

**Lake Diefenbaker Reservoir Operating Plan Consultation
Downstream Municipalities Meeting
July 16, 2012, Park Town Hotel, Saskatoon**

**Recorders: Robin Tod, Heather Davies
Facilitator: Dazawray Landrie-Parker**

Stakeholders:

| Name | Stakeholder Municipality |
|-------------------|-------------------------------------|
| Ben Boots | Buffalo Pound Water Treatment Plant |
| Paul Van Pul | Hydraulic Archaeology |
| James Harvey | Pike Lake |
| Rick Petrie | RM of Canaan #225 |
| Mel Henry | RM of Corman Park |
| Randy Ridgewell | RM of Fertile Valley |
| Eugene Matwishyn | RM of Prince Albert |
| Harvey Pippin | RM of Vanscoy |
| Brenda Wallace | Saskatoon |
| Galen Heinrichs | Saskatoon |
| Twyla Yoss | Saskatoon |
| Spencer Early | Valley People Association |
| Warren Rutherford | Warman |
| Russ McPherson | Waterwolf Planning Commission |
| William Lemisko | Worldaway Farm |

Meeting Notes

10:00 am - Dazawray opened the meeting and asked the participants to introduce themselves.

Dazawray went through an outline of the agenda. She ensured the stakeholders knew that the primary objective of the response session was to provide stakeholders the opportunity to share and discuss issues they perceive as relevant to the renewal of the Lake Diefenbaker Reservoir Operating Plan.

Dazawray also reminded stakeholders to finish and send in their completed questionnaire to Robin Tod.

The first part of the meeting was to discuss some of the challenges the downstream municipal stakeholders had related to the operation of Gardiner Dam.

Challenges

- There was some concern that an audio recording of John Pomeroy's presentation was not posted on the website.

Dam Safety

- Concern was raised as to whether the Authority is collecting adequate data to ensure that Gardiner dam is safe.
 - There was scepticism by participants that the Authority was providing accurate information when it came to the safety of Gardiner and other dams in the province.
 - At the Outlook meeting Bill Duncan indicated that the dam had only slid a maximum of 4 mm per year in the past ten years. A request was made for data on the movement of Gardiner Dam since construction of the dam in the 1960's. Comments are that the dam slippage increases when the dam reaches full supply level. Question as to whether the piezometers (75) for the dam are enough for adequate monitoring.

Flood Control

- A lot of the discussion centered around flood control and if the Authority should be operating above full supply level – one stakeholder referenced something he read or heard that indicated that the reservoir had to be at least 1.5 m below FSL for the Authority to be able to manage the reservoir for flood control – another stakeholder had been in contact with engineers who were involved in building the system and said that the reservoir could hold more than FSL in flood events. A question was raised as to why the Authority will not use the freeboard above FSL in extreme flood events?

Water Flow/Level Forecasting

- There was concern by stakeholders that, based on the Centre for Hydrology Report, the Authority is doing a poor job of forecasting inflow, water levels and outflow – they weren't sure if this was a human resource or financial issue.
- There were also comments that the forecasting methods the Authority currently uses are insufficient to determine incoming flows. It was felt that the Authority has no capacity for managing increased flows (flood control) because the reservoir is maintained at full supply level.

Water Quality

- The operation of the Qu'Appelle River dam affects the Buffalo Pound water treatment plant. Concern was raised that the Authority does not consider the water quality aspect during the operation of the Qu'Appelle dam.
- Concern was also raised in regards to the high amount of sediment in the South Saskatchewan River downstream of Gardiner Dam and the impact the sediment has on the water treatment in Saskatoon

Communication Mechanisms

- There was a general feeling that there was a lack of reliable, accurate and timely information from the Authority.

- Comments that the discharge from the dam in the past two weeks have not been posted on the Authority's website.
 - To follow-up with stakeholders' comments about SWA's website being outdated. I navigated to the Water Management tab on the www.swa.ca site and chose the Stream Flows and Lake Levels option. Both the charts associated with the Lake Diefenbaker at Gardiner Dam and Lake Diefenbaker Routed Inflow stations were up to date. However, the graph associated with the Lake Diefenbaker Outflow station was only current to June 20th (despite the current date being July 20th). So, I contacted Martin Grajczyk to find out why there is this data lag. Martin explained that the data used to update this graph is estimated by SaskPower and it is typically a few days behind. However, currently there is a one-month data lag in the data and this is because there is a problem in the file transfer from SaskPower who provides us with the data.

