ALBERTA WATER COUNCIL

MARCH 2013

Sector Planning for Water Conservation, Efficiency and Productivity

About the Water Council

The Alberta Water Council is a multi-stakeholder partnership that provides leadership, expertise and sector knowledge to engage and empower industry, non-government organizations, and governments to achieve the outcomes of the *Water for Life* strategy.

The Council regularly reviews implementation of the *Water for Life* strategy and champions the achievement of the strategy's goals. It also advises the Government of Alberta, stakeholders and the public on effective water management practices and solutions to water issues, as well as on priorities for water research.

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Acronyms

ATOC	Annotated Table of Contents
CEP	Conservation, Efficiency and Productivity
Council	Alberta Water Council
ENGO	Environmental Non-Government Organization
GoA	Government of Alberta
WFL	*Water for Life*
WPAC	Watershed Planning and Advisory Council

Executive Summary and Recommendations

The Alberta Water Council established the Sector Planning for Water Conservation, Efficiency and Productivity (CEP) Project Team as a forum for sectors to exchange ideas and discuss experiences and challenges in developing their voluntary CEP plans. As sectors prepared their plans, they received multi-stakeholder advice on how to address challenges; potential adjustments to improve the process for developing possible future sector plans were also considered. The sector plans were not developed by consensus, and neither the Council nor Alberta Environment and Sustainable Resource Development approved or endorsed sector plans.

Some gaps and potential improvements were noted with respect to the framework and process used to develop CEP plans, and observations are provided to enhance any future CEP plans that may be developed (sections 2.2 to 2.4). This report also features brief highlights of individual sector CEP plans (section 3). Finally, the report makes recommendations regarding the timing and content of sector plan progress reports to ensure that progress is noted on both CEP sector plan goals and objectives as well as on the goals of the *Water for Life* strategy (section 4).

Protecting the health of aquatic ecosystems is important and the Council believes that many of the CEP opportunities being implemented by sectors will support this goal, although precise measurement may not be possible at present.

The Council makes the following three recommendations, which also appear in the body of the report:

Recommendation 1: Sector Progress Reports

The Alberta Water Council recommends that:

a. All seven priority sectors prepare sector progress reports based on performance data as of December 31, 2014, and submit these reports to the Alberta Water Council's final meeting of 2015; and

b. The two sectors that completed sector CEP plans in 2010 (irrigation and urban municipalities) prepare interim progress reports based on data as of December 31, 2012 and submit to the Alberta Water Council not later than the final meeting of the Alberta Water Council in 2013.

Recommendation 2: Focus of Sector Progress Reports

The Alberta Water Council recommends that sector progress reports:

a. Describe and evaluate the sector's success in meeting CEP plan objectives, benchmarks and targets, including productivity and efficiency improvements, any reductions in water use, impacts on return flows, and performance relative to the baseline year. This should:
   - — Note the adoption of new industry best practices and technologies, subject to confidentiality and competitiveness considerations;
   - — Note adjustments needed to improve the sector plan or adapt to new technologies or legislative requirements (e.g., regional land use plans); and
   - — Make reference to development of CEP plans by individual sector members, if appropriate.

b. Encourage member(s) to be aware of opportunities that could improve the health of aquatic ecosystems and to work with appropriate organizations engaged in watershed management within the watersheds in which the member(s) operate(s).

c. Using metrics developed for each sector plan, summarize water use, assess and document impacts of CEP efforts, and indicate how implementation of the CEP plan is contributing to the three *Water for Life* goals, namely safe secure drinking water supply, healthy aquatic ecosystems, and reliable, quality water supplies for a sustainable economy. Other environmental impacts of CEP efforts should also be noted; e.g., impacts on riparian health, instream flow improvement, water quality.

d. Discuss opportunities and challenges.

e. Describe interactions with stakeholders on plan implementation and progress.

f. Indicate how other environmental endeavours are affecting water use (e.g., increase in water use as a result of efforts to reduce CO_2 emissions).

Recommendation 3: Establishing a New Team

The Alberta Water Council recommends that a new multi-stakeholder project team be established in 2014 to undertake the tasks listed below. The team would have representation from the seven priority sectors, Government of Alberta, environmental and other non-government organizations, and other stakeholders identified by the Alberta Water Council. The new team would:

a. Serve as a forum for sectors to share ideas, experiences and challenges in implementing their sector plans and developing their sector progress reports.
b. Receive reports from sectors on the evaluation of overall progress in implementing their CEP plans, provide feedback as appropriate, and coordinate the presentation of sector progress reports to the Alberta Water Council.
c. Evaluate and update the Framework to reflect changes as CEP plans evolve and are updated in the future (if needed).
d. Determine how to measure:
    — Overall success of CEP plans in contributing to achieving the goals of *Water for Life* including, the *Water for Life* outcome of a 30% improvement in overall efficiency and productivity of water use by 2015, and
    — The extent to which the Criteria for Reviewing Sector Plans (Alberta Water Council, 2008, p. 18, item 2) have been met.
e. Prepare a report to the Alberta Water Council that:
    — Describes the progress of sector plans in achieving CEP desired outcomes as reflected in the Framework (Alberta Water Council, 2008, p. 18, item 2), and
    — Includes recommendations to enhance sector CEP planning, implementation and reporting if needed.

Data from this report would be used by the Alberta Water Council in its report on implementation of the *Water for Life* strategy.

During the discussions leading to these recommendations, some topics of discussion were considered by some participants of the project team to be outside the scope for this project. Others held the view that these matters needed to be addressed for CEP planning to achieve its full potential. In the sense that most of these issues have policy implications and thus require consideration by the Government of Alberta, they are not within the mandate of the Alberta Water Council. However, the points are noted in this report (briefly in section 2.5, and in more detail in section 5) to reflect that they were discussed and may add value to future Council work. There was agreement to include the list of points in section 2.5, but consensus was not reached on section 5.

1.0 Introduction

For decades, Alberta has relied on natural resource sectors—primarily energy, agriculture, forestry and, indirectly, tourism—to create prosperity and attract people and investment from around the world. As the province has grown, so too have communities and industries. Crucial to this economic activity is a sustainable supply of high quality water.

A growing population and flourishing economic development are placing stresses on some rivers, lakes and aquifers. The most severe pressures are being felt in southern Alberta but concerns about water quality and quantity and the health of aquatic ecosystems[1] have also been expressed in the north. The predicted impacts of climate change may further stress Alberta's water resources.

The Government of Alberta formally recognized the vital role of water when it developed and adopted the *Water for Life* strategy in 2003. *Water for Life* (*WFL*) is the over-arching strategy for managing Alberta's water resources, emphasizing the dependence of our communities and economic well-being on clean, sustainable water supplies and healthy aquatic ecosystems.

The original *WFL* strategy identified the preparation of "water conservation and productivity plans for all water using sectors" as a key medium-term action, to be followed by long-term action to "establish an on-going monitoring program to ensure all sectors are achieving water conservation and productivity objectives."[2]

The *WFL* strategy was renewed in 2008, accompanied by an Action Plan in 2009. The renewed strategy maintains the focus on the original goals of achieving:

- Safe, secure drinking water,
- Healthy aquatic ecosystems, and
- Reliable, quality water supplies for a sustainable economy.

Three key directions that support the goals were also reiterated, namely:

- Knowledge and research,
- Partnerships, and
- Water conservation.[3]

1 It was observed that Alberta does not appear to have a formal definition of "aquatic ecosystem," although the term "aquatic environment" is defined in s.1.1(h) of the Water Act. To be consistent with the *Water for Life* strategy, it was agreed to use the term "aquatic ecosystem" in this report.

2 Government of Alberta. 2003. *Water for Life: Alberta's Strategy for Sustainability*; p. 22.

3 More information on the *Water for Life* strategy and Action Plan is available at www.waterforlife.alberta.ca/

In the renewed strategy, the key direction of water conservation notes the following key actions:

- Encourage all sectors to develop and implement sector plans for water conservation, efficiency and productivity, and
- Complete an evaluation and make recommendations on the merit of economic instruments to meet water conservation and productivity objectives.

These key actions will support the achievement of specific outcomes including:

> "Demonstration in all sectors of best management practices, ensuring overall efficiency and productivity of water use in Alberta improves by 30 per cent from 2005 levels by 2015. This will occur when either:
>
> - Demand for water is reduced; or
> - Water use efficiency and productivity are increased."[4]

The 2009 Action Plan lays out specific actions to achieve these goals and outcomes. Key action 6.3 for water conservation is to:

> "Work with key water sectors to:
>
> - Develop Conservation, Efficiency, and Productivity Plans
> - Implement Conservation, Efficiency, and Productivity Plans
> - Establish an on-going monitoring program to ensure all sectors are achieving conservation, efficiency, and productivity outcomes."[5]

The Alberta Water Council has been working since 2006 to advance water conservation, efficiency and productivity (CEP) planning. Three multi-stakeholder project teams have worked to enhance understanding of CEP and the role of sound sector plans in contributing to *WFL* goals.

The Water Conservation, Efficiency and Productivity Definitions Project Team laid the groundwork by defining the terms *conservation*, *efficiency* and *productivity* (see Appendix A) and identifying potential measures. This work developed a common understanding and created a solid foundation for future CEP planning.

The Water Conservation, Efficiency and Productivity Sector Planning Project Team was the second Council team to look at this topic. This team had two key tasks: 1) develop

4 Government of Alberta. 2008. *Water for Life: A Renewal*; p. 15.

5 Government of Alberta. 2009. *Water for Life Action Plan*; p. 21.

an Annotated Table of Contents to guide the content of CEP sector plans, and 2) build a Framework for completing those plans. This work resulted in a process for completing sector plans, a guide for what a sector plan should contain, and mechanisms for reviewing and reporting on the plans. In the 2008 Council report based on this team's work, "The Council agreed that conservation, efficiency and productivity (CEP) plans for water-using sectors would contribute to achieving the *Water for Life* goals,"[6] and would reflect the definitions as previously developed and agreed to by the Council (see Appendix A). Alberta's seven major water-using sectors were represented on this team and each agreed to voluntarily develop a CEP plan.[7] The seven priority sectors initially identified by this team were: chemical and petrochemical, forestry, irrigation, mining/oil sands, municipal, oil and gas, and power generation.[8]

The Sector Planning for Water Conservation, Efficiency and Productivity Project Team was created in March 2009, in response to recommendation 21 from the previous team. Its main purpose was to support the development of water CEP plans for the priority sectors, based on the guidance provided by the two earlier teams. As work progressed, the seven sectors were slightly re-aligned, as described below in section 3, but they still accounted for most of the allocated water in Alberta.

