

Montana – Alberta: St Mary & Milk Rivers Water Management Initiative

**Joint Initiative Team Meeting #8, Coast Lethbridge Hotel
September 24-25, 2009, Lethbridge, Alberta**

Montana	Alberta
Dustin de Yong - Office of the Lt. Governor (acting co-Chair, day 1)	Robert Harrison – Alberta Environment (co-Chair)
Randy Reed – Milk River irrigator	Roger Hohm – Alberta Agr. & Rural Dvlp't
Paul Azevedo – DNRC (secretariat)	Ken Miller – Milk River
Dave Peterson – City of Havre	Tom Gilchrist – Milk River
Harold "Jiggs" Main – Ft. Belknap Tribe	Gerry Perry – Oldman River
Larry Dolan – DNRC Technical Team	Duncan Lloyd – Oldman River
	Tim Toth – AB Environment (secretariat)
Anne Yates – DNRC (co-Chair, day 2)	Sal Figliuzzi – AB Env't Tech. Team

Regrets – Don Wilson; Anne Yates, the new Montana co-Chair, will attend on Friday

Observers – John Sanders (DNRC - St. Mary Canal rehabilitation engineer), Laurent Conard (AENV modeller)

Purpose of Phase 2 Joint Initiative Team

To explore and evaluate options for improving both Montana's and Alberta's access to the shared water of the St. Mary and Milk Rivers, and to make joint recommendation(s) on preferred options to both governments for their consideration and approval.

Meeting Objective(s)

1. Understand the Base Case situation and implications
2. Understand results of the Tier 1 (better access to share) model runs completed to date, and clarify the Tier 2 (better use of share received) options for the modellers
3. Identify actions to complete the initiative by April 2010

Notes

Day 1 – Sep. 24 – 1:00 p.m. – 6:00 p.m. Continental room

1. Welcome; Administration -- Robert Harrison; Tim Toth, Paul Azevedo
Robert welcomed the Team. Dustin de Yong will act as co-Chair until Montana's new co-Chair, Anne Yates, arrives tomorrow. The meeting objectives were accepted as presented above.

Paul reviewed Action items from JIT#6; 13 were identified for the Technical Team and are being addressed today. The final review of the Technical Background report is to be completed before next meeting – changes are to be sent to Sal/Larry, in time for the report to be approved at the October meeting. Sal advised that the comments received so far have been incorporated.

The Notes from meeting #6 (June 8-10) were adopted as sent out.

Tim reviewed the Actions from JIT #7 – there are 8 items; 4 were identified to the Technical Team. Results of all model runs to date were added to the SharePoint site and all other action items except

one have been completed. Robert will send information next week on the IFN flow (aquatic ecosystem health process in Alberta) as it relates to the St. Mary River from the international border to the St. Mary Reservoir.

The Notes from meeting #7 (July 23) were adopted as sent out.

Communications

Montana – Dustin de Yong advised that Governor Schweitzer has been updated on status of initiative; Dave Peterson has an update with the Havre City Council soon.

Alberta – Tom Gilchrist and Ken Miller have updated the Milk River WPAC. Duncan Lloyd has answered many informal questions but not made any formal presentations. No detailed government briefings have been made; Brent Paterson and Robert Harrison will meet with their executive soon after this meeting. How and when communications will be made to the public on the recommendations to the Governor and Premier has not yet been determined. Once the directions of the Initiative have gelled, AB and MT will coordinate to brief their elected officials.

Agenda items 2, 3, 4, 5 and 6 are supported by Sal and Larry's PowerPoint presentation.

2. Modelling activity since last meeting – Larry Dolan and Sal Figliuzzi

As part of the presentation, Larry and Sal reviewed the model runs and decisions made by the Technical committee to alter model runs. Also, decisions made by the co-Chairs on the model runs since meeting #7 were discussed. Additional description is contained in the presentation.

3. Discussion of modelling: theory and practice and review of Base Case scenario -- Larry and Sal

Larry and Sal reviewed the inputs to the model to show the JIT that all inputs are physical components of the water management system: channel size, irrigation hydrology, *etc.* This allows the Team to understand all the physical components of the model.

