

South Saskatchewan River Basin Adaptation to Climate Variability Project

Engagement in the Oldman-South Saskatchewan Sub-Basins

Final Report
January 2013



This study was commissioned for discussion purposes only and does not necessarily reflect the official position of the Climate Change Emissions Management Corporation, which is funding the South Saskatchewan River Basin Adaptation to Climate Variability Project. The report is published jointly by Alberta Innovates – Energy and Environment Solutions and WaterSMART Solutions Ltd.

This report is available and may be freely downloaded from the Alberta WaterPortal website at www.albertawater.com.

Disclaimer

Information in this report is provided solely for the user's information and, while thought to be accurate, is provided strictly "as is" and without warranty of any kind. The Crown, its agents, employees or contractors will not be liable to you for any damages, direct or indirect, or lost profits arising out of your use of information provided in this report.

Alberta Innovates – Energy and Environment Solutions (AI-EES) and Her Majesty the Queen in right of Alberta make no warranty, express or implied, nor assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information contained in this publication, nor that use thereof infringe on privately owned rights. The views and opinions of the author expressed herein do not necessarily reflect those of AI-EES or Her Majesty the Queen in right of Alberta. The directors, officers, employees, agents and consultants of AI-EES and the Government of Alberta are exempted, excluded and absolved from all liability for damage or injury, howsoever caused, to any person in connection with or arising out of the use by that person for any purpose of this publication or its contents.

Contents

1	EXECUTIVE SUMMARY	1
2	INTRODUCTION.....	2
3	ENGAGEMENT.....	3
3.1	Preliminary Research	4
3.2	Gathering Relevant Supporting Information.....	4
3.3	Development of Introductory Materials.....	4
3.4	Engagement Meetings	5
3.5	Project Launch.....	5
4	TERMS OF REFERENCE.....	6
4.1	Criteria for Participant Selection.....	6
4.2	Technical Teams	6
4.3	Overarching Project Principles.....	7
5	SUMMARY	7
APPENDIX A: SSRB ADAPTATION PROJECT INTRODUCTION MEMO		8
APPENDIX B: TERMS OF REFERENCE.....		10
	Figure 1: Oldman and South Saskatchewan Modelling Draft Workplan.....	17

List of Figures

Figure 1.	Engagement Process at-a-Glance	3
-----------	--------------------------------------	---

1 Executive Summary

This report describes the outreach and engagement process for the Oldman and South Saskatchewan (OSSK) component of the larger South Saskatchewan River Basin Adaptation to Climate Variability project. The engagement strategy was designed to identify and actively involve key participants in the OSSK water community in the project. Others in the region with an interest in the project will be kept informed as the work progresses.

Drawing on a variety of existing lists and networks, the Internet, and guidance from water managers in the region, the project team identified individuals and organizations that reflected the major water users and managers in the region. The SSRB Licence Viewer (http://ssrb.environment.alberta.ca/licence_viewer.html) was reviewed to ensure that major licence holders were on the list. The team also developed preliminary materials to introduce the project. These included customized presentations to a) communicate key project messages, and b) ensure that potential participants knew the project team was interested in the unique and important perspectives offered by each group or individual. Draft Terms of Reference were developed and shared with potential participants; among other things, this document laid out the project goals and objectives, work plan, and criteria for participant selection. The criteria described attributes that would most benefit the project, and noted the need for participant knowledge and expertise to maintain momentum and ensure a positive outcome.

Project team members met in person with prospective participants and those who would be kept informed throughout the basin. This approach enabled personalized discussions and provided a comfortable environment where specific concerns could be raised. The meetings took place over approximately ten weeks.

The kickoff meeting of the OSSK working group was held on November 15, 2012 in Lethbridge. The working group was introduced to the Bow River Operational Model and participants were asked to suggest initial performance measures for the OSSK part of the model to be developed. Technical teams were established and will focus on three main areas: data and modelling, ecosystem considerations, and economic development and financial implications. Also at this meeting, the working group reviewed the draft Terms of Reference document and proposed amendments.

Effective engagement is critical to the success of the project. This short report summarizes the approach used for the OSSK region and could be adapted for application in other parts of the South Saskatchewan River Basin as appropriate.

