makers to interpret and respond to economic and social pressures without a formal and public planning process.

Watershed planning, as practiced in the past in Alberta,¹⁹⁰ has provided significant benefits including

- opportunities for public involvement and cooperation
- identification and refinement of data on water use and demand, supply availability, and water quality requirements
- discussion of issues
- options and recommendations for further action.

Planning efforts have often been a response to “hot spots,” situations where there were significant problems with water supply or water quality.¹⁹¹ The planning process has been criticized for the money, time, and complex data involved and the time commitments and financial burden required of members of the public, many of whom volunteer their time. The results of planning initiatives have also been criticized because they are sometimes contentious, politically driven, and not implemented.¹⁹²

Watershed planning is not the only game in town. All decisions require planning – ranging from the planning administrators do before a licence or approval is issued to the plans that operators prepare for infrastructure such as dams or water treatment plants.

¹⁹⁰ The term previously used was “river basin planning.” This sometimes included lakes and other water bodies.

¹⁹¹ Planning initiatives for smaller streams, Willow Creek, the Oldman, Highwood, and Little Bow Rivers, and, recently, the South Saskatchewan River Basin were responses to significant problems. Although dealing with conflicts that had already surfaced, other planning initiatives were more anticipatory such as the Red Deer River Flow Regulation Studies, South Saskatchewan River Basin Planning Program (in the 1980s), Cold Lake-Beaver River Water Management Plan, and Bow River Water Quality Task Force.

¹⁹² The proposal to build the Oldman River Dam is a well-known example of a contentious planning recommendation. The *Water Management Policy for the South Saskatchewan River Basin* and the recommendations from the Cold Lake-Beaver River Water Management Plan are examples of planning results that were not implemented, in whole or in part.

Table 8

Criteria for Good Planning

1. Is the problem fully and realistically defined?
2. Are the objectives of all participants and potentially affected parties included for consideration?
3. Are the objectives clearly defined?
4. Is the process fair and open?¹⁹³
5. Is the information well-understood and scientifically-credible?
6. Have the assumptions and uncertainties been defined and evaluated?
7. Are there sufficient money, time, and other resources to do the job?
8. Are the money, time, and other resources used efficiently and effectively?
9. Does the decision solve the problem?¹⁹⁴
10. Is there consensus that the best decision was reached?¹⁹⁵
11. Is the decision in the public interest?¹⁹⁶
12. Is the proposed follow-up sufficient to resolve outstanding issues and assess the performance of the plan?

Source: Bob Morrison, "What is Planning All About Anyway?" *Moving Beyond Now*, v. 1, no. 1 (August, 2002), p. 38

These other forms of planning can be appropriate and effective as long as the criteria for good planning are followed (see, for example, Table 8.)

Potential options:

- Continue to do watershed planning as currently practiced.
- Evaluate watershed planning and other forms of planning to determine how they contribute to sustainable aquatic ecosystems and economic development.
- Revise watershed planning and other forms of planning to ensure they contribute to sustainable aquatic ecosystems and economic development.
- Apply watershed planning to areas where "anticipation" is the primary driving force. Apply other forms of planning where "crisis" is the operative word.
- Amalgamate all water-related planning into a unified process for planning watersheds.
- Abandon watershed planning in favor of other forms of planning.

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¹⁹³ This question covers a wide variety of issues including: Are some people excluded? Are issues, information, or options ignored or not properly assessed? Are people honest? Are the rules of the process clear, impartial, and obeyed?

¹⁹⁴ Deciding if the problem is solved can be difficult. It depends on how well the preceding criteria are met, the level of buy-in that could be achieved (criterion #10), and the loose-ends that remain (criterion #12). The objective is, as much as possible, to find a solution for which success is unimpeded by uncertainty.

¹⁹⁵ This does not mean that everyone agrees that the "right" option for them was chosen, but that, all things considered, they are comfortable that the best decision for all concerned was made. One of the key things to consider is whether core values or objectives were compromised to achieve a solution.

¹⁹⁶ Public interest is defined broadly. Looking at the case of public corporations, the public interest includes protecting shareholders' interests. Looking at it as a taxpayer, the public interest includes not being left to foot the bill for bad decisions – public or private. Looking at it as a human being, the public interest includes protecting safety, health, financial security, quality of life, the environment in which people live, and the values they live by.

1.6.2.2 The Step-By-Step, Long-Timeframe Approach for the *Water for Life Strategy*

The step-by-step, long-timeframe approach of the *Water for Life Strategy* may not make it possible for planning to proceed in a timely and effective manner. ▲

Discussion: The *Water for Life Strategy* includes many components that should be completed before watershed planning continues or proceeds in particular areas. It will be a long time before several of these preconditions are in place. The more significant ones are listed in Table 9.

It is worthwhile to determine the reasons for the extended deadlines, what is required to shorten the deadlines, and the watersheds in which planning could be constrained if preconditions are not in place.

Potential options:

- Continue with current timelines.
- For each watershed in which planning initiatives are anticipated, identify the preconditions needed for successful planning.
- Evaluate the timelines proposed in the *Water for Life Strategy* in terms of the preconditions for successful planning.
- Revise the timelines in the *Strategy* to ensure that the preconditions for successful planning are in place.
- Decide whether to delay or proceed with planning in watersheds where the preconditions for success will not be available in a timely manner.

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1.6.2.3 Constraints and Flexibility for Water Management Planning

Do the requirements for water management planning provide enough constraints and flexibility to ensure that objectives and priorities will sustain aquatic ecosystems and economic development? ▲

Do we have a sufficiently comprehensive concept of what a watershed plan is to be able to do one? ▲

Should plans be required to be inclusive, comprehensive and forward thinking? ▲

Discussion: As shown in Table 10, the *Framework for Water Management Planning* contains many requirements.¹⁹⁷

Advantages

The *Framework* provides a broad range of requirements to encourage effective and integrated planning, including

¹⁹⁷ *Framework for Water Management Planning*, supra n. 57, pp. 2, 6, & 9-18

Table 9

**Significant, Long-Timeframe Preconditions
for Successful Watershed Planning***
(deadlines in parentheses)

- Updating water quality programs to support watershed protection and planning (2010)
- Initial assessment of the status of aquatic ecosystems (2010)
- Monitoring, evaluation and reporting on the water allocation transfer system (2010)
- Completion of flood risk maps and warning systems (2014)
- Understanding the state of the quality and quantity of all surface water supply in all major basins (2014)
- Understanding the state of the quality and quantity of Alberta's ground water supply (2014)
- Review of the water allocation transfer system to ensure a viable market that moves water to support sustainable economic development (2014)
- Understanding the state of aquatic ecosystem (2014)
- Establishment of watershed planning and advisory councils in the Athabasca and Peace watersheds (2010)
- A multi-barrier, source-to-tap approach at all drinking water facilities (2010)
- Establishment of an adaptive management system for identifying issues, gathering information, developing and implementing action plans, and evaluating management actions (2014)
- Upgrading of drinking water facilities to meet new drinking water standards as they are implemented (2014)
- Design and implementation of regional water systems (2014)
- Water conservation and productivity plans for all water using sectors (2010)
- Implementation of economic instruments as necessary to meet water conservation and productivity objectives (2010)
- Ongoing monitoring program to ensure all sectors are achieving water conservation and productivity objectives (2014)

* Source: *Water for Life: Alberta's Strategy for Sustainability* (<http://www.waterforlife.gov.ab.ca/docs/strategyNov03.pdf>)

monitoring requirements. It ensures that planning advice is available to, but does not fetter (constrain the independence of) decision-makers. Decision-makers are able to seek and apply other criteria that are not available in a plan.

The *Framework* ensures that stakeholders have the opportunity to participate, public consultation is open, information is shared, the information collected is broad, publicly available, and clearly defined, recommendations are carefully evaluated, options explained, and consequences identified.

The *Framework* ensures that *Water Act* administrators can control the issues they may need to consider and that results will be relevant to their needs.

The potential for decisions in sub-basins that negatively influence the major basin is reduced, as is the risk that consultation with the public will miss important priorities in the community or community concerns will be overshadowed by priorities that are national or international.

Disadvantages

The *Framework* does not require consideration of the effects on non-agricultural water use and there is no requirement for integration of planning with water management decision-making. It is unclear as to how integration with other planning initiatives and decision-making is to occur.

Table 10

Requirements for Planning
Framework for Water Management Planning

- Integrated with other planning initiatives and decision-making
- Must consider the effects on present and future agricultural use such as irrigation
- Produce resource management recommendations
- Consider implications for major basin when planning for a sub-basin
- Local or regional planning priorities developed in consultation with public. Provincial priorities will consider regional and local input
- Must be consistent with legislation, regulations, and policies
- Performance monitoring requirements
- Ensuring that performance monitoring and reporting requirements are met is the responsibility of the proponent of a water management plan and must identify
 - indicators
 - target values and variability
 - monitoring required
 - who is responsible for monitoring
 - mechanisms to report results
- Issue identification must be "inclusive, comprehensive and forward thinking"
- Terms of reference must ensure that stakeholders are provided the opportunity to participate in the planning process
- Public consultation process must be clearly identified to ensure that communication is open and information is shared
- Requirements for information collection are:
 - compilation of policies, legislation, existing plans and commitments, and other relevant documents
 - roles and methods for gathering information
 - for gaps in information, value of additional data, how to get it, how much it will cost, and who will pay must be determined
- For recommendations, all information must be carefully evaluated, mechanisms and resources required to implement each option must be explained, and benefits and consequences of options must be identified
- All components of a water management plan must be documented and publicly available. Recommendations must be clearly stated. Expectations of licensees, approval holders and others must be clearly defined
- Water management plan must identify when the plan will be revisited and how appropriate adjustments will be implemented. The proponent of a plan must ensure that reviews are completed and amendments made.
- An Alberta Environment Director determines what type of plan is appropriate and if a plan is needed. This decision is based on the relevance of the issue as well as on *Water Act* requirements.
- Sets criteria for which planning initiatives are to be undertaken

Plans are expected to provide recommendations. They do not establish requirements. A plan is not required to be inclusive, comprehensive, and forward thinking nor are the decisions resulting from a plan.

Planning for a major basin is not required to consider implications for smaller watersheds.

In developing planning priorities, consideration is not required for national or international issues nor do provincial priorities have to be developed in consultation with the public. There is no requirement for consideration of the consistency of legislation and other policy instruments with planning.

The emphasis on the needs of *Water Act* decision-makers does not guarantee consistency with a watershed approach (i.e., addressing highest priority problems, consideration of both surface and ground water, well-integrated environmental, economic,

social/cultural goals, iterative decision-making, addressing environmental justice).

Water Act administrators and other decision-makers are not required to identify their expectations and participate in the planning to identify how those expectations are compatible or in conflict with the expectations of others. The *Framework* does not create results that are needed for decision-makers to be able to sustain aquatic ecosystems or economic development if *Water Act* instruments are inadequate or inappropriate for the problems they face.

There is not a similar set of explicit requirements for the planning that is conducted by *Water Act* administrators and other decision-makers prior to making decisions. It may be that explicit requirements for the "operational" planning of decision-makers are considered incompatible with proper environmental management. As a result, it is debatable whether requiring water management (or watershed) planning to meet a higher standard of performance is actually valuable to decision-makers and, therefore, an efficient use of time and money.

The *Framework* does not cover decisions under the *Environmental Protection and Enhancement Act*.

Potential options:

Status Quo

- Keep the *Framework's* requirements as they are.

Evaluation

- Evaluate the *Framework's* requirements to determine how they promote objectives and priorities to sustain aquatic ecosystems and economic development.
- Determine if and when inclusive, comprehensive, and forward thinking plans are required to sustain aquatic ecosystems and economic development.
- Evaluate the requirements for other types of planning to determine how they sustain aquatic ecosystems and economic development.
- Evaluate the need for the expectations of *Water Act* administrators to be clearly defined.
- Evaluate the *Framework's* requirements to determine compatibility with a watershed approach.

Elimination of Requirements

- Eliminate requirements that do not encourage objectives and priorities to sustain aquatic ecosystems and economic development.
- Eliminate the *Framework*.

Revision of *Framework*

- Revise the *Framework's* requirements to ensure the development of objectives and priorities to sustain aquatic ecosystems and economic development.
- Revise the *Framework* to include a requirement that watershed plans be inclusive, comprehensive, and forward thinking.
- Revise the list of results allowed in a water management plan to ensure compatibility with the *Water for Life Strategy*.
- Revise performance monitoring requirements to ensure that they contribute to sustaining aquatic ecosystems and economic development.
- Revise the *Framework* to clearly define the expectations of *Water Act* administrators.
- Revise the *Framework* to make it compatible with a watershed approach.
- Revise the *Framework* to include requirements for all forms of provincial and/or municipal planning related to watersheds.
- Revise the *Framework* to cover other provincial legislation.

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1.6.3 Outcome: Communities are demonstrating leadership in watershed management

1.6.3.1 Watershed Management Plans

Is it necessary to follow the *Framework for Water Management Planning* to have an acceptable watershed management plan?

Can “watershed” or “water use” management plans be water management plans? ▲

Discussion: Anyone can develop a water management plan and it can cover a single issue or multiple issues. However, any person developing a water management plan must follow the *Framework for Water Management Planning* to be able to do the plan and have it approved. The *Framework* only allows the development of specific options for decision-makers to consider. This may restrict the development of watershed or water use management plans or render them ineffective.

Potential options:

- Keep the *Framework* as it is.
- Determine if the requirements or restrictions in the *Framework* create the necessary preconditions for communities to demonstrate leadership in watershed management.
- Determine if and under what circumstances “watershed” or “water use” management plans can be water management plans.
- Determine if and under what circumstances other options besides those explicitly set out in the *Water Act* can be considered and acted on by decision-makers.

- Revise the *Framework* to ensure that communities can demonstrate leadership in watershed management.

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1.6.3.2 Authority for Public Consultation and Approval and Adoption of Water Management Plans

Should Alberta Environment continue to be the ultimate authority for public consultation in water management planning and decision-making under the *Water Act*?

Should Alberta Environment continue to be the ultimate authority for the approval and adoption of water management plans and decisions under the *Water Act*?

Discussion: The *Framework for Water Management Planning* provides that the provincial government has responsibility for the approval and adoption of water management plans and decisions under the *Water Act*. The *Framework* also provides that the provincial government will ensure that the level of consultation in a water management plan will be appropriate.¹⁹⁸ This ensures that the needs of *Water Act* administrators are met, but may not necessarily meet the needs of communities and stakeholders.

Potential options:

- Keep the *Framework* as it is.
- Revise the outcome to clarify the opportunities and limitations for community leadership in approving and adopting water management plans.
- Evaluate current practices to determine how they contribute to community leadership in watershed management.
- Revise the *Framework* to provide opportunities for joint decisions and sharing or delegation of provincial authority.

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1.6.4	Outcome: Albertans have the knowledge, tools, and motivation to implement actions that will maintain or improve the province's water resources (drinking water and water supplies for economic development)
	Outcome: Albertans have the knowledge and tools to implement actions to maintain or improve the province's water resources (aquatic ecosystems)

¹⁹⁸ *Framework for Water Management Planning, supra n. 57, p. 7*

Outcome Communities are demonstrating leadership in watershed management

1.6.4.1 Responsibility, Authority, and Support

Does shared responsibility mean sharing of authority by the provincial government and other decision-making bodies?

Should partnerships have regulatory authority either in having recommendations and plans adhered to or being able to participate in decision-making? ▲

Are the types and levels of support provided by the provincial government and others sufficient to provide the knowledge, tools, motivation, and leadership necessary to efficiently and effectively manage watersheds? ▲

Should the provincial government and others be required to commit to certain types and levels of support for and participation in partnerships? ▲

Discussion: Alberta Environment's principles and criteria for public involvement (Table 11) are set out in *Enabling Partnerships: A Framework in Support of Water for Life: Alberta's Strategy for Sustainability and Public and Stakeholder Involvement Principles*.¹⁹⁹

Advantages

The principles and criteria for public involvement ensure the involvement of those who have the greatest effect on water management and provide a comprehensive, realistic approach to the limits of water use. It is recognized that cooperative action is needed at many levels.