Complete detail is contained in Sal and Larry's presentation.

The total area of acreage irrigated within MT was discussed.

[1] ACTION: MT is to review their irrigation acreage used in the model to ensure that the correct acreages are being simulated.

The JIT had additional discussion about future opportunities to expand the irrigated acres modelled. It was **agreed** that discussion about future opportunities to expand irrigated acres in both jurisdictions would take place after discussion of Tier 2 model runs (October or November).

There was discussion regarding irrigation demands in the two jurisdictions.

[2] ACTION: The JIT requested further explanation of how irrigation demands are determined in both jurisdictions.

The JIT discussed reservoir operating decisions.

[3] ACTION: JIT requested a description of the operating decisions/rules needed to run Sherburne reservoir.

Larry advised the JIT that irrigation deficits can be caused by shortage of supply, timing of water movement, and limitations to physical infrastructure.

The JIT discussed potential benefits to municipal and recreational interests that may arise from some of the options modelled. Although it will be difficult to estimate the size and scope of relative benefits, the JIT **agreed** that a discussion of municipal and recreation benefits should be part of our evaluation criteria, to be reviewed at our October or December meetings.

4. Summary of modelling learnings – Larry & Sal

The Technical Team presented general observations for both MT and AB – see slides #18, 19 of presentation. In addition, the Technical Team presented key findings for each category of model runs: slides #26-27, #33-#34, #41-42, #48-49, #53-54, and #60-62.

Agenda items #5 (**Review of model results**) and #6 (**Discuss need for additional Tier 1 model runs**) became blended. As the JIT discussed results, they also discussed additional Tier 1 runs they require. For these Notes, we will report on the two agenda items simultaneously, organized by the category options used in the Technical Team presentation.

Category — Increasing St. Mary Canal capacity (slides #22-27)

The JIT requested information on the excess capacity of each of the canal size model runs. The team wanted to know how often the canal ran full and how often there was potential capacity.

[4] ACTION: Technical Team to prepare a graph showing how often there may be excess capacity available within the U.S. diversion canal for Options 1(base case), 2 (850 cfs U.S. St. Mary canal) and 3 (1200 cfs U.S. St. Mary canal).

Category — Upstream storage options (includes Lower St. Mary L. [slides #29-34], Sherburne Res. [#36-42], and combinations [#44-49])

The JIT discussed the relationship between various canal sizes with storage, and what are the comparative benefits of each.

[5] ACTION: Technical Team to undertake a run of a 650 cfs canal + the upstream Sherburne Res. and Lower St. Mary storage and compare it to just the 850 cfs canal with existing storage.

The Technical Team ran a simulation to determine the maximum hypothetical storage capacity the U.S. would need on the St. Mary River to get access to its full entitlement share. Including current storage in Sherburne Reservoir, the U.S. would need an additional 109,000 ac.ft of storage on the St. Mary River to fully access their share. Additional infrastructure improvements would be needed to take full advantage of the entire share (slide #53).

Category — Alberta Milk River storage (for AB use) [slides #56-60]

[6] ACTION: The JIT asked the Technical Team to advise if the 237,000 ac.ft. storage in Option 7c is live storage available for irrigation or if it included storage for flood-pool safety.

The JIT discussed the in-stream flow requirements downstream of the Milk R. reservoir and an appropriate IFN value that should be used in the modelling.

[7] ACTION: Technical Team is to review the assumptions made about the provision of IFN from Canadian and U.S. shares of water from both the Milk R. and the diverted St. Mary R. for Options 7a-7c (Canadian storage on Milk R.) and Option 8 (Shared Milk R. reservoir).

This may require three more AB Milk River runs.

Category — Alberta Milk River storage – Shared

The JIT discussed the results of the shared reservoir runs vs. the Base Case run and the shared reservoir run compared to the AB-only storage options, with regard to the percentage of share and irrigation deliveries.