2 Introduction

Alberta's heritage and its social, economic and environmental history are directly tied to its water resources. While Alberta's economy is fuelled by hydrocarbons, it runs on water, and the province's continued prosperity depends on sound water management decisions. In the face of climate variability and change, these decisions are becoming more complex and more critical.

Alberta is confronting important water challenges, including an expanding population, accelerating economic growth, and the increasing impact of this growth on the environment as the climate continues to shift.

The province's geographical landscape encompasses the spine of the Rocky Mountains on its western border, semi-desert plains in the south, parklands in central Alberta and boreal forest across the north. The mountain regions are the water towers for much of western Canada, while eastern and northern flowing rivers are vital to this province as well as Alberta's downstream neighbours.

The health of Alberta's natural resources and its economic vitality depend on an integrated understanding of natural climate variability as well as improved management capacity to confront the prospects and potential impacts of climate change.

These challenges present a timely opportunity to capitalize on the knowledge and experience of community and business leaders, government departments, environmental organizations and watershed groups. Water and climate adaptation issues are complex, and cannot be solved by any single initiative or sector. Alberta has a history of successfully meeting sustainability challenges through multi-sector collaboration and engagement, and the South Saskatchewan River Basin (SSRB) Adaptation to Climate Variability project will further enhance that legacy.¹ The project builds on and expands previous work done in the Bow River Basin by refining the Bow outcomes and bringing in water users and other interested parties in the southernmost part of Alberta – in the Oldman and South Saskatchewan (OSSK) sub-basins.

This report describes the process used by the OSSK project team to identify and engage key individuals and organizations throughout the region. It also presents the Terms of Reference (TOR) and guiding principles that were developed for the modelling component of the project.

¹ See Appendix A for more information on this project.

3 Engagement

The OSSK engagement strategy included a number of steps; these steps were not always sequential nor were they based on any notion of priority. The OSSK project team led the implementation of the engagement strategy, which culminated with the first meeting of the OSSK working group in November 2012.

The engagement strategy was designed to identify individuals and organizations that were critical to the project’s success, and that met the criteria for involvement as described in the TOR. The intent was to ensure that the right members of the OSSK water community were actively engaged and ready to participate.

Some individuals and organizations in the OSSK water community expressed the desire to be fully engaged in the project, while others preferred to be kept informed of progress. As the project proceeds, results and outcomes will also be shared with members of the public at appropriate times. The overall engagement process is described in this section and summarized in Figure 1.

