

Souris River Basin Plan of Study Public Briefing



**Review of the Operating Plan Contained in
Annex A of the 1989 International
Agreement Between the Governments of
Canada and the USA**





Public Consultation and Information Souris River Basin Plan of Study

Public Webinars and Meetings

Agency/Stakeholder Webinar on March 14, 2013

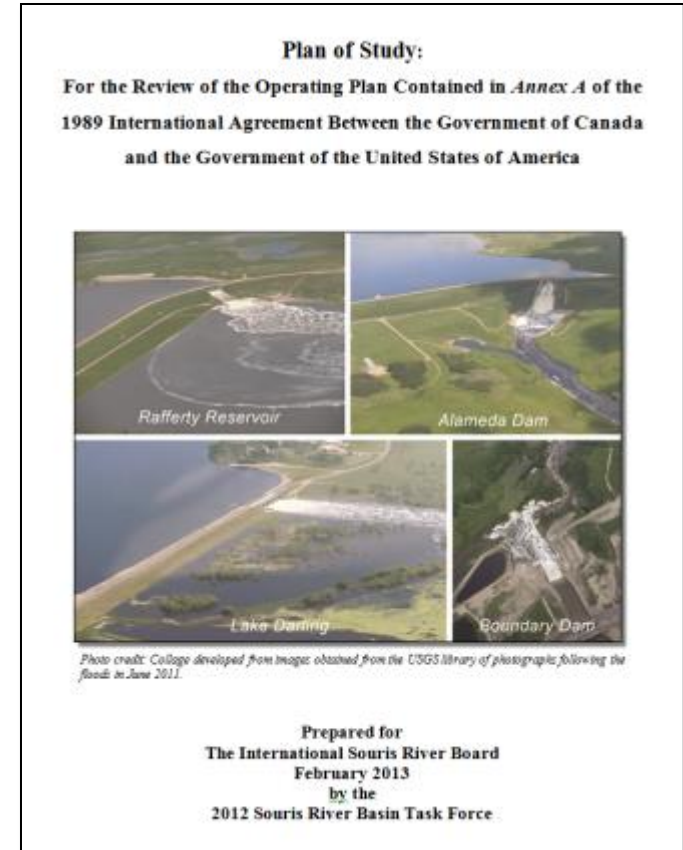
Public Meeting, Minot, ND on March 20, 2013

Public Webinar on March 26, 2013



Purpose of Public Consultations

- To inform you about the proposed study concerning the Souris River Project operations review.
- To present the draft Plan of Study.
- To solicit your comments, ideas, and advice.



Presentation Outline

- Study Purpose and Objectives.
- International Joint Commission (IJC).
- Souris Basin Project.
- Plan of Study – approach, organization, schedule, and costs.
- Questions and Discussion



Study Purpose and Objectives 1

- to conduct a review of the Operating Plan contained in Annex A of the 1989 Canada-United States Agreement for Water Supply and Flood Control in the Souris River Basin;
- to evaluate the impacts that changes to the Operating Plan of Annex A will have to downstream interests;



Study Purpose and Objectives 2

- to facilitate collaboration amongst the various Federal, State, Provincial, and Local Agencies undertaking actions as the result of the 2011 flood; and
- to ensure for agency, stakeholder, public, and local government consultation.



International Joint Commission

- Established under the 1909 Boundary Waters Treaty.
- Prevents and resolves boundary water disputes.
- Authorizes projects affecting levels and flows in boundary waters.
- Conducts studies for Governments.