[8] ACTION: The JIT requested the Technical Team to prepare additional information explaining the comparative results of Option 8 (Shared Milk R. reservoir) to the base case (Option 2a) and to Options 7a-7c (Canadian storage on Milk R.).

In addition to the average and dry year results, the JIT would like to understand the results based on median values.

The JIT discussed how in-stream flow needs were modelled in the shared reservoir run.

[9] ACTION: The JIT requested the Technical Team to review and re-run the shared Milk R. reservoir option (Option 8) to correctly handle in-stream flows downstream of a shared reservoir.

JIT discussed potential impacts the U.S. share of Milk River natural flows allocated to the Ft. Belknap Reservation could have on a shared reservoir. Impacts may vary depending on whether on not Ft. Belknap agrees to have their share of the Milk River natural flow (from U.S. share) stored in AB or delivered to the reservation boundary.

[10] ACTION: The Technical Team will develop the conceptual framework for a new model run for integrating Ft. Belknap's share of the Milk River natural flow into the joint storage option.

[11] ACTION: Alberta Technical Team to determine why there is a difference in the irrigable acreage identified in the 2003 Klohn-Crippen study, and in the current model run, for all 3 AB Milk River reservoir sizes.

Category — Administrative Options – Letter of Intent

The Technical Team had not completed the Administrative Options runs. The results for these runs will be presented at the October meeting. The JIT discussed the relationship between storage options and the Letter of Intent. It was generally understood that as additional storage infrastructure is added to the upper St. Mary R. and to the Milk R., the benefits of the LOI are diminished.

The JIT discussed the 20,000 ac.ft. LOI option and questioned whether this value was too large, particularly for the dry years.

[12] ACTION: The Technical Team is to consider the 20,000 ac.ft. LOI, whether it is too large, and if a smaller option should be investigated. The Technical Team is to decide and propose runs to the co-Chairs for approval. Runs should be made for the 650 cfs and 850 cfs canal, and should identify the maximum number of acres that can be irrigated in Milk R. Alberta, meeting Alberta's irrigation standards.

The JIT discussed the implementation of an LOI that was flexible enough to account for annual variations in water availability.

It was **agreed** that some form of flexibility to make real-time operational changes based on water availability could provide benefits to water users on both sides of the international boundary.

Overwinter storage, water available for irrigation, and total potential volumes accessed

The Team discussed jurisdictional differences in over-winter storage and the implications of storage in general. There was interest in how much water is “getting by the system” and the acres that could potentially be irrigated with this water.

[13] **ACTION:** The JIT asked the Technical Team to explore how much water could be captured and managed using all of the storage options discussed, unconstrained by existing irrigation acreages or efficiencies, and maximizing over-year storage for Sherburne, Lower St. Mary, a large AB Milk R. reservoir, an appropriately increased Fresno Reservoir, and Nelson Reservoir.

Irrigation Deliveries and Reliability [slide #73]

Relative to the total water supply, only modest benefits to irrigation are realized by increasing canal capacities or reservoir storages. The JIT discussed the apparently relatively small irrigation benefits indicated for increasing canal size, vs. potentially greater erosion of the Milk R. and delivery of that sediment to Fresno Reservoir. Episodic high flow events and ice impacts may be responsible for increased sedimentation rates.

**** End of Tier 1 model runs ****

7. Discuss need for additional Tier 2 model runs – all

The JIT reviewed the list of the Tier 2 options that was compiled from JIT#6 and handed out at this meeting.

Discussion resulted in revising/clarifying the following options:

- 3) Increase Storage on Fresno Reservoir – (i) to 137,000 ac. ft; (ii) to 160,000 ac. ft; (iii) exploring shared storage with Alberta
- 4) Develop Storage on Ft. Belknap Reservation – of 60,000 ac.ft., including input from the Milk R. and tributary flow, with a maximum diversion rate of 645 cfs. This water is for current irrigation on the reservation first, then allow for additional irrigation developed on the reservation. The timing of this storage is to be determined.
- 5) Use Milk R. reservoir for storage.
- 6) Use Ridge Reservoir for Canadian share – take Canadian water from St. Mary R. system and move it into the Milk R. system.
- 7) Use storage in Canadian St. Mary Reservoir for the U.S. share.