The principles and criteria encourage initiative, consensus, and mutually advantageous action among a wide variety of interests, yet keep a clear distinction between the advisory role of the public and the responsibilities of decision-makers. They ensure that planning advice is available to, but does not fetter (constrain the independence of) decision-makers.

With the principles and criteria, watershed management stays within the legal and practical limits of government activity, while encouraging collaboration, action, measurable results, leadership, and better management.

Key elements of successful public involvement are recognized: trust, honesty, cooperation, inclusiveness, timeliness, access to results, clear definition of roles and responsibilities, and meeting people's needs.

¹⁹⁹ Alberta Environment, *Enabling Partnerships: A Framework in Support of Water for Life: Alberta's Strategy for Sustainability* (<http://www.waterforlife.gov.ab.ca/docs/EnablingPartnerships.pdf>), pp. 3-4 and *Alberta Environment Public and Stakeholder Involvement Principles* (http://www.environment.gov.ab.ca/stakeholder/pubs/Approved_Public_Involvement_Principles.pdf)

Table 11

**Alberta Environment's
Principles and Criteria for Public Involvement**

- Governments need to engage all interests that use or impact water resources.
- Albertans must recognize there are limits to the available water supply. Water must be managed within the capacity of individual watersheds addressing all of the activities that affect water supply, water use and water quality.
- A "partnership" is a voluntary organization of provincial, watershed, community and/or individual stakeholders who agree to undertake common or complementary activities, enter into agreements, and work together for the orderly, efficient, and accountable achievement of results.
- Partnerships do not have regulatory authority.
- All partners must encourage inclusiveness and broad stakeholder representation.
- Partners must have shared understanding of the watershed approach and use consensus in their efforts to achieve it.
- Roles and responsibilities of the Government of Alberta and its partners will be identified.
- In all its partnerships, the provincial government will uphold its legislated responsibility, accountability and legal authority for water and land use management decisions.
- Watershed management must take place within municipal, provincial and federal water and land use planning and decision-making processes and under relevant policies and legislation.
- Recommendations should lead to actions, actions should have measurable results, and results should lead to improved watershed management.
- Creativity and flexibility is the key to the evolution of partnerships.
- Focusing on working collaboratively with stakeholders based on the principle of shared responsibility for the environment.
- Cooperative action at the local, regional, provincial, national, and international levels is needed for effective environmental management.
- Six principles maximize the benefits of public and stakeholder involvement:
 - Respectful: relationships based on a foundation of trust, honesty and cooperation
 - Inclusive: an opportunity for people to be meaningfully involved in matters that affect them.
 - Timely: the opportunity to be involved early in the decision-making process and have a reasonable period of time for participation.
 - Responsive: access to the results of the public and stakeholder process
 - Transparent: define and communicate roles and responsibilities in the public and stakeholder involvement process.
 - Flexible: adapt the public and stakeholder involvement process to meet people's needs.
- Where legislation prescribes a specific public involvement process, that process will take precedence in the application of the *Public and Stakeholder Involvement Principles*.

Among the three primary changes that Alberta Environment is seeking in water management is to move from regulatory activity to shared governance.²⁰⁰

Disadvantages

Provincial support and participation are not commitments. In particular, it is not specified when those with decision-making authority will be expected or required to be members of a partnership. The *Framework* and the principles do not mention the duty of the provincial government to consult with First Nations and the requirement for "good faith efforts to understand each other's concerns and move to address them."²⁰¹

²⁰⁰ Yee, *Alberta's Strategy for Sustainability*, *supra* n. 15. The other primary changes are: moving from process to outcomes and moving from water management to watershed management.

²⁰¹ *Haida Nation v. British Columbia (Minister of Forests)*, 2004 SCC 73, [2004] 3 S.C.R. 511 – quote from paragraph 49 (<http://scc.lexum.umontreal.ca/en/2004/2004scc73/2004scc73.html>) and *Taku River Tlingit First Nation v. British Columbia (Project Assessment Director)*, 2004 SCC 74, [2004] 3 S.C.R. 550 (<http://scc.lexum.umontreal.ca/en/2004/2004scc74/2004scc74.html>). For further information on these Supreme Court decisions, see John M. Olynyk, *The Haida Nation and Taku River Tlingit Decisions: Clarifying Roles and Responsibilities for Aboriginal Consultation and Accommodation*, Lawson Lundell LLP, 2005 (<http://www.lawsonlundell.com/resources/Negotiatorarticle.pdf>) and Thomas G. Rothwell, *Haida Nation v. British*

Legislation is allowed to override the principles, even when decision-makers have the discretion to do otherwise.

The principles and criteria do not recognize that partnerships can play a role in influencing the legal and practical limits of government activity. The principles and criteria make Alberta Environment's authority over water management non-negotiable. Consensus-building and effective watershed management may require that the public become partners in Alberta Environment's decision-making.

In the South Saskatchewan River Basin, much of Alberta Environment's authority over water management has been "allocated" to others through the issuance of licences for water use and approvals for wastewater discharge and modifications to the aquatic environment. As a result, joint decision-making may be a precondition to implementing improvements in water management.²⁰²

This raises the question of who should have a say in the disposition and management of resources such as water and public land that are owned by the provincial government.²⁰³

It is unclear where the public ends and a stakeholder begin.

It is unclear what is meant by creativity and flexibility. The goals of partnerships do not include effective results.

The principles and criteria do not identify if and how the public and stakeholders are to be involved at inter-provincial, provincial-territorial, national, and international levels of management.

The principles and criteria do not recognize key aspects of successful public involvement: access to information, clear understanding of process, maintenance of continuous contact, and fairness.

It is unclear how shared governance will be able to reduce regulatory activity or how regulatory activity would change.

Potential options:

- Keep the principles and criteria as they are.

Columbia, Taku Tlingit First Nation v. British Columbia: Implications for Environmental Lawyers (<http://www.eab.gov.ab.ca/dec/Rothwell%20AB%20Justice%20Aboriginal%20Law.pdf>).

²⁰² The issue of joint decision-making has been reported on at least twice by public groups. See Upper Elbow River Instream Objective Working Group, *supra* n. 35, Appendix C, pp. C-4 – C-5 & C-24 – C-26 and Alberta Irrigation Projects Association, *Meeting the Challenges in Water Resource Management*, 1993, pp. 13-15.

²⁰³ For discussion of this issue, see Michael M. Wenig, "Who Really Owns Alberta's Natural Resources?" *LawNow*, December, 2003/January, 2004 (<http://www.ucalgary.ca/~cirl/pdf/2003fDecJanWenig.pdf>) and Michael M. Wenig, "Who's Minding the Water in Southern Alberta?" *LawNow*, December, 2005/January, 2006 (<http://www.ucalgary.ca/~cirl/pdf/2005eDecJanWenig.pdf>)

- Evaluate the principles and criteria to determine how they contribute to Albertans' knowledge, tools, motivation, and ability to implement actions that will maintain or improve the province's water resources.
- Revise the principles and criteria to make them compatible with the *Water for Life Strategy* and a watershed approach and able to deliver sustainable drinking water supplies, aquatic ecosystems, and economic development.
- Make partnerships into partners in regulatory decision-making to maintain and improve water supply, aquatic ecosystems, and drinking water.
- Establish types and levels of support for and participation in partnerships.
- Establish clear lines of governance and who is responsible for compliance.

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2.0 Issues Related to the *Water for Life Strategy*

2.1 *Safe, Secure Drinking Water Supply*

2.1.1 Outcome: Safe, Secure Drinking Water Supply Outcome: Healthy Aquatic Ecosystems

2.1.1.1 Healthy Aquatic Ecosystems vs. Water Treatment Technology

To what extent will we rely on healthy aquatic ecosystems vs. water treatment technology to protect our drinking water? ▲

Are existing policy instruments able to address cumulative impacts of point source and non-point source pollution on aquatic health and drinking water safety? ▲

Discussion: A drinking water system requires multiple barriers to ensure that, if one part of the system fails, there will be other ways to identify and eliminate threats to people's health. The multiple barriers include:²⁰⁴

- source water protection
- treatment of the raw water
- a clean and protected distribution system
- monitoring and warning systems
- emergency response procedures.

With limited time, resources, and authority, choices must sometimes be made between putting a priority on protecting the source of the raw water – that is, the watershed – from contamination or increasing the level of treatment to ensure that the raw water is treated properly. Policy instruments can make these choices less costly and more effective.

²⁰⁴ For a discussion of the multi-barrier approach, see *Report of the Walkerton Inquiry*, Part Two, *supra* n. 4, Chapter 3, pp. 72-79

Potential options:

- Do not address this issue.
- Determine how current policy instruments influence the choice between water source protection and water treatment upgrading.
- Evaluate the efficiency and effectiveness of choosing to place a priority on water source protection or water treatment upgrading.
- Evaluate whether existing policy instruments are able to address cumulative impacts of point source and non-point source pollution.
- Decide where, when, and how policy instruments should be changed and applied to give priority to water source protection or water treatment upgrading.

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2.1.2 Outcome: Alberta has a comprehensive strategy to protect Albertans' drinking water

2.1.2.1 Breadth and Realism of Outcome

Is this outcome broad and realistic enough to protect consumers of drinking water? ▲

Discussion: A drinking water strategy must also be effective and provide multiple barriers of protection.

Potential options:

- Keep the outcome as it is
- Change the outcome. For example: "Alberta has a comprehensive and effective strategy that provides multiple barriers to protect Albertans' drinking water."
- Change the outcome to define performance measures for the acceptable level of protection for consumers of drinking water.

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2.1.3 Outcome: Albertans have full and complete knowledge of drinking water issues

2.1.3.1 Effectiveness of the Outcome

Will this outcome be effective in creating safe, secure drinking water supplies?

Discussion: Drinking water issues are extremely complex. Greater knowledge of drinking water issues on the part of the public will increase their ability to identify and report compliance issues. Full and complete knowledge of drinking water issues may provide the impetus for proper funding of operations as well as implementation of socially contentious initiatives when the benefits of those initiatives are clear to the public.

However, this outcome, if achieved, may make drinking water protection less efficient and effective by diverting money and personnel away from actual protection activities.

If not properly explained, information may lead to knee-jerk reactions by the public. There also might be information that should not be made public to protect against malicious acts such as vandalism and sabotage.

Potential options:

- Keep the outcome as it is.
- Review this outcome to determine if it increases or decreases the efficiency and effectiveness of drinking water protection.
- Change the outcome to emphasize full and complete knowledge of those responsible for protecting consumers of drinking water.

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2.1.4 Outcome: Albertans have real-time access to information about drinking water quality in their community

2.1.4.1 Need for Real-Time Access

Is real-time access a realistic need for consumers of drinking water?

Discussion: Real-time access to information about drinking water allows consumers of drinking water to be aware of potential issues and to take action as part of their shared responsibility for water management.

This may become a monitoring and reporting nightmare without producing a significant increase in the safety of drinking water. Assuming real-time access for consumers can be achieved, it would not avert a crisis like the Walkerton tragedy since the operators in Walkerton were not actually monitoring the water quality and were fabricating results that indicated everything was fine.

Because of the complexity of drinking water management, safe drinking water depends on “thorough and persistent activity by a regulator,” not the public. The public have “contracted out” the responsibility for drinking water to the government so that they can spend their time doing other important things and the experts can make the timely and informed decisions necessary to keep people safe.²⁰⁵

Potential options:

- Keep the outcome as it is.

²⁰⁵ Morrison, “Indentured Servants,” *supra* n. 71, pp. 17-24

- Evaluate the feasibility and benefit of real-time access to information about drinking water.
- Revise the outcome to make it applicable to those who are responsible for managing and regulating drinking water.
- Revise the outcome to ensure the availability of information that the public needs and can realistically act upon.
- Revise the outcome to make the knowledge of administrators and regulators so good that the public does not need to access or act upon the information.

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2.1.5 Outcome: Alberta's drinking water infrastructure meets emerging standards and is managed for long-term sustainability

2.1.5.1 Outcome's Applicability to Watersheds and Other Infrastructure

Should this outcome be applied to all water infrastructure and to watersheds in general? ▲

Discussion: All water infrastructure (not just drinking water infrastructure) and watersheds in general face the challenge of dealing with emerging standards and long-term sustainability.

Potential options:

- Keep the outcome as it is.
- Add new outcomes identifying what is expected of other infrastructure and the management of watersheds (beyond watershed plans) in terms of dealing with emerging standards and long-term sustainability.

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2.2 Healthy Aquatic Ecosystems

2.2.1 Outcome: All aquatic ecosystem outcomes

2.2.1.1 Definition of Aquatic Ecosystem

Should the same definition of aquatic ecosystem be used?

Discussion: Different policy instruments use different definitions of the aquatic ecosystem or aquatic environment:

- *Water for Life*: "Aquatic ecosystem – An aquatic area ... [including] rivers, lakes and wetlands"²⁰⁶
- *Water Act*: "'aquatic environment' means ... the components of the earth related to, living in or located in

²⁰⁶ *Water for Life Strategy, supra n. 1, p. 24*

or on water or the beds or shores of a water body ... and their interacting natural systems"²⁰⁷

- *Framework for Water Management Planning*: "The aquatic environment ... includes naturally occurring features, such as rivers, streams, creeks, riparian areas, lakes, wetlands and groundwater."²⁰⁸
- The definition of legal bank from the *Surveys Act* is not consistent in all cases with the "natural boundary" definition in the *Land Titles Act*, which relies on the common law of accretion.
- Definitions of aquifer, ground water, springs, water wells, geysers, and riparian areas are also not clear.

Definitions that stick to surface water and/or the bed and shores are easier to manage because they are generally more clearly defined. However, there is no clear line that separates water and land environments.²⁰⁹ Water bodies, riparian areas, and ground water are part of an interconnected ecosystem. This is particularly important for small streams and lower class wetlands where small changes in riparian areas and ground water can have disproportionately larger impacts.

Potential options:

- Continue with current differences in definitions.
- Determine how the differences in definition contribute to protecting users and uses of the aquatic environment and promote good practice in water management.
- Revise the definitions to make them compatible with the *Water for Life Strategy*, but still allow differences to exist.
- Revise the definitions and their implementation to ensure that users and uses of the aquatic environment are protected
- Adopt one definition that suits all needs.

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2.2.1.2 Broad Range of Tools and Techniques to Protect Aquatic Ecosystems

There is not an outcome in the *Water for Life Strategy* that calls for a broad range of water management tools and techniques to be implemented to protect aquatic ecosystems. ▲

Discussion: A broad range of water management tools and techniques need to be available because of the varied uses of aquatic ecosystems and the complexity of interactions within the environment.

Potential options:

- Do not add a new outcome.

²⁰⁷ *Water Act*, supra n. 12, s. 1(1)(h)

²⁰⁸ *Framework for Water Management Planning*, supra n. 57, p. 20

²⁰⁹ Alberta Environment, *Facts and Information on Water in Alberta*, 2002 (<http://www.waterforlife.gov.ab.ca/docs/infobook.pdf>), p. 15

- Add a new outcome.

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2.2.2 Outcome: Efforts to protect aquatic ecosystems in critical areas are underway

2.2.2.1 Emphasis on Protection of Aquatic Ecosystems in Critical Areas

Does an emphasis on protecting aquatic ecosystems in critical areas improve or reduce our ability to protect the users and uses of the aquatic environment? ▲

Discussion: The emphasis on protecting aquatic ecosystems in critical areas is compatible with other key policy instruments.²¹⁰ It assures protection of habitats that are vital to fish, other animals, sustainability, and/or people's commercial and recreational use of the environment. Identification of critical areas also assists municipalities in determining where to focus their efforts.

The idea of what constitutes a critical habitat varies, though. It may mean investment of money and time in areas that are "lost causes," do not need government intervention, or are "squeaky wheels" that divert attention and resources away from efforts to protect the overall health of ecosystems.

In assessing which areas are critical, risks are typically not well understood in terms of cumulative impacts. Social, economic and administrative issues may take precedence over environmental issues. Proponents of lower impact development strategies may then be penalized by rigid application of existing guidelines and requirements. In some cases, guidelines and requirements have not kept pace with developments within industry.