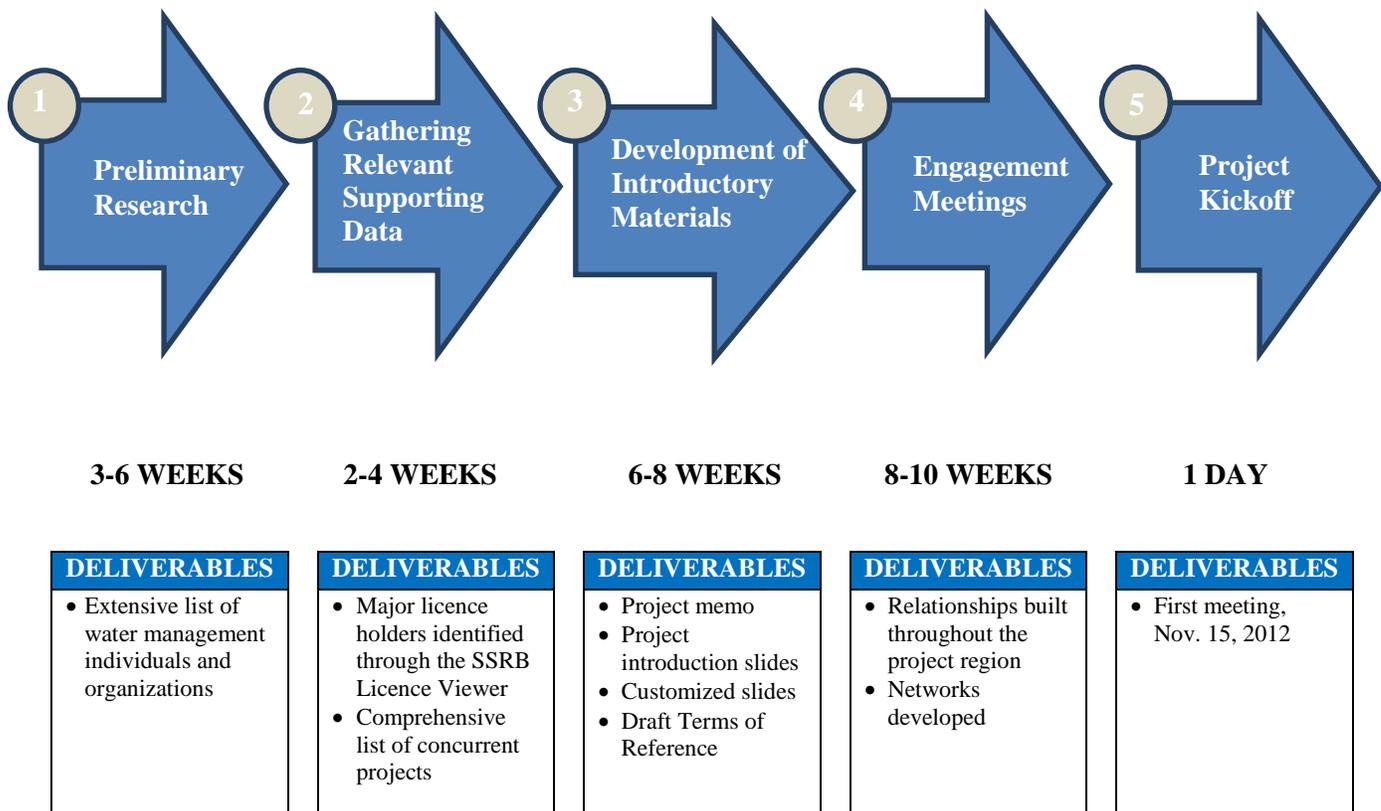


Figure 1. Engagement Process at-a-Glance

3.1 Preliminary Research

The first step in the engagement process was compiling an extensive list of individuals and organizations involved with some aspect of water management in the OSSK region. The project team drew on their own networks and contact lists, informally conversed with regional subject matter experts, talked to water management advisors for the project,² and undertook a wide range of Internet searches.

3.2 Gathering Relevant Supporting Information

To ensure that the contact list was as comprehensive as possible, other relevant data were also considered. The project team used the online SSRB Licence Viewer³ to identify major licence holders in the OSSK and ensure they were on the contact list.

Recognizing that various other projects had been completed or were underway in the basin (some with similar working groups and events), the project team compiled a list of these projects and the individuals or organizations leading them. These lists were an additional source of potential contacts as well as opportunities for alignment and collaboration with concurrent activities. This list is being maintained throughout the course of the project.

Organizational leaders in the network of OSSK water managers were also asked to identify individuals who they thought would be suitable project participants. This offered the project team access to career-long awareness of stakeholder interactions in the region, and streamlined the participant selection process.

3.3 Development of Introductory Materials

A short memo was prepared to help communicate with potential participants about the project. This memo (Appendix A) offers an overview of the broader South Saskatchewan River Basin Adaptation to Climate Variability Project and provides context for the modelling work, which will be a central part of OSSK project activities. Printed copies of the memo were left with potential participants to remind them of some of the details. The memo has also facilitated communications with wider audiences such as participant organizations and communities.

A standard introductory presentation was also developed to provide an overview of the project including its goals, drivers, objectives, and structure. To reflect the unique interests and likely perspective of each potential participant, the project team customized the standard presentation for each engagement conversation. The slides covered the critical information relevant to the individual and his or her organization and could be left behind or emailed upon request. Draft TOR for the project, described in Section 4, were also made available.

² Project advisors are specific people in the project team network with deep domain expertise and extensive career experience.

