

RDRMUG EXECUTIVE COMMITTEE

February 19, 2015 – Badlands Community Facility

10:30 – 11:45 - Lunch will be arranged

1. Call to Order:

2. Agenda

2.1. Additions

2.2. Approval

3. Minutes:

3.1. Review minutes from December 4, 2014

3.2. Business arising from minutes of December 4, 2014

4. Action Plan

4.1. Project Lead Coordinator report/process

4.2. Next steps

5. Hart Water Management Report

5.1. Update included

6. RDRMUG Financial Update

6.1. 2015 Municipal funding requests

6.2. 2015 Budget revised with 2014 Actuals

7. Additions

8. Next Meeting: Call of the Co-Chairs

9. Adjournment

RDRMUG EXECUTIVE COMMITTEE

Meeting Minutes December 4, 2014

1. Call to Order: 10:10 by Co-Chair P. Churchill

Attendance: P. Churchill, A. Campbell, B. Shepherd, G. Campion, B. Shaw, S. Grudecki, T. Yemen, T. Leslie, K. Ryder

2. Agenda: Approved

Motion: S. Grudecki

Carried

3. Minutes: From Sept. 18, 2014

No business arising from the minutes of Sept. 18, 2014

Motion: G. Campion

Carried

4. New Business:

4.1. Review Terms of Reference for Municipal Water Protection Action Plan

K. Ryder assisted by B. Shaw reviewed the Terms of Reference for Action Plan.

After discussion:

Motion to recommend acceptance of Action Plan Terms of Reference to RDRMUG membership.

G. Campion

Carried

4.2. Hiring of Lead Project Coordinator to Prepare Action Plan

RDRMUG to advertise for a limited term contract employee to act as lead coordinator to prepare Action Plan. Draft job description reviewed.

Motion to recommend proceeding with advertising position with the intent of hiring a limited term contract employee to RDRMUG membership.

B. Shepherd

Carried

Steering Committee selected from Executive Committee to Interview, Hire and Direct Contract Position

The Steering Committee will comprise of the two Co-Chairs, Councillor D. Wyntjes, Bill Shaw, Councillor S. Grudecki, Councillor B. Shepherd and K. Ryder

4.3. Review Current Committee Structure

After review and discussion of the current River Hazard Committee it was decided that this role was not necessary at this time and as it was an Ad-Hoc committee a recommendation to discontinue this committee would be made.

Motion to recommend to the RDRMUG Membership that the River Hazard Committee be discontinued.

T. Leslie

Carried

4.4. Review of 2015 Operating Budget

K. Ryder reviewed the 2015 Draft Operating Budget with the Executive Committee. He highlighted the areas of changes specifically relating to the new Contract Position and suggested that the 2015 RDRMUG Membership fees remain at .25 per capita. K. Ryder stated that with the current dollars in the bank and the .25 per capita would support a contract position for 2015 and six months into 2016.

Motion to recommend to the RDRMUG Membership that the 2015 Operating Budget be accepted with the per capita membership fee remaining .25.

A. Campbell

Carried

4.5. Review Future Meeting Dates

After discussion it was decided that the current meeting dates, times and location was working well as reflected in the attendance.

Motion to recommend to the RDRMUG Membership that the regular RDRMUG Meetings be held at 1:00 pm, bi-monthly on the third Thursday in Drumheller. (Unless a field trip was organized i.e.: Dickson Dam)

S. Grudecki

Carried

4.6. Renewal of Executive Director Contract

After discussion

Motion to recommend to the RDRMUG Membership that K. Ryder's contract as Executive Director be extended for one year with a 3% increase in base rate.

B. Shepherd

Carried

5. Next Meeting: Call of the Co-Chairs

6. Adjournment: 11:40 G. Campion

Carried

Red Deer River Water Users Group
Water supply Security

DRAFT Dec 2014

Review and Discussion of "Red Deer River Flood Mitigation Study" (Stantec 2014)

Under contract to the Government of Alberta, Stantec prepared a lengthy report (211 pages plus 13 Appendices) with numerous recommendations on measures that would assist in mitigating flood damages in the Red Deer River Basin and contribute to mitigating the impacts of drought. The measures were organized under 11 structural and non-structural concepts. Without questioning the value of each recommendation for mitigating flood damages, the potential benefit of each concept in providing more secure water supplies to municipalities in the Red Deer River Basin are noted below.