Potential options:

- Keep the outcome as it is.
- Develop a common definition and priority list for efforts to protect critical areas.
- Evaluate the performance of previous efforts to protect critical areas to determine how they contribute to protecting and improving the health of aquatic ecosystems.
- Revise the outcome. For example: "Efforts to protect and improve the health of aquatic ecosystems provide the maximum benefit in terms of sustaining those ecosystems and maintaining or re-establishing natural biodiversity."

²¹⁰ Examples of policy instruments placing a priority on critical areas are:

- "Highest priority will be given to those water bodies where present or future ecological integrity is at greatest risk or where the greatest benefits of preventative or mitigative actions can be achieved." ("Strategy for the Protection of the Aquatic Environment," *supra* n. 80, p. 23)
- "The Department of Fisheries and Oceans will apply this policy primarily in freshwaters, estuaries and coastal situations where most damage to fish habitats has taken place and where the risk of future damage is highest." (*Policy for the Management of Fish Habitat, supra* n. 23, p. 2)

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2.2.3 Outcome: Water is managed and allocated to sustain aquatic ecosystems and ensure their contribution to Alberta's natural capital and quality of life is maintained

2.2.3.1 Natural Capital

What is "natural capital"? ▲

Discussion: It is unclear what "natural capital" is.

Potential options:

- Keep the outcome as it is.
- Provide clarification on what natural capital is.

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2.2.4 Outcome: Water management objectives and priorities for sustaining aquatic ecosystems are established through watershed plans

2.2.4.1 The Watershed Approach

What is a watershed approach? ▲

Discussion: Watershed plans depend on adopting a watershed approach. However, there is no commonly accepted definition in Alberta of what a watershed approach is or should be. The United States Environmental Protection Agency (US EPA) has provided a good description of the components of a watershed approach (Table 12).²¹¹ In Alberta, these components have been to some extent incorporated into examples of policy development, development of legislation, monitoring, planning, and operations.²¹² Based on this experience, it is unclear if watershed plans and their implementation are better or worse than alternate approaches²¹³ in terms of protecting users and uses of the aquatic environment.

The role of adequate financing in a watershed approach has not been identified.

²¹¹ For a discussion of the complexities related to a watershed approach, see Michael M. Wenig, "Thinking Like a Watershed," *LawNow*, June/July, 2004 (<http://www.ucalgary.ca/~cirl/pdf/2004cJunJulWenig.pdf>)

²¹² Less use of these components has been evident in allocations and approvals, standard-setting, financing, and compliance.

²¹³ Examples of alternate approaches are free market mechanisms, administrative discretion, traditional water management, and supply augmentation. For a discussion of traditional water management, see Bob Morrison, "Traditional Water Management Decision-Making," *Moving Beyond Now*, v. 1, no. 3 (July, 2004), pp. 13-16.

Table 12	
Components of a Watershed Approach	
• Coordinating framework	
• Public & private efforts	
• Address highest priority problems	
• Hydrologically-defined geographic areas	
• Consider both surface & ground water	
• Those most affected by decisions are involved throughout	
• Environmental, economic, & social/cultural goals well-integrated	
• People well-informed	
• People participate in planning & implementation	
• Sound scientific data, tools, & techniques	
• Iterative decision-making, incl. evaluation of effectiveness	
• Shared information	
• Common understanding of roles, priorities, & responsibilities	
• Development of management options & action plans	
• Environmental justice* addressed	
• Goal & target setting	
• Make progress based on available information while continuing analysis & verification	
* Environmental justice is "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or a socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies. Meaningful involvement means that: (1) potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health; (2) the public's contribution can influence the regulatory agency's decision; (3) the concerns of all participants involved will be considered in the decision making process; and (4) the decision makers seek out and facilitate the involvement of those potentially affected." (U.S. Environmental Protection Agency <i>Environmental Justice</i> , 2004 (http://www.epa.gov/compliance/environmentaljustice/index.html))	
Source:	U.S. Environmental Protection Agency, <i>Watershed Approach Framework</i> , (http://www.epa.gov/owow/watershed/framework.html) as summarized in Waxwing Synthesis and Resolution Inc., <i>Issues and Policy Recommendations: Nose Creek Watershed - Appendices</i> , , Nose Creek Watershed Partnership, 2005 (http://www.airdrie.ca/Content/environment/nosecreek/images/Nose_Creek_Objective_2_Appendices_final.pdf), p. 47

Potential options:

- Do not address this issue.
- Have each watershed planning and advisory committee define what a watershed approach should be.
- Evaluate past efforts to apply components of a watershed approach to determine what worked and what did not.
- Evaluate the *Framework for Water Management Planning*, the US EPA components, and other approaches and prepare a proposal for a common or minimum definition of what a watershed approach should be.
- Adopt a common or minimum requirement for a watershed approach.

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2.2.5 Outcome: Albertans have the knowledge and tools to implement actions to maintain or improve the province's water resources (aquatic ecosystems)

2.2.5.1 Motivation to Protect Aquatic Ecosystems

This outcome, unlike similar ones in the *Water for Life Strategy*, does not aspire to influence the motivation of Albertans. ▲

Discussion: A key factor in maintaining or improving the aquatic environment is motivation.

Potential options:

- Keep the outcome as it is.
- Change the outcome to include motivation to implement actions to maintain or improve the aquatic environment.

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2.2.5.2 Self-Interest in Protecting Aquatic Ecosystems

Should this outcome be supplemented or replaced by a goal to increase self-interest in protecting users and uses of the aquatic environment? ▲

Discussion: This outcome speaks to people's knowledge and tools, but does not mention people's self-interest, a key aspect of behavior. Self-interest is often, but not necessarily a matter of economics.

Potential options:

- Keep the outcome as it is.
- Change the outcome to include influencing people's self-interest to implement actions to maintain or improve the aquatic environment.

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2.2.6 Outcome: Communities are demonstrating leadership in watershed management

2.2.6.1 Leadership Provided by Elected Officials and Administrators

Should the Strategy include an outcome related to the leadership provided by elected officials and administrators? ▲

Discussion: Most regulatory decisions from approvals to enforcement are based on leadership from elected officials or administrators, not the community. This outcome does not identify the outcome(s) expected from elected officials and administrators when they exercise leadership.

Potential options:

- Keep the *Strategy* as it is.
- Include an outcome related to the leadership provided by elected officials and administrators in watershed management. For example: "Elected officials and other government decision-makers meet the highest standards of leadership in managing watersheds."

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2.2.6.2 Roles Communities Play in Management

Should the outcome be expanded to identify the roles communities are expected to play in management as opposed to leadership? ▲

Discussion: *Leadership* is the ability to cope with change – promoting it, resisting it, or adapting to it. *Management* is the ability to handle routine, but usually complex problems.²¹⁴ This outcome does not identify the roles communities are expected to play in the management of watersheds.

Potential options:

- Keep the outcome as it is.
- Change the outcome to identify the roles communities are expected to play in management of watersheds. For example: "Communities, through their municipal governments, other organizations, and individual actions, ensure that watersheds are managed to maintain and improve social, economic, and environmental sustainability."

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2.3 *Reliable, Quality Water Supplies for a Sustainable Economy*

2.3.1.1 Quality of Water Supplies to be Achieved

Should this overall outcome be revised to define the level of quality of water supplies that should be achieved? ▲

Discussion: A sustainable economy depends on knowing what level of quality of water supplies is considered acceptable/desirable.

Potential options:

- Do not change the outcome.
- Change the outcome to define the level of quality of water supplies necessary to achieve a sustainable economy. For example: "Reliable, high quality water supplies for a sustainable economy."

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2.3.2 Outcome: All outcomes related to a sustainable economy

²¹⁴ Based on John P. Kotter, "What Leaders Really Do," *Harvard Business Review*, December, 2001, pp. 85-96 (from Bob Morrison, "Planning Predestination: The Decision to Build Three Gorges Dam," *Moving Beyond Now*, v. 1, no. 4 (August, 2004), p. 28)

2.3.2.1 Role of Communities in Providing Leadership and Management

Should an outcome be added to define the role of communities in providing leadership and management to ensure reliable, quality water supplies for a sustainable economy? ▲

Discussion: Communities have an essential role in providing leadership and management to ensure reliable, quality water supplies for a sustainable economy. Unlike under "Healthy Aquatic Ecosystems," the role of communities in providing leadership and management has not been specified.

Potential options:

- Do not add a new outcome.
- Add a new outcome. For example: "Communities, through their municipal governments, other organizations, and individual actions, ensure that water supplies are not a limiting factor in achieving a sustainable economy."

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2.3.3 Outcome: A broad range of water management tools and techniques are implemented

2.3.3.1 The Term Water Management

Should the term water management be replaced with something else? ▲

Discussion: The term "water management" may be inappropriate. The challenges we face are not about managing water but how we manage what we do with it or do to it.

Potential options:

- Keep the term water management.
- Replace water management with the term "water use management."

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2.3.3.2 Implementation of Tools and Techniques

Should this outcome instead be to implement the tools and techniques necessary to ensure that the economy has the reliable, quality water supplies necessary for sustainability? ▲

Discussion: People do not care whether or not a broad range of water management tools and techniques are implemented. They care about results.

Potential options:

- Keep the outcome as it is.

- Replace or supplement the outcome. For example: “A sufficiently broad range of water management tools and techniques are available and considered when choosing the best solutions for ensuring reliable, quality water supplies.”

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2.3.4 Outcome: All sectors are demonstrating best management practices and improving efficiency and productivity associated with water use

2.3.4.1 Other Areas for Best Management Practices

Is this outcome broad enough? ▲

Where else should best management practices be demonstrated? ▲

Discussion: This outcome focuses on efficiency and productivity associated with water use. Effectiveness of water use is a concern of equal or greater importance.

As well, best management practices may be required in other areas of water management such as protection of watersheds, management of aquatic ecosystems, integrated management, planning, floodplain management, approvals, and supply augmentation.

Potential options:

- Keep the outcome as it is.
- Review current best management practices to determine which other aspects of water management should be expected to use best management practices.
- Clarify the outcome as to how it relates to the effectiveness of water use.
- Clarify the *Strategy* as to the expectations for best practices in other aspects of water management.

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2.3.4.2 Making the Best Good

Is the “best” good enough or is it too good? ▲

Discussion: As we sometimes discover after something goes wrong, the best may not be good enough. Other times the best may be unnecessary, placing a burden on water users or taxpayers that is not justified by the benefits.

Instead, it may be more useful to seek and apply good management practices. As an example, the good practice guidelines developed by the World Commission on Dams have

been adapted to provide a set of criteria that apply to all aspects of water management.²¹⁵ (Table 13)

Potential options:

- Keep the outcome as it is.
- Replace “best management practices” with “good management practices.”

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2.3.5 Outcome: The overall efficiency and productivity of water use in Alberta has improved by 30% from 2005 levels by 2015 (firm targets to be determined by the Provincial Water Advisory Council)

2.3.5.1 The Alberta Water Council's Role

Is the Alberta Water Council's role clear? ▲

Discussion: The “Provincial Water Advisory Council” is now the Alberta Water Council. It is currently working on the question of water conservation, efficiency, and productivity.

The Advisory Committee on Water Use Practice and Policy appears to have viewed the Council's role differently from this outcome. First, the Committee appears to have expected a more integrated effort through a “provincial Water Conservation Plan” rather than the “water conservation and productivity plans for all water using sectors” committed to in the *Water for Life Strategy*. Second, the Committee wanted this provincial plan “developed under the scrutiny of the Alberta Water Council” with the efficiency and productivity target “subject to evaluation” rather than determination by the Council.²¹⁶

This view of the Council's role as evaluating rather than determining efficiency and productivity targets was included in the recently issued *Guideline* for oilfield injection.²¹⁷

Potential options:

- Do not address the different views on what the Council's role is.
- Determine the advantages and disadvantages of a provincial plan vs. sector plans.

²¹⁵ Bob Morrison, “Good Practice for Water Management Decision-Making,” *Moving Beyond Now*, v. 1, no. 3 (July, 2004), pp. 17-19

²¹⁶ Advisory Committee on Water Use Practice and Policy, *supra* n. 14, p. 19

²¹⁷ “The Alberta Water Council has an important role in recommending changes to water management in Alberta, under the *Water for Life* strategy. The Council will evaluate the value of water in Alberta's economy, review the use of economic instruments in water management, and provide advice to the Government of Alberta on other vital issues relevant to the management and regulation of water resources in the province.” (*Water Conservation and Allocation Guideline for Oilfield Injection*, *supra* n. 16, p. 45)

- Determine the advantages and disadvantages of an evaluation vs. a determination role for the Alberta Water Council in setting efficiency and productivity targets.
- Revise the outcome and the instruments for achieving it to maximize the benefits and minimize the negative consequences of efficiency and productivity targets.

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2.3.5.2 Market Mechanisms

Are market mechanisms a more appropriate approach? ▲

Discussion: The provincial government believes that water conservation is “absolutely critical” and that, if this target is not achieved, Alberta is “going to be in trouble for the future.”²¹⁸

Requirements for efficiency and productivity that are imposed by government provide an open, collaborative, and fair method of achieving water conservation. The undesirable side-effects of more efficient water use (e.g., less water available for other users or the environment, prices some can not afford) can be managed with government intervention.

The market, however, is believed to be generally more efficient and responsive in setting prices that encourage water users to conserve water. The market may make it possible to increase efficiency and productivity sufficiently without setting a specific target in watersheds as long as there is a cap on the amount of water that can be allocated and allocation transfers are allowed.

In making a choice between government regulation and market mechanisms, it is important to remember that increased efficiency does not necessarily mean less use. In fact, water consumption could increase because water allocation transfers will result in higher use of existing allocations. In addition, attempts to increase efficiency may lead to reduced return flows which would, in turn, result in less water available for re-use downstream.²¹⁹

Potential options:

- Keep the outcome as it is.
- Evaluate the ability of government requirements and market mechanisms to achieve water conservation.
- Revise the outcome to encourage the most effective mix of government requirements and market mechanisms.
- Revise the outcome to achieve water conservation through market mechanisms only.

