

## The Sustainable Water Management in the Athabasca River Basin Initiative

March 2017

### Introduction and context

Proactive and informed water management requires a clear understanding of how future climatic and land use change may affect water resources, the users who depend on them, and Alberta's ability to respond and adapt. To add to the challenge, Alberta will continue to experience droughts, flooding, and increased pressure on surface water and groundwater quality and supplies due to population growth, economic development and changing environmental management practices.

The Sustainable Water Management in the Athabasca River Basin Initiative (ARB Initiative or Initiative) will use a collaborative modelling process that has been used in other basins in Alberta (AI-EES, 2010; Alberta WaterSMART and AI-EES, 2013; Alberta WaterSMART, 2014). This process brings together the best available data, modelling tools, and an inclusive and diverse set of participants (the Working Group) from across the basin in a transparent and open process, to explore mitigation, adaptation, and management strategies in response to a range of potential future change.

The ARB Initiative provides a foundation to support cumulative effects assessments, basin water management plans, adaptive and sustainable water management, and accessible and transparent information on basin water resources and management.

This work will start with the Athabasca River Basin, with an aim to build up to looking at the whole Slave River system (Athabasca River Basin, Peace River Basin, Peace-Athabasca Delta, and Slave River Basin).

The ARB Initiative supports long term sustainable management of water resources in the Athabasca River Basin (ARB). The ARB Initiative views the watershed as an integrated ecosystem, from headwaters to Lake Athabasca, with consideration given for current water use and needs along its course, as well as potential future effects from changes in climate landscape, and development in the basin.



## Challenges in the Athabasca River Basin

The ARB will be challenged by converging interests due to changes in climate and land use, accelerating economic growth, and subsequent cumulative impacts in the basin. In part, challenges are due to perceptions and misunderstandings regarding water resources in the basin.

Some examples of concerns about the impact of human development in the basin include:

- Unmanaged recreational activities identified in several parts of the watershed
- Economic activity such as forestry, agriculture, coal mines, oil and gas, and pulp and paper mills in the upper portion of the watershed
- Discharge from municipal wastewater treatments into the Athabasca river system from communities along the river (e.g., Fort McMurray, Hinton, Whitecourt, Jasper, Athabasca)
- Sand and gravel extraction throughout the watershed
- Potential construction of hydroelectric dams in the region (SCRS, 2013), and
- Oil sands development in the Lower Athabasca region.

In addition to the above listed concerns, a series of knowledge and process gaps in the ARB region must be addressed. Examples of this include:

- A comprehensive, accessible analytical set of integrated models that are transparent and accessible
- A Water Management Plan for the ARB to guide water management and conservation that the Director (as per the *Water Act*) would consider when making licence and approval decisions in the basin, and
- A collaborative and engaging process that can be used to:
  - Identify potential future water management issues in the entire basin, and possible strategies to address them
  - Further the development and ongoing improvement of regional plans, sub-regional plans, and environmental management frameworks for the ARB
  - Support Alberta's Integrated Resource Management System, and guidance received from Albertans during the 2013 Water Conversation, which both highlighted the importance of more integrated, watershed-based approaches to environmental and resource management
  - Support cumulative effects throughout the basin from future development, and
  - Identify management options and practices in order to build resilience to the potential future impacts of potential future change.

## The ARB Initiative

The ARB Initiative will use an integrated modelling tool, with an inclusive and diverse Working Group (WG), to assess the current and future state of water resources by modelling the current watershed, and estimating a range of potential impacts on the quantity, and to some degree quality, of water resources from future changes in climate and land use in the ARB.

The Initiative will provide a collaborative, transparent, and science based platform to test opportunities to adapt to and build resilience to future change through adaptive management options that can address the current and future water-related issues and concerns in the ARB.

The ARB Initiative will be developing a Roadmap for sustainable water management throughout the ARB—the ARB Roadmap. A Roadmap is:

- a set of strategies and practical actions
- developed by an inclusive basin-wide working group using collaborative modelling and dialogue
- a recommended path toward sustainable water management in a basin
- intended to inform future planning and management efforts as they relate to water

## **The ARB Initiative structure**

The ARB Initiative has a Logistics and Administrative Committee (LAC), and a working group (WG). The LAC will support the long-term success of the Initiative and provide support to maintain the long-term vision of the Initiative, and support the WG. The ARB Initiative will be managed by the Project Team from Alberta WaterSMART (WaterSMART), an independent, third party committed to directing and documenting the work in a balanced and valuable manner.

The success of collaborative work of this nature depends largely on the commitment and effectiveness of the WG. WaterSMART will identify and invite WG participants from across the basin to participate and represent the diverse interests and expertise of the basin. These participants will be asked to contribute their time, expertise, ideas, people, data and/or funding to the project, and be committed to the project principles, including collaboration and obtaining results.

Participants are driven by different needs, legislation, and business objectives, but everyone needs a well-managed water supply. The WG will use the collaborative process with a watershed focus, as well as bringing their individual focus to introduce diverse interests and perspectives. The process enables decision support and exploration of impacts and opportunities for sustainable water management in the watershed; rather than obtaining consensus for a given decision.

Funding will be aggregated from funding agencies e.g., Alberta Innovates – Energy and Environment Solutions, Government of Alberta (GoA), industry (e.g. forestry, coal, agriculture, oil and gas, etc.), and other WG participant organizations.