1. Dams With Reservoir Storage

Stantec Recommendation: Adding additional dams and reservoirs to the river system for flood attenuation is not recommended at this time; however this option should be revisited from time to time. Future adaptation requirements may warrant reconsideration of the value of additional dams and reservoirs.

Comments: Dams and reservoir storage may have water supply benefits in addition to flood control benefits. Both objectives should be considered in any future storage assessments. Dam sites identified by Stantec that would be beneficial for flood mitigation, and may also have value for water supply purposes would be the following:

- Site S6 on the Little Red Deer River (35,000 dam³)
- Site S14 on the James River (73,000 dam³)
- Site S1C on the Red Deer River near Vam Creek (50,000 dam³). Stantec considered this site to be most desirable.

The value of these projects for water supply purposes would be subject to AESRD decisions on instream flow requirements downstream of the dams and the ability to maintain storage for water supply purposes during sequences of years with low runoff. Simulation modelling would be required to determine the water supply benefits.

Other sites assessed by Stantec for flood mitigation were considered to be too costly, too small to be effective, too far upstream to control a significant portion of the basin, or had severe reservoir impacts on farmsteads and other infrastructure.

2. Dry Dams

Stantec Recommendation: Adding dry dams to the river system for flood attenuation is not recommended at this time; however this option should be revisited from time to time. Future adaptation requirements may warrant reconsideration of the value of additional dry dams.

Comments: Dry ponds are commonly used in Alberta urban centres for managing storm water runoff for relatively frequent events, such as those with 1:25 or 1:50 return periods. While not common in Alberta, dry dams are being used elsewhere to control less frequent flood events, such as those with 1:100 or 1:250 return intervals. Typically, there is no permanent pool with a dry dam. Hence, the environmental footprint is often less imposing than that of a dam and reservoir, and the cost of construction is considerably lower. Dry dams, by definition, would not be effective for improving the performance in meeting consumptive water demands in the Red Deer River Basin. Most of the deficits to urban municipalities would occur during the winter months when there is little or no water in the reservoirs.

3. Off Stream Storage
9. Water Management Strategies

Stantec Recommendation: The Stantec report reviewed two water supply projects: the Special Areas Water Supply Project (SAWSP) and Crawling Valley Reservoir. Neither of these projects have a significant impact on mitigating floods. However they have regional impacts on mitigating the effects of droughts.

Comments: SAWSP is sourced from the Red Deer River near Stettler. The project is designed to improve water supply security for a major portion of the Special Areas and parts of the Counties of Stettler and Paintearth. SAWSP is currently in the EIA stage to determine its economic, environmental and social acceptability. The Crawling Valley Reservoir in the County of Wheatland is sourced from the Bow River and provides water primarily for irrigation within the Eastern Irrigation District. The project requires a new spillway. Both of these offstream projects could contribute to water supply security for individual rural domestic users and regional co-operative projects.

4. Establish Dyking
5. Improve Dyking

Stantec Recommendation: Constructing new dykes and improving existing dykes appear to be the most effective mitigation measures to protect property and critical infrastructure from flood damage. Major dyking projects are recommended for the Sundre and Drumheller urban centres. Less extensive works are recommended for several other areas in the Red Deer River Basin.

Comments: Dykes are a common means of reducing flood damages in Alberta. Although dykes typically increase downstream flow by a small amount by reducing overbank flood flows and associated evapo-transpiration and seepage losses, they do so under flood conditions when there are no water demand shortages. Dykes do not contribute to drought mitigation.

6. Dickson Dam Operation

Stantec Recommendation: Stantec recommends that a study be conducted to review and potentially revise operation of Dickson Dam such that flood control is given a higher priority.

Comments: The history of Dickson Dam operation was reviewed by AMEC (2009). The review concluded that there is a need for a comprehensive study of the operation to ensure that this costly infrastructure

is operated to maximum advantage considering all uses of the project, while ensuring that legal priorities, licensing conditions and government policies are respected.