dropping the following options:

- 1) Developing off-stream storage on the Blackfeet reservation – Spider Lake
- 2) Developing off-stream storage on the Blackfeet reservation – Goose lake
- 8) Water marketing – Blackfeet Tribe
- 9) Diversion from Tiber Reservoir
- 10) Duck Creek diversion

and adding the following options:

- 11) Shared St. Mary Canal – modellers are to model a canal size between 850 and 1200 cfs to determine a more optimal canal size. There are 2 variations:
 - (A) moving additional Canadian St. Mary water through the canal, and
 - (B) moving additional U.S. St. Mary water through the canal.
- 12) Move the deficit payback period to May 15th for both jurisdictions

- 13) Credits – U.S. diverts less of their share than they are entitled to over a certain time period to build a credit, and later, takes more of their share to offset that credit

[14] **ACTION:** Modellers to determine what flow is needed to irrigate an additional (i) 5000 ac. (total 13,000 ac.) and (ii) 10,000 ac. (total 18,000 ac.) in the Canadian Milk R. basin. Runs to be modelled at 850 cfs, and depending on the results, consider modelling at 1200 cfs only if there will be value in making the larger canal capacity runs. Technical Team to determine if there is any disadvantage to MT for these runs.

The JIT **agreed** to give Robert and Anne the authority to judge whether or not recommendations for additional Tier 2 runs are appropriate to pursue.

A summary of the additional runs identified will be provided by Larry and Sal for these Notes after discussion and clarification with the Technical Team and the co-Chairs. See Attachment 1: **Future Model Runs – Tier 1 and Tier 2 Options and Questions.**

8. Plan for completion of Initiative – Robert and Anne

Anne reviewed a proposed timeline needed to complete the Initiative – Attachment 2: **Draft Timeline for Completion.** The Team discussed and **agreed** that the proposed timeline is what is necessary to complete the project on time, and is attainable.

[15] **ACTION:** Robert and Anne will draft the evaluation criteria needed to rank potential options and present it to the JIT. Economic analysis will only be addressed at an overview level.

[16] **ACTION:** Secretariat will draft a framework describing an international watershed team to coordinate cross-border water management.

Presentations to stakeholders must clearly identify all alternatives discussed and the direction the JIT is going.

The Team will use conference calls or extend the meetings as needed to ensure there is sufficient time to deal with issues. The co-Chairs will determine at the October meeting whether we need a 3-day meeting in December.

All pieces of information must be drafted for the January meeting.

9. Meeting review and plan for next meeting – Tim and Paul

The following items were **agreed** to or adopted:

The Notes from meeting #6 (June 8-10) were adopted as sent out.

The Notes from meeting #7 (July 23) were adopted as sent out.

(1) It was **agreed** that discussion about future opportunities to expand irrigated acres in both jurisdictions after would take place discussion of Tier 2 model runs (October or November). [p. 2]

(2) JIT **agreed** that a discussion of municipal and recreation benefits should be part of our evaluation criteria, to be reviewed at our October or December meetings. [p. 3]

(3) It was **agreed** that some form of flexibility to make real-time operational changes based on water availability could provide benefits to water users on both sides of the international boundary. [p.4]

(4) The JIT **agreed** to give Robert and Anne the authority to judge whether or not recommendations for additional Tier 2 runs are appropriate to pursue. [p. 6]

(5) The Team discussed and **agreed** that the proposed timeline is what is necessary to complete the project on time, and is attainable. [p. 6]

Summary of ACTIONS

Actions that are being dealt with as **new model runs** are identified below by cross-reference to that **item** in Attachment 1: **Future Model Runs – Tier 1 and Tier 2 Options and Questions**.

[1] **ACTION:** MT is to review their irrigation acreage used in the model to ensure that the correct acreages are being simulated.

[2] **ACTION:** The JIT requested further explanation of how irrigation demands are determined in both jurisdictions.