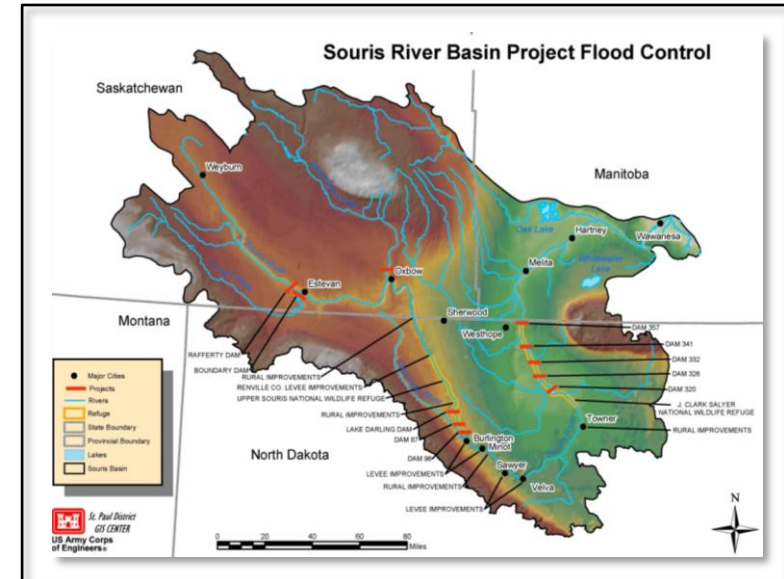
1989 Souris River Agreement

- **Souris River Basin Project**
- **Designated Entities**
- **Annex A - Operating Plan**
- **Annex B - Apportionment and Flow**
- **International Souris River Board's Responsibilities**

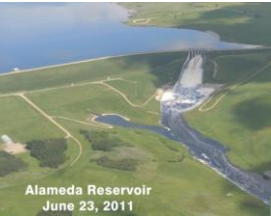


Souris River Basin Project

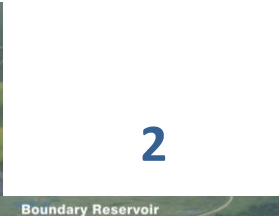
- Water Supply and Flood Control in the Souris Basin relies on the operation of several reservoirs in Canada and the United States:
 - Alameda Reservoir
 - Rafferty Dam
 - Boundary Dam
 - Lake Darling
 - Several smaller dykes and levees