Shoreline Erosion

- It is perceived that there is a lot of environmental damage both upstream and downstream of the dam caused by both the building of the reservoir and the operation of Gardiner Dam.
- There was a comment that the extreme slothing/slumping of the shoreline is noticeable both downstream and upstream of the Gardiner dam. It was also mentioned that wind and wave action can cause erosion problems on Lake Diefenbaker.
- Concerns were raised that the water released from Gardiner Dam, either through the turbines, or through the spillway, has an impact upon the environment and causes problems for shoreline erosion downstream.

Management Priorities

- It was the general view of the participants that the priority of managing Lake Diefenbaker is to maximize revenue by maximizing the production of hydroelectric power.
- Concerns were raised that the management decisions are not focused on any other user, but SaskPower.
- Some of the issues users have with managing for hydroelectric, resulting in low lake levels in the spring include:
 - recreation users around Lake Diefenbaker cannot access boat launches because the spring water levels are below the launches; and
 - irrigators cannot get water from the lake as water levels are too low for pumps

Irrigation

- A comment was raised that irrigation downstream along the South Saskatchewan River is really tough as water levels can fluctuate between 3 to 4 feet overnight.

Climate Change

- There was concern about the unknown impact of climate change on the system and how this will impact the users of the system.

Future Demand for Water Allocations

- There was a comment that future additional water allocations from Lake Diefenbaker will be provided to industrial users, including three new potash mines.
 - One of the stakeholders, who had previously worked for Mosaic, commented that the allocations to the current potash mines are not that great. Mosaic uses 0.6 m³/s and the new K&S mine will use 0.6 m³/s and this water use will decrease. However, this stakeholder also commented that if the additional allocations requires that work needs to be done on the Qu'Appelle channel, to increase the allocation from the system, this will be very expensive.

SaskPower

- A comment was raised that SaskPower does not use the Coteau Creek generating station as a back-up power supply.
- There was some discussion that SaskPower has developed a sophisticated analysis to assess the impact of not maintaining a certain head of water has on hydroelectric power and revenue generation. However, participants felt that not enough rigour has been placed on assessing all of the impacts the operation of the dam causes (e.g., sedimentation/shoreline erosion). There was a general feeling that there needs to be some sort of cost/benefit analysis to ensure all of the direct and indirect operational costs are accounted for.

There was a refreshment break at 10:55 and meeting re-convened at 11:05 a.m.

The second part of the meeting included focusing on the Issues Matrix component of the meeting.