[3] **ACTION:** JIT requested a description of the operating decisions/rules needed to run Sherburne reservoir.

[4] **ACTION:** Technical Team to prepare a graph showing how often there may be excess capacity available within the U.S. diversion canal for Options 1(base case), 2 (850 cfs U.S. St. Mary canal) and 3 (1200 cfs U.S. St. Mary canal).

[5] **ACTION:** Technical Team to undertake a run of a 650 cfs canal + the upstream Sherburne Res. and Lower St. Mary storage and compare it to just the 850 cfs canal with existing storage. [See **item #1 on Attachment 1.**]

[6] **ACTION:** The JIT asked the Technical Team to advise if the 237,000 ac.ft. storage in Option 7c is live storage available for irrigation or if it included storage for flood-pool safety.

[7] **ACTION:** Technical Team is to review the assumptions made about the provision of IFN from Canadian and U.S. shares of water from both the Milk R. and the diverted St. Mary R. for Options 7a-7c (Canadian storage on Milk R.) and Option 8 (Shared Milk R. reservoir) [See **item #11 on Attachment 1.**]

[8] **ACTION:** The JIT requested the Technical Team to prepare additional information explaining the comparative results of Option 8 (Shared Milk R. reservoir) to the base case (Option 2a) and to Options 7a-7c (Canadian storage on Milk R.)

[9] **ACTION:** The JIT requested the Technical Team to review and re-run the shared Milk R. reservoir option (Option 8) to correctly handle in-stream flows downstream of a shared reservoir. [See **item #12 on Attachment 1.**]

[10] **ACTION:** The Technical Team will develop the conceptual framework for a new model run for integrating Ft. Belknap's share of the Milk River natural flow into the joint storage option. [See **item #13 on Attachment 1.**]

[11] **ACTION:** Alberta Technical Team to determine why there is a difference in the irrigable acreage identified in the 2003 Klohn-Crippen study, and in the current model run, for all 3 AB Milk River reservoir sizes. [See **Question #3 on Attachment 1.**]

[12] **ACTION:** The Technical Team is to consider the 20,000 ac.ft. LOI, whether it is too large, and if a smaller option should be investigated. The Technical Team is to decide and propose runs to the co-Chairs for approval. Runs should be made for the 650 cfs and 850 cfs canal, and should identify the maximum number of acres that can be irrigated in Milk R. Alberta, meeting Alberta's irrigation standards. [See "**Letter of Intent**" on **Attachment 1.**]

[13] **ACTION:** The JIT asked the Technical Team to explore how much water could be captured and managed using all of the storage options discussed, unconstrained by existing irrigation acreages or efficiencies, and maximizing over-year storage for Sherburne, Lower St. Mary, a large AB Milk R. reservoir, an appropriately increased Fresno Reservoir, and Nelson Reservoir. [See **item #25 on Attachment 1.**]

[14] **ACTION:** Modellers to determine what flow is needed to irrigate an additional (i) 5000 ac. (total 13,000 ac.) and (ii) 10,000 ac. (total 18,000 ac.) in the Canadian Milk R. basin. Runs to be modelled at 850 cfs, and depending on the results, consider modelling at 1200 cfs only if there will be value in making the larger canal capacity runs. Technical Team to determine if there is any disadvantage to MT for these runs. [See **item #23 on Attachment 1.**]

[15] **ACTION:** Robert and Anne will draft the evaluation criteria needed to rank potential options and present it to the JIT. Economic analysis will only be addressed at an overview level.

[16] **ACTION:** Secretariat will draft a framework describing an international watershed team to coordinate cross-border water management.

The Secretariat will draft the actions and activities and send them to the JIT. The Team will review and identify anything that was missed and advise the Secretariat.

Next meeting

October 28-29, starting about 8:00 a.m., at Best Western Hotel, Great Falls, MT.

The meeting was adjourned at 3:00 p.m.