An objective, comprehensive study of Dickson Dam operation should consider flood control as well as the following aspects identified by AMEC:

- A water quality study to determine if the current minimum release from Glennifer Reservoir of 16.0 m³/s is needed for the entire length of the river and for the entire winter to maintain favourable water quality conditions. Much has changed in the basin over the past 25 years. Populations have increased, industrial development has expanded, and agricultural practices have changed. So too have wastewater treatment technologies and standards. It is possible that 16.0 m³/s is no longer the required flow for water quality maintenance.
- When water is available in the reservoir and there is a high probability of filling, consider making releases to meet the needs of consumptive users along the river in addition to meeting the WCO and water quality needs. It may be possible to eliminate most of the winter deficits without jeopardizing the other uses of the reservoir.
- Consider sharing the risk among all users to minimize impacts of deficits. For instance, if recreation users and in-stream requirements could tolerate less than ideal conditions in 10% of the years (or some other appropriate percentage), the lowest desirable drawdown rule curve could be lowered making more of the reservoir storage available for meeting withdrawal needs. With the current operation plan, the range of reservoir storage below the lowest desirable drawdown rule curve is not utilized for meeting downstream consumptive and in-stream demands.

Utilize existing water supply forecasts to maximum advantage. Consider adjusting rule curves based on forecasted runoff and probabilities of filling.

7. Basin Wide Mitigation Plans

Stantec Recommendation: Basin wide mitigation includes maintaining transportation routes on critical highways, development of emergency preparedness plans, wetland preservation, additional natural flow monitoring stations, and improvement in weather forecasting. All are recommended by Stantec.

Comments: All measures noted can help to mitigate the impacts of flooding. Almost all measures are neutral for drought mitigation. The exception is "weather forecasting". This measure should go beyond weather forecasting by extending it to streamflow forecasting, and including seasonal water supply forecasts as well as flood forecasts. Water supply forecasts would assist in determining the probability of filling Glennifer Reservoir. In years when there is a high probability of filling the reservoir, the reservoir could be operated differently than it is under current operations. This would provide additional benefits in the higher runoff years. Not knowing what the future holds for water supply, current operators must cautiously conserve water in the event that the following year is going to be a low runoff year, or worse, the start of a three-year drought.

Studies in the United States and Australia have shown that long-range streamflow forecasts can be made by exploiting the lag relationship between the El Nino Southern Oscillation (ENSO) and the serial correlation in streamflow itself (Piechota 1988; Piechota 1999; Tootle and Piechota 2006).

In a recent study of atmosphere/ocean climate oscillations on streamflow in Saskatchewan (St. Jaques et al. 2011), it was concluded that the ENSO, Pacific Decadal Oscillation (PDO), Pacific North American oscillation (PNA) and the Arctic Oscillation (AO) all had impacts on annual mean daily streamflow in Saskatchewan. This finding is promising, however, further research is needed to determine if these indicators can be developed into a meaningful seasonal forecasts for specific streams in Alberta and Saskatchewan.

Additional natural flow monitoring stations would be useful for establishing streamflow trends due to climate change, and appropriate adjustment measures for both floods and droughts.

8. Synthesizing Provincial, Regional and Local Project Priorities

Stantec Recommendation: Stantec recognised the need to co-ordinate the flood mitigation activities on individual municipalities or other local entities to ensure no duplication of effort, all impacts upstream and downstream are considered and to consider if and how joint flood mitigation projects can contribute to drought mitigation in a cost effective way.

Comments: A basin-wide approach to flood mitigation is essential. Consideration of joint flood/drought mitigation projects is also essential, particularly as it related to the use of existing or new storage projects.

9. Water Management Strategies

See Concept 3. Offstream Storage
Concept 8 Synthesizing Provincial, Regional and Local Project Priorities

10. Critical Infrastructure (water and wastewater facilities, fire halls, police stations, hospitals, etc)

Stantec Recommendation: Protect critical infrastructure downstream of Dickson Dam for a dam release rate of 2000 cms plus freeboard (Page 6.3).