³ See the SSRB Licence Viewer at http://ssrb.environment.alberta.ca/licence_viewer.html

3.4 Engagement Meetings

Project team members met with potential participants in person to introduce the project and ascertain their interest in being involved. The team was flexible in accommodating potential participants' busy schedules. Many of these conversations were one-on-one, which enabled a more personalized discussion and a comfortable environment where issues specific to each individual or organization could be raised. Positive, inclusive language was used throughout the process to encourage creative ideas and participation, and provide the foundation for effective implementation later in the project. Meeting in person gave potential participants as well as the project team an opportunity to ask questions and determine whether involvement with the working group was a good fit for the individual and the project.

Occasionally, potential participants and their organizations were engaged in a broader manner. For example, the project team made presentations to members of the Alberta Irrigation Projects Association, the Oldman Watershed Council and Southgrow Regional Initiative at their regularly scheduled meetings. As required, members of these groups could follow up with the project team for more information and, in some cases, the team initiated further interaction with members.

These meetings took place over approximately ten weeks. A final list of working group participants was developed during that time and invitations were issued to the initial meeting.

This kind of engagement has served the project and its participants particularly well. These highly customized meetings demonstrated to the eventual participants (and those who will be kept informed) that the project team is committed to them and to their unique knowledge and capacity to act on the final outcomes of the project.

3.5 Project Launch

The OSSK kickoff meeting was held on November 15, 2012 in Lethbridge. The purpose of the meeting was to introduce all the working group members to each other and allow time for them to interact, bring all participants to the same level of knowledge about the project, and begin some early steps in the project work. Background on the Bow River Operational Model and its associated performance measures was provided. This gave the new working group some ideas and context, which enabled them to suggest possible OSSK performance measures along with contacts who could provide necessary data and information. Participants reviewed the draft TOR for the project and proposed several changes, knowing that the TOR would be finalized the next time the group is convened.

4 Terms of Reference

The Terms of Reference (TOR) were drafted by the project team based on the project funding agreement with the project's funding body (the Climate Change Emissions Management Corporation), and with input from the engagement meetings. The TOR describes the overall project objectives, goals and work plan, criteria for participant selection and other important components of the project. Prior to the official formation of the working group, the TOR was an evolving document. The working group will finalize the TOR in February (see Appendix B) and this document will guide the rest of this phase of the project. Several key sections of the TOR are briefly described below.

4.1 Criteria for Participant Selection

The criteria for participant selection describe attributes that would most benefit the working group dynamic and the project objectives. The criteria are listed in the TOR document (Appendix B). The thought process for developing the criteria included a number of considerations, briefly noted below.

Major water licence holders would have an interest in the project outcomes, as would those with a significant current or future need for water. Water users and managers would also have valuable experience on which to draw. The requirement for related technical and operational knowledge ensures that participants can bring their knowledge to the working group discussions and to the project work so the deliverables and results are valid, vetted and reasonable. These requirements will also provide assurance that participants can implement any of the preferred scenarios produced by the collaborative modelling work. Being committed to the project and its outcomes is the final important criterion for participation.

Participants are expected to be willing to work collaboratively and cooperatively and to be honest and candid in assessing options that emerge from the modelling activity.

4.2 Technical Teams

Three technical teams were established at the first working group meeting:

- The Data and Modelling Team will work with the modellers to identify and fill data and information gaps, vet the model as it is being developed and review model output.
- The Ecosystem Team (renamed from the “Environmental Impacts, Opportunities Team” as documented in the TOR) will focus on identifying appropriate ecosystem-related performance measures and associated data sources.
- The Economic Development Team (renamed from the “Economic and Financial Implications Team” as documented in the TOR) will focus on identifying appropriate economic performance measures and associated data sources.

If required, other experts can be consulted throughout the course of the work. Other teams will be established as the work progresses. Teams may draw on other individuals and organizations in the region, local academic or industry experts, and other members of their own organizations. This ensures access to the broad skill sets found in the region for the duration of the project. The

intent of these teams is to work with the project team to develop, review and vet specific aspects of the work in between reviews at the full working group meetings. These teams typically meet via conference call supported by computer document-sharing software (in this case, Netviewer™).

4.3 Overarching Project Principles

The nine principles listed in the TOR guide the project as a whole and were agreed to by the working group. These principles place important boundaries on the modelling work and help to manage expectations for the project deliverables.