1.1 Purpose of the Sector Planning for Water CEP Project Team

The Sector Planning for Water CEP Project Team was established as a forum for sectors to exchange ideas and discuss experiences and challenges in developing their plans, which were prepared by the seven major water-using sectors on a voluntary basis.[9] The priority sectors could provide updates and get multi-stakeholder advice on how to address any challenges they faced. As sectors prepared their plans, potential adjustments to the CEP Framework or Annotated Table of Contents were considered as a way to improve the process for developing future sector plans, should the need be identified. The Alberta Water Council regularly received progress updates and provided feedback as required.

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6 Alberta Water Council. 2008. *Recommendations for Water Conservation, Efficiency and Productivity Sector Planning*; p. 5. Section 1.1 of the Annotated Table of Contents in this report (p. 27) notes specifically that sector plans should "Describe how the goals, objectives and future vision of this plan will support the principles, goals and outcomes outlined in the *Water for Life* strategy."

7 The reports from the first two Council teams are available on the Council's website at www.awchome.ca.

8 In the Council's CEP work, the term "sectors" refers to the seven major water-using sectors in Alberta.

9 Complete terms of reference along with a list of team members and acknowledgements appear in Appendix B.

Sector plans were not developed by consensus, and neither the Council nor Alberta Environment and Sustainable Resource Development approved or endorsed the plans.

Two key tasks initially intended for the team (items (g) and (h) in Recommendation 21 from the previous CEP team) were subsequently determined to be more appropriate for the next CEP team, expected to be established in 2014. These tasks were:

> "g. To determine how to aggregate information based on the planned targets and performance measures so as to enable the Alberta Water Council to assess the overall success of CEP plans in achieving *Water for Life* goals and outcomes; and
>
> "h. To prepare a report to the Alberta Water Council on the progress of sector plans in achieving CEP objectives. Data from this report would be used by the Alberta Water Council in its Report on Implementation of the *Water for Life* strategy." [10]

The Council amended the original terms of reference accordingly.

All seven priority sectors regularly reported progress as they developed their water CEP plans. The completed plans were presented first to the project team with an opportunity for comment and feedback, and then to the Council. The results of the work to fulfill the terms of reference are described in this report.

10 Alberta Water Council. 2008. *Recommendations for Water Conservation, Efficiency and Productivity Sector Planning*; p. 26.

2.0 Evaluation of the Sector Planning Process

2.1 Introduction

2.1.1 What is a Sector Plan?

The CEP plan for each sector outlines the sector's overall strategy for achieving identified water conservation, efficiency and productivity objectives. The sector plan contains targets or benchmarks that reflect the circumstances of each sector and gives direction on management practices that individual water users can take to help achieve the sector's overall goals and targets. Implementation of the plans should result in continuous improvement of water CEP in the sector.

As noted in section 1, sector plans were expected to identify opportunities that, when implemented, would contribute to meeting *WFL* goals. Plans should also be linked to broader societal goals and initiatives, including Watershed Planning and Advisory Council (WPAC) Watershed Management Plans and other Government of Alberta (GoA) initiatives as appropriate. Individual sectors will report on progress in meeting their sector targets and objectives. To the extent that relevant information is available, progress reports will also describe how sector results contribute to *WFL* goals, recognizing that CEP plans and objectives may not be framed in a way that facilitates a robust and transparent assessment of the plan's implications for *WFL* goals. The expectations for sector progress reports and the evaluation of sector progress are described in more detail in section 4 of this report.

The Annotated Table of Contents (ATOC)[11] provides detailed guidance on the content that sectors were asked to consider in developing their plans. The Framework for CEP Sector Planning (Figure A-1 in the ATOC) lays out the process for sectors to follow in preparing their plans.

Members of each sector can take direction from their sector's overarching plans and develop CEP measures for their own operations as appropriate. Individual water licence holders may choose to develop a plan for their operations. Just as sector plans identify opportunities for sector members to contribute to achieving the overall conservation goals in the *WFL* strategy, actions by each individual member will help that sector meet its goals and targets.

11 The Annotated Table of Contents is an important feature of the Council's 2008 report, *Recommendations for Water Conservation, Efficiency and Productivity Sector Planning.* This report is available online at www.awchome.ca/LinkClick.aspx?fileticket=PuidLw1BNbg%3d&tabid=59.

2.1.2 The Importance of Sector Planning

The *WFL* strategy is clear that fluctuating and unpredictable water supplies, combined with continued population and economic growth, make it essential for Alberta to better manage this finite but renewable resource. A major component of better management is improving water conservation, efficiency and productivity.

The priority sectors account for most of the allocated water in Alberta. The Framework for CEP planning was developed with them in mind,[12] but it was intended to be used and adapted by other sectors as appropriate. In its 2008 report, the Alberta Water Council noted that, "Smaller water users are encouraged to undertake CEP initiatives but these users are not expected to develop formal CEP plans."[13] By using the Framework and ATOC, sectors can tap into their own expertise and experience as well as get advice and input from other stakeholders on potential actions that have the greatest opportunity for achieving CEP improvements.

2.2 The CEP Framework and Annotated Table of Contents

As sectors developed their plans according to the steps outlined in the Framework and the details in the ATOC, their experience gave rise to a number of comments and observations. Although it is uncertain if other water-using sectors will develop a CEP plan now that the seven priority plans are complete, some sector members may prepare individual plans for their company, municipality or irrigation district.[14] These plans may or may not be made public, but these entities could benefit from the experience and insight gained through this work. Documenting suggested changes to the Framework and ATOC also completes a task previously envisioned by the Alberta Water Council, which was to "determine the need for enhancements and changes to the Framework document and Annotated Table of Contents" (recommendation 21e). [15]

The review of the Framework and ATOC can guide sector members who want to develop their own CEP plans and additional water-using sectors that decide to develop CEP sector plans.

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12 Recommendation 16 in the Framework states that the initial focus of sector planning should be on capturing the largest individual water users within a sector or on users representing most of the water use in a sector.

13 Alberta Water Council. 2008. Recommendations for Water Conservation, Efficiency and Productivity Sector Planning; p. 9.

14 The forestry and power generation sectors have relatively few members and their sector plans are expected to apply to all of their respective companies and operations.

15 Alberta Water Council. 2008. Recommendations for Water Conservation, Efficiency and Productivity Sector Planning. p. 26.

2.2.1 Assessing the CEP Framework

The seven water-using sectors were guided by the Framework for CEP Planning. The Council noted the importance of having sectors fully engaged in CEP planning and was of the view that engagement by the priority sectors was satisfactory for the purpose of this voluntary process. Sectors were expected to identify who is responsible and who is accountable for implementation of the CEP plans[16] to ensure the plans are embraced and implemented by all sector members.

In general, the Council believed the CEP Framework, to the extent that it has been implemented, is a reasonable guide for sectors to use in developing their plans. Two specific areas were noted as places for possible improvement:

- The options for stakeholder engagement. Most sectors chose Option C for stakeholder engagement,[17] which may have affected the amount and extent of stakeholder input. Aspects of this point and its ramifications are discussed further in sections 2.3 and 2.4. Some sectors who considered the use of Option A concluded it would not take less time, as suggested in the Framework.
- The timeframe for reporting sector progress. The Framework suggests reporting be done every year or every other year, but every three to five years might be more reasonable. Preparing progress reports will be very labor intensive, especially for sectors with many members. Also, for some industries, improvements are driven by technology; in the irrigation sector, for example, when the area that can be converted to low pressure pivots is covered with this type of pivot, further CEP progress is expected to slow significantly until new technology is developed. For other sectors, substantial improvements in CEP will likely only be achieved through large investments that depend on the life cycle of existing capital equipment and projects.

The Council recognizes the voluntary nature of the CEP process and chose not to propose changes to the three stakeholder engagement options described in the Framework, although the discussion in sections 2.3 and 2.4 should be considered when plans are revised and new plans are being prepared. Overall the Council believes that the first six steps in the Framework are generally solid. The next CEP team will be involved in assessing progress and may recommend

16 Alberta Water Council. 2008. *Recommendations for Water Conservation, Efficiency and Productivity Sector Planning*; p. 38.

17 Option C was: The sector team is made up of sector members only and the sector opts to provide copies of its draft plan to various stakeholders during its development. Option A was: The sector team is multi-stakeholder. Option B was: The sector team is made up of sector members only, and a separate multi-stakeholder advisory committee is established.

changes to steps 7 through 10 as the plans are implemented, including any changes to progress reporting timelines.

2.2.2 Assessing the CEP Annotated Table of Contents

The assessment of the Annotated Table of Contents (ATOC) focused on three main areas. Again, it is not known whether other sectors will be preparing water CEP plans, but current plans may be revised or rewritten at some point, and the Council wanted to provide guidance to those using the ATOC in the future, based on its experience.

Repetition and report length

The ATOC was regarded as a good step-by-step guide to "fill in the blanks" in each sector plan, but several sectors found that following each step led to lengthy and repetitive plans with a lot of detail. The amount of background information required was considered to be particularly onerous for some sectors. Feedback was that the length of the resulting reports deterred many readers, both within and outside the sector. Guidance was needed to ensure that members understood the intent, goals and targets in the plan they were approving. The challenge is to reduce redundancy without eliminating important content.

The Council encourages sectors to include a one-page summary that describes the sector targets and goals. This would enable readers to quickly assess the plan and see the direction the sector is taking, and would be especially valuable to those outside the sector who want a quick overview.

Combining introduction and background

Sectors and sub-sectors whose water use is closely related could reduce duplication and enhance readers' understanding of the sectors by preparing a complementary introduction and background that describe an entire sector's water uses and where losses occur. From there, separate sections for each sub-sector can identify the challenges and opportunities that affect their CEP plan.