Comments: Protection to 2000 cms is a lower level of protection than current government policy for new government funded infrastructure. Current policy calls for 1:500 year protection for lifeline infrastructure (court houses, provincial buildings, schools, correctional facilities, etc) and 1:1000 year for critical lifeline infrastructure (legislative buildings, communication centres, hospitals, extended care facilities, museums, archives, etc) (Alberta Infrastructure 2013). Stantec estimates that the 1:100 year flood downstream of Dickson Dam (considering the effects of Dickson Dam regulation) is 2227 cms at Red Deer, 2070 cms at Drumheller and 1579 cms at Bindloss (Page 3.15). Estimates of the 1:500 and 1:1000 year floods are not provided, but presumably they would be considerably higher than 2000 cms. In light of the current policy for new government funded infrastructure, design criteria for protection of **existing** government infrastructure should consider a higher level of protection than 1:100 year return period. A higher level of protection for water and wastewater treatment plants would result in less frequent disruption to these essential services.

11. Erosion Control

Stantec Recommendation: Monitor post-flood channel conditions to ensure the high flow stream channel is adequately preserved and stream migrations are minimized in strategic locations. Preserve channel conveyance capacity.

Comments: Erosion control measures will not contribute to drought mitigation in the Red Deer River Basin.

Summary

The most direct inter-relationship between water management for flood control and water supply would be via a joint use reservoir. The Stantec report recommends against constructing a flood control dam and reservoir for reasons noted above. If the Province decides that a reservoir is an appropriate measure for flood control, they should be encouraged to locate and size the reservoir to provide both flood control and water supply benefits. In the Bow River Basin, AMEC recommended that the Springbank Reservoir in the Elbow River Basin be built for joint flood control/water supply use. The most recent government announcement indicated that it would be a dry reservoir, useful only for flood control purposes. The rationale would be to reduce landowner impacts, cost and environmental impacts. Sufficient study has not been done to quantify impacts of either type of reservoir.

Two measures recommended by Stantec should be considered for water supply as well as flood control. These two measures are streamflow forecasting and review of Glennifer Reservoir operations. The scope of any studies related to these measures should consider both benefits.

References:

Alberta Infrastructure 2013. *Flood Risk Management Guidelines for Location of New Facilities Funded by Alberta Infrastructure*. Alberta Infrastructure. Edmonton, AB.

AMEC Earth and Environmental (AMEC). 2009. *South Saskatchewan River Basin in Alberta Water Supply Study*. Alberta Agriculture and Rural Development. Lethbridge, Alberta.

Stantec 2014. *Red Deer River Basin Flood Mitigation Study*. Southern Alberta Flood Recovery Task Force. Edmonton, AB.

Toward a RDRMUG Crown Reservation

Meeting 2:00 PM September 4, 2014
Government Building, Red Deer AB

DRAFT, Sept 5, 2014

Todd Aasen, Approvals Manager, Red Deer Terry Chamulak, Hydrologist, Red Deer
Thorsten Hebben, Head, Surface Water Policy, Edm Dick Hart, Consultant, Calgary
Michael Seneka, Hydrologist, Surface Water Policy, Edm

1. Background

Hart provided background related to RDRMUG, and its current initiative to obtain a Crown Reservation for municipal licensing.

2. Licensing Status

- SSRB Plan: Recommendation -- Tentative licence allocation limit for Red Deer Basin = 600,000 dam³. Review at 550,000 dam³.
- Licence Viewer: Frequency of updates
AESRD does not routinely use the SSRB Licence Viewer data (they have their own database). Terry Chamulak indicated that the Licence Viewer data is up to date; its primary drawback from AESRD viewpoint is that it is only for the SSRB.
- Allocation Volume or Allocation Volume minus Return Flow?
Q: Do limits relate to gross withdrawals or net withdrawals (Allocation minus Return Flow)?
A: At present AESRD is tracking gross withdrawals (Allocation only). In the review they may consider net withdrawals.

Hart indicated that in the SSRB Plan, he believed that net withdrawals were considered as demand data in the modelling.