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²¹⁸ Yee, *Alberta's Strategy for Sustainability*, *supra* n. 15, 19:06

²¹⁹ Watrecon, *supra* n. 85, pp. 12-17

Table 13 Good Practice in Water Management Decisions¹			
Barriers to More Effective and Sustainable Water Management	Strategic Priority	Key Principles	Key Decision Points
<ul style="list-style-type: none"> Limited, superficial, belated public involvement Lack of recognition and empowerment of negatively affected people Lack of transparency Political interference 	Public Acceptance	<ul style="list-style-type: none"> Recognition of rights & assessment of risks Safeguarding of entitlements of all affected people Access to information & availability of legal and other support for all stakeholders Informed participation by all groups of people Demonstrated public acceptance of key decisions achieved through agreements negotiated in an open & transparent process conducted in good faith Free, prior, informed consent through formal & informal representative bodies² 	Needs Assessment
<ul style="list-style-type: none"> Overestimation of demand Narrow range of alternatives Limited expertise of personnel 	Comprehensive Options Assessment	<ul style="list-style-type: none"> Clear definition of needs & objectives prior to identification & assessment of options Comprehensive, participatory assessment of full range of policy, institutional, management, & technical options Same significance given to social, environmental, economic, & financial factors Priority given to increasing the effectiveness & sustainability of existing water, irrigation, & energy systems Continuation of options assessment through all stages of planning, project development, & operations 	Selecting Alternatives
<ul style="list-style-type: none"> Narrow range of alternatives Lack of monitoring and evaluation of project performance Preference for large projects Influence of vested interests 	Addressing Existing Management³	<ul style="list-style-type: none"> Optimization of benefits from existing infrastructure, operations, monitoring, technology, land use, regulatory tools, priorities, & initiatives Addressing outstanding social, economic, & environmental issues⁴ Formalized operating agreements with time-bound licence periods Comprehensive post-project monitoring, evaluation, & review of performance, benefits, & impacts 	Project Preparation
<ul style="list-style-type: none"> Limited expertise of personnel Rudimentary economic analysis Cosmetic, poorly informed consideration of social and environmental concerns 	Sustaining Ecosystems⁵ and Livelihoods	<ul style="list-style-type: none"> Understanding, protection, & restoration of ecosystems Understanding how community livelihoods depend on & influence ecosystems Minimization & mitigation of harm to the health & integrity of ecosystems Priority given to avoidance of impacts in accordance with a precautionary approach National policy for maintaining selected rivers with high ecosystem functions & values in their natural state Avoidance of significant impacts on threatened & endangered species. When impacts cannot be avoided, provide viable compensation measures resulting in a net gain for the species within the region Environmental flows to help maintain downstream ecosystem integrity & community livelihoods 	Project Implementation
<ul style="list-style-type: none"> Control of decision-making by centralized government agencies Government collaboration with, subsidies for, and legal and procedural decisions that favor certain interests 	Recognizing Entitlements and Sharing Benefits	<ul style="list-style-type: none"> Mutually agreed & legally enforceable mitigation, resettlement, & development provisions Recognition of entitlements that improve livelihoods & quality of life Successful mitigation, resettlement, & development are fundamental responsibility of State & developer Impact assessment includes all people upstream, downstream, & in catchment areas whose properties, livelihoods, & non-material resources are affected Recognition of adversely affected people as first among the beneficiaries of the project 	Project Operation
<ul style="list-style-type: none"> Financing with minimal oversight, disclosure of information, and penalties for non-compliance⁶ Failure to meet commitments and legal/policy requirements Burden of ineffective projects on government treasuries 	Ensuring Compliance	<ul style="list-style-type: none"> Adoption by sponsoring, contracting, & financing institutions of clear, consistent, common criteria & guidelines Compliance with all commitments & regulatory/non-regulatory measures for planning, implementation, & operation Mutually reinforcing incentives, sanctions, & mechanisms for social, environmental, & technical measures Compliance subject to independent & transparent review Flexibility when needed to accommodate changing circumstances Preparation of compliance plan Cost of compliance built into project budget 	
<ul style="list-style-type: none"> Lack of watershed context Unilateral rather than cooperative action Rigid rather than flexible arrangements Lack of sanctions for non-compliance 	Sharing Rivers for Peace, Development, and Security⁷	<ul style="list-style-type: none"> Constructive co-operation Basin agreements in shared river basins based on principles of equitable & reasonable utilization, no significant harm, prior information, & these strategic priorities Intractable disputes resolved through dispute resolution 	

1. Based on World Commission on Dams, *Dams and Development*, 2000 (<http://www.dams.org/>), pp. 74, 91, 167-194, 199-211, & 213-257. 2. The Commission limited this principle to indigenous and tribal people. 3. The Commission called this priority "Addressing Existing Dams." 4. The Commission's recommendation was to address "outstanding social issues" and strengthen "environmental mitigation and restoration measures." 5. The Commission used the word "rivers," but clarified this as "rivers, watersheds and ecosystems." 6. The Commission focused on the role of foreign financial assistance to developing countries. 7. The Commission discussed this priority primarily in terms of international rivers.
December 15, 2006

Appendix A
Project Team Members
and Consultants

Members

Policy Issues and Gaps Project Team Alberta Water Council

Jim Badger, Treaty 8
Mark Brostrom, City of Edmonton
Bob Demulder, Alberta Chamber of Resources
Claude Chamberland, Canadian Association of Petroleum Producers
Susanne Forbrich, Environment Canada
Audrey Murray, Alberta Energy
Ted Nason, Alberta Sustainable Resource Development
Judy Stewart, Watershed Planning and Advisory Councils, Chair
Jason Unger, Alberta Environmental Network
Jim Webber, Alberta Irrigation Projects Association
Les Wetter, Ducks Unlimited

Project Managers

Robyn Kuhn, Alberta Environment
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Consultants for this project

Dennis Westhoff, Westhoff Engineering Resources Ltd.
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Appendix B

Scope of Work and Approach

Scope of Work

This project will relate to three of the Project Team's tasks:

- Identify the existing water management system in Alberta
- Define a process for identifying policy and legislative issues in water management systems in Alberta
- Identify policy and legislation issues in the water management system

Three documents will be prepared:

- **Inventory of water management outcomes** based on a literature review of existing materials.²²⁰
- **Inventory of water management policy instruments** based on a literature review of existing materials
- **Initial list of policy issues and gaps** based on past consultations and input from subject matter experts facilitated by the consultants.

Approach

A policy is created because there is an issue that needs to be resolved and resolved so that a specific outcome is achieved. Legislation, program objectives, and other methods of providing direction to decision-makers are developed to maximize the chances of successful implementation. The success of a policy is determined by considering its advantages, disadvantages, and any unresolved issues. (Figure 1)

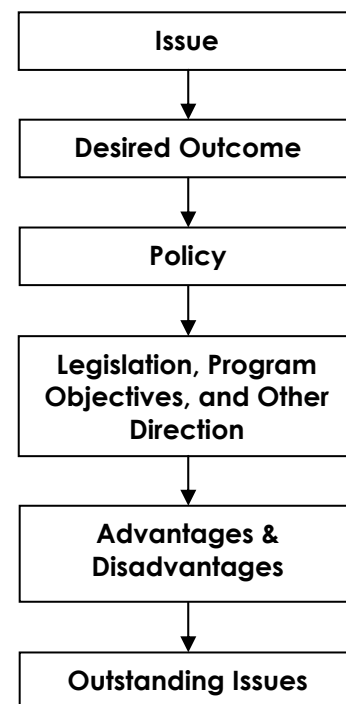
The approach to this project was systematic and impartial. There are diverse policies for water management and equally diverse views on the importance and effectiveness of those policies. The diversity of policies and views needed to be incorporated clearly and fairly.

Consultation

We identified and assessed policies using our extensive experience in water management. The Project Team also made an invaluable contribution through its review of our progress.

Although our joint expertise is considerable, others with experience in water management needed to be consulted to ensure a high quality and credible product.

Figure 1
Policy Process



²²⁰ The inventory of outcomes used for this project were the outcomes established in *Water for Life Strategy* (Alberta Government, *Water for Life: Alberta's Strategy for Sustainability*, 2003 (<http://www.waterforlife.gov.ab.ca/docs/strategyNov03.pdf>)). For an inventory of water management outcomes, see Kim Lalonde, *Sustainable Resource and Environmental Management: An Inventory of Provincial Outcome Statements-Final Report*. Alberta Environment, 2006

There are subject matter experts who can add value to scoping and issue identification. As well, an important contribution can be made by people who, although lacking professional credentials, can provide information and insights because of their experience in dealing with water issues.

People and organizations outside of the Project Team and consulting firms were contacted by e-mail and invited to contribute their knowledge and opinions, including reviewing draft materials prepared for this project. The list of people contacted was extensive to avoid the appearance of giving preferential treatment to some. The list was developed by identifying groups and individuals who had indicated an interest in watershed management.

Organizations such as government agencies and interest groups were encouraged to disseminate information to their members to ensure that their policies and the implementation of those policies could be properly understood. We followed up with groups and individuals as appropriate to ensure that information and opinions were clear and pertinent to the project.

A website was established at the beginning of the project. The purpose of the website was to provide additional information to participants and allow them to download files related to the project.

Two inventories of documents were developed. The first was an inventory of policies and policy instruments (e.g., legislation, guidelines, programs). The second was an inventory of research, analysis, recommendations, and views. Both inventories were extensive, but by no means complete. Documents can be added to the inventories in the future as they become available.

Documents from the two inventories were reviewed and, as appropriate, used in identifying and assessing policies. As many documents as possible have been examined within the timeframe, resources, and priorities for this project. The scope of the issues considered has been broad. However, unless previously examined in the existing literature, consideration of how Alberta stacks up nationally and internationally was not part of the terms of reference.

Criteria

Many criteria can be used in assessing water management policies.²²¹ Four criteria were used in this project:

- Is a policy or policy instrument compatible with a watershed approach?
- Does a policy or policy instrument promote good practice in water management decisions?
- Is a policy or policy instrument an efficient use of time and resources?
- Is a policy or policy instrument effective (e.g., to meet desired outcomes)?

²²¹ See, for example, Waxwing Synthesis and Resolution Inc., *Issues and Policy Recommendations: Nose Creek Watershed, Appendices*, 2005 (http://www.airdrie.ca/Content/environment/nosecreek/images/Nose_Creek_Objective_2_Appendices_final.pdf)
Tables D-6 – D-8

Terminology

Terminology must be clear. We cast a wide net with the terms used. Here is how we defined key terms:

Issue: a question, problem, undesirable result, or matter of concern or dispute

Desired Outcome: a goal, purpose, target, or positive result

Policy: a plan, strategy, or course of action considered prudent to achieve a desired outcome

Direction: the instruments or mechanisms (e.g., legislation, programs, guidelines, procedures) established to implement a policy

Advantages/Disadvantages: the pros/cons, strengths/weaknesses, and positive/negative aspects of policy implementation

Outstanding Issue: unresolved aspects of an issue or undesirable consequences

Coverage

On a priority basis, policy implementation was covered from the general to the specific. Relevant economic, social, environmental, and operational factors were considered. To achieve the Project Team's objective of creating an initial list of policy issues and gaps, the coverage of policies and the consideration of factors varied from issue to issue.

As budget allowed, the most significant policy instruments were examined using four levels of analysis:

Level 1 – Preliminary Assessment: A brief description of advantages, disadvantages, issues, and priorities for further work based on our experience and input from Project Team members.

Level 2 – Literature Review: Based on project priorities, summaries of existing information on advantages, disadvantages, issues, and gaps.

Level 3 – Additional Analysis: Based on previous work, priorities, and budget, examination of a select number of topics in greater detail.

Level 4 – Synthesis: Preparation of a report which clearly and concisely describes outstanding issues and gaps.

Priorities

The Policy Issues and Gaps Project Team identified a set of priority areas to guide scoping and issue identification. Each of these priority areas were analyzed at Level 1, that is, assessed based on the experience of the consultants with input from the Project Team.

Six priority areas were analyzed at Level 2. This meant that, for those six, literature was reviewed to identify existing information on the advantages and disadvantages of policy instruments and outstanding issues and gaps. Subject matter experts were consulted where appropriate.

The priority areas were:

Analyzed at Levels 1 and 2: (list alphabetically)

- How are existing and future water users and uses protected with existing policy instruments?
- How are water, air, and land use decisions linked by existing policy instruments?
- How does compliance happen with existing policy instruments?
- How does existing policy deal with potential long-term water supply changes?
- How would lower impact development be implemented in an urban and rural municipal context using existing policy instruments?
- To what extent will watershed planning options be enabled or constrained by existing policy instruments?

Analyzed at Level 1: (list alphabetically)

- Are existing policy instruments compatible with public views?
- As set out in existing policy instruments, what level of risk is acceptable?
- Based on existing policy instruments, what are acceptable levels of sustainability?
- Based on existing policy instruments, where does informed consent stop and "selfless authoritarianism" begin?
- Can we predict and manage floods and droughts in small watersheds using existing policy instruments?

- Do existing policy instruments provide Albertans with the necessary knowledge and tools?
- How are water bodies, riparian areas, and ground water treated as a single resource in existing policy instruments?
- How do existing policy instruments protect the aquatic environment and how is the aquatic environment reflected or accounted for in decision-making?
- How do market mechanisms and cost-sharing play a role?
- How would Alberta handle a Walkerton situation with existing policy instruments?
- Under existing policy instruments, are Directors accountable to the Alberta Water Council and Watershed Planning and Advisory Councils?
- What jurisdiction (authority or responsibility) do the Alberta Water Council and Watershed Planning and Advisory Councils have to actually do anything about policy and implementation of policies identified or analyzed?
- When policy instruments are applied, to what extent are different interests allowed to compete in having their concerns considered?

Organizing Framework

The information collected for this project was organized using the categories in the worksheet shown in Appendix C. The worksheet was based on *Water for Life: Alberta's Strategy for Sustainability*. Modifications to the worksheet were made as the project evolved. The worksheet itself was primarily used to do the Level 1 analysis.

Issues and gaps that deal with similar aspects of water management were grouped and linkages between similar issues identified within the limits of time and budget. Linkages were analyzed to describe how existing outcomes, policies, and direction are contributing to the water management system. Consideration was given to how qualitative direction is translated into quantitative results.

Appendix C
Worksheet for Analysis

Issue	Desired Outcome	Policies and Policy Instruments	Advantages	Disadvantages	Outstanding Issues	Options
Drinking Water or Aquatic Ecosystems or Water Supplies for a Sustainable Economy	For example: "Safe, Secure Drinking Water Supply"	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">

Appendix D

Issues

**From *Water Management in Alberta: Challenges for the Future*
(review of water policy and legislation)**

Issues From *Water Management in Alberta: Challenges for the Future*²²²

• Involving the Public in Decision-Making

- When should the public be involved?
- Who should be involved?
- How should the public be involved
- What issues should be subject to public review?
- Which decisions should be subject to public review?
- What information should be available to the public?
- What are the possible opportunities for public input to the river basin planning process?
- Should legislation contain provisions for different forms of public input such as meetings?
- Who should be involved in public input to the approval process under legislation?

• Planning for the Future

- What is the role of the river basin planning process in water management decision-making?
- How should water management decisions be made in basins where the planning process has not started or is incomplete?
- What objectives or guidelines should be addressed in a river basin plan?
- What should be the relationship of the integrated resource planning process to the river basin planning process?
- What relationship should other planning activities have with the river basin planning process?
- What information does the public need on the quantity and quality of surface and ground water?

• Protecting Our Surface and Ground Water Resources

- How should basic and desirable instream flow needs be defined?
- How should instream flow needs be met during natural low flow periods?
- Is it acceptable to express the government's commitment to protecting instream flows by way of policy or is legislation needed?
- Are there other options for ensuring ground water protection? Should these options be legislated?
- Should water quality guidelines or objectives for Alberta's rivers be established before allocating water?
- What are the most appropriate means to support the integration of water quality/quantity relationships in all water management decisions (e.g., by policy statement, provisions in legislation)?
- What enforcement measures and /or penalties should be applied to water resource violations?
- Should governments take a more active role in managing lake levels or should nature be left to take its course?
- What role should the various levels of government take in managing lake water quality?

• Using Our Water Resources Wisely

- Should the sale or transfer of water licences or portions of licences be allowed with some form of government control?

²²² *Water Management in Alberta: Challenges for the Future* was an initiative by Alberta Environment in the early 1990s to develop new water management policies and legislation. It led to the passage of the *Water Act*. These issues are taken from various documents prepared for the initiative. This list does not include all issues raised since there was some overlap and some issues were of a technical nature. Some issues have been edited for clarity.

- What restrictions should be placed on such sale of licences (e.g., protection of instream flow levels, setting minimum and maximum flows for irrigation canals, protection against speculative sale of water rights)?
 - Should the sale or transfer of water rights be allowed between sectors of the economy, such as irrigation, industry, or municipalities?
 - Should new licences be issued for a fixed term?
 - Should water management legislation be flexible enough to recognize objectives and guidelines developed through planning programs?
 - What should be the maximum level of water allocation per river basin or ground water aquifer?
 - Should the rights of domestic water users be addressed?
 - Should potable ground water be used for purposes other than domestic uses, such as oilfield injection or irrigation?
 - If so, what quantity or amount of ground water withdrawal should be allowed for these purposes?
 - What roles should the province have in developing future water management projects and in mitigating the damages caused by water in its natural state?
 - How should the distribution of costs to direct beneficiaries, local governments, and the public be determined for the construction, operation, maintenance, and rehabilitation of water management projects?
 - Should water conservation initiatives be addressed in policy and legislation?
 - What water conservation options and strategies could be legislated?
 - Should water conservation include the maintenance of instream flows, water quality, and aquatic ecological processes?
 - Should water charges and rate structures that encourage water conservation be established for consumptive users?
 - How should development in floodplains be controlled?
 - What roles should legislation have in controlling this development?
 - What options should be considered for addressing drought problems over the long term?
- **Cooperating With Other Governments**
 - How can shared responsibility for water management be emphasized in the legislation?
 - What role should inter-governmental bodies such as the Prairie Provinces Water Board and the Mackenzie River Basin Commission play?
 - To what extent should *Canada Water Act* studies be conducted?
 - How can duplication of effort be reduced?
 - How should local governments be involved as partners?
- **Water Rights**
 - Clear definitions are required for a variety of issues.
 - Should more flexibility be built into legislation for guidelines?
 - How should water be shared during a shortage?
 - Should some uses of water or some activities that affect water bodies be exempt from the requirement to be approved by the government?
 - Should there be a process for appealing a decision?
 - Should the enforcement system be streamlined and modified?
 - Should enforcement be the same under each piece of legislation?
 - Should Alberta Environment have a role in settling disputes?
 - Should administrative penalties (a form of enforcement that acts like a parking ticket) be used to enforce legislation?
 - Should enforcement be delegated to local governments?
 - Should those accused or convicted of violations be publicly identified?