Attachment 1: Future Model Runs – Tier 1 and Tier 2 Options and Questions

New Option runs are numbered below in quotation marks followed by their technical description. To track the new Option runs against the ACTIONS in the Notes above, we refer to them in the Notes as **item 1, item 2, etc.**

Tier 1 Options

St. Mary Canal options

No new runs.

Lower St. Mary Lake storage (2 new items)

1. New Run “Option 4c” – 650 cfs canal plus existing Sherburne storage, plus 8,800 ac-ft. Lower St. Mary L. storage (provide comparison to output 850 cfs canal and existing Sherburne storage and filling rule curves)
2. New Run Option “4a1” – 850 cfs canal run with revised Sherburne filling curve plus 8,800 ac-ft. Lower St. Mary (compare to output of Option “4a”) (This takes advantage of additional d/s storage and modified filling curve for Sherburne.)

Increased Sherburne storage

No new runs.

Combine increased Lower St. Mary Lake and Increased Sherburne storage (1 item)

3. New Run “Option 6a1” – Run option “6a” with modified Sherburne filling curve. Does this increase its benefits? **LOW PRIORITY**

Model runs with modified Sherburne filling curve (5 items)

4. New Run “Option 2a1” – Option 2a (850 canal with 83,000 ac. ft. Fresno storage) and modified Sherburne filling curve.
5. New Run “Option “2c1” – Option 2c (850 canal with 137,000 ac. ft. Fresno storage) and modified Sherburne filling curve.
6. New Run “Option 2e” – 850 canal with 160,000 ac. ft. Fresno storage drawdown to 123,000 ac-ft. and modified Sherburne filling curve.
7. New Run “Option 4d” – 850 canal, 137,000 Fresno with drawdown to 100,000, plus 8,800 ac-ft. Lower St. Mary, and modified Sherburne filling curve.
8. New Run “Option 4e” – 850 canal, 160,000 Fresno with drawdown to 123,000, plus 8,800 ac-ft. Lower St. Mary and modified Sherburne filling curve.

[After discussion, two items on the original list proposed were deleted. Numbering continues with item # 11 below.]

Full U.S. Share with maximum storage

No new runs.

Alberta-Milk River storage (1 item)

11. Re-run of “Options 7a, 7b and 7c” with appropriate IFN (non irrigation season [Nov1- Mar 31] IFN=lesser of Q_{nat} . or 15 cfs, irrigation season [Apr 1-Oct 31] for $Q_{nat}<25$ cfs: IFN = Q_{nat} , for $Q_{nat} \geq 25$ cfs; IFN=greater of 25 cfs or 30% of Q_{nat})
 - a) 850 cfs canal, 122,000 ac-ft. Milk R. Reservoir AB (former run #7a)
 - b) 850 cfs canal, 188,000 ac-ft. Milk R. reservoir AB (former run #7b)

c) 850 cfs canal, 237,000 ac-ft. Milk R. reservoir AB (former run #7c)

Shared Milk River storage (2 items)

12. Re-run of “Option 8” - Shared storage with following considerations;
IFN A) For non irrigation months Oct 16 to March 15, IFN = lesser of Q_{nat} or 15cfs with U.S to provide 50% Canada provides additional below confluence of 2 channels,
B) for irrigation months [March 16-Oct 15] for $Q_{nat} < 25$ cfs: IFN = Q_{nat} for $Q_{nat} \geq 25$ cfs; IFN = greater of 25cfs or 30% of Q_{nat} . U.S. to provide 50%, Canada provides additional below confluence of 2 channels.
13. New Run – “Option 8b” - Shared storage (“Option 8” in item 12) needs to be re-run with the additional following consideration: the potential impacts the shared reservoir may have on the U.S. share of Milk River natural flow allocated to the Ft. Belknap Reservation.
MT to provide instructions on whether this is required and if so how to account for Ft. Belknap interests.

Letter of Intent

In discussion, the Joint Team questioned a 20,000 ac-ft. LOI as they did not believe there was that volume of water in low-flow years. The Joint Team requested the Tech Team to consider this, and propose a series of runs to the co-Chairs for approval. Tech team should consider runs with 650 cfs canal, 850 cfs canal and an intermediate size LOI. The runs should identify the maximum number of acres that can be irrigated in Milk R. Alberta, meeting Alberta’s irrigation standards.