Providing firm numbers and targets

Ideally, sector plans will present goals with clear numerical targets for conservation, efficiency and productivity as appropriate, along with data that reflect aspects of water use at the sector and watershed levels (e.g., diversion vs. consumption). Stresses vary in different parts of Alberta, which means the extent and impact of CEP measures required will also vary. This could lead to unfair comparisons between sectors if only the numerical targets are considered; for example, it may not be as crucial to reduce consumption in northern basins as in the water-short southern basins. As well, sectors may be unable to disclose targets and firm numbers for reasons related to competitiveness. Nevertheless, sector plans should include clear numerical targets and, if for some reason this is not possible, the plan should indicate the barriers to developing and publicizing such numbers.

2.3 Assessing the Process for Developing Sector Plans

The process for developing sector plans generally worked well. These plans represent targets set by sectors to making CEP improvements, and their implementation means getting better at how we, as a society, use water. The benefits of this open and collaborative approach were clear:

1. Sectors' willingness to share information (with limitations on information related to competitiveness) raised awareness of both what has been done to improve water CEP and future opportunities that may not otherwise have been considered. This sharing of information and experiences also created a better understanding of the interests and perspectives of all sectors, and the need to consider diverse environmental, social and economic factors.
2. The sector planning process helped raise the profile of water within sectors. During the development of CEP plans by sectors, sector members heard presentations, attended workshops and engaged in discussions about CEP and the role of sector members in contributing to their sector's targets.
3. The multi-stakeholder discussions provided a venue for raising concerns and challenges with respect to sector planning and for finding solutions, both in terms of improved management practices and approaches to developing and implementing sector plans.
4. The outcomes of this work showed that improvements in water conservation, efficiency, and productivity can be achieved, and that achievement will be gained through concerted effort guided by progressive thinking, strategic planning and investments of human and economic resources.

Several practical aspects of CEP plan preparation emerged as work progressed. These are noted here for the benefit of those who have yet to develop a CEP plan, to inform future teams and to provide guidance to sectors when it is time to update their plans.

Time and resource commitment

All sectors found that hundreds of hours, much of it volunteer time, were needed to develop their CEP plans. Future plans should require less time to complete because they can build on the work already done. Nevertheless, the amount of time required to engage members, create buy-in, and develop and approve the plans is substantial, particularly where the sector has a large number of members. Plans for urban municipalities and the irrigation sector were developed as "pilots" with support from the GoA, specifically Alberta Environment and Sustainable Resource Development, and Alberta Agriculture and Rural Development. Substantial additional resources will be needed to implement sector plans and report on progress, and each sector is working to ensure adequate resources are secured and allocated appropriately. Sectors that are contemplating CEP plans should build in sufficient time for the process.

Increasing participation in a sector plan

The onus has been on individual sectors to encourage participation by their individual members. Demonstrating the benefits of participation, such as cost savings, improved competitiveness, improved water quality or improved aquatic ecosystem health in the community where the water user operates, is a valuable way to encourage others to get involved and develop their own water CEP plan. Profiling success stories and providing wider recognition is a good way to publicize the benefits of participation.

CEP plans were developed voluntarily by the seven major water-using sectors; they are commended for this initiative and are encouraged to widen participation by their members in CEP activities. As new water allocation policies and tools are developed, other tools to increase participation in CEP planning could emerge, such as the establishment of incentives or regulation.

Sector engagement

Communication to members within sectors during the development of a CEP plan is critical. To create support for the plan, sector members must be clear about what the plan is trying to achieve, the options for achieving the goals, and why the targets were selected. In sectors with many members, workshops were useful in building this understanding. Websites and SharePoint sites can also be used to engage members but these are generally less effective than

face-to-face interaction, especially when there is a lot of information to share. Opportunities for meaningful input early in the process increase the commitment and likelihood of eventual implementation of the sector plan by members.

Stakeholder engagement and review of draft CEP plans

In developing their CEP plans, most sectors used Option C for stakeholder consultation; that is, the sector established a team of sector members only and then distributed its draft plan to various stakeholders for review and comment.[18] This option could potentially result in new perspectives on the draft plans and identify opportunities for improvements. To the Council's knowledge, draft sector plans were circulated for review to WPACs and other stakeholders in areas where the sector operates. The sector team responsible for developing the plan then responded to feedback from these external stakeholders.

Some stakeholders, including some WPACs, expressed that it was difficult to thoroughly review sector plans in a timely manner. Such a task is not part of their mandate, and non-government organizations often lack sufficient staff and volunteer capacity to respond to requests to review major documents. This is noted as a potential process concern and something that the next project team may wish to consider.

The Council previously developed a list of criteria to guide sectors when presenting to the Council and to guide Council feedback on the plans.[19] However, some of the criteria for review may not have been as effective as they were intended to be, particularly criterion 2 regarding benchmarks and measurable CEP targets, and criterion 5 regarding stakeholder involvement.

The next project team should review all the criteria, particularly criteria 2 and 5, considering if enhancements are needed to clarify the scope of CEP desired outcomes. When the criteria were first compiled, it was not possible to anticipate every aspect of sector plan development; some of the things that were proposed three years ago for a sector plan may be more appropriate for an individual company, municipality or irrigation district as it prepares a CEP plan for its own operations.

All plans were formally presented to the Council at a board meeting where Council members could ask questions and provide feedback at a high level. Over the course of the CEP plan

18 Option A was to establish a multi-stakeholder project team to prepare the plan. With Option B, the team preparing the plan would comprise sector members only and a separate multi-stakeholder advisory committee would be set up.

19 Alberta Water Council. 2008. *Recommendations for Water Conservation, Efficiency and Productivity Sector Planning;* p. 18 – 19.

presentation process, Board members acknowledged the substantial effort that went into preparing the voluntary plans, and noted the need to ensure the plans protect aquatic ecosystem health, the need for metrics to evaluate progress toward the 30% target and the challenges in developing such metrics.

Sector approval of its CEP plan

Approval of the CEP plan by each sector is an important final step prior to implementation.[20] Like most reports and documents with extensive and diverse input, adopting or approving a CEP plan can be challenging during the final phases. Sectors should seek to address as many issues and concerns as early in the process as possible, but time and resources will almost certainly need to be allocated to deal with last-minute input and negotiations, "tweaking" of goals and targets, and finalizing the text and rationale in the plan.

2.4 Sector Plan Implementation

Implementation of sector CEP plans is step 7 in the Sector Planning Framework. A key task in the terms of reference for this project was to "receive updates from sectors on progress and challenges in developing and implementing CEP plans." Developing sector CEP plans took longer and was more challenging than expected, as reflected in the discussion above and, as a result, only a few sectors were able to begin the implementation phase during this project. The Alberta Water Council agreed that receiving updates from sectors on implementation and providing feedback, along with other work described in section 4 as part of the next steps, would need to become the responsibility of a new Council project team, as reflected in recommendation 3.

20 Sector plans are not approved by the Alberta Water Council or Alberta Environment and Sustainable Resource Development.

2.5 Policy Gaps and Links with Other Water Management Initiatives

Work now underway on other water management initiatives, including water licensing and allocation, is broadly relevant to water CEP planning. Several key issues and policy gaps were identified and were recognized as being outside the mandate for this project. These areas are noted here to indicate that they were considered and discussed. Although differing opinions existed on how they should be addressed, these are important and timely matters that warrant discussion, clarification and guidance by the GoA. Further perspectives and commentary appear in section 5 of this report.

The relationship between water licensing, allocation and CEP planning is particularly important and encompasses:

- Consumptive water use
- Return flows
- Water licensing and allocation
- The fate of water that is conserved
- Collection and use of storm drainage water

Cumulative effects management is another policy area with implications for CEP planning. As sectors begin to implement their CEP plans, situations could arise in which a decision has both positive and negative environmental impacts and requires trade-offs to be made. For example, a new technology could substantially reduce greenhouse gas emissions, but increase consumptive water use. To improve decision making across air, land, water and biodiversity, the GoA is developing a Cumulative Effects Management System. Any future changes to the water management system as a result of the review or implementation of a cumulative effects management system should encourage gains in water CEP while ensuring no significant harm (as defined by the regulator) to downstream users or the environment. Although cumulative impacts of CEP gains were not identified in the sector plans, these could be included in future progress reports.

Other initiatives in the South Saskatchewan River Basin could contribute to the health of aquatic ecosystems by managing rivers in a more integrated and innovative manner. One of these is described in Appendix C.

As sector plans are implemented by their members, sectors are encouraged to consider how their CEP actions can improve aquatic ecosystem health and to highlight any resulting adjustments to their plan in their progress reports (see Recommendation 2, section 4.2).

3.0 Highlights of Sector CEP Plans

The priority sectors have completed their sector plans; highlights of each sector's CEP plan are noted below. All completed sector plans are available on the Alberta Water Council website at www.awchome.ca/Projects/WaterConservationEfficiencyandProductivity/tabid/115/Default.aspx. The Sector CEP Plans were prepared voluntarily, approved by their respective sector organizations, and presented to the Council for comment, but the Council had no role in approving them.

The original seven sectors noted previously were based on representation at the Council. As work progressed, the sectors were slightly realigned; this affected the chemical and petrochemical, oil and gas, and mining (including oil sands) sectors.

The chemical and petrochemical sector, as represented on the Council, contains two umbrella organizations: the Chemistry Industry Association of Canada, which represents chemical producers; and the Canadian Fuels Association, which represents downstream petroleum products (petroleum refiners and marketers). Because of their differing water uses and umbrella organizations, the two sub-sectors agreed to create their plans independently of one another. Thus, water CEP plans were prepared for Chemical Producers and for Downstream Petroleum Products.

The Council has representation from the oil and gas sector and from the mining sector, which includes oil sands. The CEP planning committee for the upstream oil and gas sector was established as a sub-group of the Canadian Association of Petroleum Producers' Water Task Group. Because this Task Group includes members from the Oil Sands Developers Group and the Alberta Chamber of Resources, it was decided to develop a single plan for both the upstream component of the oil and gas sector, and the oil sands component of the mining and oil sands sector. This sector was called the Upstream Oil and Gas Sector.

Rural municipalities have expressed interest in the sector planning process but the Alberta Association of Municipal Districts and Counties (AAMDC) does not have the capacity to lead the development of a water CEP plan for that sector. The AAMDC believes rural municipal water use is adequately covered by other sector CEP plans and will focus its resources towards assisting the Alberta Urban Municipalities Association in implementing and promoting its sector CEP plan.