• **Instream Flow Needs**

- What water bodies should be assigned a high priority for the establishment of instream flow needs?
- What level of risk to the maintenance of instream needs and withdrawal uses should be considered in establishing instream flow needs?
- Should a stream's capacity to assimilate waste be considered as an independent use in establishing instream flow needs?
- How can the public be most effectively involved in the establishment of instream flow needs?

• **Lake Management**

- What should be the balance between active (structural) lake management and indirect (non-structural) lake management?
- What agencies should be responsible for land use planning around lakes?
- Should Alberta Environment take some responsibility for private sewage treatment guidelines around lakes?
- Should lake planning recommend specific controls on pesticides, fertilizers, and other intensive agricultural operations (such as feedlots) around lakes?
- How should forestry planning account for concerns regarding lake protection or should Alberta Environment be involved?
- Should there be changes in how shoreline developments are controlled?

• **Water Conservation**

- What is an appropriate definition of water conservation?
- Does water conservation mean more than the protection and wise use of water?
- What are the reasons for promoting water conservation?
- What policy, legislation, and regulations that facilitate conservation should be adopted?
- What role should recycling (including effluent) play in water conservation?
- How can conservation of aquatic ecosystems be achieved?

• **Water Pricing**

- In addition to annual operating and maintenance costs, will capital costs be shared?
- Are tax levies against land holdings the most efficient and equitable way of collecting costs from private beneficiaries?
- Should the principle of user pay be applied to non-consumptive water users?
- Should new water users be asked to pay the total incremental cost of expanding water systems or should these costs be spread over all users?
- Should the province develop a program to encourage installation of water meters?
- Should the province take a more active role in encouraging or requiring municipalities to adopt conservation pricing practices?
- Should conservation programs, funding, and incentives be applied equally in all parts of the province?
- Should all types of users in all parts of the province pay the same fee per unit of water?
- Should rates reflect the amount of water withdrawn or the amount of water consumed?
- Should revenues be earmarked for specific water management initiatives?
- Should fees be applied to ground water as well as surface water?
- Should non-consumptive or instream water uses such as waste assimilation, water-based recreation, and fisheries be required to pay a fee?
- What action should be taken if some water users are unable to pay a fee?

- **Operation and Maintenance of Water Management Projects**

- Should the province own and operate water management projects?

- **Water for Irrigation**

- Should minimum standards be set for return flows?
- Should irrigation districts be required to monitor the water quality of their return flows?

- **Environmental Impact Assessment**

- How should cumulative effects assessment be incorporated into broader-based planning studies?

Appendix E

Funding Analysis

Methodology

Information was gathered primarily from annual reports. Data on provincial grants to municipalities were acquired from the Municipal Financial Information System. In a few cases, it was possible to obtain additional information from other sources

An initial review of annual reports indicated that, because of frequent changes in the way expenses were categorized, it would not be possible, in most cases, to separate expenses for water management from other expenses. This was confirmed by detailed data collection. As a result, only expenses for some aspects of water management could be specifically identified. The remainder of water management expenses is intermingled with other environmental expenses.

The initial review of annual reports also indicated that to be able to obtain a realistic, yet consistent comparison of expenses, it would be necessary to begin with the year 1991. Even then it was not possible to gather information on all aspects of environmental expenses for the period up to the latest complete fiscal year (2005/06).

The ministries, departments, and agencies for which annual reports were reviewed are:

- Alberta Agriculture
- Alberta Agriculture, Food and Rural Development
- Alberta Environment
- Alberta Environmental Protection
- Alberta Community Development
- Alberta Forestry, Lands and Wildlife
- Alberta Heritage Savings and Trust Fund
- Alberta Infrastructure
- Alberta Infrastructure and Transportation
- Alberta Municipal Affairs
- Alberta Public Works, Supply and Services
- Alberta Recreation, Parks and Wildlife Foundation
- Alberta Special Waste Management Corporation
- Alberta Sport, Recreation, Parks and Wildlife Foundation
- Alberta Sustainable Resource Development
- Alberta Tourism, Parks and Recreation (Parks and Recreation Component)
- Alberta Transportation
- Alberta Transportation and Utilities
- Environment Council of Alberta
- Water Resources Commission

During the period examined, each of these organizations was active in either water or environmental management.

In the end it was possible to complete a time series of expenses for these aspects of water or environmental management:

- functions²²³ within Alberta Environment
- functions²²³ within Alberta Sustainable Resource Development

²²³ Functions for which an organization was responsible during Fiscal Year 2005/06.

- functions²²³ within the Parks and Protected Areas part of Alberta Community Development
- provincial government grants for municipal water management construction and operation (as reported by municipalities)²²⁴
- provincial government grants for municipal waste management and other environmental use and protection (as reported by municipalities)
- the Irrigation Rehabilitation Program

Within the time frame for this project, aspects of water or environmental management for which a complete time series of expenses could not be developed were:

- flood damage (Alberta Municipal Affairs)
- the farm water program (Alberta Agriculture, Food and Rural Development)
- wildlife damage (Alberta Agriculture, Food and Rural Development)
- special waste management & Swan Hills Treatment Plant (Alberta Infrastructure and Transportation)
- infrastructure assistance for municipal wastewater (Alberta Agriculture, Food and Rural Development)
- municipal water, wastewater, and regional systems grants (Alberta Infrastructure and Transportation)
- Environment Council of Alberta
- Water Resources Commission

Limitations and Assumptions

The information collected had limitations in its application to this project. In some cases, assumptions were made to overcome limitations.

1. As noted, expenses for many aspects of water management were not identified specifically and consistently in annual reports. The way expenses were categorized often changed from year-to-year. As a result, expenses for water licensing and approvals, water monitoring and compliance, water standards, water planning, water research, water policy, and operation of provincial water infrastructure could not be pinpointed. Within the time frame for this project, it was not possible to obtain additional information. Reasonable assumptions could not be developed to overcome this limitation.
2. The data on provincial grants for municipalities from the Municipal Financial Information System (MFIS) are for the calendar year instead of the provincial government's fiscal year. These data are also provided by the municipalities which may sometimes identify a type of grant incorrectly. It is not known to what extent, if any, the data are affected.
3. Ministries and departments have expenses for support services and other ministry-wide or department-wide functions. Information is not available in annual reports nor could it be obtained within the time frame for this project on how these expenses could or should be divided among different functions.

The need to divide up these "corporate" expenses occurs in two ways. First, there is a need to divide corporate expenses for the former Ministry/Department of Environmental

²²⁴ Grants for water supply and distribution, wastewater treatment and disposal, and storm sewers and drainage.

Protection among functions of Alberta Environment, Alberta Sustainable Resource Development, and Alberta Community Development. Second, there is a need to assign a portion of corporate expenses to water or environmental functions for organizations that perform other unrelated functions. For example, Parks and Protected Area functions were, prior to December, 2006, the responsibility of Alberta Community Development which had many other responsibilities.

It was assumed that the division of corporate expenses could be reasonably estimated by dividing the expenses for particular functions by the total of all non-corporate expenses within an organization and then multiplying the expenses for corporate services by the resulting portion of non-corporate expenses. For the former Ministry/Department of Environmental Protection, it was possible to allocate expenses in this way for support services and other ministry-wide or department-wide functions. For other organizations, complete information on ministry-wide or department-wide functions not included in "support services" was either not available or could not be obtained within the time frame for this project. As a result, only expenses for functions specifically identified as "support services" were used in calculating expenses for the Parks and Protected Areas functions of Alberta Community Development. As a result, the expenses for those functions are under-estimated.

4. Major funding for the Swan Hills Treatment Plant has been transferred from Alberta Environment to Alberta Infrastructure and Transportation. It was not possible within the time frame for this project to determine if Alberta Environment still has expenses related to the Treatment Plant or special waste management in general. This may mean over-estimation of expenses for Alberta Environment after Fiscal Year 2002/03 if there are expenses that are more properly assigned to the cost of the Treatment Plant or under-estimation of Alberta Environment expenses prior to Fiscal Year 2003/04 if there are expenses related to the categories of "special waste management assistance" or "Special Waste Management Corporation" that are unrelated to the Treatment Plant.
5. Amortization of capital assets for the former Ministry/Department of Environmental Protection was not provided in annual reports in a manner that would allow it to be precisely divided among functions now performed by Alberta Environment, Alberta Sustainable Resource Development, and Alberta Community Development. It was not possible within the time frame for this project to obtain additional information on this matter.

In their 2001/02 annual reports, net book value of capital assets at the end of Fiscal Year 2000/01 was provided for Alberta Environment and Alberta Sustainable Resource Development. The net book value of the capital assets for Parks and Protected Areas was interpolated based on the net book value reported for Alberta Environmental Protection in the 2000/01 annual report. (Table E-1)

This information on net book value was assumed to be a reasonable method of dividing amortization of capital assets for Fiscal Years 1995/96 to 1999/2000. For Fiscal Year 2000/01, the information was used for amortization reported for regions. Fiscal Year 2000/01 "head office" amortization for non-support functions (i.e., excluding support services) was divided based on the proportion of other non-support function expenses (i.e., after expenses for support services were subtracted and ministry-wide expenses - except amortization expenses - had been distributed).

Table E-1			
Capital Assets Distribution			
Fiscal Year 2000/01			
(thousand \$)			
Functional Area	Net Book Value	Share	Source
Alberta Environment	711,442	69.3%	ENV, <i>Annual Report: 2001/02</i>
Alberta Sustainable Resource Development	145,986	14.2%	SRD, <i>Annual Report: 2001/02</i>
Parks and Protected Areas	168,809	16.4%	Interpolated
Total (as of March 31, 2001)	1,026,237	99.9%	Alberta Environmental Protection, <i>Annual Report: 2000/01</i>
Total share percentage does not equal 100% due to rounding.			

6. In Fiscal Years 1996/97 to 1999/2000 for the Natural Resources Service of Alberta Environmental Protection, regional expenses and adjustments made to convert "departmental" expenses to a "ministry" accounting stance were not reported in a manner that would allow them to be precisely divided among functions now performed by Alberta Environment, Alberta Sustainable Resource Development, and Alberta Community Development. It was not possible within the time frame for this project to obtain additional information on this matter.

It was assumed that a reasonable method of dividing these expenses among Alberta Environment, Alberta Sustainable Resource Development, and Parks and Protected Areas functions was to use the proportion of expenses for Natural Resources Service functions reported in the annual report for Fiscal Year 2000/01. (Table E-2)

An additional calculation was made, but not used in this analysis. It was assumed that a reasonable method of identifying infrastructure expenses for Natural Resources Services regions in Fiscal Years 1996/97 to 1999/2000 was to re-assign the Alberta Environment portion of those expenses based on the average expenses for Surface Water Development and Operations vs. Water Resources Administration for Fiscal Years 1991/1992 to 1994/1995.

7. In Fiscal Year 1997/98 for the Environmental Protection Revolving Fund, expenses for equipment, materials, supplies, and consolidating adjustments were not reported in a manner that would allow them to be precisely divided among functions now performed by Alberta Environment, Alberta Sustainable Resource Development, and Alberta Community Development. It was not possible within the time frame for this project to obtain additional information on this matter.

It was assumed that a reasonable method of dividing these expenses among Alberta Environment, Alberta Sustainable Resource Development, and Parks and Protected Areas functions was to use the proportion of other expenses in the Fund.

8. In Fiscal Years 1997/98 to 1999/2000, valuation and other adjustments were not reported in a manner that would allow them to be precisely divided among functions now performed by Alberta Environment, Alberta Sustainable Resource Development, and Alberta Community Development. It was not possible within the time frame for this project to obtain additional information on this matter.

Table E-2		
Natural Resources Service Expenses for Regions (thousand \$)		
Functional Area	Amount	Share
Alberta Environment Functions		
Water Management	12,127	
Sub-Total	12,127	18.6%
Sustainable Resource Development Functions		
Client & Licensing Services	16,781	
Enforcement Field Services	16,141	
Fisheries & Wildlife	5,168	
Sub-Total	38,090	58.4%
Parks and Protected Areas Functions		
Recreation & Protected Areas	14,986	
Sub-Total	14,986	23.0%
TOTAL	65,203	100.0%
Source: Alberta Environmental Protection, <i>Annual Report: 2000/01</i>		

It was assumed that a reasonable method of dividing these expenses among Alberta Environment, Alberta Sustainable Resource Development, and Parks and Protected Areas functions was to use the proportion of expenses for those functions during Fiscal Years 2001/02 to 2005/06.

- Accounting practices used in annual reports have changed during the period analyzed. These changes may have resulted in significant differences in the amount of expenses reported in different years. Areas where these differences might have occurred include the switch in Fiscal Year 1997/98 from a departmental accounting stance to a ministry accounting stance and the reporting of amortization beginning in Fiscal Year 1995/96.

An assessment of the limitations and assumptions is provided in Table E-3.

Indicators

The indicators that would allow the change in funding to be evaluated directly are:

- willingness of Albertans (as water users, taxpayers, etc.) to pay for goods or services provided by the provincial government in the areas of water and environmental management
- the amount of money required to provide water and environmental goods and services at specified levels of quantity, quality, and timeliness

- results that could be related to year-by-year expenditures.

Information for developing these indicators could not be gathered during the time frame for this project.

Instead, more general and indirect indicators were developed. These are change in:

- provincial population
- inflation
- government revenue
- the provincial economy

The data and sources used for these indicators are shown in Table E-4.

Table E-3																
Assessment of Uncertainty in Expense Estimates																
Limitation/ Assumption	Potential Influence on Expense Estimates															Assessment
	Fiscal Year Ending															
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	
Potential incorrect identification of type of municipal grant	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	<ul style="list-style-type: none"> No pattern is evident. Totals appear reasonable although they can not be considered precise. It is assumed the data provide a good indication of change in the level of funding.
Allocation of corporate expenses		?	?	?	?	?	?	?	?	?						<ul style="list-style-type: none"> There does not appear to be a better way of dividing corporate expenses. The assumption used does not affect total expenses for the former AEP. It is expected the assumption will not affect trends for the individual functional groups (ENV, SRD, and PPA) since corporate expenses for activities such as finance, communications, personnel, IT, policy, strategy, and ministry & executive offices would generally be apportioned in line with the amount of budget allocated to particular functions. Even when there are extraordinary expenses for such things as wildfires and floods, it is expected the increased expense would be accompanied by an increased share of corporate-level expenses. However, if there is an issue, it could be significant for FYs 1995/96 to 2000/01 since the percentage of corporate expenses was substantially higher, averaging 14%.
Special waste management	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	<ul style="list-style-type: none"> If there is an error in removing all special waste expenses from the expenses for ENV, then it is expected to be small since – following the write-down in FY 1995/96, ENV's reported expenses for "Special Waste Management Corporation" averaged \$934,500 per year or 0.9% of ENV's total expenses.
Amortization of capital assets					?	?	?	?	?	?						<ul style="list-style-type: none"> The validity of the assumption that amortization reflects FY 2000/01 net book value depends on factors such as service life of assets and the extent to which capital assets of ENV, SRD, and PPA changed. These factors could not be assessed with the reported data. The assumption does not affect expenses for the former AEP, but a significant difference from the assumption could influence estimates for ENV, SRD, and PPA since for FYs 1996/97 to 2000/01 amortization represented 8-9% of total expenses (after wildfire expenses had been deducted).
Natural Resources Service expenses						?	?	?	?							<ul style="list-style-type: none"> The FY 2000/01 annual report is the only one that provides data on the distribution of expenses for functions within regions. If NRS regional functions changed substantially from FYs 1996/97 to 1999/2000, then the assumption used to divide expenses among ENV, SRD, and PPA would be off the mark. PPA expenses are particularly sensitive to this issue since NRS regional expenses in that area were 72% of total expenses. ENV and SRD expenses could also be significantly affected, although their percentage of NRS regional expenses was lower, 12% and 20% respectively (with wildfire expenses subtracted from the SRD total).

