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**REPORT TO WILDERNESS MOUNTAIN WATER SERVICE COMMISSION
MEETING OF TUESDAY, MARCH 31, 2015**

SUBJECT DAM SAFETY AND MAINTENANCE STRATEGY

ISSUE

To review the dam safety and maintenance issues related to the Wilderness Mountain Water Service Area (WMWSA) and more specifically to review the need for William Brook Reservoir as a raw water supply for the water service.

BACKGROUND

At the Wilderness Mountain Water Service Commission (commission) meeting of October 7, 2014, the commission requested that the Capital Regional District (CRD) staff develop a strategy for proposed dam safety upgrades particularly for the William Brook reservoir (lower reservoir) as identified in the five-year capital plan as presented. It was proposed to complete dam safety improvements on the upper reservoir for a total of \$10,000 which was approved by the Commission and the proposed dam safety improvement for \$30,000 in 2016 be reviewed and determine if the WMWSA should maintain ownership of the dam, transfer ownership or decommission the dam altogether.

The lower reservoir was built in the late 1970's or early 1980's as the sole water source for the Wilderness Mountain (Mount Matheson Estates) development and it is located on private property (5250 Mount Matheson Road). At that time, the lower reservoir serviced the customers/lots that comprised phase one of the residential development. Wilfred Brook reservoir (upper reservoir) was later constructed at a higher elevation and became the primary water source for the Wilderness Mountain Water Service Area (WMWSA) and the lower reservoir was disconnected from the water system.

The WMWSA has three dams, one at the lower reservoir and two at the upper reservoir. In accordance with the Dam Safety Regulation of the British Columbia Water Act, the CRD is obligated to operate the dams in a safe manner. This includes, but not limited to, completing routine inspections and maintenance tasks, regulatory reporting, preparation and maintenance of Operation, Maintenance and Surveillance manuals, and Emergency Preparedness Procedures manuals, and potentially periodic dam safety reviews/studies based on the consequence of failure rating. Minor maintenance is typically funded by the operating budget and major expenditures are included in the capital budget.

Review of Water Supply for Wilderness Mountain

The annual water consumption since the water treatment plant project was completed in 2012 is recorded, but the volumes recorded are not accurate due to changes of equipment related to the construction. A conservative estimate of the annual total demand is less than 20,000 cubic metres including an estimate for infilling of vacant residential lots within the service area.

Further, the water service area has relied on the upper reservoir as the sole source of raw water since the CRD took on ownership and operation of the system.

Recently obtained reports related to the water system from the Province of British Columbia indicate that the plan was to abandon the lower reservoir as development occurred and to fully rely on the upper reservoir (Bullock Baur report of April 3, 2000). Another Bullock Baur report of February 9, 1996 indicates that the upper reservoir "stores a total volume of approximately 55,000m³[cubic metres]". It is assumed that this volume is the gross storage volume and not practically available for water production due to the submarine terrain and vertical location of the raw water pump. The combined volume of the two reservoirs was noted as 80,000 cubic metres and therefore, the Williams Brook reservoir volume is assumed to be 25,000 cubic metres.

The CRD staff undertook a desktop exercise of quantifying the effective (useable) volume of water in Wilfred Reservoir and concluded that approximately 42,000 cubic metres is available, although raw water quality problems may arise as the reservoir is drawn down excessively. Even with increased future water demands there would be well in excess of one year's of storage for the service area, assuming no inflow from rainfall when starting with a full reservoir.

While the lower reservoir no longer serves as a potable water source for the Wilderness Mountain community, it does provide an alternate raw water source should the upper reservoir become unusable for some reason although the water would have to be treated to a higher level than the upper reservoir, due to known turbidity and manganese issues as identified in the Bullock Baur report of April 3, 2000. If the lower reservoir was used for a potable water source, a water treatment facility and pump station would need to be constructed at the reservoir. An additional underground water main would need to be installed to connect to the existing water supply system. An engineering study would be required prior to making these changes to the system.

ALTERNATIVES

Alternative 1

That the Wilderness Mountain Water Service Commission request that the CRD staff canvass the local area to determine if there is a desire from another party to take on ownership and operation of the William Brook dam and reservoir from the Capital Regional District.

Alternative 2

That the Wilderness Mountain Water Service Commission direct CRD staff to maintain ownership of the William Brook dam and reservoir for the benefit of the water service area customers as an alternative raw water supply for the future and/or for fire protection independent to the primary drinking water system.

Alternative 3

That the Wilderness Mountain Water Service Commission direct CRD staff to prepare details to decommission the William Brook dam and reservoir and report back to the commission.

IMPLICATIONS

Alternative 1 - If a new owner were to be identified, the CRD could negotiate the transfer ownership of the dam assets and possibly the related portion of the water rights license (subject to approval by the Province of British Columbia which issues water licenses under the *BC Water Act*). The property owner where the dam is located should be included in the process. An agreement would be negotiated at a cost. If transfer of ownership is not achieved in 2015, CRD staff will recommend undertaking improvements in 2016 to address risk, liability and compliancy with the Dam Safety Regulations

Alternative 2 - Should the commission desire to maintain ownership of the dam and reservoir for the benefit of the water service area customers as an alternative raw water supply for the future and/or for fire protection then annual operating and capital budgets would require funding for dam safety and maintenance tasks and capital improvements would be required to make the water potable, if needed for domestic use.

Alternative 3 - Should the commission direct CRD staff to prepare details to decommission the dam, it is proposed that a \$2,000 budget be established from the capital reserve account for CRD staff effort to conduct a conceptual study to identify the work to remove the dam including environmental restoration.

If the dam was to be decommissioned then the WMWSA would cease to fund annual operating and capital expenditures related to dam safety and maintenance for the lower dam only.

CONCLUSION

The WMWSA does not require William Brook reservoir as a raw water source as Wilfred Brook reservoir has sufficient capacity for existing and estimated future demand of the existing service area based on historical usage, even though the reservoir would be beneficial if the upper reservoir failed, the raw water from the lower reservoir would have to be treated and conveyed to the distribution system.

The WMWSA will continue to incur dam safety maintenance costs as well as downstream liability issues related to the William Brook dam unless the dam is transferred in ownership to another party or the dam is decommissioned.

RECOMMENDATION

That the Wilderness Mountain Water Service Commission request that the CRD staff canvass the local area to determine if there is a desire from another party to take on ownership and operation of the William Brook dam and reservoir from the Capital Regional District.

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