Chemical Producers

The Chemistry Industry Association of Canada (formerly the Canadian Chemical Producers Association) led the CEP plan development for chemical producers. This sector includes a small number of large companies that operate mainly in the Fort Saskatchewan region and in central Alberta near Joffre. Water use in the chemical industry can be in three primary areas: as steam in the process, as cooling water in cooling towers, and as part of the chemical reactions, it can be part of the product. Water usage for the total chemical industry in the period 2005 – 2009 has been reduced by about 23%. Some of those reductions resulted from the closure of older less efficient components of the facilities. At the same time production from the facilities has increased.

The plan identified ten opportunities for CEP improvements; these focus on process control and quality maintenance, and some opportunities are already being implemented. As part of continuous improvement small incremental measures will be implemented to reduce unnecessary wastage from process leaks and to enhance water use efficiency. The most significant improvements in water use in the chemistry industry will occur with major capital investments related to stock turnover or expansion. This allows older, less efficient equipment to be taken out of service and replaced with current technology resulting in greater efficiency and productivity.

The industry's Responsible Care® initiative has resulted in, among other things, members eliminating 98% of their emissions of 14 high-priority substances targeted by Canada's Chemical Management Plan. The recent additional commitment to sustainability and the continuing commitment to continuous improvement are consistent with the effective implementation of CEP plans.

Downstream Petroleum Products

The Canadian Fuels Association, formerly the Canadian Petroleum Products Institute, led the development of the plan for this sector, which is a smaller industrial water user in Alberta and has an allocation of less than 1% of Alberta's total water allocation. The plan covers three refineries, one asphalt plant and a large number of marketing and distribution facilities in Alberta that are operated or managed by Canadian Fuels member companies. The industry has substantially improved water use efficiency over the past decade through continuous improvement despite regulatory changes requiring more use of energy and water. The sector plan identified 15 opportunities for a potential of 22 CEP outcomes:

- Nine conservation opportunities that may decrease overall water use (e.g., alternative water sources);

- Eight efficiency opportunities that may decrease overall consumptive water use by reducing water losses to the atmosphere and/or increase the volume of water discharged back to the source; and
- Five productivity opportunities that may increase production while maintaining the same amount of water used.

Forestry

The Alberta Forest Products Association coordinated the production of the forestry sector plan. As the champion of this plan, the Association will continue to work with Alberta's pulp and paper mills to identify further opportunities for water CEP, drawing from the Alberta, national, and international experience. It is up to each mill to determine which opportunities are feasible, and when and how CEP initiatives might be undertaken. Overall, this sector has established the following criteria for measuring success of its plan:

- Rivers are healthy.
- Effluent quality is maintained or improved.
- Water diversion is decreased.
- Water intensity (cubic metres used to produce a tonne of pulp) is reduced.

Irrigation

The Alberta Irrigation Projects Association oversaw the preparation of the irrigation sector plan and is championing its implementation. The 13 irrigation districts are working to develop district-specific strategies that will outline how they can best contribute to achieving the overall sector targets. The irrigation districts will participate in water quality studies that will provide information for the improvement of water quality within and downstream of irrigation districts. The districts are collaborating on and helping to fund a five-year water quality study in the irrigation districts and a groundwater study of the impact of intensive livestock on the nitrogen content of groundwater. Highlights of the Irrigation Sector CEP Plan include:

- To measure against the 30% CEP goal set out in the *Water for Life* strategy (to be achieved during the target period of 2005 – 2015), the irrigation sector has targeted a 15% improvement in efficiency and a 15% improvement in productivity. The sum of their efficiency and productivity targets is 30%.
- Although Alberta's irrigated area may expand, the target is to keep diversions from rivers at or below the level of the base year 2005 on a 10-year running average, which takes into account the vagaries of climate.
- Seventy percent of the land in irrigation districts will be irrigated using current best management practices by 2015.

Power Generation

The Power Generation sector CEP plan was developed collaboratively by TransAlta, ATCO Power, and Capital Power. The Power Generation sector does not have an umbrella association and special effort was taken by the group to ensure that the plan was representative of the sector as a whole.

Water CEP improvements in this sector have already taken place. Process improvements, technology improvements and the replacement of aging facilities have influenced and are expected to continue to influence water use. For example, the transition from existing fossil-fuelled thermal facilities (e.g., coal) to combined-cycle, cogeneration and renewables is reducing water use intensity. A key challenge will be the interrelationships between regulatory objectives (e.g., air emission controls could lead to increased water consumption). Highlights of this sector plan include:

- Electricity demand growth over the base period (2000 – 2002) is projected to be 49% by 2015 and 117% by 2029.
- Water productivity improvement over the base period is projected to be 31% by 2015 and 50% by 2029.
- Water consumption is expected to stay about the same until 2030, despite projected doubling of electricity demand. Total water consumption is expected to grow 2% by 2015 and 8% by 2029.

The sector has developed a metric that can be used to estimate water consumption in Alberta. Improving the availability and completeness of actual water diversion, consumption and return flow information submitted to Alberta Environment and Sustainable Resource Development from all sources will improve estimates of actual water consumption and use in the future.

Upstream Oil and Gas

Preparation of the sector plan for Upstream Oil and Gas was overseen by members of the Canadian Association of Petroleum Producers, the Alberta Chamber of Resources, and the Oil Sands Developers Group.

The sector target focuses on improving non-saline water use. Specifically, the sector aims to improve non-saline water use productivity by 24% by 2015, compared to 2002 to 2004. Actual productivity will vary in wet or dry years. The targeted improvement is between 15% and 47% depending on the type of oil or bitumen production. As a result of industry's pro-activity, much of the targeted improvement in non-saline water use productivity has been realized relative to the baseline period. The sector plan recommends a number of potential CEP opportunities that members could consider to secure the most significant CEP gains, many of which focus on the increased use of saline water in place of fresh water.

Urban Municipalities

The Alberta Urban Municipalities Association (AUMA) oversaw production of the CEP plan for the urban municipal sector. Its targets are based primarily on input received from members and guidance from a team of experts. The targets focus on:

- Increasing water use reporting through Alberta Environment and Sustainable Resource Development's electronic Water Use Reporting system;
- Estimating municipal infrastructure leakage and identifying ways to reduce it;
- Getting municipal CEP plans in place for individual cities, towns and villages; and
- Implementing incentives or disincentives to promote the use of water-efficient fixtures and technologies.

To help municipalities implement the CEP plan and begin to develop baselines, the AUMA developed a series of resources to help its members reach the targets in the CEP plan. A key target is to have sector members prepare their own water CEP plans and the AUMA has produced a CEP planning guide that municipalities can adapt to their situation. AUMA has also developed, in cooperation with the Council, an instructional video to show members how to access and use Alberta Environment and Sustainable Resource Development's online system for reporting water use data. Finally, AUMA has developed a Water Microsite to house relevant resources and provide links to additional tools, at http://water.auma.ca/. Tools include water audits, examples of incentives and disincentives that municipalities can use to increase the uptake of water efficient fixtures and technologies and a model bylaw.

4.0 Next Steps in CEP Planning

The Sector Planning Framework envisioned, in steps 8 through 10, that:

- Sectors would produce regular progress reports for the Alberta Water Council;
- The Council would review the results and outcomes of sector planning; and
- Implementation and reporting would be ongoing, as sectors were "expected to identify opportunities for continuous improvement and incorporate these into their CEP plans."[21]

With the completion of sector CEP plans, the next phase of work will entail monitoring and evaluating progress. All sectors have committed to implementing their plans and reporting progress to the Council. Each sector plan has its own performance measures on which it will report; these will be used to evaluate progress and performance and to determine the overall contributions of sectors to meeting the *Water for Life* goals and key directions.

Based on work with a variety of sectors and stakeholders, this section of the report lays out next steps and recommendations on specific areas that the next Council team should address to maintain momentum and reinforce the importance of sector plan implementation.

4.1 Implementing Sector CEP Plans

Step 7 in the Sector Planning Framework involves implementation by sectors of the CEP measures outlined in their respective plans. The seven sector plans were completed over a three-year period from 2010 to 2012: two in 2010, two in 2011, and three in 2012. The Alberta Water Council agreed that it was most appropriate for this team to conclude its work with the development of all the plans and then to recommend that the next team serve as a forum and sounding board for implementation.

Sector progress reports are expected to address implementation challenges, one of which will be assessing performance against what the sector said it would do. Challenges will vary from sector to sector but, in a broad sense, the Council expects there may be challenges in the following areas:

- Commitment and participation of sector members: All sector members need to understand and be made aware of the benefits of developing and implementing a water CEP plan, both to expand participation and to discourage naysayers.
- Policy and regulation: Changes in public policy or regulatory regime for a sector could affect implementation.

21 Alberta Water Council. 2008. *Recommendations for Water Conservation, Efficiency and Productivity Sector Planning;* p. 17.

- Technology: Presumably technology exists to enable sectors to implement the measures described in their plan, but new technology could affect implementation in a positive or negative way.
- Financial and human resources: Sectors would have considered costs in their plans, but many factors could affect the economics of implementation. Capacity could also be a limiting factor.
- Political will: CEP planning competes with many other worthy issues and activities, and for municipal plans, will require prioritization by politicians and acceptance by the public at the municipal level.
- Public reaction: As the plans are implemented and different approaches are put in place, stakeholders and members of the public may have a reaction to which sectors need to respond.

Sectors are in the best position to foresee implementation challenges or difficulties, and progress reports should address implementation challenges such as those noted above.

4.2 Evaluating Sector Progress and Performance

Monitoring and reporting on progress is essential for successful implementation. This ensures that performance is tracked and results are quantified where appropriate according to the measures and targets in each plan. Sectors need a reasonable amount of time to complete specific projects and see the results, but the *Water for Life* strategy targets a 30% improvement in overall efficiency and productivity of water use by 2015. Initial thinking was that, between 2012 and 2015, sectors should prepare progress reports every two years, starting two years after their plan is completed, which would be consistent with the Framework. Such reports would be provided to the Alberta Water Council, sector stakeholders and the public. However, several sectors held the view that it is likely to take more than two years to see any real progress as a result of the CEP plans.