Features of Souris River Projects – 2011 Flood



1



2



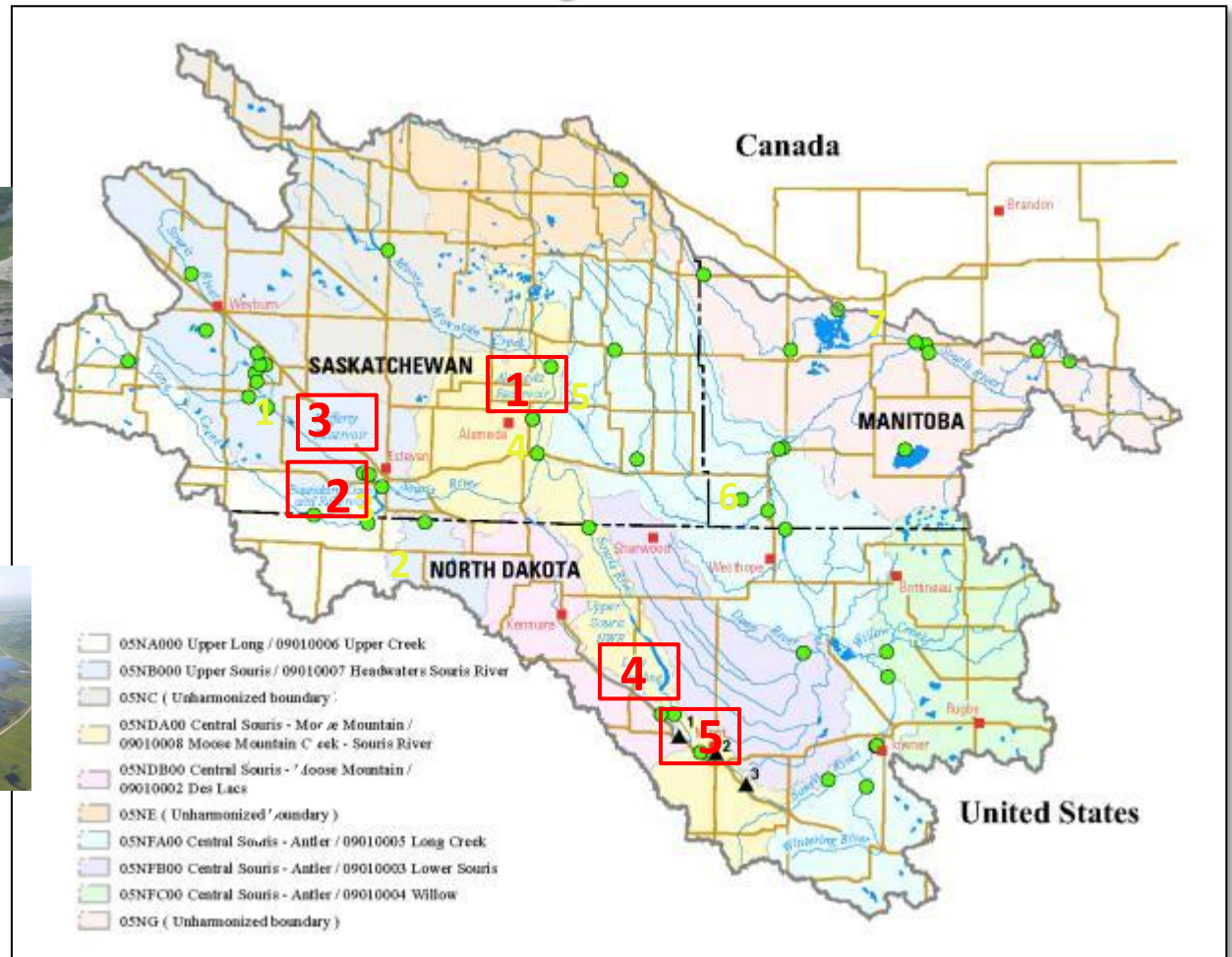
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Souris River Basin Plan of Study

Designated Entities

For construction, maintenance, and operations of reservoirs:

- For Canada:
 - Government of Saskatchewan (Water Security Agency) for both flood and non-flood operations
- For USA:
 - US Army Corps of Engineers for flood operations
 - US Department of Interior through US Fish and Wildlife Service for non-flood operations



Annex A – Operating Plan

- Objectives of the Operating Plan:
 - Provide 1-percent (100-year) flood protection at Minot, North Dakota;
 - Provide flood protection to urban and rural areas downstream of Rafferty Dam, Alameda Dam, and Lake Darling Dam; and
 - Ensure to the extent possible that the existing benefits from the supply of water in the Souris River basin and the Souris Basin Project are not compromised.



Annex B – Apportionment and Low Flow

- Annex B ensures:
 - Existing water supply and flow regime are not compromised in the Souris River basin from the operation of the Souris Basin Project.
 - Sharing of water between the two countries as per the Amendment to the 1989 Agreement in 2000.



International Souris River Board

- The Board has oversight function to ensure:
 - determination of the system operations under the 1989 Agreement on the Flood Operation or Non-Flood Operation of the Operating Plan;
 - mechanisms are in place for coordination of data exchange, flood forecasts, and communications;
 - reporting to the Commission on any issues related to flood operations and management; and,
 - providing recommendations on how flood operations and coordination activities could be improved.