Issues Matrix

| Issue | Reservoir Value/ Service | Frequency | Seasonality | Severity | Trend | Competing Values | Comments |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------------------------|---------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soil erosion/ sedimentation | Water Quality | Ongoing | Annual | It ranges in severity, but it can be very severe | It ranges from constant to getting worse | Power generation, inability to react quickly (not proactive) | Concern that erosion increases the amount of phosphorous in the water. Excess silt and sand in the water is a problem for water pumps and water treatment plants. It was suggested that predictable or steady release would likely reduce erosion. Another solution is vegetative buffers along riparian areas to reduce erosion. Comment that the flows on the North Saskatchewan River are maintained within a range while there is a large range in the flows of the South Saskatchewan River. |
| Prevention of dam failure | Flood Control/ dam safety | None | June | Extreme | None | Maintain reservoir at a higher water level/elevation | To prevent dam failure stakeholders perceived that water levels cannot exceed FSL elevation. |
| Reservoir capacity | Flood control | Trend - winter minimums have increased over time. | Spring/ early summer, possibly winter | Extreme | Increasing over time - Comments that the median flows of the reservoir have increased in the past five years. | Upstream erosion | Variability in water levels, between high and low water levels, results in erosion both downstream and along the lake's shorelines. It was thought that the Authority should maximize flood control. It was suggested that the Authority manage the reservoir such that water levels are at least 1.5 m below FSL. It is perceived that FSL or when the water level is less than 1.5 m below FSL there is no flood control. Comment that if we have the capacity for flood control, that it will deal with most situations. |
| A failure of the Gardiner Dam is unacceptable and this incident would be catastrophic for the City of Saskatoon. | Dam Safety | Ongoing | Ongoing | Extreme | Increasing with managing dam at increasing water levels | Disagreement on the use of free board - whether Gardiner Dam has capacity over FSL | There was a request for better communication/information on how much the dam has moved. A question was raised as to if the dam is safe when lake elevation is above FSL? There was a comment that in 2011 the minister committed the Authority to review the province's water management infrastructure and its current operations. A suggestion was made that there needs to be an outside/unbiased review of the dam structures/dam safety in SK on a regular basis. Comments that SWA has committed to repair 20 dams during the next drought cycle. A question was raised as to if and when the weather would allow the repair of these dams. A question was raised as to why SWA will not use the freeboard above the FSL in extreme flood events. Comments that there should be a comparison of the cost and loss of the operation of the Gardiner dam to the revenue SaskPower generates. Comments that the public wishes to have a reliable power supply. |
| Lack of water flow/lake elevation forecasting | Forecasting/ Predictability | Ongoing | Ongoing | Manage what you measure | Has been getting worse | Human/financial resources | Comments and concerns that water forecasting is getting worse - Pomeroy noted that SWA has the worse forecasting for an earthen dam. Stakeholders were wondering if this is a human resources or financial issue? |
| Delivery, timing, channels, accuracy of information | Communication | Ongoing | Ongoing | | Downstream irrigator found an improvement in communication this year compared to previous years. | | Comment that there is too much reliance on person-to-person communications, and that this could be a problem when staff changes or goes on holidays, etc. There was a concern that the data on the SWA website is often outdated and currently two weeks old. Reliability of information is questionable; for example, one stakeholder said that in spring 2012, SWA staff indicated that there was no snow pack in the Rockies. |
| Lack of policies | Operation Policies | Ongoing | Ongoing | This affects everything - this is very serious | | | Stakeholders want to see something in writing on how the system is operated. Comments that communications with the operators of Alberta dams (Alberta Environment) and Manitoba should be better with SWA. There was a comment that the Prairies Provinces Water Board has some responsibility for this. Concern was raised that SWA does not have good predicting tools and SWA does not have an operating procedure for Gardiner Dam, and that nothing has been done since 2005. Comments that developing the policies in-house is not the best method. The operating plan should be more than certain water level targets at certain dates, it is also important to know what the releases will be from the dam. The operating plan should be transparent and available to the public; concern that the policies are influenced by political and other considerations. There was concern that numerous groups contact SWA for consideration for the management of flows. Stakeholders would like to know how the requests are managed between the competing users/requests. There was a suggestion that SWA needs to develop an operating plan for the management of Gardiner Dam in the short term; long term issues can be developed in the long term. |

| Issue | Reservoir Value/ Service | Frequency | Seasonality | Severity | Trend | Competing Values | Comments |
|-------------------------------------------------------------------------------------|--------------------------|----------------------------------------|-------------|----------|-------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wind - wave action of lake. Safety issue for the maintenance of Gardiner Dam | Safety | Unknown - erosion/ sedimentation daily | Open water | Extreme | | | Stakeholders perceive there to be a bigger concern when water levels are close to FSL. Thoughts that erosion and siltation would be significant during high wind situations. Questions were raised as to what would happen to upstream users problems (i.e. erosion) if the reservoir water level was moved to above the FSL? |

There was some discussion about the purpose of this consultation process and it was assumed that the draft reservoir operating plan will incorporate some trade-offs in how the reservoir is operated.

The third part of the meeting focused on identifying the impact that flow; water levels; timing and other criteria had in relation to the identified issues and values associated with the Issues Matrix.