Table E-3																
Assessment of Uncertainty in Expense Estimates																
Limitation/ Assumption	Potential Influence on Expense Estimates															Assessment
	Fiscal Year Ending															
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	
Environmental Protection Revolving Fund expenses							?									<ul style="list-style-type: none"> It is not expected that a different method of dividing these expenses would make a significant difference since the expenses involved are only 1.5% of the AEP total.
Valuation and other adjustments							?	?	?							<ul style="list-style-type: none"> It is not expected that a different method of dividing these expenses would make a significant difference since the expenses involved only exceed 1.0% of the AEP total for one year (FY 1998/99) and only when wildfire expenses are subtracted from the total. Even then, the percentage is low: 2.2%
Change to ministry accounting stance	-	-	-	-	-	-										<ul style="list-style-type: none"> Expenses are available for ministry and department accounting stances for AEP for FYs 1997/98 to 2000/01 and SRD for FYs 2001/02 to 20005/06. In those years, ministry expenses exceeded department expenses by \$15-25 million for each year but one. In the other year (FY 1998/99) ministry expenses were \$227 million greater than department expenses. It was not determined if accounting practices and operational and financial circumstances were similar during FYs 1991/92 to 1996/97. If practices and circumstances were similar, then expenses have been significantly underestimated during the early years of the period analyzed.
Other changes in accounting practices	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	<ul style="list-style-type: none"> The potential influences of other changes in accounting practices could not be determined from the available information.
KEY:	= Limitation/assumption not applicable						AEP = Alberta Environmental Protection ENV = Alberta Environment FY = Fiscal Year NRS = Natural Resources Service PPA = Parks and Protected Areas (Alberta Community Development) SRD = Alberta Sustainable Resource Development + = potential overestimation of expenses - = potential underestimation of expenses ? = direction of potential change unknown									

Table E-4

General and Indirect Indicators

	Calendar Year															
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Population (Alberta)	2,469,069	2,510,001	2,543,033	2,574,890	2,601,282	2,615,873	2,636,489	2,695,474	2,730,818	2,819,423	2,879,743	2,907,882	2,994,387	3,034,362	3,066,257	3,182,178
Annual Change		1.7%	1.3%	1.3%	1.0%	0.6%	0.8%	2.2%	1.3%	3.2%	2.1%	1.0%	3.0%	1.3%	1.1%	3.8%
Mean Annual Change																1.7%
Annual Rate of Change 1991 to 2005																1.7%
Inflation (CPI: Alberta)	93.1	98.5	100.0	101.2	102.6	105.0	107.3	109.5	110.7	113.4	117.4	120.1	124.2	129.7	131.5	134.3
Annual Change		5.8%	1.5%	1.2%	1.4%	2.3%	2.2%	2.1%	1.1%	2.4%	3.5%	2.3%	3.4%	4.4%	1.4%	2.1%
Mean Annual Change																2.5%
Annual Rate of Change 1991 to 2005																2.2%
Provincial Economy (GDP: million \$)	71,487	72,578	74,567	80,846	87,444	91,987	98,248	108,110	108,895	116,237	143,155	150,454	150,594	171,175	187,152	215,858
Annual Change		1.5%	2.7%	8.4%	8.2%	5.2%	6.8%	10.0%	0.7%	6.7%	23.2%	5.1%	0.1%	13.7%	9.3%	15.3%
Mean Annual Change																7.8%
Annual Rate of Change 1991 to 2005																8.1%
	Fiscal year ending															
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Provincial Government Revenue (million \$)	14,185	13,737	14,271	15,406	16,164	15,515	16,652	17,754	16,819	20,103	25,527	21,926	22,662	25,887	29,328	35,887
Annual Change		-3.2%	3.9%	8.0%	4.9%	-4.0%	7.3%	6.6%	-5.3%	19.5%	27.0%	-14.1%	3.4%	14.2%	13.3%	22.4%
Mean Annual Change																6.9%
Annual Rate of Change FY 1991/92 to 2005/06																7.1%

Population: 1990-2002 – Alberta Municipal Affairs, *Alberta's Official Population From 1960 to 2002* (<http://www.municipalaffairs.gov.ab.ca/ms/pdf/albertaPopHist.pdf>), 2003 – Alberta Municipal Affairs, *2003 Official Population List* (<http://www.municipalaffairs.gov.ab.ca/ms/pdf/2003pop.pdf>), 2004 – Alberta Municipal Affairs, *2004 Official Population List* (<http://www.municipalaffairs.gov.ab.ca/ms/pdf/2004Pop.pdf>), 2005 – Alberta Municipal Affairs, *2005 Official Population List* (<http://www.municipalaffairs.gov.ab.ca/ms/pdf/2005pop.pdf>). The "official" population does not include residents living on First Nations reserves.

Consumer Price Index (CPI): Statistics Canada (<http://www40.statcan.ca/01/cst01/econ150a.htm?sdi=consumer%20price%20index>)

Gross Domestic Product (GDP): Alberta Finance, 1990-2001 (http://www.finance.gov.ab.ca/aboutalberta/2001_econ_accts_ab_canada_comparison.pdf), 2003-2005 (http://www.finance.gov.ab.ca/aboutalberta/alberta_facts_brochure/index.html#17), Statistics Canada, 2002 (<http://www40.statcan.ca/01/cst01/econ15.htm>)

Provincial Government Revenue: FY 1991/92 to 2004/05 – Government of Alberta, "Historical Fiscal Summary, 1987-88 to 2008-09," *Budget 2006* (<http://www.finance.gov.ab.ca/publications/budget/budget2006/fiscalt40.pdf>), FY 2005/06 – Government of Alberta, *Annual Report 2005/06* (http://www.finance.gov.ab.ca/publications/annual_repts/govt/ganrep06/cfs.html#4)

Glossary

Most of the definitions are adapted from the *Water for Life Strategy* and the *Guidebook to Water Management*.²²⁵

Accretion: The gradual and imperceptible accumulation of land on a shore due to natural causes.

Adverse effect: Impairment of or damage to the environment, human health or safety or property (*Environmental Protection and Enhancement Act*); impairment of or damage (*Water Act*)

Allocation: Assignment of resources to an activity; the volume, rate, and timing of water authorized for an activity

Approval: Authority for constructing works or for undertaking an activity within a water body (*Water Act*); authority to conduct various activities including, among many things, well drilling, waterworks, wastewater, or storm drainage systems, designated livestock operations, pesticide application, analytical laboratories, generation of thermal or hydroelectric power, and release of substances that cause or may cause an adverse effect (*Environmental Protection and Enhancement Act*)

Assignment: A temporary contracting of all or part of a licensed or registered water allocation by the licensee or registrant to another licensee or registrant in good standing, who is able to access the same water as a result of the natural flow or natural presence of the water without adversely affecting other water users or the aquatic environment (*Administrative Guideline for Transferring Water Allocations*)

Aquifer: An underground water-bearing formation that is capable of yielding water (*Water Act*)

Assimilative capacity: The ability of a water body to purify or remove contaminants

Augmentation: An increase in the flow or water level due to the diversion of water or release of stored water by a person into a water body

Contaminant: A substance that, in a sufficient concentration, will render water, land, fish, or other thing unusable or harmful

Criteria: See performance measure

Current and future users and uses: People or activities (including environmental, economic, and social processes) for which water is necessary or desirable now or, as expected or predicted, will be necessary or desirable in the future

Deleterious substance: Any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water; any water that contains a substance in such quantity or concentration,

²²⁵ Government of Alberta, *Water for Life: Alberta's Strategy for Sustainability*, *supra* n. 220 and Bow River Basin Council, *Guidebook to Water Management*, 2002 (<http://www.brbc.ab.ca/pdfs/Guidebook.pdf>)

or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water (*Fisheries Act*)

Director: A person designated by the Minister to perform certain activities such as issuing licences or approvals under the *Water Act* or *Environmental Protection and Enhancement Act*

Drinking water: Water that has been supplied for human consumption

Ecosystem: A community of interdependent organisms together with the environment which they inhabit and with which they interact

Effluent: Liquid waste, usually released from a wastewater treatment system or process

First-in-time, first-in-right: In Canada, the doctrine of prior allocation which specifies how water supplies are divided among water users during a shortage. When there is not enough water to satisfy all water users, prior allocation allows a water user with an older right to use all the water to which that person is legally entitled before any water can be used by a water user with a more recent water right

Floodplain: Land that is subject to flooding from a river or other water body

Guidelines: See performance measure

Habitat: The part of the physical environment in which a plant or animal lives

Infrastructure: Physical facilities such as canals, reservoirs, pipelines, and treatment plants

Instream needs: The flow and water quality required to protect the river ecology and riparian environments.

Jurisdiction: The extent or range of authority over people, land, air, resources, or activities

Licence: Legal permission to impound, store, consume, take, or remove water

Local authority: A municipal government and sometimes other public organization (e.g., an irrigation district) to which the provincial government, through an act of the legislature, has granted decision-making power over part of the province

Natural flow: The amount of water that would have been in a river, lake, or other water body if there had been no diversion or addition of water by people.

Objective: See performance measure

Oilfield injection: The addition of water into an oil-bearing formation to increase the amount of oil that can be extracted

Outfall: The point at which a pipe or channel discharges to a water body

Performance measure: A tool used to determine whether or not success has been achieved

Criteria: Specific, often numerical performance measures that are not legally binding unless designated in legislation or regulations

Guidelines: Specific performance measures that are not legally binding unless designated in legislation or regulations and that describe how something is to be accomplished

Objectives: Performance measures that are not legally binding unless designated in legislation or regulations and that describe what is to be accomplished

Policy: A statement of intent that is not legally binding

Principle: A fundamental, general rule for action or conduct that is not legally binding

Standard: A legally binding requirement, often established through legislation or regulations, that is used to judge compliance

Policy: See performance measure

Policy instruments: Policies and the measures such as laws, regulations, strategies, guidelines, standards, and programs that are developed to implement them

Principle: See performance measure

Produced water: Ground water incidentally pumped out a well used for hydrocarbon production.

Raw water: The water in rivers, lakes, reservoirs, canals, aquifers, and other water bodies before it is diverted and treated for people to use.

Riparian area: The land adjacent to a river or other water body

Riparian buffer or setback: An area adjacent to a water body that is designed to, in some fashion, protect the water body and the aquatic ecosystem from degradation from pollution, erosion, and other factors and, in some cases, provide habitat for wildlife and recreational opportunities for people.

Riparian rights: The legal ability, under common law, of a person owning or leasing land along a water body to use water and protect the quantity and quality of water in the water body. Riparian rights have been restricted, but not eliminated by legislation in Alberta.²²⁶

River basin: The land drained by a river and all its tributaries

RSA: *Revised Statutes of Alberta*

Standard: See performance measure

Stormwater: Run-off of water from the land due to precipitation or snowmelt

Time-limited approvals: An approval that has an expiry date and for which a renewal must be approved

²²⁶ David R. Percy, *Framework for Water Rights Legislation in Canada*, Canadian Institute of Resources Law, 1988, pp. 17-22

Transfer: The diversion of water from one major river basin to another;²²⁷ a change, approved by Alberta Environment, in the location or use for all or a portion of the water allocated under a licence

Value of water: [provided by the federal-provincial Value for Water Team²²⁸] Value can be observed based upon individual's choices in the marketplace – how much someone is willing to pay for something indicative of a value for it. Valuation is complicated by the concepts of price, cost and value where price is an established retail cost set by a market, cost includes all the components that go into price but are not necessarily included in a price whereas value may encompass price and cost but also includes all the intangibles such as societal and existence inputs.

When talking about valuing the environment we are basically looking at the changes in satisfaction or welfare that people derive or economic performance that firms derive from the environment. The difficulty with determining the value for environmental 'goods and services' is that they cannot be bought and sold. For example people are willing to pay for clean water or air but no market exists, therefore the willingness to pay must come from other means. For firms the value is relative to its importance and need in the production process or business function.

Valuation is useful to decision making because it identifies and quantifies in monetary terms the value of resources. This is important because if resources are expressed in terms of value and economic benefit, then informed decisions can be made which reflect the value of the natural resources to a community. Value is expressed in money terms so that a yard stick can be provided with which to compare the relative value of ecosystem components and economic activities.

WPAC: See Watershed Planning and Advisory Council

WCO: See water conservation objective

Wastewater: Unwanted products or materials that are dissolved, suspended, or carried in water

Water conservation objectives: The amount and quality of water necessary for the

- (i) protection of a natural water body or its aquatic environment
- (ii) protection of tourism, recreational, transportation or waste assimilation uses of water
- (iii) management of fish or wildlife

and may include water necessary for the rate of flow of water or water level requirements (*Water Act*)

Watershed: An area of land that drains into a water body

²²⁷ The major river basins are the Peace/Slave, Athabasca, North Saskatchewan, South Saskatchewan, Milk, Beaver, and Hay.

²²⁸ Value of Water Team, *The Basics of the Economic 'Valuation' of Water*, 2006. For more information on the valuation of natural capital, see Gardner Pinfold Consulting Economists Limited, Steven Renzetti, Robert Cairns, and Quentin Grafton, *Monitoring the Value of Natural Capital: Water*, Environment Canada, 2002 (http://www.ec.gc.ca/erad/dwnld_html/NaturalCapital_e.htm)

Watershed Planning and Advisory Council: A group to engage governments, stakeholders, other partnerships, and the public in watershed assessment and watershed management planning considering existing land and resource management planning processes and decision-making authorities (*Enabling Partnerships: A Framework in Support of Water for Life: Alberta's Strategy for Sustainability*)

Wetland: An area covered permanently, occasionally, or periodically by shallow water for a sufficient period to support aquatic life, including marshes, bogs, sloughs, fens, swamps, muskegs, and ponds, but not rivers or lakes

Sources

Policies

- Alberta Energy, Alberta Environment, and Alberta Sustainable Resource Development, *Our Commitment to Sustainable Resource and Environmental Management*, 2006 (http://www.srem.gov.ab.ca/pdf/Signed_Charter1.pdf)
- Alberta Energy and Natural Resources, Fish and Wildlife Division, *Fish & Wildlife Policy for Alberta*, 1982
- Alberta Environment Response to the Recommendations of the Highwood Public Advisory Committee, 2006
- Alberta Environment's Response to the Recommendations of the Upper Elbow River Instream Objectives Working Group, 1999
- Alberta Environmental Protection, *Sustaining Alberta's Biodiversity* (<http://www.environment.gov.ab.ca/info/library/5852.pdf>)
- Alberta Government, *A Place to Grow: Alberta's Rural Development Strategy*, 2005 (<http://www.rural.gov.ab.ca/strategy/grow-feb2005.pdf>)
- Alberta Government, *Alberta's Commitment to Sustainable Resource and Environmental Management*, 1999 (<http://www.srd.gov.ab.ca/info/sustainable.pdf>)
- Alberta Government, *Water Conservation and Allocation Policy for Oilfield Injection*, 2006 (http://www.waterforlife.gov.ab.ca/docs/Oilfield_Injection_Policy.pdf)
- Alberta Government, *Water for Life: Alberta's Strategy for Sustainability*, 2003 (<http://www.waterforlife.gov.ab.ca/docs/strategyNov03.pdf>)
- Alberta Legislative Assembly, *Vision of Sustainable Development*, 1993 in Alberta Environmental Protection, *Sustaining Alberta's Biodiversity* (<http://www.environment.gov.ab.ca/info/library/5852.pdf>)
- Alberta Municipal Affairs, *Land Use Policies*, 1996 (<http://municipalaffairs.gov.ab.ca/ms/pdf/landusepoliciesmqga.pdf>)
- Canadian Wildlife Service, *A Wildlife Policy for Canada*, 1982 (http://www.cws-scf.ec.gc.ca/publications/pol/cont_e.cfm)
- Environment Canada, *Federal Water Policy*, 1987 (http://www.ec.gc.ca/water/en/info/pubs/fedpol/e_fedpol.pdf)
- Fisheries and Oceans Canada, *Policy for the Management of Fish Habitat*, 1986 (http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/legislation-lois/policies/fhm-policy/pdf/policy_e.pdf)

