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**REPORT TO WILDERNESS MOUNTAIN WATER SERVICE COMMISSION
MEETING OF FRIDAY 24 SEPTEMBER 2010**

SUBJECT WATER TREATMENT UPGRADE

ISSUE

Upgrades to water treatment for the Wilderness Mountain water service are required to comply with current regulatory standards and improve operational performance. 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. All grantable work must be completed by March 31, 2012.

BACKGROUND

As a condition of conversion of the Wilderness Mountain water system to a local service of the Capital Regional District (CRD) in 2008, the CRD required that the infrastructure be upgraded to comply with regulatory requirements. The existing water supply and treatment system consists of Wilfred Reservoir and the pumphouse where sodium hypochlorite is added as a disinfectant. Although the water is considered bacteriologically safe to drink, further water treatment improvements were proposed to comply with regulatory standards including the Vancouver Island Health Authority (VIHA) 4-3-2-1 Policy¹ (pursuant to the *Drinking Water Protection Act*) and the *Guidelines for Canadian Drinking Water Quality*.

The original cost estimate for a DAF water treatment plant and to improve mixing in the storage tanks was estimated to be \$708,000, which formed the basis of the provincial infrastructure grant application. In 2005, the CRD was awarded a grant under the Community Water Improvement Program, funding two-thirds of the project cost up to a maximum grant of \$472,000. Approval to borrow the balance of \$236,000 (and an additional \$45,000 for service conversion expenses) through the Municipal Finance Authority was approved by petition of the residents at the same time the service was converted.

Recent costs to construct DAF water treatment plants for CRD water service areas on Salt Spring Island were in the range of \$1.2 to \$1.4 million. Although those plants are somewhat larger than would be required for Wilderness Mountain, it is now apparent that construction of a new DAF plant for Wilderness Mountain would cost at least \$1 million.

The feasibility of connecting the Wilderness Mountain system to the CRD regional water supply system was considered in 2007, at the request of several service area residents. Such connection proved not to be feasible due to costs (estimated to be in the range of \$1.9 to \$4 million in 2007) and inconsistency with the CRD Regional Growth Strategy.

A water quality sampling and analysis program has been conducted by CRD staff in the past year for the purposes of monitoring drinking water quality as well as to assist with selection of appropriate water treatment process. The resulting data will enable a more rigorous approach to treatment process design than was previously possible. Based on the new data, a DAF plant may exceed treatment needs to meet regulatory requirements.

¹The 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.

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On April 28, 2006, a public health engineer from VIHA issued a Construction Permit (W-S-0809) for the addition of ultraviolet disinfection units and related equipment as an additional means of disinfection. Based on a recent conversation, this approach remains acceptable to the public health engineer, although further treatment measures would be required to meet the previously mentioned standards.

ALTERNATIVES

1. That the Wilderness Mountain Water Service Commission:
 - a) Authorize the expenditure of up to \$50,000 from the capital project budget for staff time, materials and expenses to design and construct improvements to the Wilfred Reservoir pumphouse including ultraviolet disinfection units, new chlorine dosing pump and a magnetic flow meter; and
 - b) Authorize the expenditure of up to \$20,000 from the capital project budget for staff time and consulting services to evaluate options for further water treatment upgrades based on source water quality data, and to recommend a treatment upgrade plan that meets project scope, cost, schedule and regulatory requirements.
2. That the Wilderness Mountain Water Service Commission authorize staff to petition the residents and property owners of the Wilderness Mountain water service area to borrow up to \$700,000 to construct a new water treatment plant based on a Dissolved Air Flotation process.

IMPLICATIONS

Alternative 1

The addition of ultraviolet light disinfection units, new chlorine dosing pump and a magnetic flow meter would provide immediate benefits by providing an additional means of disinfection and provide more reliable and consistent chlorine dosing. The cost to complete these upgrades would be minimized by using simple components that plug into standard 110 volt wall sockets and do not require centralized process control. The work would be completed by CRD engineering and operations staff, and is eligible for grant funding. The proposed equipment would be integrated into the overall upgrading project. However, these upgrades will not achieve full compliance with regulatory requirements during times of high source water turbidity or during an algae bloom. In addition, the addition of UV disinfection will not address the issue of disinfection by products and therefore, further treatment measures would be required.

Further, it is proposed to immediately engage a consulting engineering firm to develop a long-term 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 of the appropriate treatment process to comply with regulatory requirements. The combined Alternative 1 cost of \$70,000 represents about 10% of the overall upgrade budget, leaving \$638,000 available for implementation of the long-term upgrade plan within the original project budget and approved funding.

Alternative 2

It is expected that additional borrowing of up to \$700,000 would be required to complete construction of a DAF plant and this would require an annual budget increase of approximately \$77,000 for 15 years (based on 15-year borrowing through the Municipal Finance Authority at 6% interest). This would require a parcel tax increase of up to \$1,000 for each of the 81 taxable parcels in the service area. The annual cost to operate a DAF plant would also require a substantial increase in the operating budget.

CONCLUSION

The costs to proceed with construction of a DAF plant outweigh the potential benefits. A phased approach to improve water treatment could achieve substantial improvements immediately while a plan is being developed to achieve full compliance with regulatory requirements for drinking water quality.

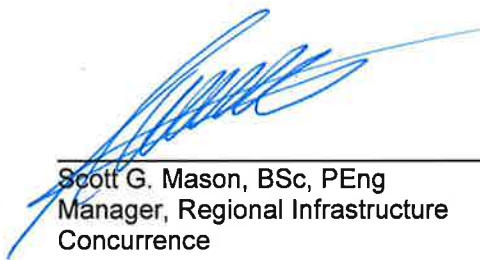
RECOMMENDATION

That the Wilderness Mountain Water Service Commission:

- a) Authorize the expenditure of up to \$50,000 from the capital project budget for staff time, materials and expenses to design and construct improvements to the Wilfred Reservoir pumphouse including ultraviolet disinfection units, new chlorine dosing pump and a magnetic flow meter; and
- b) Authorize the expenditure of up to \$20,000 from the capital project budget for staff time and consulting services to evaluate options for further water treatment upgrades based on source water quality data, and to recommend a treatment upgrade plan that meets project scope, cost, schedule and regulatory requirements.



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