Criteria Matrix: Discussion on Flows Needs, Water Level Needs, Timing of Needs and Other Criteria

| Issue | Reservoir Value/Service | Flow Needs | Water Level Needs | Timing of Flows | Other Criteria | Comments |
|------------------------------------------------------------------------------------------------------------------|----------------------------|------------|-------------------|-----------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Soil erosion/ sedimentation | Water Quality | 3 | 3 | 2 and 3 | Condition of Qu'Appelle channel | |
| Dam Failure | Flood Control/dam safety | 3 | 3 | 3 | Seasonality - would rather valley have higher water levels/flooded in winter than spring/summer (growing season) | Stakeholders agreed that it is very unlikely that a dam failure will occur. |
| Reservoir capacity | flood control | 3 | 3 | 3 | | |
| A failure of the Gardiner Dam is unacceptable and this incident would be catastrophic for the City of Saskatoon. | Dam Safety | 3 | 3 | 3 | | |
| Lack of water flow/lake elevation forecasting | Forecasting/Predictability | 3 | 3 | 3 | | |
| Delivery, timing, channels, accuracy of information | Communication | 3 | 3 | 3 | | There is concern that there is very little disseminating of information to stakeholders. |
| Lack of policies | Operation Policies | 3 | 3 | 3 | | |
| Wind - wave action of lake. Safety issue for the maintenance of Gardiner Dam | shoreline stability | 3 | 3 | 3 | | |
| Flood protection | | 3 | 3 | 3 | | |
| drought protection | | 3 | 3 | 3 | | |

The top three priorities for the downstream municipal stakeholders are dam safety, flood control, and water quality. Large releases of water and reservoir levels were also identified as priorities.

Future Direction

- Stakeholders commented that it is important for the Reservoir Operating Plan to establish priorities including flood control. The other issues are not as much a priority.
- Stakeholders feel that, due to high water levels and shoreline erosion, over the long-term power generation will be influenced by the influx of silt and erosion which will eventually fill in the reservoir.
- If disasters are going to happen on an infrequent basis; government/SWA should establish some protection for downstream users. Comments that no public official or provincial/federal representative would come out to offer assistance. Discussions regarding the limitations of assistance during a flood situation, comments that RM of Corman Park provided extensive assistance to the residents of the community.

Meeting broke for lunch at 12:35 p.m and reconvened at 1:07 p.m.

Dazaway noted that some of the people at the July 16th meeting were from the upstream communities, one by choice and a couple because their community/RM was incorrectly identified as upstream.

Dazaway introduced the Traffic Card Voting component of the response meeting as a way of prioritizing and understanding which issues were the most important to the participating stakeholders.

Traffic Card Voting

| Issue | Reservoir Value/Service | # of green | # of Yellow | # of red | Comments |
|-------------------------------------------------------------------------------------------------------------------------|--------------------------|------------|-------------|----------|-------------------------------------------------------------------------|
| Soil erosion/ sedimentation | Water Quality | 13 | 1 | 0 | Lower concern due to having dealt with the issue in their own situation |
| Dam Failure | Flood Control/dam safety | 13 | 1 | 0 | |
| Reservoir capacity | flood control | 13 | 1 | 0 | Not concerned as resident is 120 feet above the water level. |
| A failure of the Gardiner Dam is unacceptable and this incident would be catastrophic for the City of Saskatoon. | Dam Safety | 12 | 2 | 0 | Dam failure is very unlikely to occur. |

| Issue | Reservoir Value/Service | # of green | # of Yellow | # of red | Comments |
|-------------------------------------------------------------------------------------|--------------------------------|-------------------|--------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------|
| Lack of water flow/lake elevation forecasting | Forecasting/ Predictability | | | | |
| Delivery, timing, channels, accuracy of information | Communication | 9 | 5 | 0 | There was some concern surrounding the value of the information, downstream municipalities must always respond to situation. |
| Lack of policies | Operation Policies | 13 | 1 | | |
| Wind - wave action of lake. Safety issue for the maintenance of Gardiner Dam | shoreline stability | 6 | 6 | 2 | |

Note: although there were 15 stakeholders in attendance, 1 stakeholder left at lunch. Therefore, there were only 14 stakeholders involved in the Traffic Card Voting component of the response meeting.

There was a request that more information be provided by SaskPower about their objectives for management of water levels and the production of hydroelectric power associated with the Coteau Creek Generating Station.

Dazaway indicated that SaskPower would be involved in the stakeholder feedback meeting in November. Meeting adjourned at 1:30 p.m.