Action: Todd Aasen will ascertain what water demand values were considered in the modelling for the SSRB Plan.

Aasen indicated that estimated return flows and irrigated areas are not provided on licences, but they are available in reports and on plans.

- Gross Drainage Areas (GDA) or GDA minus closed drainage areas?
Hart indicated that the rationale for the allocation limitations in the Red Deer Basin appeared to be protection of the Red Deer River aquatic ecosystem. There are substantial areas within the Red Deer Basin that do not contribute to mainstem flow, particularly in the area between Stettler and Hanna. There are other areas that only rarely would contribute to mainstem flow, such as the Sylvan Lake, Gull Lake and Buffalo Lake drainages.
Q: Should projects in those non-contributing areas be excluded from the allocation limits?
A: Todd Aasen responded: Initially we could consider the entire area because of the ease of obtaining the data. In doing the review after the 550,000 dam³ has been reached, the database could be refined.

Hart indicated that the allocations within the non-contributing area between Stettler and Hanna totaled about 10,000 dam³. Other non-contributing areas could bring the total to as high as 15,000 dam³.

The following data for licences within the gross drainage area were provided by Aasen and Hart:

	Aasen (Source: AESRD Database)		Hart (Source: Licence Viewer)	
	Number	Allocation (dam ³)	Number	Allocation (dam ³)
Licences	3,037	332,247	2753	330,875
Registrations	15,456	3,986	Not Determined	
Adjustments for licence misfiles, duplications, etc			-13	-41,280
Adjusted total for licences			2,740	289,595

Allocation totals obtained by Aasen (332,247) and by Hart (330,875) using two different databases were very close -- less than 1% difference. However, Hart found duplications and misfiled licences in the Licence Viewer that resulted in an over allocation of 41,280 dam³. This reduced Hart's total to 289,595 dam³.

Action: The allocation database compiled by Hart from the Licence Viewer was provided to Aasen for verification and a final current total.

- Applications on hand
Todd Aasen indicated that the large licence applications were as follows:

Project	Allocation applied For (dam ³)	Expected allocation (dam ³)	Comments
SAWSP	61,500	33,000	Project reduced in size. EIA stage.
Acadia Irrigation	56,700	56,700	Dormant. Aasen will check on status.
Mtn View Regional	14,900	3,381	Licence for 3,381 issued Aug 22.
Total		93,081	

3. Glennifer Operation: Minimum release 16.0 m³/s? 17.0 m³/s?

Todd Aasen indicated that there has been no change in the minimum flow release of 16.0 m³/s. In the previous few years more than 16.0 m³/s were released to lower the reservoir to increase flood storage.

4. Red Deer WCOs: Interpretation of Director's Decision, Jan 16, 2007

The Directors decision on implementation of the Red Deer WCO is ambiguous. It is uncertain whether the implementation date of May 1, 2005 applies to the licence priority date or the date the licence was issued.

http://esrd.alberta.ca/water/legislation-guidelines/documents/WCO_Red_Deer_River.pdf

Others at the meeting agreed that the implementation date was uncertain.

Action: Clarification of the implementation for the WCO will be sought. Todd Aasen to inform Hart when a decision has been made.

5. Enforcement of WCOs

Full implementation of WCOs requires real time natural flows and winter monitoring. Are these problems being addressed?

Terry Chamulak indicated that work is progressing on providing real time natural flow during the open water season. A website has been established by AESRD with daily Qnat at Red Deer, Drumheller and Bindloss.

<http://www.environment.alberta.ca/apps/LicenceMonitoring/Details.aspx?ID=RedDeer>

These real time natural flows at the three stations will enable implementation of WCOs during the open water period.

Natural flow during winter months is under investigation. The stage/discharge relationships developed and used in the open water season are unreliable during winter. Frequent monitoring (metering) is expensive. Some work has been done on flow trends during the winter months. Trends can be an indicator of potential problems related to instream flows. Todd Aasen indicated that if a problem is suspected, metering crews would be dispatched to ascertain the flow prior to taking enforcement actions.

6. Shortage Plans

Three or four shortage plans in the Red Deer Basin are in place. The plans generally involve sharing deficits among junior and senior users using the assignment provision of Water Act.