Recommendation 1: Sector Progress Reports

The Alberta Water Council recommends that:

a. All seven priority sectors prepare sector progress reports based on performance data as of December 31, 2014, and submit these reports to the Alberta Water Council's final meeting of 2015; and

b. The two sectors that completed sector CEP plans in 2010 (irrigation and urban municipalities) prepare interim progress reports based on data as of December 31, 2012 and submit to the Alberta Water Council not later than the final meeting of the Alberta Water Council in 2013.

As described in the Framework, these reports will emphasize the sector's progress in implementing plans and the sector's success in meeting the targets or benchmarks set out in its CEP plan. Sectors will evaluate their own plans and success in achieving the goals and objectives in their plan as well as the *WFL* goals. The reports should evaluate and quantify productivity and efficiency improvements as well as any reductions in water use or diversions that are achieved, consistent with the proposed measures and targets. They should also reflect how sector progress is contributing to the three *WFL* goals. It is important for sectors to acknowledge the broader context in which they operate by understanding the impacts of their CEP activities including the impacts on aquatic ecosystems.

Although the targets set out in most sector plans would likely not change between the time the plan was prepared and 2015, ongoing implementation and evaluation is very likely to reveal opportunities for refinements and improvements. Changes in regulations, policy, or technology could also result in adjustments to the sector plan, which should be highlighted in the progress reports.

Recommendation 2: Focus of Sector Progress Reports

The Alberta Water Council recommends that sector progress reports:

a. Describe and evaluate the sector's success in meeting CEP plan objectives, benchmarks and targets, including productivity and efficiency improvements, any reductions in water use, impacts on return flows, and performance relative to the baseline year. This should:
   - Note the adoption of new industry best practices and technologies, subject to confidentiality and competitiveness considerations;
   - Note adjustments needed to improve the sector plan or adapt to new technologies or legislative requirements (e.g., regional land use plans); and
   - Make reference to development of CEP plans by individual sector members, if appropriate.

b. Encourage member(s) to be aware of opportunities that could improve the health of aquatic ecosystems and to work with appropriate organizations engaged in watershed management within the watersheds in which the member(s) operate(s).

c. Using metrics developed for each sector plan, summarize water use, assess and document impacts of CEP efforts, and indicate how implementation of the CEP plan is contributing to the three *Water for Life* goals, namely safe secure drinking water supply, healthy aquatic ecosystems, and reliable, quality water supplies for a sustainable economy. Other environmental impacts of CEP efforts should also be noted; e.g., impacts on riparian health, instream flow improvement, water quality.

d. Discuss opportunities and challenges.

e. Describe interactions with stakeholders on plan implementation and progress.

f. Indicate how other environmental endeavours are affecting water use (e.g., increase in water use as a result of efforts to reduce CO_2 emissions).

Consideration was given to adding a clause to this recommendation that would have sectors assess water conservation and potential return of water that is no longer needed. One sector further suggested that any potential returns as a result of water conservation should be designated to ameliorate or maintain instream flows, and that simply doing the assessment would raise awareness of the need for potential mitigative measures in the watershed. Various opinions and options were discussed, as reflected below, but there was no agreement to include such a clause in the recommendation.

Some sectors noted that due to lack of resources and lack of clarity around the assessment approach, it would be very challenging to do such an assessment in a consistent and meaningful manner. However, it might be possible for sectors that operate in several watersheds to work with WPACs to undertake this work, with financial support from the Government of Alberta. These sectors further advised that if they did identify any conserved water that could be returned, it would be returned to the GoA, as "…the right to the diversion and use of all water in the Province is vested in Her Majesty in right of Alberta except as provided for in the regulations."[22]

Some sectors then suggested that the GoA provide direction for the use of conserved water, including opportunities and tools for the use of conserved water for the amelioration or maintenance of instream flow. Some opposed this idea because it could discourage infrastructure investment by water-using sectors. Rather, the GoA should identify which reaches of a river are degraded and why, and then propose solutions.

22 *Water Act.* RSA 2000, Chapter W-3, section 3.

As reflected in recommendation 3 in section 4.5, the next project team should serve as a multi-stakeholder forum in which sectors can share their results and obtain feedback and suggestions to address issues that may arise. This team should also coordinate the presentation of progress reports to the Council to ensure the reports are meaningful and timely, and that they clearly demonstrate the results (or explain a lack of results) that have been achieved to date. These tasks will form part of the terms of reference for the next team.

4.3 Evaluating Overall CEP Progress

The *Water for Life* Action Plan stresses the need to demonstrate best management practices in all sectors to "ensure an improvement in overall efficiency and productivity of water use in Alberta by 30% by 2015, based on 2005 levels. Improvements will occur when water demand decreases or when efficiency and productivity increases."[23]

Each sector plan has established specific units to measure changes in water CEP for that sector and will report progress based on those units. Because there are no consistent targets or performance measures across all seven sector plans, it is difficult to develop metrics that aggregate these numbers for the province as a whole. Developing such metrics to measure overall CEP progress was initially a task for this Alberta Water Council team. Sectors were considered to be in the best position to identify how to measure CEP in their sectors, and work to develop metrics for aggregating sector achievements at the provincial level should begin once each sector knew how it would measure progress. This challenge was discussed and it was not possible to develop an effective approach in the time available. A key task for the next CEP team, as noted in recommendation 3, will be to determine if and how to measure overall success of CEP plans in achieving this *WFL* outcome.

The Council sought to provide clear guidance for the next team as it takes on this important task, without being prescriptive. Defining targets for all three *WFL* goals would help sectors, the regulator and the people of Alberta measure progress against them. The 30% provincial target is important, but water quality and the overall health of aquatic ecosystems, safe secure drinking water, and reliable quality water supplies for a sustainable economy are also important. Water quality, lake levels, and the health of aquatic ecosystems should not be negatively affected by measures to improve CEP. The 30% target is an aspirational or "stretch" target that may not be realistic for sectors to achieve on an individual basis, but other sectors may exceed the target, which is why aggregate metrics are needed.

23 Government of Alberta. 2009. *Water for Life Action Plan*, p. 20.

By definition, mixed units are being used. The *WFL* target of a 30% increase in efficiency and productivity is mixing units of water with units of what is produced using that water. Because the target is a percentage, the metric needs to be in a percentage. There was no stipulation as to how to divide up efficiency versus productivity, so the percentages would therefore be additive. For example, if one were to achieve 5% increase in efficiency and 25% increase in productivity, then the target would be achieved.

Basin-specific considerations will be part of evaluating progress, with specific improvements targeted to both water quality and quantity and how they apply to *WFL* goals, recognizing that it may not be possible to achieve all goals equally. It might be useful for the next team to engage a consultant with experience in water CEP planning and knowledge of how this work has been implemented in other jurisdictions to review the work being done in Alberta.

CEP sector plan development and implementation is a voluntary approach. The Council and the next CEP project team have important roles in measuring progress and success in achieving the 30% target. However, ultimately it is up to the GoA to decide if the voluntary approach is effectively meeting the *WFL* goals and, if not, what other options could be pursued. The policy gaps identified in section 2.5 demonstrate there are limits to what CEP planning can accomplish until additional tools and policies are developed and implemented.

4.4 Ensuring Continuous Improvement

The monitoring and reporting section in the ATOC (section 5.3) reflects the need for sector plans to commit to continuous improvement. The expectation is that implementation of sector plans will be evaluated and progress reported. Sectors have shown leadership by setting, what are in many cases, "stretch" targets in their voluntary water CEP plans. The Alberta Water Council is optimistic that these targets, and the GoA's 30% target, will be achieved. The Council recommended in 2008 that the CEP sector planning process be formally evaluated to determine the extent to which the achieved results have contributed to *WFL* goals, possibly including a recommendation to Alberta Environment and Sustainable Resource Development "that they consider mandatory CEP planning such as requiring water licence holders to develop and implement CEP plans."[24] The Council further noted in its 2008 report, "Not only will evaluation provide sectors with an opportunity to identify changes needed to improve the results of their plans, but evaluation will enable continual adaptive management to emerging issues such as

24 Alberta Water Council. 2008. *Recommendations for Water Conservation, Efficiency and Productivity Sector Planning*, p. 21 (Recommendation 9).

climate change, potential water shortages, ecosystem deterioration, new forms of pollution and new policies developed to address emerging issues."[25]

The CEP plans provide guidance and information for sector members to collectively share water use management best practices, approaches and emerging technology as appropriate for their sectors. This information can then be applied by individual sector members as they develop their own plans and targets. In its fourth review of implementation progress of the *Water for Life* strategy (2009 – 2011), the Council stressed the importance of sectoral leadership in achieving the strategy's key direction of Water Conservation. Specifically, the Council recommended that "Water-using sectors with water conservation, efficiency and productivity (CEP) plans raise awareness of their plans by promoting them to their members, thus encouraging all members to develop individual CEP plans or strategies to contribute to CEP gains."[26]

2015 is a benchmark year for assessing CEP results and time will be needed to implement activities identified in CEP plans before the effects of implementation are apparent. Thus, there is no need for sectors to undertake a substantial review of their plans prior to 2015. The focus from 2012 to 2015 should be on implementation, monitoring results, and making any adjustments in response. The Council recognizes the large effort involved in developing sector plans and the time needed to implement them.

As implementation proceeds and sector comfort and familiarity with its plan increases, opportunities to go beyond expectations in the plan may emerge. Opportunities may arise for sector members to collaborate within their sectors, for sectors to collaborate with other sectors, and for collaborations within and across watersheds and with knowledgeable external experts to develop and apply innovative solutions to contribute to *WFL* goals and outcomes. These experts could include instream flow needs specialists, fisheries and wetland biologists, water market experts, water treatment specialists, agrologists and others.

25 Alberta Water Council. 2008. *Recommendations for Water Conservation, Efficiency and Productivity Sector Planning*, p. 36.

26 Alberta Water Council. 2012. *Review of Implementation Progress of* Water for Life*, 2009 – 2011*, p. 22, online at www.awchome.ca/LinkClick.aspx?fileticket=9oSr0gmfWjQ%3d&tabid=102.

