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**REPORT TO LYALL HARBOUR / BOOT COVE WATER LOCAL SERVICE COMMITTEE  
MEETING OF TUESDAY 19 OCTOBER 2010**

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**SUBJECT     WATER TREATMENT UPGRADE PROJECT**

**ISSUE**

Funding provided through an infrastructure grant and loan authorization is insufficient to complete a new treatment plant based on the originally proposed Dissolved Air Flotation (DAF) process.

**BACKGROUND**

The existing LHBC water supply and treatment system, constructed by the CRD in 1979 and later additions, consists of a small man-made lake (Money Lake No. 1), a pump house near the lake where sodium hypochlorite is injected to oxidize iron and manganese in the source water, and a treatment plant at the entrance to the service area where the water is filtered through sand and activated carbon beds and re-chlorinated for primary and residual disinfection. Although the water is considered bacteriologically safe to drink, further water treatment improvements were proposed to comply with the VIHA 4-3-2-1 Policy<sup>1</sup> (pursuant to the *Drinking Water Protection Act*) and the *Guidelines for Canadian Drinking Water Quality*.

In 2008, the Capital Regional District (CRD) received a federal/provincial infrastructure grant of \$852,800 under the Municipal Rural Infrastructure Fund (MRIF) for the purpose of upgrading water supply infrastructure for the LHBC water service. The scope of work included the installation of customer water meters, provision of a new balancing tank, and a treatment upgrade to meet current and anticipated regulatory standards for surface water treatment.

Based on previous analysis of treatment alternatives by a consulting engineer for similar CRD water sources in the Gulf Islands, staff recommended construction of a new water treatment plant for LHBC based on a process consisting of flocculation, dissolved air flotation (DAF), sand and carbon filtration, ultraviolet (UV) irradiation for primary disinfection, and chlorination for secondary (residual) disinfection. A budgetary cost estimate of \$1.28 million for the plant, tank and meters formed the basis of the successful grant application and a 2009 petition to borrow the \$430,000 local community share of the project funding; for a total project budget of \$1,282,800. The installation of customer water meters has been completed at a total cost of \$114,132, of which \$19,890 was funded by a Gas Tax grant, leaving a budget of \$1,188,558 for the tank and treatment upgrades.

As approved by the LHBC Water Local Service Committee (LHBC) 01 September 2009 the CRD has awarded a contract to Genivar, at a cost not to exceed \$81,585, to provide design and construction engineering services for a new DAF-based water treatment plant and a storage tank. This assignment does not include evaluation of treatment alternatives. Site reconnaissance and preliminary design commenced early in 2010, but was suspended in July 2010 when an updated project cost estimate revealed that the budget would not be sufficient to complete the work according to the original plan, including previously unresolved project details that had recently come to light.

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<sup>1</sup> The VIHA 4-3-2-1 Policy relates to water treatment objectives for the removal or inactivation of microbiological contamination, number of treatment methods and maximum limit for turbidity.

The updated cost estimate (prepared by staff) to complete the upgrade project as originally planned (customer meters, new DAF water treatment plant and 30,000 imperial gallon storage tank) is \$1.59 million, which exceeds the available project budget by \$287,000. This estimate considers 2009 and 2010 actual costs and tender prices for very similar CRD projects on Salt Spring Island. Based on this new information, a new tank and DAF treatment plant cannot be completed for LHBC without a substantial increase in funding.

In an informal meeting with staff on 23 August 2010, the LHBC members advised that increasing the project budget should be considered only as a last resort, and that alternatives should be pursued to meet project objectives without increasing the budget. Conceptual alternatives discussed included upgrading the existing treatment plant, and various means of collecting seepage or shallow groundwater in the immediate vicinity of the Money Lake dam.

### **ALTERNATIVES**

1. That the Lyall Harbour/Boot Cove Water Local Service Committee authorize the expansion of the scope of consulting services and related staff time to include evaluation of options for water treatment equipment upgrades based on source water quality data, and development of an upgrade plan and preliminary treatment process design that meets project scope, budget, schedule and regulatory requirements.
2. That the Lyall Harbour/Boot Cove Water Local Service Committee authorize the expenditure of up to \$10,000 from the capital project budget for staff time and expenses to petition the residents and property owners of the Lyall Harbour/Boot Cove water service area to borrow up to \$300,000 new funding for construction of a new water treatment plant based on a Dissolved Air Flotation process.

### **IMPLICATIONS**

#### Alternative 1

It is proposed to immediately engage a consultant to develop treatment upgrade plan based on the available water quality data that meets the project schedule and budget constraints. This work would produce a preliminary design and cost estimate for construction of treatment upgrades and a new balancing tank as required to achieve current regulatory requirements. It is estimated that the expansion of the scope of consulting services, including related CRD staff time, would not exceed \$20,000 (1.6% of the overall project budget).

The infrastructure grant agreement requires the project to be completed by March 31, 2012. The window of approximately 19 months to complete the work and claim grant funding will require that major components are ordered and construction begins as soon as practicable in order to complete and commission upgrades before the federal and provincial funding expires. Since the project and program deadlines have already been extended and the MRIF program is no longer active, a further grant schedule extension is highly unlikely.

#### Alternative 2


A DAF plant is expected to achieve full compliance with regulatory requirements for water treatment; however, the additional borrowing of up to \$300,000 required to complete construction of a DAF plant would require an annual budget increase of approximately \$33,000 for 15 years (based on 15-year borrowing through the Municipal Finance Authority at 6% interest). This would require a parcel tax increase in the order of \$200 for each of the 171 taxable parcels in the service area. The annual cost to operate a DAF plant is also likely to be greater than that of other treatment technologies capable of meeting the treatment objectives.

**CONCLUSION**

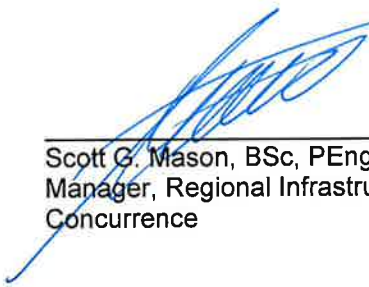
The costs to proceed with construction of a DAF plant outweigh the potential benefits. It is likely that alternative treatment approaches could achieve full compliance with regulatory requirements for drinking water treatment at a lower capital and life cycle cost than DAF. The services of a consulting engineer specializing in water treatment are required to evaluate options for water treatment upgrades based on source water quality data, and develop an upgrade plan that achieves the expected project outcomes.

**RECOMMENDATION**


That the Lyll Harbour/Boot Cove Water Local Service Committee authorize the expansion of the scope of consulting services and related staff time to include evaluation of options for water treatment equipment upgrades based on source water quality data, and development of an upgrade plan and preliminary treatment process design that meets project scope, budget, schedule and regulatory requirements.



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