5 Summary

The engagement strategy for the OSSK component of the South Saskatchewan River Basin Adaptation to Climate Variability project was designed to identify and actively involve key participants in the OSSK water community. Using a variety of approaches, the project team identified individuals and organizations that reflected the major water users and managers in the region. The team also developed preliminary materials to introduce the project, including customized presentations and draft TOR that laid out the project goals and objectives, work plan, and criteria for participant selection.

Project team members met in person with prospective participants throughout the basin. This approach enabled personalized discussions and provided a comfortable environment where specific concerns could be raised. The meetings took place over approximately ten weeks and, in the end, more than 30 knowledgeable participants agreed to be part of the OSSK working group. This broad mix of experience will bring diverse perspectives to the discussion, enriching the model development process and the eventual adaptation scenarios that emerge.

The kickoff meeting of the OSSK working group was held on November 15, 2012 in Lethbridge. The working group was introduced to the Bow River Operational Model and participants were asked to suggest initial performance measures for the OSSK part of the model to be developed. Technical teams were established and will focus on three main areas: data and modelling, ecosystem considerations, and economic development and financial implications. At this meeting, the working group also reviewed the TOR document and proposed amendments.

The project team will continue to engage participants and others in the OSSK region as appropriate over the next year to share results and develop wider interest in the project.

Appendix A: SSRB Adaptation Project Introduction Memo

South Saskatchewan River Basin Adaptation to Climate Variability Project

May 2012

A new project being launched this spring will harness the energy and creativity of southern Albertans to explore practical options for adapting to climate variability and change. Water is fundamental to community sustainability and growth, and the way water is managed in the South Saskatchewan River Basin (SSRB) will become even more important in the face of changing weather patterns and climate.

In January 2012, the Climate Change Emissions Management Corporation awarded funding for the *SSRB Adaptation to Climate Variability Project*. The funds were provided to Alberta Innovates-Energy Environment Solutions and WaterSMART Solutions Ltd. to support the first stage of this adaptation work.

This initiative will build on and integrate existing data, tools, capacity and knowledge of water users and decision makers to improve understanding and explore how to manage for the range of potential impacts of climate variability throughout the SSRB's river systems. This understanding will support collaborative testing and development of practical and implementable adaptive responses to climate variability, from the local community scale to the provincial scale. Using existing analytical and decision-support tools, the project will engage many people and groups to build:

- a common understanding of feasible and practical mechanisms for adapting to climate variability and change, and
- increased capacity for an informed, collaborative and adaptive approach to water resource management throughout the SSRB. This will enable organizations, communities and individuals to assess their risks in near real-time and determine their most suitable responses to climate variability within the physical realities of SSRB river flows, requirements and infrastructure.

The first stage of the project is divided into four coordinated phase:

Foundational Blocks: Initial Assessment

The first phase of the work is an initial assessment of the data, tools, capabilities, processes and frameworks that already exist and could form elements of the foundational blocks to support integrated water management by water users, decision makers and other interested parties over the long term. This work will identify the core resources for the project, identify critical gaps to be addressed, and ensure existing knowledge, tools, and experiences are leveraged, while avoiding duplication of work already completed or underway.

Bow River Basin: Adaptation and Live Test Year

The second phase will re-engage Bow River Project participants and engage new participants with an interest in the Bow River Basin to: advance climate adaptation decision making related to water resources, explore climate variability scenarios, identify impacts and risks to the river system and its

users, and identify adaptation options. Participants will also document the net benefits of re-managing flows in the Bow River and identify infrastructure options that could assist with adaptation strategies. All of this work will provide support for a 'virtual' river test year, or perhaps an actual test year of modified flow, to better match the three Water for Life goals

Oldman River Basin and South Saskatchewan River Modelling

In the third phase, participants will model the Oldman River Basin (Oldman River and Southern Tributaries, including the Belly, St. Mary and Waterton Rivers), and the South Saskatchewan River to the Alberta border. Users, decision makers and others in the Oldman and South Saskatchewan River (OSSK) Basins will form a river working group and set principles to guide and inform the model-based work, incorporating an environmental and climate adaptation focus. A comprehensive river system model for the OSSK Basins will be developed. Inputs to the SSRB from the Milk River will be part of this data, but the Milk will not be explicitly modelled. Throughout the model building, participants will discuss work that has been or is being done, and possible next steps in building the capability and capacity for adaptation around river management in the SSRB.