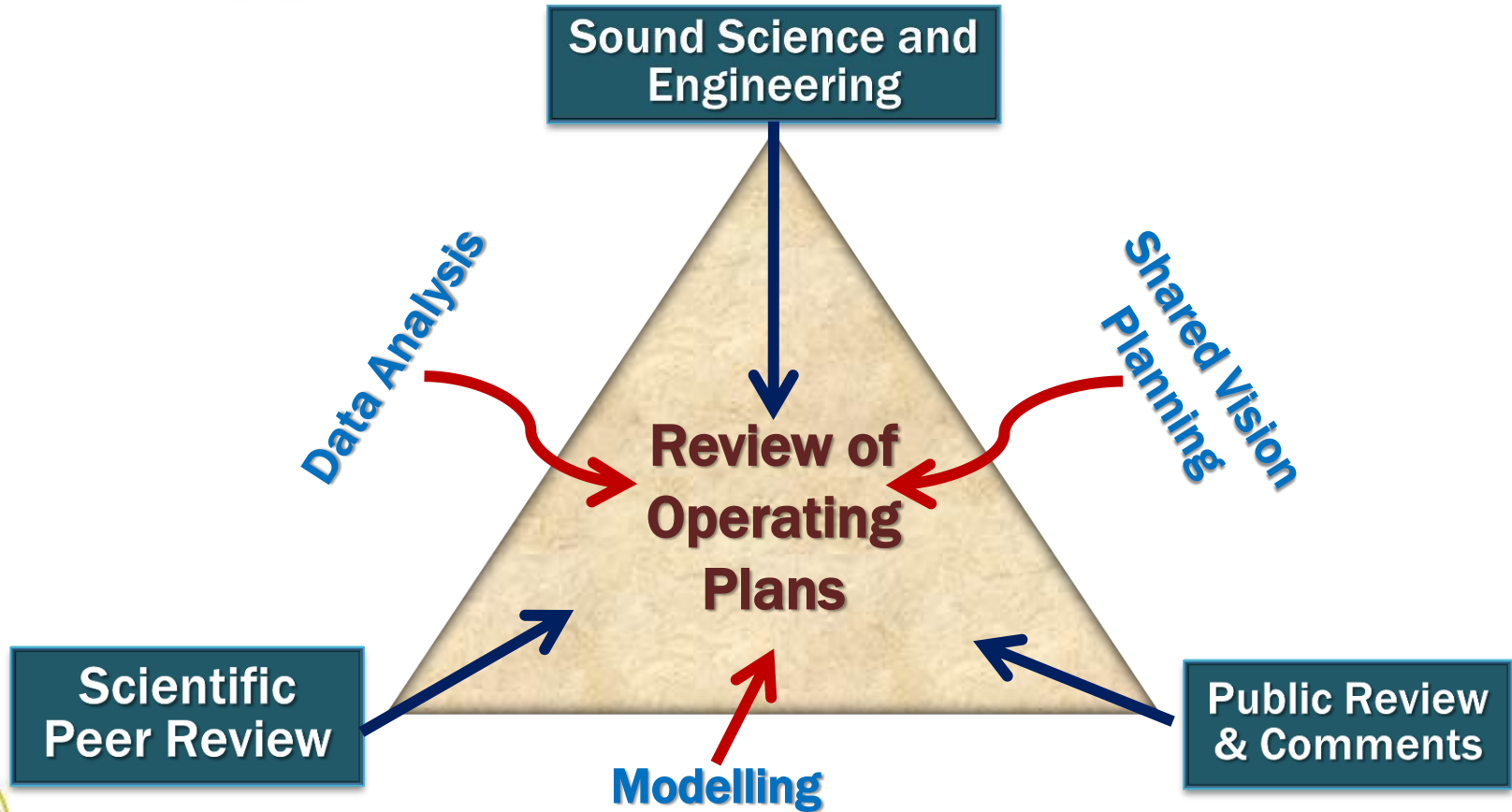


Lessons Learned from Other Studies

- Clear study objectives.
- Public consultation important, early, and often.
- Early decisions on methods to evaluate water management options.
- Design and develop studies that support objective decision making goals.



Study Approach



Operations Review - Approach

- Understand how water levels and flows affect people and the ecosystem both upstream and downstream.
- Understand the hydrological and hydraulic processes of the Souris River system.
- Apply modern science and engineering tools to evaluate water management options.
- Consider all interests including the ecosystem.
- Ensure public participation throughout the study.