Legislation, Regulations, and Codes of Practice

- Code of Practice for Outfall Structures on Water Bodies*, 2003 (http://www.gp.gov.ab.ca/documents/Codes/OUTFALL.cfm?frm_isbn=0779722965)
- Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body*, 2003 (http://www.gp.gov.ab.ca/documents/Codes/PIPELINE.cfm?frm_isbn=0779736494)
- Code of Practice for Wastewater Systems Using a Wastewater Lagoon*, 2003 (http://www.gp.gov.ab.ca/documents/Codes/LAGOON.cfm?frm_isbn=0779723007)
- Code of Practice for Watercourse Crossings*, 2003 (<http://www.gp.gov.ab.ca/documents/codes/Crossing.cfm>)
- Environmental Protection and Enhancement Act*, RSA 2000, c. E-12 (<http://www.gp.gov.ab.ca/documents/acts/E12.cfm>),
- Municipal Government Act*, RSA 2000, c. M-26 (http://www.gp.gov.ab.ca/documents/Acts/M26.cfm?frm_isbn=0779748638)
- Public Lands Act*, RSA 2000, c. P-40 (http://www.gp.gov.ab.ca/documents/Acts/P40.cfm?frm_isbn=077974764X)
- Water Act*, RSA 2000, c. W-3 (http://www.gp.gov.ab.ca/documents/Acts/W03.cfm?frm_isbn=0779727428)
- Water (Ministerial) Regulation*, A.R. 205/908 (http://www.gp.gov.ab.ca/documents/Regs/1998_205.cfm?frm_isbn=0779737342), s. 11 (h)-(i) & (k)-(n)

Guidelines and Other Policy Instruments

- Alberta Energy, Alberta Environment, and Alberta Sustainable Resource Development, *Information-Sharing Initiative* (http://www.srem.gov.ab.ca/info_sharing.html)
- Alberta Energy, Alberta Environment, and Alberta Sustainable Resource Development, *Land Use Framework* (<http://www.srem.gov.ab.ca/luf.html>)
- Alberta Energy, Alberta Environment, and Alberta Sustainable Resource Development, *Sustainable Resource and Environmental Management* (SREM) (<http://www.srem.gov.ab.ca/index.html>)
- Alberta Energy, Alberta Environment, and Alberta Sustainable Resource Development, *Upstream Oil and Gas Policy Integration Project* (http://www.srem.gov.ab.ca/oil_and_gas.html)

- Alberta Environment, *Administrative Guideline for Transferring Water Allocations*, 2003 (http://www3.gov.ab.ca/env/water/legislation/Guidelines/Transfer_Guidelines.pdf)
- Alberta Environment, *Approvals and Licences, Water Act Fact Sheet* (<http://www3.gov.ab.ca/env/water/Legislation/FactSheets/GeneralInfo.pdf>)
- Alberta Environment, *Approved Water Management Plan for the South Saskatchewan River Basin* (http://www3.gov.ab.ca/env/water/regions/ssrb/pdf/SSRB_Plan_Phase2.pdf)
- Alberta Environment, *Business Plan 2002-05* (<http://www.finance.gov.ab.ca/publications/budget/budget2002/envir.html#1>)
- Alberta Environment, *Business Plan 2003-06* (<http://www.finance.gov.ab.ca/publications/budget/budget2003/envir.html#1>)
- Alberta Environment, *Business Plan 2005-08* (<http://www.finance.gov.ab.ca/publications/budget/budget2005/envir.pdf>)
- Alberta Environment, *Business Plan 2006-09* (<http://www.finance.gov.ab.ca/publications/budget/budget2006/envir.html#1>)
- Alberta Environment, *Climate Change and Water in Alberta*, 2004 (http://www3.gov.ab.ca/env/water/GWSW/quantity/learn/influence/IF3_climchange.html)
- Alberta Environment, *Enabling Partnerships: A Framework in Support of Water for Life: Alberta's Strategy for Sustainability* (<http://www.waterforlife.gov.ab.ca/docs/EnablingPartnerships.pdf>)
- Alberta Environment, *Framework for Water Management Planning* (http://www3.gov.ab.ca/env/water/legislation/Framework_Text_Only.pdf)
- Alberta Environment, *How is Water Quality Protected* (<http://www3.gov.ab.ca/env/water/swg/#Back4>)
- Alberta Environment, *How we will continue to be a leading edge jurisdiction for the 21st century* (http://www3.gov.ab.ca/env/dept/strat_direction.html)
- Alberta Environment *Public and Stakeholder Involvement Principles* (http://www.environment.gov.ab.ca/stakeholder/pubs/Approved_Public_Involvement_Principles.pdf)
- Alberta Environment, "Strategy for the Protection of the Aquatic Environment," *Framework for Water Management Planning* (http://www3.gov.ab.ca/env/water/legislation/Framework_Text_Only.pdf), pp. 19-31
- Alberta Environment, *Water Conservation Objectives*, Information Sheet (http://www3.gov.ab.ca/env/water/regions/ssrb/pdf/InfoSheet_WCOs.pdf)
- Alberta Environment, *Water Licence Cancellations for Non-Use of Water Allocated by a Licence* (<http://environment.gov.ab.ca/info/library/5845.pdf>)
- Alberta Environment's *Performance Measures and Indicators - Levels 1 & 2: Environmental Indicators (&) Behavioural Indicators*, 2002 (<http://www3.gov.ab.ca/env/dept/reports/performance/perfmeasures.pdf>)
- Alberta Government, *Water Conservation and Allocation Guideline for Oilfield Injection*, 2006 (http://www.waterforlife.gov.ab.ca/docs/Oilfield_Injection_GUIDELINE.pdf)
- Alberta Sustainable Resource Development, *Fish Conservation Strategy for Alberta: 2006-2010*, 2006 (<http://www.srd.gov.ab.ca/fw/fishing/pdf/Fish%20Conserv%20Strategy%202006.pdf>)
- Auditor General of Alberta, *Annual Report: 2005-2006* (<http://www.oag.ab.ca/pdf/ar2005-06volume1.pdf>)
- Canadian Council of Ministers of the Environment, *Canadian Environmental Quality Guidelines*, 2006 (http://www.ccme.ca/publications/ceqg_rcqe.html)
- Environmental Appeals Board, *Judicial Reviews* (<http://www3.gov.ab.ca/eab/judicial.htm>)
- Environment Canada's Sustainable Development Strategy (1997-2000)* (http://www.ec.gc.ca/sd-dd_consult/final/SDG13_E.HTM)
- Federal-Provincial Subcommittee on Drinking Water, *Canadian Drinking Water Guidelines Development Process*, 1999 (http://www.iigr.ca/pdf/documents/1057_Canadian_Drinking_Water.pdf)
- Fisheries and Oceans Canada, *Our Waters, Our Future: Strategic Plan 2005-2010*, 2005 (http://www.dfo-mpo.gc.ca/dfo-mpo/plan/plan_e.pdf)
- Government of Canada, Government of Alberta, Government of Saskatchewan, and Government of Manitoba, *Master Agreement on Apportionment*, 1969 (http://www.iigr.ca/pdf/documents/1348_Master_Agreement_on_App.pdf).
- Government of Canada, Government of Saskatchewan, Government of Alberta, Government of British Columbia, Government of the Yukon, and Government of the Northwest Territories, *Mackenzie River Basin Transboundary Waters Master Agreement*, 1997 (http://www.mrb.ca/document_details.asp?DID=3&File=WaterMaster.zip)
- Government of the United States and [Government of Canada], *International Boundary Waters Treaty Act*, (<http://laws.justice.gc.ca/en/i-17/245665.html>)
- Leggat, Keith, *Shared Environmental Governance*, Alberta Environment Conference, 2006 (<http://www.environment2006.com/PDFs/session33a.pdf>)
- Privy Council of Canada, *A Framework for the Application of Precaution in Science-based Decision Making about Risk* (http://www.pco-bcp.gc.ca/default.asp?Language=E&page=publications&doc=precaution/precaution_e.htm)
- Supreme Court of Canada, *Haida Nation v. British Columbia (Minister of Forests)*, [2004] 3 S.C.R. 511. 2004 SCC 73 (<http://scc.lexum.umontreal.ca/en/2004/2004scc73/2004scc73.html>)
- Supreme Court of Canada, *Taku River Tlingit First Nation v. British Columbia (Project Assessment Director)*, [2004] 3 S.C.R. 550, 2004 SCC 74 (<http://scc.lexum.umontreal.ca/en/2004/2004scc74/2004scc74.html>)
- Yee, Beverly, *Alberta's Approach to Community Governance*, Pollution Probe National Water Policy Workshop, 2006 (<http://www.pollutionprobe.org/Happening/pdfs/waterpolicyworkshops/workshop1/byee.pdf>)
- Yee, Beverly, *Alberta's Strategy for Sustainability*, 2005, video (http://www.iisd.org/natres/water/pwps_presentations.asp)

Other Documents

- Aboriginal Law in Canada*, Treaty 8 First Nations of Alberta
(http://www.treaty8.ca/upload/documents/T8_info_Legal_Introduction.pdf)
- Acuna, Ricardo, "Pricing our water not the answer," *Calgary Herald*, October 28, 2006, p. A28
"Adaptive Management" (http://en.wikipedia.org/wiki/Adaptive_management)
- Advisory Committee on Water Use Practice and Policy, *Final Report*, 2004
(http://www.waterforlife.gov.ab.ca/docs/Final_Recommend_Online.pdf)
- Agriculture and Agri-Food Canada, *Department Performance Report (2004-2005)* (http://www.tbs-sct.gc.ca/rma/dpr1/04-05/AAFC-AAC/AAFC-AACd4501_e.asp)
- Agriculture and Agri-Food Canada, *On-line agri-environmental data, information, tools and expertise to support land-use decision-making*, National Land and Water Information Service (http://www.agr.gc.ca/nlwis-snite/index_e.cfm)
- Alberta Agriculture, Food and Rural Development, *Irrigation Rehabilitation Program 2004/2005 Status Report*
([http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/irr8555](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/irr8555))
- Alberta Environment, *Aboriginal Water Issues*, Background Paper Volume 3, Challenges for the Future, 1991
- Alberta Environment, *Assessment of Vegetation Removal as a Water Management Option*, Pekisko-Stimson Water Management Study, 1987
- Alberta Environment, *Challenges for the Future*, Water Management in Alberta: Challenges for the Future, c. 1991
- Alberta Environment, [discussion of the value of water] (<http://www3.gov.ab.ca/env/water/Conservation/value.cfm>)
- Alberta Environment, *Enforcement of the Environmental Protection and Enhancement Act and Water Act: 1 Jul 2006 – 30 Sep 2006* (http://www3.gov.ab.ca/env/protenf/compliance/pubs/Quarterlyreport_Jul-Sept2006.pdf)
- Alberta Environment, *Facts and Information on Water in Alberta*, 2002
(<http://www.waterforlife.gov.ab.ca/docs/infobook.pdf>)
- Alberta Environment, *Integrated Resource Management* (<http://www3.gov.ab.ca/env/irm/index.html>)
- Alberta Environment, *Milk River Basin Study: Consumptive Use of Water – Methodology Update*, 1990
- Alberta Environment, *Outcomes and Follow-Up From Workshop on Regional Strategies*, 2001 (http://www3.gov.ab.ca/env/irm/docs/Key_messages_of_RS_Workshop_Oct%2026.pdf)
- Alberta Environment, *Report on Implementation Progress of Water for Life*, 2005
(http://www.waterforlife.gov.ab.ca/docs/WFL_ImplementationReport_Oct2005.pdf)
- Alberta Environment, *Valuing Water: Pricing and Other Economic Instruments*, Water for Life backgrounder, 2004
(<http://www.waterforlife.gov.ab.ca/html/background4.html>)
- Alberta Environmental Protection, *A Comparison of Alberta's Environmental Standards to Those of Other North American Jurisdictions*, 1999 (http://www3.gov.ab.ca/env/protenf/documents/enviro_standards99.pdf)
- Alberta Environmental Protection, *Consumptive Demand Analysis: Highwood River Diversion Plan*, 1993
- Alberta Environmental Protection, *Discussion Draft of Legislation*, Water Management in Alberta: Challenges for the Future, c. 1992
- Alberta Government, *Alberta's Environment: Toward the 21st Century* (c. 1991)
- Alberta Government, "Alberta Environment orders company to restore flow to altered creek"
(<http://www.gov.ab.ca/acn/200609/20576F5A1271E-0A7C-EB62-1F3C3ABEF9B236DA.html>).
- Alberta Irrigation Projects Association, *Meeting the Challenges in Water Resource Management*, 1993
- Alberta Science and Research Authority (in collaboration with the Alberta Water Council), *Water Research Strategy*, 2006 (http://www.asra.ab.ca/resources/publications/pdf/2006_water_strategy.pdf)
- Alberta Water Council, *Summary Report of Meeting #8*, November 17, 2005
(<http://www.waterforlife.gov.ab.ca/awc/docs/AWCSummaryReportMeeting8.pdf>)
- Alberta Water Council, *Summary Report: Meeting #12*, September 14, 2006
(<http://www.waterforlife.gov.ab.ca/awc/docs/AWCSummaryReportMeeting12.pdf>).
- Barg, Stephan and Darren Swanson, *Full Cost Accounting for Agriculture*, International Institute for Sustainable Development, 2004 (http://www.iisd.org/pdf/2006/natres_full_cost_agri.pdf)
- Bow River Basin Council, *Guidebook to Water Management*, 2002 (<http://www.brbc.ab.ca/pdfs/Guidebook.pdf>)
- Breitman, Terri, David Clarke, Wayne Jackson, Neil McNeil, and Bob Morrison, *Scoping of Non-Storage Options*, Highwood Management Plan, Alberta Environment, 2001
- California State Water Resources Control Board, *Information Pertaining to Water Rights in California – 1990*
(http://www.waterrights.ca.gov/application/forms/infobook.htm#_Toc442697738)
- Canadian Water Resources Association, Alberta Branch, *Building a National Freshwater Strategy: Alberta's Perspective*, 2000 (http://www.cwra.org/About_CWRA/CWRA_Branches/Alberta/Alberta_Events/Alberta_CWRA_2000_Report.pdf)
- Christensen, Randy, and Simone Magwood, "Groundwater Pricing Policies in Canada," in Linda Nowlan, *Buried Treasure: Groundwater Permitting and Pricing in Canada*, The Walter and Duncan Gordon Foundation, 2005, pp.
- Clark, Karen, Jennifer McKay, and Anne Mitchell, *Sustainable Development in Canada: A New Federal Plan*, Canadian Institute for Environmental Law and Policy, 2001 (<http://cielap.org/pdf/sdreport.pdf>)
- Clean Air Strategic Alliance (<http://www.casahome.org/>)
- Clipperton, G. Kasey, C. Wendell Koning, Allan G. H. Locke, John M. Mahoney, and Bob Quazi, *Instream Flow Needs Determinations for the South Saskatchewan River Basin, Alberta, Canada*, 2003
(http://www3.gov.ab.ca/env/water/regions/ssrb/pdf_phase2/IFN/IFN%20Full%20Report.pdf)