Action: The Water Act assignment provision requires interpretation as to whether or not it is the appropriate tool to use for water sharing. AESRD will follow up on this. Todd Aasen to keep Hart informed.

7. Crown Reservation

Hart asked for comments, issues and concerns related to a Crown Reservation reserving a quantity of unallocated Red Deer River water for municipal purposes.

- There is concern with bypassing the Water Act priority principle for routine licensing purposes. Reservations have been put in place under extenuating circumstances. For example:
 - Reserve water for First Nation Reserves and to better meet current demands (AR 171/2007).
 - Reserve water as partial compensation for land control or mitigation of impacts by government projects (AR 391/2003).
 - Establish limits on irrigation expansion (AR 307/91 was repealed on August 1, 2007).
- At RDMUG's first attempt to obtain a Crown Reservation, AESRD was about to initiate a public consultation program (Water Conversations). A decision was delayed pending completion of the

program. At this meeting, we were advised that the program has been completed and a draft report has been prepared but not yet released. Michael Seneka has reviewed the report. He indicated that a Crown Reservation was not explicitly mentioned in the draft report. The report recommends no change to the water allocation system in the Water Act. With respect to municipal water supply servicing, the report recommends emphasis on regional systems. Michael speculated that a Crown Reservation is probably not off the table, but the Government may not act on the issue until the concept of regional systems and funding is further explored.

At the meeting, it was noted that municipalities in the Red Deer Basin are well aware of the value of regional systems and may well be leading the way in their development. The following have been developed and are functional.

- Mountain View Regional Water Services Commission
- North Red Deer Regional Water Services Commission
- Highway 12/21 Regional Water Services Commission
- Shirley McClennan Regional Water Services Commission
- Aqua Regional Water Services Commission
- Henry Kroeger Regional Water Services Commission
- Morrin/Munson
- Three Hills/Trochu

It was further noted and acknowledged that regional systems will not address the need for new water allocations to keep pace with population growth within communities, which is the primary objective of RDRMUG's desire to secure a Crown Reservation.

- Hart noted that the first water management legislation in western Canada, the North West Irrigation Act of 1894, contained the same priority system that is a hallmark of the current Water Act (first in time, first in right). But it also contained a "Precedence of Use" which listed the follow order of precedence:
 1. Domestic (defined as household, livestock, railway steam engines)
 2. Irrigation
 3. All Other Uses

Each of the three Precedents had its own priority system. All priorities within the Domestic Precedence would have to be met before any Irrigation or Other Uses could be met. And all priorities within the Irrigation Precedence would have to be met before Other Uses could be supplied. During the years since 1894, the order of Precedence was modified several times (although Domestic was always first) and its administration was simplified to the extent that by the 1990s Precedence of Use was almost meaningless. In the Water Act of 1999, there is no mention of Precedence among the various purposes for using water, although **riparian landowners** have the highest priority for the domestic and agricultural use of **small quantities** of water without a licence.

The key message in this discussion is that as early as 1894 it was recognized the human uses of water should have the highest priority for diversions of the natural flow of streams in western Canada. A Crown Reservation for municipal use would help to restore that priority position for human use in a way that could be done without any changes in the Act. It would help to avoid,

or at least delay, the situation in which many communities in the Bow, Oldman and South Saskatchewan River Basins are facing or will be facing, which is scrambling to find an allocation seller who might be willing to go through the water transfer process and sell his or her allocation for a reasonable fee.

8. Adjournment

The meeting was adjourned.

Action Items:

- 1. Todd Aasen will ascertain what water demand values were considered in the modelling for the SSRB Plan.**
- 2. The allocation database compiled by Hart from the Licence Viewer was provided to Aasen for verification and a final current total. Todd Aasen will advise Hart of allocations.**
- 3. Clarification of the implementation for the WCO will be sought. Todd Aasen to inform Hart when a decision has been made.**
- 4. The Water Act assignment provision requires interpretation as to whether or not it is the appropriate tool to use for water sharing. AESRD will follow up on this. Todd Aasen to keep Hart informed.**