Number of runs unknown at this time.

Balance Periods

No new runs requested.

Tech Team to report results of first 4 model runs (#16a – 16d) to co-Chairs for further instructions.

Tier 2 Options

Options eliminated since the creation of the initial Tier 2 list (Sep. 24, 2009):

- Spider Lake
- Goose Lake
- Ridge Reservoir
- Water marketing by Blackfeet Tribe
- Diversion from Tiber Reservoir
- Duck Creek diversion

Offstream storage along St. Mary Canal vs. downstream of canal

20. New Runs “Option 17a, 17b, and 17c” - 850 cfs canal, existing Sherburne with modified filling curve, 83,000 ac-ft. Fresno storage, plus indicated off-stream storage.

Model off-stream storage along St. Mary canal of:

- a) “Option 17a” – 5,000 ac-ft off-stream storage
- b) “Option 17b” – 10,000 ac-ft off-stream storage
- c) “Option 17c” – determine an optimal storage based on benefits

Increased storage in Fresno Reservoir shared with Alberta

21. New Run “Option 18a” – 850 cfs canal, 137,000 ac-ft. Fresno with storage above 83,000 ac-ft. shared between AB and MT, with Alberta storing Canadian Milk R. share as a credit with overyear carry over, and drawing on that credit from U.S. St. Mary water to supply from Milk R. irrigation in Alberta; Sherburne modified rule curve.

Increased storage in St. Mary Reservoir, Alberta, for U.S. water

No new run.

“Option 18b” – Review balance period or hydrology and speculate on size of credit available each year.

Insight into this credit system may come from results of annual balance period. The Tech Team will evaluate and discuss possible runs with co-Chairs. (U.S. St. Mary storage in Canada of 30,000ac-ft. with carryover storage which U.S. can draw on through U.S. canal when needed.)

Storage on Ft. Belknap Reservation (1 item)

22. New Run “Option 22” – new 60,000 ac.ft. off stream storage near Ft. Belknap Reservation, withdrawal from Milk River diversion to dam to a maximum of 520 cfs to irrigate current lands on the Ft. Belknap reservation plus 19,390 new acres on reservation (** MT secretariat is to clearly describe this option. MT to undertake design specs.)

MT needs to determine if this is for improving the reliability of existing irrigated acres, adding new acres and if so, how much, or both, and the priority access to flow between new reservoir and traditional irrigators.

Canadian participation in U.S. St. Mary Canal with Canadian water (1 item)

23. New Runs “Options 19a – 19d” Canada access to utilize U.S. canal to divert Canadian St. Mary water to meet Canadian irrigation demands in Milk R. basin. Canadian demand to be met 1st by Canadian Milk share, 2nd by LOIs, 3rd by diversions of Canadian St. Mary share. Use Sherburne modified rule curve. (If it has big impact on U.S., may need to consider a larger canal.)

- a) “Option 19a” – 850 canal, 13,000 acres irrigated, plus Letter of Intent – Alberta water
- b) “Option 19b” – 850 canal, 18,000 acres irrigated, plus LOI – Alberta water
- c) “Option 19c” – 850 canal, 13,000 acres irrigated, no LOI – Alberta water
- d) “Option 19d” – 850 canal, 18,000 acres irrigated, no LOI – Alberta water

Canadian participation in U.S. St. Mary Canal with U.S. water (1 item)

24. New Runs “Options 20a – 20d” Canada to utilize U.S. St Mary diversions to help meet Canadian irrigation demands in Milk basin. Use Sherburne modified rule curve. (if it has big impact on US may need consider larger canal)

- a) “Option 20a” – 850 canal, 13,000 acres irrigated, plus Letter of Intent – Montana water
- b) “Option 20b” – 850 canal, 18,000 acres irrigated, plus LOI – Montana water
- c) “Option 20c” – 850 canal, 13,000 acres irrigated, no LOI – Montana water
- d) “Option 20d” – 850 canal, 18,000 acres irrigated, no LOI – Montana water