Foundational Blocks: Development

The final phase will see development of new adaptation foundational blocks. This work will be based on the gaps identified in the initial assessment, which may include acquiring, updating, or purchasing useful data and tools for future work to develop adaptation options for integrated river management.

This project will take approximately two years to complete. It should significantly advance climate adaptation resilience in the SSRB, leave a legacy of data, information and tools, and inform similar future work throughout the rest of the SSRB. We hope, with subsequent support, to then expand the work to encourage climate adaptation throughout the entire SSRB.

Project updates and reports can be accessed through the Alberta WaterPortal at: www.albertawater.com

If you have any specific questions regarding this work, please contact AI-EES or WaterSMART Solutions Ltd.

SSRB Adaptation Project
Oldman River and South Saskatchewan River (OSSK)
Modelling

Terms of Reference

V9 DRAFT FOR FINAL REVIEW

Vision Statement
Overarching Project Principles
Project Goals
Key Deliverables
Expected Benefits
Project Participants
Timeline and Budget
Appendix

Vision Statement

In order to evaluate opportunities that exist to increase adaptive management capacity and integrated watershed response, the Oldman and South Saskatchewan River System (OSSK) will be modelled and managed as an integrated system, from headwaters and tributaries to the Alberta border, with due consideration given for the growth and change of the key users and purposes along its course as well as potential future impacts of climate variability. As part of the river management system, there will be open and readily available interactive, fit-for-purpose models. These models will be capable of providing information for decision-makers to assess implications of, respond to, and mitigate a wide array of user needs, water management objectives and climate variability forecasts.

Project Principles

- Causing no significant, measurable, incremental environmental harm
- Assuming the Oldman and South Saskatchewan sub-basins remains closed to new allocations
- Meeting Alberta's annual apportionment commitments to Saskatchewan
- Maintaining minimum flow requirements for municipalities
- Supporting the long term population, economic, and irrigation growth forecasts
- Meeting known First Nations' water needs
- Respecting Alberta's legal water priority system (FITFIR)
- Achieving Alberta's policy goals in the *Water for Life* Strategy
- Aligning with South Saskatchewan Regional Plan development
- Not proposing that any one water user bear the costs of providing benefits to other users.
- Focusing on seeking solutions not historic causes
- All work and information related to the project will be made public

Project Goals

- Develop a common understanding of river flow and the respective timing and uses of water by licence holders and other key water users, including essential environmental processes.
- Use available public data, verified by stakeholders throughout this technical research project.
- Use verified data sets applied to computer models to develop practical water demand and management scenarios to alter on-stream storage, flow rate timing, and water uses to determine an economically achievable river system management regime to accommodate the interests of the various water uses along each reach of its main stem and tributaries while protecting, and possibly enhancing, the aquatic ecosystem.
- Determine within reasonable ranges the costs and benefits to existing water users and/or to other users from different management scenarios.
- Evaluate regional implications for water supply and timing under historic conditions, given current and forecast future demand. Provide the capability to evaluate these conditions from forecast changes in climatological conditions.
- Based on the modelling results, assess water management alternatives and infrastructure changes to protect, and where possible enhance, the basic aquatic ecosystem while better accommodating the interests of the many water uses along each reach.
- This robust and agreed upon model can then be applied to climate variability and change scenarios using the model. If time and budget permit, the application of various climate scenarios will be begun under this round of funding. If budget or time constraints prevent that, the climate scenarios would be applied using the next round of funding.
- Communicate these scenarios and operating regimes effectively to local, regional, and provincial levels of government for their purposes.
- Prepare reports and other public communication vehicles and mechanisms (as needed).
- Conduct any additional modelling that may be needed and recommend the agreed upon adaptive management model to government. Revisions and improvements will be run on completed model as needed.