Souris River Study - Scope

- **Souris River System from the upper reaches through to the confluence with the Assiniboine River.**
- **No change to 1989 Agreement however potential challenges will be identified.**



Souris River Study - Organization

- A Study Manager
- Bi-national Study Task Force
- Public Advisory Group
- Independent Science Peer Reviewers
- Technical Teams on reservoirs operations and hydrology
- Alternative operating plans assessment group
- Communications and information technology



Improved Operational Plans

- Examine operation of existing dams and reservoirs for improved water supply and flood management.
- Identify improvements to operating rules considering the 2011 event.
- Test proposed operations plans and evaluate potential impacts on water supply and flood control.
- Consider implications of climate variability and climate change scenarios.



Souris River Study - Timelines

Start Up Tasks (First three to four months)

- Study organization, science methods, evaluation methods, people

Early Tasks (Year 1)

- Investigate hydrological physical processes
- Identification of operating improvements, capabilities, and limitations

Subsequent Tasks (Year 2)

- Evaluate impacts of various water management options

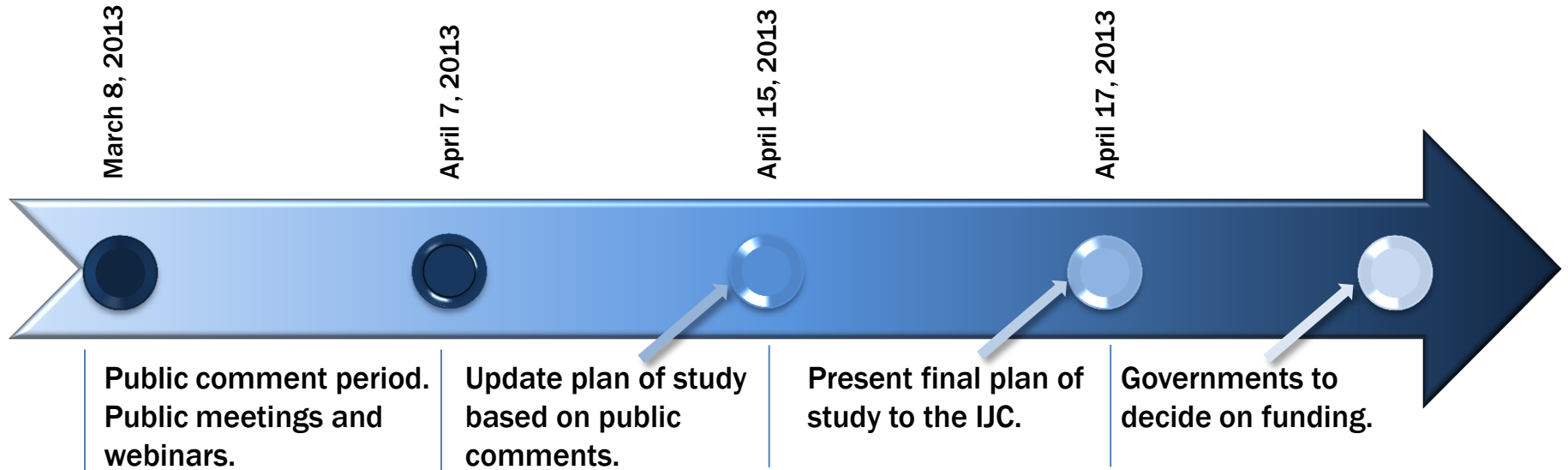


Estimated Study Costs

- Study expected to last two years with 50/50 cost sharing between countries.
- Three different options proposed
 - Minimum Scope Study - \$ 1.05 million (*limited number of operating plans evaluated*)
 - Medium Scope Study - \$ 1.33 million (*limited to fair number of operating plans evaluated*)
 - Full Scope Study - \$ 2.14 million
- Task Force recommended that at least the medium Scope Study be undertaken.