Maximum water supply option (2 items)

The JIT requested the Tech Team to explore:

25. How much water could be captured and managed using all of the storage options discussed, U.S. share of St. Mary River water, no canal capacity constraints and assume, AB Milk River irrigation efficiencies and guidelines, for all irrigation, including Montana irrigation:

“Option 21a” – 850 cfs canal and existing storage

“Option 21b” – 850 cfs canal and indicated storage

- Current Sherburne storage
- Increased 8,800 ac-ft. Lower St. Mary
- Large Alberta Milk River reservoir
- Appropriate increased Fresno Res. (may not be necessary with Alberta Reservoir)
- Nelson Reservoir

26. “Option 21c” – Determine the amount of acres that can be irrigated with this supply to Alberta irrigation shortage criteria.

QUESTIONS

1. St. Mary Canal options

Needed is additional analysis = the number of days the 650, 850 and 1200 cfs canals are running full for the dry, average and wet years.

2. Increased Sherburne storage

Summarize the benefits of increased storage on Sherburne Res. as the Joint Team was sensing limited benefits. Is this true?

3. Alberta-Milk River storage

With 3 different storage sizes (122,000; 188,000; 237,000 ac.ft) and an 850 cfs canal, and considering IFN needs,

- How often does the AB Milk R. dam fill?
- Sort out the irrigated acres discrepancy between 2003 consultant report and model runs for all 3 Milk R. Reservoir sizes.

4. Alberta Milk River storage – shared

From ACTION [8]: The JIT requested the Technical Team to prepare additional information explaining the comparative results of Option 8 (Shared Milk R. reservoir) to the base case (Option 2a) and to Options 7a-7c (Canadian storage on Milk R.).

- In addition to the average and dry year results, the JIT would like to understand the results based on median values.

5. Technical Consideration of Hydrologic Sequences

What are the probabilities of the following sequences?

- Dry year followed by a dry year
- Wet year followed by a wet year
- Dry year followed by a wet year
- Wet year followed by a dry year

Is there a probability of predicting? Could you make operational decisions in the current year based on the probability of what the next year might be?

Attachment 2: Draft Timeline for Completion Meeting

- September-‘09
 - Base Case is reviewed and understood, and Tier 1 model results are complete (“better access to share”)
 - Tier 2 options for modeling are discussed and finalized (“better use of share received”)
 - Timeline to complete report by April, 2010 is reviewed and finalized
- October-‘09
 - All outstanding issues with Tier 1 model runs are resolved
 - Tier 2 model run results are reported
 - Additional models runs (combinations of Tier 1 and 2) are identified and finalized
 - Evaluation Criteria and Interests needed to evaluate options are finalized
 - Draft framework for potential International Watershed Coordinating Team is outlined
 - Technical Background report is finalized
- December-‘09
 - All Tier 1 model runs are completed
 - All outstanding issues with Tier 2 model runs and combination model runs are resolved
 - Prioritized list of models runs for final consideration/fine tuning is finalized
 - Operations / maintenance and capital cost estimates for options are complete
 - Final “Recommendations report” format is finalized
 - Approval process for Recommendations Report is presented
 - Presentations have been given to stakeholder groups
- January-‘10 – Start building group consensus
 - Evaluation Criteria is applied to all remaining options
 - Preliminary recommendations for Recommendations Report are developed by Joint Team
 - Draft framework for potential International Watershed Coordinating Team is completed to 60% level
- February-‘10
 - 1st Draft of Recommendations Report is reviewed by Joint Team
- March -‘10
 - 2nd draft of Recommendations Report reviewed and comments are finalized by Joint Team
 - Draft framework for potential International Watershed Coordinating Team is completed to 90% level
- April -‘10
 - Final Recommendations Report is approved by Joint Team
 - Framework for International Watershed Coordinating Team is approved by Joint Team
- Post April Process
 - Jurisdiction Governments are briefed by their team
 - Meeting with interested public are held by Governments and JIT members