Key Deliverables

- Project team of licensees and select key interest groups.
- Collaborative (not necessarily consensus) process to engage participants.
- Agreed upon data sets for each key component of river system management.
- Vetted and supported mass balance model of the Oldman and South Saskatchewan River system, including the Southern Tributaries, over the available historic record.
- Vetted and supported set of Performance Measures reflecting the range of participant interests and needs throughout the basin.
- Practical and well considered “Scenarios” exploring improvement of various aspects of river management, infrastructure options to mitigate potential impacts, and other mitigation and improvement alternatives.
- Written reports and other public communication vehicles and mechanisms (as needed).
- Final report and recommendations to CCEMC and government with preliminary information on benefits, costs, and actions needed to assess adaptation strategies around climate variability and change, and to support decisions related to implementation.

Expected Benefits

- Working collaboratively to identify and vet potential innovative solutions to the challenges facing our river basin
 - Improved management and mitigation options related to risk to high value and volume users from drought
 - Improved knowledge of risks and mitigation options, if any, from moderate flood events
 - Options to improve aquatic ecosystem protection in prioritized reaches
 - Options to improve access to senior priority water for human use
 - Improved economic development opportunities under sustainable conditions
 - Improved recreational opportunities in certain reaches
- Improved and shared data, knowledge, and management information
- A comprehensive river system model to assess possible impacts of climate variability on the river system and develop adaptation strategies.
- Preliminary adaptation strategies for the system to flexibly adapt to various climate variability scenarios
- Puts useful, credible new tools into the hands of decision-makers and advisors for the long run
- Common ground, common goals and credibility through public and community involvement from the beginning

Note: In addition to river operations and infrastructure, there is a broad set of socioeconomic, cultural and attitude issues related to water use and adapting to climate variability. The adaptation discussions and strategies developed in this project will endeavor to identify and consider as many related issues as possible, but may not have the time or scope to address them all thoroughly.

Project Participants

Criteria for Participant Selection

- Significant water licence holder
- Significant future or current need for water
- Important knowledge and technical skills needed for project to succeed
- Managerial knowledge needed for implementation
- Every participant brings resources to the table
- Every participant brings commitment to results

Key Stakeholder Participants

- Irrigation Districts (e.g., SMRID, LNID, TID, UID, Raymond)
- Cities of Lethbridge and Medicine Hat
- WPACs (OWC, SEAWA)
- Rural Municipalities – some represented by SouthGrow and others
- Trout Unlimited
- Ducks Unlimited
- Alberta Agriculture and Rural Development
- Alberta Environment and Sustainable Resource Development
- Alberta Tourism, Parks and Recreation
- Others as selected by participants

Additional Advisors and Information Providers/Recipients

- Other provincial agencies?
- University of Lethbridge
- Federal Department of Fisheries and Oceans (DFO)
- Agri-Environment Services Branch (Agriculture and Agri-Food Canada)
- Other federal agencies?

Project Platform

WaterSMART as a neutral independent party takes overall project accountability to the funding agency, (Climate Change Emissions Management Corporation), as well as project leadership, coordination/management, banker functions, contract management, and administrative processes.

Working Group

One representative from each agreed upon participating organization

(~30 maximum). Additional expertise, individuals, organizations applied at technical team level.

Working group tasks include:

- Assemble data and QA/QC data for reasonableness
- Develop consensus on data, model, performance indicators for each participant
- Develop scenarios for initial model runs (revise, refine, improve)
- Prepare and/or vet economic assessments (costs and benefit estimates associated with scenarios)
- Establish environmental thresholds, indicators and assessments associated with scenarios
- Outline social/community implications of scenarios (recreation, assured water supply, etc.)
- Support preparation and approval of final report

Technical teams as needed, may include:

- Data and Modelling sub team
- Ecosystem sub team
- Economic Development and Financial Implications sub team
- Communications / Report Editing Team
- Others TBD

APPENDIX

Excerpt: OSSK Timelines and Deliverables from SSRB Adaptation Project's CCEMC Funding Agreement

Phase 3: Oldman River Basin and South Saskatchewan River Modelling

Milestone 9: Oldman River Basin and South Saskatchewan River Pre-Stakeholder Engagement

Objective: Engage stakeholders in the Oldman and South Saskatchewan River Basins (OSSK) to form a river consortium to define the terms of reference and set of principles that will guide and inform the modelling work on environmental and adaptation focuses in the Oldman and South Saskatchewan River Basins.