4.5 New Alberta Water Council Team

As noted in earlier sections of this report, certain tasks need further work and the Alberta Water Council proposes that a new project team be established. Considerable momentum has developed around water CEP and this new team will have an important role in moving this work forward. As with previous Council teams, this multi-stakeholder group would be given several key tasks, described in recommendation 3.

Recommendation 3: Establishing a New Team

The Alberta Water Council recommends that a new multi-stakeholder project team be established in 2014 to undertake the tasks listed below. The team would have representation from the seven priority sectors, Government of Alberta, environmental and other non-government organizations, and other stakeholders identified by the Alberta Water Council. The new team would:

a. Serve as a forum for sectors to share ideas, experiences and challenges in implementing their sector plans and developing their sector progress reports.

b. Receive reports from sectors on the evaluation of overall progress in implementing their CEP plans, provide feedback as appropriate, and coordinate the presentation of sector progress reports to the Alberta Water Council.

c. Evaluate and update the Framework to reflect changes as CEP plans evolve and are updated in the future (if needed).

d. Determine how to measure:

   — Overall success of CEP plans in contributing to achieving the goals of *Water for Life* including, the *Water for Life* outcome of a 30% improvement in overall efficiency and productivity of water use by 2015, and

   — The extent to which the Criteria for Reviewing Sector Plans (Alberta Water Council, 2008, p. 18, item 2) have been met.

e. Prepare a report to the Alberta Water Council that:

   — Describes the progress of sector plans in achieving CEP desired outcomes as reflected in the Framework (Alberta Water Council, 2008, p. 18, item 2), and

   — Includes recommendations to enhance sector CEP planning, implementation and reporting if needed.

Data from this report would be used by the Alberta Water Council in its report on implementation of the *Water for Life* strategy.

5.0 Other Issues and Perspectives

The commentary in section 5 reflects the views of some sectors and does not have consensus. The material is presented to reflect some of the opinions on these matters and the scope of the team's discussion.

A number of issues with links to water CEP planning were discussed in some detail, with diverse opinions being held on these matters. These items were briefly noted in section 2.5. Some sectors held the view that related policies ought to be clarified and policy gaps filled to realize the full benefits of water CEP planning. Others agreed that these are important issues but did not see the need for them to be considered in this report as they viewed them as separate from CEP planning and thus out of scope.

In the sense that most of these issues have policy implications that require consideration by the Government of Alberta, they are not within the mandate of the Alberta Water Council. However, the points are noted here to reflect that they were discussed and could add value to future Council work.

The relationship between water licensing, allocation and CEP planning

Consumptive use

Some sectors noted that water CEP improvements can increase consumptive water use, as water that is conserved could be consumed for new economic activity or other purposes. Potential impacts need to be considered when implementing CEP activities as they have implications for both water quality and quantity, and for the overall water allocation system. Other members noted that the opposite position could be stated.

Return flows

Some sectors noted that water CEP improvements can reduce return flows due to increased intensity of water use. If source diversions are not reduced, lower return flows can affect ecosystem health and water users who rely on upstream return flows for their allocation. Other sectors noted that reducing return flows can improve downstream water quality.

These potential impacts need to be considered when implementing CEP activities as they have implications for both water quality and quantity, and for the overall water allocation system.

Water licensing and allocation

In Alberta, a licence is required to divert and use fresh (non-saline) water from lakes, rivers, streams, groundwater and other water bodies as outlined in the *Water Act*.[27] Such licences

27 A licence is not required for saline groundwater.

include a stated purpose for the water allocation, a priority number and an expiry date (with some exceptions). The licence will also have a suite of conditions that may outline: how and where the water will be diverted and returned to the source; in what quantities water can be diverted; and when water can be diverted. Licences may also include quality conditions related to return water. Licensees must follow the terms of their licence as directed by the GoA, and these licences can be amended by the GoA.

An application for a water licence, amendment to a water licence or a licence transfer that would involve a conservation holdback in the South Saskatchewan River Basin (a closed basin) must be made in a form and manner satisfactory to the regulator.[28] As the regulator, the GoA has the responsibility to consider all relevant matters and factors in issuing a licence, transfer or amendment and making conservation holdbacks under the *Water Act*. This may include considering any existing, potential or cumulative effects on the aquatic environment and other licensees, among other things.[29] The regulator may also consider any applicable water guideline, water conservation objective and water management plan when deciding whether to issue a licence.[30]

Sector CEP plans can provide opportunities to benefit aquatic ecosystems. Some opportunities can be pursued without any changes to the provincial water management system, while others may encounter barriers to implementation.

Allocating water to various uses across the province, including water to maintain healthy aquatic ecosystems is the responsibility of the GoA. This fundamental responsibility of the regulator (that is, the GoA) is very important in terms of what can and cannot be explicitly accomplished through CEP sector plans.

The Council previously noted that establishing protected water is an important issue for the GoA to address in any review of the water allocation process.[31]

28 *Water Act*. RSA 2000, Chapter W-3, section 50.

29 *Water Act*. RSA 2000, Chapter W-3, section 51(4b).

30 *Water Act*. RSA 2000, Chapter W-3, section 51(4c).

31 Alberta Water Council. 2009. *Recommendations for Improving Alberta's Water Allocation Transfer System*. This report noted: "Protected Water should be defined as an appropriate proportion of natural flow and determined through the consideration of science and community values. In setting the flow, it is important to be cognizant of such sustaining factors as riparian health, source water protection, protecting water quality, providing habitat for fish or wildlife, wetland restoration, and non-consumptive recreation purposes" (p.11).

The fate of water that is conserved

Water conserved through increased efficiency or productivity (and thus is "unused" under the current licence) could be used for future growth, managing risk (e.g., risk related to climate change and variability), and reducing withdrawals. Through CEP planning, licensees could, where feasible, identify opportunities to apply water they conserve towards improving the health of aquatic ecosystems in their watershed.

One view on the fate of conserved water is that if water saved through efficiency and productivity improvements is used strictly for these two uses, then it is not necessarily being conserved for healthy aquatic ecosystems (goal 2 in *WFL*). Alternatively, if water is not diverted, it may contribute to healthy aquatic ecosystems.

Other sectors disagreed with this assessment, noting that successful CEP projects that increase productivity and efficiency reduce the need for additional water supplies and thus directly benefit aquatic ecosystems and prevent further degradation. These sectors are of the view that it is the GoA's role to manage basin allocations to achieve water conservation objectives.

Tools and policies to secure healthy aquatic ecosystems must also be in place, including education about the important role of CEP in aquatic ecosystem health, but this aspect was not addressed by sectors, particularly in the early plans, and some sectors viewed it as out of scope. The GoA administers water and watershed management activities and is responsible for the way water is allocated in the province and for establishing water conservation objectives.

Under the *Water Act*, a licensee may not hold a licence for a water conservation objective. Mechanisms already exist, subject to the regulatory process, to make conserved water available for certain economic and other purposes and to ensure safe secure drinking water.[32] The GoA's proposed review of the water allocation system should address how it will meet water conservation objectives and the potential role water conserved through efficiency and productivity improvements could play in helping to meet all three goals of the *WFL* strategy.

Not all water used by sectors is licensed. For example, some sectors use unlicensed water in the form of rainwater, grey water, and saline water[33] and include these sources in their sector plans to help meet their CEP targets. In some situations, this practice can free up fresh water for other

32 One mechanism available across the province is to amend a licence. In the South Saskatchewan River Basin, the main mechanism is the transfer system.

33 As outlined in Water (Ministerial) Regulation AR 205/98, section 1(1)(z), only water with less than 4,000 mg/L total dissolved solids is subject to licensing. Water with more than 4,000 mg/L total dissolved solids is classed as saline.

uses; the use of saline water by the oil and gas sector is one example. Some sectors believe this approach contributes to meeting *WFL* goals and outcomes. Others argued that this practice does improve the intensity of freshwater use but does not actually reduce total water use and does not represent an increase in efficiency because the same amount of water, or more, may be used but taken from a different unregulated source. Thus it is uncertain whether the approach affects the achievement of *WFL* goals and outcomes, and underscores the need for a provincial water inventory as well as clear provincial policies and regulations regarding these water uses.

Collection and Use of Storm Drainage

Interest is growing in the collection, use and management of storm drainage. Rainwater that is collected and diverted to a storm water collection system may require a licence under the *Water Act* if the intent is to use that water. The decision on whether a *Water Act* licence is required is made on a case-by-case basis. Some sectors see the purpose-built, large-scale collection of storm drainage as another source of water and not as a form of CEP that would be within the scope of CEP planning. Other sectors may intend to use this collected storm drainage in their CEP plans. Policies regarding the use of storm drainage are needed, including whether the use of storm drainage ought to be considered within the CEP calculation of water efficiency.

In summary, important links between CEP planning and the water allocation process, and the challenges these links can create were acknowledged. The Council recognized the need for improvements to Alberta's water allocation transfer system in 2009. The Council's report on this matter[34] makes recommendations for an improved and robust water allocation process that will set aside protected water and balance social, economic and environmental objectives. It is expected that a number of these items will arise during the GoA's planned conversation with Albertans in 2013 on water.

34 This report, entitled *Recommendations for Improving Alberta's Water Allocation Transfer System*, is available on the Council's website at www.awchome.ca/

5.1 Perspectives on Providing Environmental Benefits in CEP Plans

Table 1 (Examples of CEP Opportunities) in section 4 of the ATOC identifies "environmental" as a type of CEP opportunity and provides examples. The accompanying footnote states that "There may be some environmental opportunities that if adopted by a sector contribute to *Water for Life* goals but not directly to gains in conservation, efficiency and productivity. Sectors are encouraged to adopt environmental opportunities in their plan in conjunction with other CEP opportunities."[35]

One sector saw an opportunity for CEP sector plans to more explicitly contribute to the healthy aquatic ecosystems goal in the *WFL* strategy, particularly in basins where aquatic ecosystems are at risk due to high levels of water allocation (e.g., lower Bow River, southern tributaries of the Oldman River,[36] Athabasca River downstream of Fort McMurray in the winter months[37]).