Public Comment Timeline



How to Reach Us

- Plan of Study available at www.ijc.org follow the link to “Boards” and then “Ongoing Tasks Forces”
- Contact the Plan of Study development team at moins@ottawa.ijc.org





Questions and Discussion





Appendix & Technical Slides



Appendix - Optimal

Number	Description	Group	Duration	Estimate, \$K
Project 1a	Review language of the operating rules from the 1989 Agreement and produce a white paper highlighting key elements, challenges and issues faced during 2001 and 2011 floods.	Task Force	Two weeks	10
Project 1b	Provide recommendations on areas where changes to the language of the operational rules may be required in the present form, i.e. no changes to the operational rules.		four weeks	20
Project 2	Compile list of Operations Review related projects. Perform gap analysis to identify and prioritize work that is required in support of the review.		four weeks	15
Project 3	Compile a list of physical data of the Souris River Basin. Perform gap analysis to identify and prioritize work that is required in support of the review.	Data Work Group	six weeks	20
Project 4	Compile a list of reservoir characteristics data. Perform gap analysis to identify and prioritize work that is required in support of the review.		Two months	25
Project 5	Souris River Basin Hydrometeorological Data Network Improvement Project (Coordination)		One year	5
Project 6	Compile a list of the Souris River Hydraulic Characteristics Data. Perform gap analysis to identify and prioritize work that is required in support of the review		four weeks	40
Project 7	Regional and Reconstructed Hydrology of the Souris River in Support of the Review of Operating Plan	Hydrology & Hydraulics Work Group	Six months	100
Project 8	Develop 10,000 or 50,000 years of stochastic water supplies for the three sets of data series for the state of nature flows in the Souris River basin using ARMA or ARIMA models or equivalent methodology		Six months	100
Project 9	Establish thresholds among hydro-climatological, basin physical and contributing drainage area by selecting an appropriate model and its application for this task		Three months	60
Project 10	Develop tools and procedure for predicting forecasted water supply - establish degrees of confidence for various lead times		Six months	50
Project 11	Develop climate change water supplies at key locations in the Souris River basin using results from Stantec or other Task Force supplied specifications		Six months	100
Project 12	Reservoir flow release attenuation and translation in support of the review of operating plan in the Souris River Project using storage routing options		Six weeks	25
Project 13	Reservoir flow release attenuation and translation in support of the review of operating plan in the Souris River Project using unsteady state modelling		Six months	35
Project 14	Design a facilitated expert workshop to develop project goals and objectives, performance indicators and penalty functions at key basin locations and associated evaluation metrics	Plan Formulation & Evaluation Work Group	Two months	60
Project 15	Develop descriptive modelling tools using HEC-ResSim or equivalent as the core & screen alternatives to meet study objectives including improvements from water supply forecasting		Two months	300
Project 16	Develop prescriptive modelling tools using HEC-ResPRM or equivalent as the core & screen alternatives to meet study objectives including improvements from water supply forecasting		Two months	250
Project 17	Quantify improvements in system operations by including water supply forecasts for the shortlisted candidate regulation plans		Two months	75
Total				1290



Study Management Costs - Full

No.	Activity	Year 1, \$K	Year 2, \$K	Total, \$K
1	Work Group Management	120	215	335
2	Public Advisory Committee	40	60	100
3	Communications and Outreach	40	60	100
4	Information Management	40	60	100
5	Peer Review Proocess	15	35	50
6	Study Coordination	75	85	160
	Total	330	515	845



Appendix - Optimal

Study Overall Costs Including Technical Studies – Optimal Scope				
No.	Activity	Year 1, \$K	Year 2, \$K	Total, \$K
1	Work Group Management	120	215	335
2	Task Force Reviews	45	0	45
3	Data Work Group	80	10	90
4	Hydrology & Hydraulics Work Group	350	120	470
5	Plan Formulation & Evaluation Group	185	500	685
6	Public Advisory Group	40	60	100
7	Communications and Outreach	40	60	100
8	Information Management	40	60	100
9	Peer Review Process	15	35	50
10	Study Coordination	75	85	160
	Total	990	1145	2135