Steps	Start-End Date	Tasks	Budget
<ul style="list-style-type: none"> • Discuss and meet with stakeholders to engage and garner support for the work and form OSSK Consortium to support the modelling work. • Develop a Terms of Reference and set of principles to guide the modelling process. • Attend and present at National CWRA Conference in Banff (June) and Oldman Watershed Council Science Forum (October) to promote the work and engage experts. 	May-June 2012	SSRB Adaptation Project Presentation at the National CWRA conference in Banff to raise public awareness and local engagement.	\$5K
	April- September 2012	Terms of reference and project principles for OSSK work.	\$20K
	September-October 2012	Presentation at OWC Science Forum and BRBC workshop to engage OSSK participants.	\$5K
	September-December 2012	Report detailing who was engaged, why, and the engagement process, including details on the consortium formed and the terms of reference, and the guiding principles for the modelling work.	\$15K

Milestone 10: Oldman River Basin and South Saskatchewan River Pre-work Model Development

Objective: Complete the pre-modelling work to have a base/skeleton model and a draft of proposed Performance Measures (PMs) ready for OSSK consortium members to start working with.

Steps	Start-End Date	Tasks	Budget
<ul style="list-style-type: none"> Model set up (take SSRB model and cut out Oldman and SSK rivers, get Southern Tributaries model schematics and data, get Milk River information and rough schematic in for it). Build hydro-generation stations into schematic (plants and run of river). Develop a draft of proposed performance measures (PMs). Complete set up of a functional model. 	October-December 2012	Skeleton of the OSSK Model as starting point for stakeholders	\$50K
	October-December 2012	Draft set of potential Performance Measures (PMs)	\$25K

Milestone 11: Oldman River Basin and South Saskatchewan River Model Development with Stakeholders

Objective: Develop a comprehensive river system model for the Oldman and South Saskatchewan River Basins, which included the Oldman River, the Southern Tributaries, and the South Saskatchewan River. Inputs to the SSRB from the Milk River will be part of this data, but the Milk will not explicitly be modelled.

Steps	Start-End Date	Tasks	Budget
<ul style="list-style-type: none"> Develop PMs based on stakeholder input to the draft. Vet model and data with consortium. Run Computer-Aided Negotiation (CAN) sessions and use PMs to develop possible scenarios to adapt to changes in climate. 	December 2012-February 2013	Detailed set of Performance Measures (PMs).	\$100K
	April-June 2013	First 2-day CAN modelling session with OSSK Consortium to develop OSSK river management scenarios.	\$150K
	July-September 2013	Second 2-day CAN modelling session 2 with OSSK Consortium to refine OSSK river management scenarios.	\$150K

Steps	Start-End Date	Tasks	Budget
	December 2012- January 2014	A fully functioning tool for assessing impacts and exploring adaptation options in the lower basins of the SSRB.	\$200K

Milestone 12: Post-project Stakeholder Engagement/Communication

Objective: Meetings and discussions with Oldman/South Saskatchewan Basin stakeholders and the public on work that was done, and possible next steps in building the capabilities and capacity for adaptation around river management in the SSRB.

Steps	Start-End Date	Tasks	Budget
<ul style="list-style-type: none"> • Session with the Consortium to review the OSSK work and establish next steps. • General modelling session with public and stakeholders to educate on the work done and proposed future work in the SSRB. 	November 2013- January 2014	OSSK Consortium final review of OSSK work and next steps based on extensive Phase 3 work.	\$50K
	January- February 2014	Communication of OSSK work, with discussion and feedback through a full day modelling session.	\$50K

Milestone 13: Oldman River Basin and South Saskatchewan River Results and Recommendations

Objective: Report on the results from the modelling work, and develop recommendations on how to proceed with integrated river management in the SSRB to enhance the ability of stakeholders to adapt to changes in river flows results from stresses such as climate variability and change.

Steps	Start-End Date	Tasks	Budget
<ul style="list-style-type: none"> • Compile results. • Develop recommendations based on post-stakeholder engagement for further work on integrated SSRB management and how that can assist adaptation to changes in climate. • Complete final report. 	January- March 2014	Report summarizing all OSSK work and results with next steps and recommendations for future work.	\$25K