Another sector notes that the Athabasca River remains a lesser-utilized basin in Alberta, with approximately 4.4% allocation.[38] The oil sands mining industry holds most of these allocations. Actual use for oil sands mining in 2011 was 0.54% of annual flows with a maximum of 3% of low winter flows.[39] By 2030, it is projected that the oil sands mining industry will require 1.4% of average annual flows. The health of the aquatic ecosystem is balanced with oil sands development during low winter flows by cumulative withdrawal limits set by the Alberta and Federal Governments.[40]

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35 Alberta Water Council. 2008. Recommendations for Water Conservation, Efficiency and Productivity Sector Planning. p. 31.

36 See: *South Saskatchewan River Basin: Water Management Recommendations, A Report to Alberta Environment* prepared by Basin Advisory Committees for the Oldman River, Red Deer River, Bow River and South Saskatchewan (sub-basin) River. July 2004. Online at www.environment.alberta.ca/documents/BAC_Recommendations.pdf

Also see: *South Saskatchewan River Basin Water Management Plan Phase Two: Background Studies by Alberta Environment*. June 2003. Online at www.environment.gov.ab.ca/info/library/7884.pdf

Also see: *Oldman River State sof the Watershed Report.* Oldman Watershed Council. 2010. Online at http://oldmanbasin.org/index.php/teams-and-projects/state-of-the-watershed-report/

Also see: *The 2005 Report on the State of the Bow River Basin* by Bow River Basin Council. 2005. Online at

http://wsow.brbc.ab.ca/index.php?option=com_content&view=article&id=82&Itemid=179

37 See: *Canada's Oil Sands Opportunities and Challenges to 2015: An Update.* National Energy Board. 2006. Online at www.neb-one.gc.ca/clf-nsi/rnrgynfmtn/nrgyrprt/lsnd/pprtntsndchllngs20152006/pprtntsndchllngs20152006-eng.pdf. Accessed February 2013.

38 Alberta Environment. 2010. Online at http://environment.alberta.ca/01750.html. Accessed March 2013.

39 *Water Use in Canada's Oil-Sands Industry: The Facts.* Stuart Lunn, SPE Economics & Management, Volume 5, Number 1, January 2013, pp. 17-27. Please note there is a cost to access this article at the time of printing.

40 *Water Management Framework: Instream Flow Needs and Water Management System for the Lower Athabasca River*. Alberta Environment and Fisheries And Oceans Canada. February 2007. Online at www.dfo-mpo.gc.ca/regions/central/pub/water-eau/pdf/water-eau_e.pdf. Accessed March 2013.

Although recognizing that CEP plans for the seven major water-using sectors have been completed, one sector believes that the plans would have been improved by:

- Identifying opportunities and options for committing conserved water[41] to improve aquatic ecosystem health in ecosystems that are unhealthy or at-risk due to high levels of licensed water withdrawal. It is recognized that mechanisms and tools to support these commitments are yet to be developed under the Government's proposed water allocation review;
- Committing to collect hard data to verify impacts on aquatic ecosystems;
- Defining a specific "protected water for the environment" target or making a commitment to hold (and not reallocate or transfer) some conserved water until the needs of the aquatic ecosystem are determined;
- Committing to not counting the use of return flows, grey water, reused water and storm drainage water as part of their conserved water;
- Using specific information from WPAC State of the Watershed reports, scientific studies and advice of experts on in-stream flow needs and functional flows to identify aquatic ecosystems that are unhealthy or at-risk in the watershed(s) in which the sector and its members operate; and
- Committing to work with WPACs and other appropriate parties to ensure aquatic ecosystems are healthy.

This sector also believes that sector plans would have better addressed these interests if there had been broader engagement with environmental stakeholders as well as with federal and provincial departments of health. This could have been accomplished by involving environmental non-government organizations (ENGOs) on a multi-stakeholder team to develop the sector plan (Option A in the Framework) or by ensuring that ENGOs were specifically invited to review the draft plan. The process for developing sector plans is further discussed in section 2.3.

41 See Appendix A for the definition of "water conservation" that has been agreed to by the Alberta Water Council.

This sector further believes that any future sector plans as well as any CEP plans developed by individual licensees should also reflect an awareness and understanding of the watershed in which they operate. These plans should draw on existing data and information including state of the watershed reports prepared by the WPACs as well as other relevant water studies.[42] Such knowledge will help establish a baseline for the health of the watercourse or watershed, against which future CEP activities can be assessed.

Other sectors were of the view that reflecting "awareness and understanding" is too vague to allow comparison among watersheds and that this is outside the original scope of CEP planning.

All sectors agreed that protecting the health of aquatic ecosystems is important and believe that many of the CEP opportunities being implemented by sectors will support this goal, although precise measurement may not be possible at present. Many sectors believe that future population and economic growth can be accommodated by using water that is conserved through improvements in efficiency and productivity, which would reduce the need for additional withdrawals in the future. Sectors will continue to be required to meet the conditions in their licences, which are determined by Alberta Environment and Sustainable Resource Development, and take into account the need to protect aquatic ecosystem health.

42 Examples of additional resources and information sources appear in Appendix D.

Appendix A: Definitions

The first team established by the Alberta Water Council to consider water conservation, efficiency and productivity recommended definitions for these terms as part of its foundational work. These definitions were adopted by the Council. Additional descriptive text appears in the Council's 2007 report, *Water Conservation, Efficiency and Productivity: Principles, Definitions, Performance Measures and Environmental Indicators*. Further, the second Council team to consider water conservation, efficiency and productivity identified a need for consistent and accurate definitions for water allocation, diversion, return flow and water consumption and these were adopted in the Council's 2008 report *Recommendations for Water Conservation, Efficiency and Productivity Sector Planning.*

Conservation is defined as:

1. *Any beneficial reduction in water use, loss or waste.*
2. *Water management practices that improve the use of water resources to benefit people or the environment.*

Efficiency is defined as:

1. *The accomplishment of a function, task, process, or result with the minimal amount of water feasible, or*
2. *An indicator of the relationship between the amount of water needed for a particular purpose and the quantity of water used or diverted.*

Productivity is defined as:

1. *The amount of water that is required to produce a unit of any good, service, or societal value.*

A *water allocation licence* authorizes a licence holder to divert a volume of water at a specified rate and timing from a certain water source for a particular project or purpose.

A *diversion* represents the amount of water withdrawn from the water source, subject to the restrictions of a licence.

Return flow represents the water diverted from a water source, subject to the restrictions of a licence, and returned to the river after use, potentially with altered quality.

Water consumption is the difference between the amount of water diverted and the return flow; it represents the volume of water that is actually consumed or lost in the production of a good, service or societal benefit.

Appendix B: Team Members and Terms of Reference

Project Team Members

Maureen Bell	Alberta Environmental Network Water Caucus
Tasha Blumenthal	Alberta Association of Municipal Districts and Counties
Rachel Bocock	Alberta Urban Municipalities Association
Scott Hillier	ConocoPhillips
Ron McMullin	Alberta Irrigation Projects Association
Valerie Moore	City of Calgary
Keith Murray	Alberta Forest Products Association
Jennifer Nitschelm	Alberta Agriculture and Rural Development
Sarah Pearce	Alberta Environment and Sustainable Resource Development
Al Schulz	Chemistry Industry Association of Canada
Kelly Scott	ATCO Power
John Skowronski	Canadian Fuels Association
Judy Stewart	Alberta Lake Management Society
Andre Asselin	Alberta Water Council
Alesha Hill	Alberta Water Council

Former Team Members, Alternates and Other Contributors

Lauren Baldwin	Alberta Urban Municipalities Association
Giselle Beaudry	Alberta Environment and Sustainable Resource Development
Cheryl Bradley	Southern Alberta Group for the Environment
Carolyn Campbell	Alberta Wilderness Association
Deanne Carson	TransAlta Corporation
Lisa Maria Fox	Sustainability Resources
James Guthrie	TransAlta Corporation
Kate Hovland	Alberta Association of Municipal Districts and Counties
Ahmed Idriss	Capital Power
Kate Murray	City of Calgary
Ken Omotani	TransAlta Corporation
Richard Phillips	Bow River Irrigation District
Kim Sanderson	Green Planet Communications
Jeff Shipton	Millar Western
Nancy Stalker	City of Calgary
Jason Unger	Environmental Law Centre
Lorie Wagner	Alberta Water Council

Acknowledgements

Members of the Sector Planning for Water Conservation, Efficiency and Productivity Project Team showed remarkable dedication and commitment in completing their tasks. The Alberta Water Council is especially grateful to the following organizations for their in-kind contributions in support of this work:

- Alberta Chamber of Resources
- Alberta Irrigation Projects Association
- Alberta Agriculture and Rural Development
- Alberta Association of Municipal Districts and Counties
- Alberta Environment and Sustainable Resources Development
- Canadian Association of Petroleum Producers
- Canadian Fuels Association
- Chemistry Industry Association of Canada
- City of Calgary

Project Team Terms of Reference

Initial terms of reference approved by the Alberta Water Council on March 19, 2009. Membership amended June 4, 2009. Timelines and Deliverables, Budget amended March 24, 2011. Timelines and Deliverables amended March 22, 2012 and October 25, 2012.

Context

In September 2008 the Water Conservation Efficiency and Productivity (CEP) Project Team delivered its final report and recommendations to Council. Recommendation 21 was that Council establish a multi-stakeholder Project Team to assist seven priority sectors with the development and implementation of sector CEP plans. Council approved the establishment of the Sector Planning for CEP Project Team to undertake the tasks described in recommendation 21 of the CEP report. Participation of water using sectors in developing and implementing plans to improve water conservation, efficiency and productivity will demonstrate to Albertans their commitment to achieving Water for Life objectives.

Strategic Intent (Goal)

The Sector Planning for CEP Project Team will serve as a forum:

- To reduce challenges in developing and implementing sector plans through sharing of ideas, knowledge, opportunities and experiences
- To evaluate and determine the need for enhancements to the CEP Framework document and Annotated Table of Contents.

Objectives

- Provide a venue for stakeholders to discuss challenges, share ideas, and provide feedback if necessary to ensure successful adoption of the multi-stakeholder component in sector planning.
- Evaluate and where necessary recommend improvements that would result in increased participation in a sector plan.
- Identify the challenges and opportunities for developing a metric or metrics for aggregating CEP data from the seven priority plans.
- Report to the Alberta Water Council on the progress of the seven sectors in developing CEP plans in accordance with the CEP Framework and progress towards achieving CEP objectives.