## What is the value of collaborative modelling and how does it work?

A collaborative modelling process will be used for this work as it:

- Is a proven process from modelling work completed over the last six years in the South Saskatchewan River Basin (SSRB) in southern Alberta, and in other parts of the world
- Does not duplicate work; it builds on what has been done in the basin by using existing knowledge, data, and tools where possible
- Brings together a wide range of basin perspective types with local and regional expertise, supported by tools and data, to have an open, transparent conversation about basin wide risks, concerns, and opportunities
- Works with participants to develop and use transparent and accessible modelling tools in live modelling sessions to explore what opportunities might exist at basin and local scales to help mitigate or address identified risks and concerns, and provide effective, science-based decision support for basin planning and management, and
- Engages participants from the beginning, and participants own the process as it is participant driven, and managed by WaterSMART- participants are engaged, they see and understand the tools, they help create and add to the process, they can see their interest in the bigger picture.

## Benefits of the ARB Initiative

The ARB Initiative will:

- Provide an elevated and documented common understanding throughout the ARB water community about the current state of the river system, how it is managed and how it may change in the future
- Identify the most promising strategies for adapting to future water management challenges
- Identify critical gaps in data, science, processes and/or policy supporting water management in the ARB
- Connect climate, land, and water issues to further ensure municipalities, industry and policy-makers have a better understanding of the potential impacts of climatic and environmental changes in the ARB
- Provide accessible and transparent information on basin water management issues, concerns, and opportunities
- Be a collaborative process to capture, document and share the data needed for decision-makers to be better informed of watershed management impacts and options, with all project data, models and documentation to be made publically available
- Provide a platform, the people, and the process to support collaborative decision support and information, and adaptive and sustainable water management
- Support cumulative effects assessments, basin water management plans, environmental assessments, regional planning, and ongoing state of the watershed reporting
- Create value for GoA and Albertans by offering basin wide, multi-perspective information and findings to facilitate proactive sustainable water management with informed, science-based, transparent decision making. Some examples would include:
  - Providing knowledge and information for land use and regional planning initiatives, as well as the development of a water management plan for the whole ARB
  - Identifying critical monitoring needs and gaps
  - Establishing a publically shared context for water management issues and opportunities in the basin as reference for industry's regulatory applications and assessments

- Encouraging and enabling greater awareness of the water challenges and opportunities in the north as well as increasing public access to data and information
- Adopting and promoting a watershed wide and cumulative effects approach to water management discussions, consistent with GoA and Watershed Planning and Advisory Councils (WPAC) thinking
- Providing better information across all sectors to enhance planning, sustainable economic growth, management of natural resources, and reclamation efforts
- Supporting cumulative effects assessment from a basin perspective, a key focus area for much of the oil sands industry, and
- Supporting informed science based decision making and policy.
- Help with planning and management of water for quantity and quality for municipal, industrial, environmental, and traditional/cultural use in the basin by providing an opportunity to assess the current state of river flow, timing of flow, impacts of water quality, and opportunities for regional water management in the face of potential environmental and climatic change.

The ARB Initiative is not a GoA initiative. The GoA has taken part in this Initiative as an interested stakeholder, who is likely to derive benefit from the outputs. GoA is one of many participants in the Initiative and does not lead the process. As such, engagement activities taking place through the Initiative are not on behalf of government. Tools and recommendations delivered through the initiative may help inform development of future GoA products, including policy, regulation, or decisions. It is these products upon which GoA would directly engage and consult, as it may find appropriate. The GoA is not the only recipient of project outcomes; recipients include all water users and broader water community in the basin who can use the products (tools and process) after the work is complete.

It is the hope and expectation of all that are involved, including GoA that the outcomes from this work will serve to further the development and ongoing improvement of regional plans, sub-regional plans, and environmental management frameworks for the ARB. There is never a guarantee with any work that GoA will use the outcomes, but their support indicates their intent to do so, as the GoA supports the project and wants people to participate. There is a high expectation that the findings and outcomes of this Initiative will be implemented and/or used in decision making around future development and planning with respect to water.

WG discussion and findings will be captured and documented by WaterSMART, shared with all participants, and made public, following the completion of each phase of the ARB Initiative. WaterSMART will gather output from all the modelling runs and present the information in a neutral transparent manner for review by all WG participants. As potential strategies and options begin to emerge from the modelling, the information is compiled and shared. The process of developing the report is cumulative and iterative in that it builds on each meeting and the modelling done to date. The entire WG does not have to agree with a specific strategy; the report simply reflects that the strategy was assessed and if the group feels it is valid, it is included. WaterSMART strives to put forward information and findings supported by all participants.

Similar work in the SSRB in southern Alberta (AI-EES, 2010; Alberta WaterSMART and AI-EES, 2013; Alberta WaterSMART, 2014) has seen participants treating the collaborative process as an innovative and productive process for decision support, information and knowledge building in a watershed. The work in the SSRB has been, and continues to be used to support management and planning decisions around water resources in southern Alberta by government departments, industry, and other participant groups.

## More information

For further information or discussion of this work, please contact Alberta WaterSMART via [info@albertawatersmart.com](mailto:info@albertawatersmart.com) or call 403.210.5276.

## Sources

AI-EES (Alberta Innovates- Energy and Environment Solutions). 2010. Bow River Project Final Report. Prepared by The Bow River Project Research Consortium. December 2010 Last accessed December 9, 2013 from <http://www.albertawater.com/index.php/projects-research/bow-river-project>

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