- Conference Board of Canada, *Sustainability: A Winning Merger of Growth and the Environment*, 2006 (<http://www.conferenceboard.ca/boardwiseii/signin.asp> - free document, but sign-in required to access)
- Ellis, W. H., *Legal Constraints on Alberta Water Management*, Alberta Environmental Research Trust, 1984.
- "Defining Sustainability," The Sustainability Report (<http://www.sustreport.org/background/definitions.html>)
- Environics International, *Public Opinion on Environmental Education, Urban Sprawl, and Water Issues*, Sustainability Network, 2002 (<http://www.sustain.web.ca/cbt/research%20-%20July%202002.pdf>)
- Environment Canada, "Integrated Resource Management," *Glossary* (<http://www.ec.gc.ca/cppic/En/glossary.cfm?view=details&id=345>)
- Environmental Law Centre, *Comments on the Preliminary Report of the Advisory Committee on Water Use Practice and Policy*, 2004 (<http://www.elc.ab.ca/ims/client/upload/Comments%20on%20Water%20Use%20Practice%20and%20Policy1.pdf>)
- Environmental Legislation Review Panel, *Report*, 1991
- Equus Consulting Group Inc., *Pooling Your Ideas: Summary of Consultation Results*, Water for Life, Government of Alberta (<http://www.waterforlife.gov.ab.ca/docs/consultationsummary.pdf>)
- Equus Consulting Group, *Water for Life, Minister's Forum on Water: Summary of Advice Received*, Government of Alberta, 2002 (http://www.waterforlife.gov.ab.ca/docs/summary_report.pdf).
- External Advisory Committee on Smart Regulation, *Smart Regulation: A Regulatory Strategy for Canada*, 2004 (<http://www.regulatoryreform.com/pdfs/Canada%20Smart%20Regulation%20Report%20Sept%202004.pdf>)
- Farr, Daniel, Steven Kennett, Monique M. Ross, Brad Stelfox, and Marian Weber, *Al-Pac Case Study Report – Part 2: Regulatory Barriers and Options*, National Round Table on the Environment and the Economy, 2004 (http://www.nrtee-trnee.ca/eng/programs/Current_Programs/Nature/Boreal-Forest/Documents/200407-ALPac-Case-Study/Part2-Regulatory-Barriers/200407-ALPac-CS_Part2_E.pdf)
- Geowa Information Technologies Ltd., *Water Use for Injection Purposes*, 2003 (http://www.waterforlife.gov.ab.ca/docs/geowa_report.pdf)
- Gladwell, Malcolm, "Blowup," *The New Yorker*, January 22, 1996, pp. 32-36
- Government of Canada, *Economic Instruments for Water Demand Management in an Integrated Water Resources Management Framework*, 2005 (http://policyresearch.gc.ca/doclib/WaterSymposium_e.pdf)
- Government of Canada, *Market-Based Instruments for Water Demand Management I: The Use of Pricing and Taxes*, 2005 (<http://policyresearch.gc.ca/doclib/SD%20BN%20Pricing%20E.pdf>)
- Government of Canada, *Market-Based Instruments for Water Demand Management II: Water Markets*, 2005 (<http://policyresearch.gc.ca/doclib/SD%20BN%20Markets%20E.pdf>)
- Griffiths, Mary and Dan Woynilowicz, *Oil and Troubled Waters*, Pembina Institute for Appropriate Development, 2003 (<http://www.pembina.org/pdf/publications/OilandTroubledWaters.pdf>)
- Henry Winters, et. al. v. United States of America 207 U.S. 564 (1908)
- Hydroconsult and Canadian Resource Economics, *South Saskatchewan River Basin: Non-Irrigation Water Use Forecasts*, Alberta Environment, 2002
- Hydrogeological Consultants Ltd., *Use of Water by Alberta's Upstream Oil and Gas Industry*, Canadian Association of Petroleum Producers, 2002 (<http://www.capp.ca/raw.asp?x=1&dt=NTV&e=PDF&dn=56487>)
- International Institute for Sustainable Development (<http://www.iisd.org/about/>)
- Kennett, Steven A., "A Checklist for Evaluating Alberta's New Land-Use Initiatives," *Resources*, no. 95 (Summer, 2006), Canadian Institute of Resource Law (<http://www.ucalgary.ca/~cirj/pdf/Resources95.pdf>), pp. 1-8
- Kennett, Steven A., "Reinventing Integrated Resource Management in Alberta: Bold New Initiative or 'Déjà Vu All Over Again'?" *Resources*, no. 77 (Winter, 2002), Canadian Institute of Resources Law (<http://www.ucalgary.ca/~cirj/pdf/Resources77.pdf>)
- Klemeš, V., "Dilettantism in Hydrology: Transition or Destiny," *Water Resources Research*, v. 22, no. 9 (August, 1986), pp. 1775-1885
- Kotter, John P., "What Leaders Really Do," *Harvard Business Review*, December, 2001
- Kwasniak, Arlene, "Will Canada be forced to share its water supply?" *U*, Winter, 2006 (<http://www.ucalgary.ca/umagazine/issues/2006-02/departments/unleashed-opinion.html>)
- Kwasniak, Arlene J., *Alberta Public Rangeland Law and Policy*, Environmental Law Centre, 1993.
- Lalonde, Kim, *Sustainable Resource and Environmental Management: An Inventory of Provincial Outcome Statements-Final Report*. Alberta Environment, 2006
- Lennon, Joe, *Highwood and Sheep Rivers: Estimation of Historical Consumptive Water Use: 1950-1988*, Alberta Environmental Protection, 1993
- Lindblom, Charles, "The Science of Muddling Through," *Public Administration Review*, v. 19, no. 2 (1959), pp. 79-88
- Lochhead, Jim and Avra Morgan, "Statutory Framework for Drought Management in Colorado," *Drought & Water Supply Assessment*, Colorado Water Conservation Board, Chapter 5 (http://cwc.state.co.us/Conservation/Drought/Drought_Water/pdf/Chapter%205.pdf)
- MacNichol, Vance, *A Proposal for Regulating Resource Development*, 2002 (<http://www3.gov.ab.ca/env/dept/reports/RegReviewReport.pdf>)
- Marbek Resource Consultants Ltd. and Steven Renzetti, *Analysis of Economic Instruments for Water Conservation*, Canadian Council of Ministers of the Environment, 2005 (http://www.ccme.ca/assets/pdf/ei_marbek_final_rpt_e.pdf).
- Morrison, Bob, "Aesop's Fables, Informed Consent, and Social Engineering: The Trouble With Risk Analysis," *Moving Beyond Now*, v. 1, no. 2 (May, 2003), pp. 13-18
- Morrison, Bob, "Can Chaos Theory Solve the Puzzles of Planning?" *Moving Beyond Now*, v. 1, no. 1 (August, 2002), pp. 11-15

- Morrison, Bob, "Civilized Ill-Will, Self-Evident Rationality, Faith-Based Consent, and Selfless Authoritarianism: Definitions of Decision-Making," *Moving Beyond Now*, v. 1, no. 3 (July, 2004), pp. 3-11
- Morrison, Bob, "Good Practice for Water Management Decision-Making," *Moving Beyond Now*, v. 1, no. 3 (July, 2004), pp. 17-19
- Morrison, Bob, "Indentured Servants, Proof of Innocence, and Mark Twain's Cat: Lessons from the Walkerton Tragedy," *Moving Beyond Now*, v. 1, no. 5 (August, 2005), pp. 1-26
- Morrison, Bob, "Measuring Two-Cents' Worth: The Benefits and Hazards of Gauging Public Views on Issues," *Moving Beyond Now*, v. 1, no. 1 (August, 2002), pp. 19-36
- Morrison, Bob, "Planning Predestination: The Decision to Build Three Gorges Dam," *Moving Beyond Now*, v. 1, no. 4 (August, 2004), pp. 3-21
- Morrison, Bob, "Traditional Water Management Decision-Making," *Moving Beyond Now*, v. 1, no. 3 (July, 2004), pp. 13-16.
- Morrison, Bob, "What is Planning All About Anyway?" *Moving Beyond Now*, v. 1, no. 1 (August, 2002), pp. 37-39
- Morrison, Bob, "What Really Matters – Part 2: Long-Term, Short-Term, and Changed Water Rights," *Moving Beyond Now*, v. 1, no. 2 (May, 2003), pp. 1-11
- Nowlan, Linda, *Buried Treasure: Groundwater Permitting and Pricing in Canada*, The Walter and Duncan Gordon Foundation, 2005
- O'Connor, The Honourable Dennis R., *Report of the Walkerton Inquiry, Part One: The Events of May 2000 and Related Issues*, Queen's Printer for Ontario, 2002
(<http://www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/part1/>).
- O'Connor, The Honourable Dennis R., *Report of the Walkerton Inquiry, Part Two: A Strategy for Safe Drinking Water*, Queen's Printer for Ontario, 2002 (<http://www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/part2/>)
- Olynyk, John M., *The Haida Nation and Taku River Tlingit Decisions: Clarifying Roles and Responsibilities for Aboriginal Consultation and Accommodation*, Lawson Lundell LLP, 2005
(<http://www.lawsonlundell.com/resources/Negotiatorarticle.pdf>)
- Percy, David R., *Framework for Water Rights Legislation in Canada*, Canadian Institute of Resources Law, 1988
- Public Advisory Committee, Highwood Water Management Plan, Phase 1, *Final Report: Volume 1 - Report and Recommendations for Highwood Diversion Plan*, 2006
- Public Trust Doctrine (http://en.wikipedia.org/wiki/Public_trust_doctrine)
- Renzetti, Steven and Diane Dupont, "An Assessment of the Impact of Charging for Provincial Water Use Permits," *Canadian Public Policy*, v. 25, no. 3 (1999) (<http://qed.econ.queensu.ca/pub/cpp/sept1999/Renzetti.pdf>), pp. 361-378
- Results from Completed Workbooks: Data Tables, Water for Life, Alberta Environment, 2002
(<http://www.waterforlife.gov.ab.ca/docs/1-bwbsummary.pdf>)
- Results from Random Telephone Survey: Summary Report, Alberta Environment, 2002
(<http://www.waterforlife.gov.ab.ca/docs/questionnaire.pdf>)
- Rothwell, Thomas G., *Haida Nation v. British Columbia [and] Taku Tlingit First Nation v. British Columbia: Implications for Environmental Lawyers* (<http://www.eab.gov.ab.ca/dec/Rothwell%20AB%20Justice%20Aboriginal%20Law.pdf>)
- Speck, Stefan, "Do European Water Abstraction Taxes Affect Competitiveness," Government of Canada, Policy Research Initiative, Sustainable Development Briefing Note, 2005
(http://policyresearch.gc.ca/doclib/R1_BN%20EuroWater_E.pdf)
- Task Force on Future Environmental Directions for Alberta, *Ensuring Prosperity: Implementing Sustainable Development*, Environment Council of Alberta, 1995
- Tickner, Joel, Carolyn Raffensperger, and Nancy Meyers, *The Precautionary Principle in Action: A Handbook*, Science and Environmental Health Network (<http://www.biotech-info.net/handbook.pdf>)
- "Tory trust on climate policy wanes," *Calgary Herald*, October 2, 2006, A5
- United Nations, *Report of the World Summit on Sustainable Development*, 2002
(http://www.un.org/summit/html/documents/summit_docs.html) - 2nd item in list
- United States Environmental Protection Agency, *Environmental Justice*, 2004
(<http://www.epa.gov/compliance/environmentaljustice/index.html>)
- United States Environmental Protection Agency, *Guidance Manual for Compliance With the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources*, 1991
- United States Environmental Protection Agency, *Watershed Approach Framework*
(<http://www.epa.gov/owow/watershed/framework.html>)
- Upper Elbow River Instream Objectives Working Group, *Report*, 1999
- Water Management Review Committee, *Report*, 1995
- Watrecon Consulting, *People to Water, Water to People*, Alberta Institute of Agrologists, 2005
- Waxwing Synthesis and Resolution Inc., *Assessment of Alberta's Draft Water Strategy*, 2003
- Waxwing Synthesis and Resolution Inc., *Issues and Policy Recommendations: Nose Creek Watershed*, 2005
(http://www.airdrie.ca/Content/environment/nosecreek/images/Waxwing_Nose_Creek_Objective_2_Main_Report.pdf)
- Waxwing Synthesis and Resolution Inc., *Issues and Policy Recommendations: Nose Creek Watershed, Appendices*, 2005
(http://www.airdrie.ca/Content/environment/nosecreek/images/Nose_Creek_Objective_2_Appendices_final.pdf)
- Weber, Jack A., "Integrating Conservation Targets into Water Demand Projections," *Journal of the American Water Works Association*, v. 85 (August, 1993), pp. 63-70
- Wenig, Michael M., "Can Environmental Law Really Help? An Update from the Trenches," *LawNow*, February/March, 2006 (<http://www.ucalgary.ca/%7Ecirl/pdf/2006aFebMarWenig.pdf>)

- Wenig, Michael M., "Facing Up to the Roots of Environmental Disputes," *LawNow*, October/November, 2003 (<http://www.ucalgary.ca/~cir/pdf/2003eOctNovWenig.pdf>)
- Wenig, Michael M., "Making Sense of New Terms," *Law Now*, October/November, 2005 (<http://www.ucalgary.ca/~cir/pdf/2005dOctNovWenig.pdf>)
- Wenig, Michael M., "Precautionary Principle Gains a Judicial Foothold," *LawNow*, August/September, 2003 (<http://www.ucalgary.ca/~cir/pdf/2003dAugSepWenig.pdf>)
- Wenig, Michael M., "Should the Polluter Pay?" *LawNow*, February/March, 2004 (<http://www.ucalgary.ca/~cir/pdf/2004aFebMarWenig.pdf>)
- Wenig, Michael M., "The Democracy Deficit in Canadian Environmental Policy Making," *LawNow*, August/September, 2004 (<http://www.ucalgary.ca/~cir/pdf/2004dAugSepWenig.pdf>)
- Wenig, Michael M., "The 'Sleeping Giant' of Watershed Protection," *LawNow*, April/May, 2006 (<http://www.ucalgary.ca/~cir/pdf/2006bAprMayWenig.pdf>)
- Wenig, Michael M., "Thinking Like a Watershed," *LawNow*, June/July, 2004 (<http://www.ucalgary.ca/~cir/pdf/2004cJunJulWenig.pdf>)
- Wenig, Michael M., "Water for Oil – How much of a trade off makes sense?" *LawNow*, June/July, 2003 (<http://www.ucalgary.ca/~cir/pdf/2003cJunJulWenig.pdf>)
- Wenig, Michael M., "What's *Smart* about Ignoring Cumulative Environmental Effects?" *LawNow*, April/May, 2005 (<http://www.ucalgary.ca/~cir/pdf/2005bAprMayWenig.pdf>)
- Wenig, Michael M., "Who Really Owns Alberta's Natural Resources?" *LawNow*, December, 2003/January, 2004 (<http://www.ucalgary.ca/~cir/pdf/2003fDecJanWenig.pdf>)
- Wenig, Michael M., "Who's Minding the Water in Southern Alberta?" *LawNow*, December, 2005/January, 2006 (<http://www.ucalgary.ca/~cir/pdf/2005eDecJanWenig.pdf>)
- Wenig, Michael M. and Michael S. Quinn, "Off Course in Managing Transboundary Rivers," *LawNow*, September/October, 2006 (<http://www.lawnow.org/downloads/documentloader.aspx?id=3716>)
- "Wingspread Statement on the Precautionary Principle" cited in Joel Tickner, Carolyn Raffensperger, and Nancy Meyers, *The Precautionary Principle in Action: A Handbook*, Science and Environmental Health Network, n.d. (<http://www.biotech-info.net/handbook.pdf>)
- Winter, Thomas C., Judson W. Harvey, O. Lehn Franke, and William M. Alley, *Ground Water and Surface Water: A Single Resource*, U.S. Geological Survey, Circular 1139, 1998 (<http://pubs.usgs.gov/circ/circ1139/>)
- World Commission on Dams, *Dams and Development: A New Framework for Decision-Making*, Earthscan Publications, 2000 (<http://www.dams.org/>). For reaction to the Commission's process and report, see <http://www.wcdassessment.org/> and http://www.geocities.com/vlado_stastny/12-43/DEV-dams02.html
- World Commission on Environment and Development, *Our Common Future*, 1987

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