Key Tasks

- Develop work plan describing key tasks, milestones, and deliverables as well as timelines for completing key tasks.
- Receive updates from sectors on progress and challenges in developing and implementing CEP plans with a particular emphasis on steps 1 to 6 of the Framework Document including the Criteria for Review by Council and Table of Contents document.
- Determine how to assist sector members that may not have the capacity to fully develop and/or implement CEP plans (e.g., data and reporting components) and make recommendations for how such assistance might be provided.
- Receive reports from sectors on metrics being used to measure and report on CEP outcomes, and provide guidance to sectors on development and use of metrics.

Timelines and Deliverables

The Project Team will provide the following deliverables to the Alberta Water Council

- Status reports on progress of the seven sectors in developing their plans in accordance with the CEP Framework on an ongoing basis.
- All sector plans will be completed by October 2012 and the team's final report will be presented to Council at the March 2013 board meeting which will include:
  - Recommendations to address challenges encountered by sectors with respect to the Framework Document, and
  - Recommendations that would assist the next team with the evaluation of the overall CEP process, including identifying challenges and opportunities of developing a metric or metrics for aggregating CEP data from the seven priority plans.

Membership

The multi-stakeholder Project Team will have representation from the following sectors:

Irrigation, Power Generation, Oil & Gas, Mining (oil sands), Chemical and Petrochemical, Forestry, Large Urban Municipalities, Small Urban Municipalities, Rural Municipalities, the Alberta Lake Management Society, Alberta Environment, Alberta Agriculture and Rural Development, and the water caucus of the Alberta Environmental Network.

The project team will meet regularly and will operate in a manner that is consistent with the rules, policies and procedures adopted by the Alberta Water Council, including the use of consensus to make decisions in a multi-stakeholder process.

All members of the Project Team will participate actively and will take on tasks such as proposing options/solutions, providing data and information, drafting documents, consulting with stakeholders and hosting meetings.

Budget

The team does not anticipate any budget beyond core support will be required.

Appendix C: Other Initiative That Could Contribute to the Health of Aquatic Ecosystems

Improving Riparian Health

Cottonwoods (*Populus sp.*) are a keystone species in assessing riparian health. Their establishment requires specific bank exposure and water recession conditions that are often impaired downstream of dams. Studies have identified how recruitment of cottonwoods and associated riparian vegetation can be stimulated by using stored water from reservoirs behind dams to dramatically increase recruitment.

Wet years provide an opportunity for successful recruitment. Non-vegetated bank is exposed making new space available for seedling germination and establishment, river levels rise to points where new seedlings can establish above normal high water marks, and water is more likely to be available to maintain river elevation by slowing recession curves.

The opportunity to start the process in the Oldman Basin came in 2010 with good snowfalls and wet spring weather. In 2011, a plan was put in place under the direction of a steering committee, including the irrigation districts in the Oldman Basin, to enhance riparian vegetation recruitment in a series of wet years. Water was released from the Oldman Reservoir to enhance germination of seedlings along the Oldman River. In 2011, the second year of releases, a coordinated effort was made to establish cottonwoods below the St. Mary, Waterton and Oldman River dams. Water recession rates were held below (less than) 4 cm per day to enable seedling establishment. Faster rates of recession result in roots of small plants drying out and the seedlings dying. Seedlings established in 2010 were supported by releases in 2011. Over 30,000 acre-feet (over 37 million m^3) of water was released to the rivers in 2011 to control recession rates, with the result that millions of seedlings have germinated and many more millions increased in size and robustness. The plan was implemented as the result of collaboration with Alberta Environment and Sustainable Resource Development, which controls flows from major water structures; the University of Lethbridge, which provided the science and direction as to timing and amount of water released; Alberta Agriculture and Rural Development, which played an advisory role and encouraged wide participation; and the irrigation districts on the Oldman system that accepted the increased risk to their operations and managed their storage and diversions to help make this possible.

Appendix D: Other Resources

Other resources and organizations that could be useful in developing sector plans and preparing progress reports are listed below. Some of these were noted in Appendix D (Tools for Stakeholder Consultation) of the Alberta Water Council's 2008 report, *Recommendations for Water Conservation, Efficiency and Productivity Sector Planning.* These resources and others are noted here for easy reference by sectors and the list was current at the time this report was written. WPACs have produced many excellent materials and these are accessible through the appropriate WPAC website shown below. The Council also encourages sectors and large licensees, as well as watershed groups to work with appropriate experts to identify local environmental opportunities to apply some conserved water to improve aquatic ecosystem health in the watersheds in which they operate.

Stakeholder Consultation Resources

Various organizations have developed manuals, toolkits and other documents that provide guidance for good stakeholder consultation, including the following:

- International Association for Public Participation, www.iap2.org
- International Association of Facilitators, www.iaf-world.org
- Canadian Association of Petroleum Producers, www.capp.ca
- Canadian Rural Partnership, www.rural.gc.ca

Non-Government Organizations

The Council has identified the following five broad categories of non-government organizations (NGOs) with an interest in water issues; many NGOs are represented within these organizations.

1. Environmental

Organizations in this category are organized under the Alberta Environmental Network (AEN), which is a non-profit, non-partisan umbrella organization dedicated to helping preserve and protect Alberta's environment. Membership in the AEN is open to any non-profit, non-governmental organization demonstrating sincere concern and action toward a healthier environment. AEN coordinates environmental organization participation in Government of Alberta and other multi-stakeholder consultations, working groups and conferences. The AEN's website is www.aenweb.ca.

2. Fisheries Habitat Conservation

The Fisheries Habitat Conservation Collective consists of the following organizations:

- Alberta Conservation Association, www.ab-conservation.com/go/default
- Alberta Fish and Game Association, www.afga.org
- Alberta Riparian Habitat Management Society, www.cowsandfish.org
- Angling Outfitters Association of Alberta
- Nature Conservancy of Canada (Alberta), www.natureconservancy.ca/en/where-we-work/alberta
- Trout Unlimited Canada – Alberta Chapter, www.tucanada.org/index.asp?p=1979

3. Lake Environment Conservation

Alberta Lake Management Society, www.alms.ca/

4. Watershed Planning and Advisory Councils

Watershed Planning and Advisory Councils (WPACs) were established under the *Water for Life* strategy and were subsequently designated by Alberta Environment to assess the condition of their watershed and prepare plans to address watershed issues. These independent, non-profit organizations also conduct education and stewardship activities. WPACs typically include representatives of key stakeholders in the watershed, including provincial, municipal and federal governments, important industrial sectors, conservation groups, and aboriginal communities. They engage watershed residents in their work and seek consensus on solutions to watershed issues. Each WPAC is expected to develop an Integrated Watershed Management Plan and an important preliminary part of this work is the preparation of a State of the Watershed report. WPACs are at different stages, but their work is particularly useful in understanding conditions in each watershed, including the health of aquatic ecosystems.

The Alberta Watershed Planning and Advisory Councils consist of the following WPACs (see http://albertawpacs.ca/ for more details):

- Athabasca Watershed Council, www.awc-wpac.ca/
- Battle River Watershed Alliance, www.battleriverwatershed.ca/
- Beaver River Watershed Alliance, http://beaverriverwatershed.ca/
- Bow River Basin Council, www.brbc.ab.ca/
- Lesser Slave Lake Watershed Council www.lswc.ca/
- Mighty Peace Watershed Alliance, www.mightypeacewatershedalliance.org/
- Milk River Watershed Council Canada, www.milkriverwatershedcouncil.ca/
- North Saskatchewan Watershed Alliance, www.nswa.ab.ca/
- Oldman Watershed Council, www.oldmanbasin.org/
- Red Deer River Watershed Alliance, www.rdrwa.ca/
- South East Alberta Watershed Alliance, www.seawa.ca/

5. Wetland Conservation

- Ducks Unlimited Canada, www.ducks.ca/

Alberta Water Council Documents

The Alberta Water Council and its project teams have produced material in a number of areas relevant to water CEP and stakeholder consultation. These documents are all available on the Council website at www.awchome.ca.

- *Moving from Words to Actions – Recommendations to improve communication, coordination and collaboration between and among Water for Life partnerships* (2011)
- *Consensus Decision-Making Toolkit* (2010), published with the Clean Air Strategic Alliance
- *Provincial Ecological Criteria for Healthy Aquatic Ecosystems: Recommendations from the Alberta Water Council* (2009)
- *Recommended Projects to Advance the Goal of Healthy Aquatic Ecosystems* (2009)
- *Recommendations for Improving Alberta's Water Allocation Transfer System* (2009)
- *Healthy Aquatic Ecosystems – A Working Definition* (2008)
- *Recommendations for Water Conservation, Efficiency and Productivity Sector Planning* (2008)
- *Recommendations for a Watershed Management Planning Framework for Alberta* (2008)

- *Water Conservation, Efficiency and Productivity: Principles, Definitions, Performance Measures and Environmental Indicators* (2007)
- *Water Policy Issues and Gaps* (2007)
- *Review of Implementation Progress of Water for Life, 2009 – 2011 (2012)*
- *Review of Implementation Progress of Water for Life, 2006 – 2008* (2009)
- *Review of Implementation Progress of Water for Life, 2005 – 2006* (2007)
- *Review of Implementation Progress of Water for Life, 2004 – 2005* (2005)

Other Resources

- *Water for Life* Strategy and related documents are available at www.waterforlife.alberta.ca
- Alberta Environment and Sustainable Resource Development has a great deal of information available on its website, including scientific studies and reports, qualitative and quantitative data on surface water, and Environmental Impact Assessments. The main website is at http://environment.alberta.ca/; EIAs available online are at https://external.sp.environment.gov.ab.ca/DocArc/EIA/Pages/default.aspx
- Alberta NAWMP Implementation Plan 2007 – 2012, http://abnawmp.ca/media/uploads/AB_NAWMP_Implementation_Plan_2007-2012.pdf
- *A Review of the Indicators of Wetland Health and Function in Alberta's Prairie, Aspen Parkland, and Boreal Dry Mixwood Regions.* The Water Research User Group, Alberta Environment; H.E. Wray and S. E. Bayley, University of Alberta. 2006. http://environment.gov.ab.ca/info/library/7869.pdf

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Website: www.albertawatercouncil.ca