



**REPORT TO CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE
MEETING OF WEDNESDAY 10 FEBRUARY 2010**

SUBJECT THE WESTSHORE WASTEWATER TREATMENT STRATEGY

PURPOSE

To request approval from the Core Area Liquid Waste Management Committee (CALWMC) for the Westshore wastewater treatment strategy as selected by the Westshore Wastewater Treatment Subcommittee (WSSC).

BACKGROUND

At its meeting of 02 June 2009, the CALWMC selected Option 1A as the preferred system configuration for the Core Area Wastewater Treatment Program (CAWTP). This option, as it relates to the Westshore, included a facility at the Juan de Fuca recreation centre for the representative costing in the federal funding submission.

At its meeting of 28 October 2009, the CALWMC approved the following motion:

That a subcommittee be struck consisting of the Board member from Colwood, the Board member from Langford, and as many representatives for their Councils as they desire to advise the Core Area Liquid Waste Management Committee on the wishes of their two communities as it relates to the sewage treatment project and future governance as per the terms of reference attached to the staff report.

The first meeting of WSSC was held 23 November 2009. The WSSC met three additional times between 01 December 2009 and 12 January 2010. The WSSC made a decision on the preferred wastewater treatment strategy at its last meeting, with the following resolution:

That the Westshore Wastewater Treatment Subcommittee approve the Option 5 Strategy for the Liquid Waste Management Plan Amendment—a 7 ML/d wastewater treatment plant at Colwood City Hall and 7 ML/d of treatment capacity at the proposed McLoughlin wastewater treatment plant with biosolids treatment at the central biosolids facility.

ALTERNATIVES

The WSSC reviewed and considered a number of wastewater treatment strategies and sites for the Westshore. The alternatives included a single wastewater treatment plant (WWTP), multiple WWTPs and two hybrid options that included a smaller WWTP(s) in the Westshore with some capacity at McLoughlin. The WSSC also received information on the options available for biosolids treatment and unit capital and operating costs for the various alternatives with and without participation in cost allocation for the core area facilities.

Wastewater Treatment Strategy Alternatives

In addition to Option 1A approved by the CALWMC, the WSSC reviewed four other wastewater treatment strategies; two Westshore stand-alone alternatives and two alternatives (Option 1A hybrids) with Westshore as participants in the entire CAWTP.

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Alternative 1

This alternative identifies the costs and unit costs of the 14 ML/d Option 1A Westshore WWTP at Juan de Fuca as a Westshore stand-alone facility.

Alternative 2

This alternative identifies the costs and unit costs for 3-5 ML/d WWTPs as Westshore stand-alone facilities; at Westhills, North Langford and the Colwood City Hall site.

Alternative 3

This alternative represents a hybrid of Option 1A with WWTPs at McLoughlin, Saanich East, a 5 ML/d WWTP at Colwood City Hall and a 3 ML/d WWTP in North Langford. The capacity at McLoughlin would increase from 84.1 ML/d to 91.1 ML/d to provide Westshore with a capacity allocation of 14 ML/d.

Alternative 4

This alternative also represents a hybrid of Option 1A with WWTPs at McLoughlin, Saanich East and a 7 ML/d MBR WWTP at Colwood City Hall. The capacity at McLoughlin would increase from 84.1 ML/d to 91.1 ML/d to provide to Westshore with a capacity allocation of 14 ML/d.

Biosolids Processing Alternatives

The WSSC was provided with information on the two alternatives for processing Westshore biosolids: at a central facility and a separate biosolids processing facility for the Westshore. The WSSC was presented with the capital costs for a Westshore biosolids facility that includes processes similar to those proposed for the central facility (i.e., digestion, biogas recovery and cleaning). The WSSC heard from the consultants that the savings from the economies of scale are significant for construction and operation of one biosolids facility for the CAWTP compared to constructing an additional biosolids facility for the Westshore.

The current Westshore population and corresponding wastewater flows are very low relative to the core area. A 7 ML/d WWTP will produce approximately 1,100 kg/day of dried biosolids which represents approximately 5% of the 2030 biosolids volume predicted for the CAWTP. The organic waste that would be collected in the Westshore also represents a fraction of the core area and it is likely that all digestible organic waste would be processed at a central facility prior to digestion anyway. In addition, the biogas generated from sludge digestion can be cleaned, compressed and injected into the natural gas grid more efficiently and cost-effectively at one location with no reduction in revenues or potential markets when compared to implementing two separate biosolids processing facilities.

FINANCIAL IMPLICATIONS

The Option 1A approved by the CALWMC on 02 June 2009 has a total capital cost of \$967.5 million. The capital cost for the various Westshore wastewater treatment strategy alternatives are provided below.

The capital costs for the Westshore stand-alone alternatives are \$131.8 million for Alternative 1 and \$298 million for Alternative 2. Both of these estimates include \$10 million as an allocation of capital costs for a portion of the central biosolids processing facility.

The capacity of the McLoughlin wastewater treatment plant can be increased to accommodate the additional 7 ML/d proposed at an estimated cost of \$ 3.5 million. The concrete tanks will increase slightly to accommodate the additional flow with minor increases in the headworks for additional hydraulic capacity and sizing for some equipment.

The capital costs for the Option 1A hybrids are \$987.3 million for Alternative 3 and \$960.8 million for Alternative 4.

Biosolids Processing Alternatives

The capital cost of a Westshore biosolids facility that includes digestion, biogas recovery and cleaning is estimated at \$68 million. The capital cost to provide biosolids processing at a central facility for the Westshore is approximately half of the capital costs to build a separate facility for the Westshore. A separate biosolids treatment facility for the Westshore would essentially increase the capital cost of the Westshore WWTP by about 50%.

Unit Capital and Operating Costs for Wastewater Treatment Alternatives

The unit capital and operating costs were calculated using the average dry weather design capacity for each alternative. The unit capital and operating costs costs for Option 1A approved by the CALWMC are \$3,085 per cubic metre and \$166 per cubic metre, respectively. The unit capital and operating costs for Option 1A less the Westshore WWTP is \$3,063 per cubic metre and \$163 per cubic metre, respectively.

The following table provides the unit capital and operating costs for each of the Westshore wastewater treatment strategies described above:

Wastewater Treatment Strategy Alternatives – Unit Capital and Operating Costs

Alternative	Unit Capital Cost (\$/m³)**	Unit Operating Cost (\$/m³)
1*	3,955	187
2*	7,065	309
3	3,121	171
4	3,065	166

* Unit costs for Westshore stand-alone

** Based on two-thirds funding

The implications for a Westshore stand-alone strategy are reflected in the comparison of the unit capital and operating costs for Alternative 4 and Alternative 1 in the above table. That is, both these wastewater treatment strategies include a 14 ML/d WWTP in the Westshore. The unit capital cost for this WWTP increases by over 25% if the Westshore were to go on its own. The core area unit capital costs decrease by approximately 1% with the Westshore on its own.

CONCLUSIONS

There are a number of conclusions that can be drawn from the information presented to the WSSC:

- 1) It is more cost-effective for the Westshore to participate with the core area in allocating costs for the entire system not just the Westshore facilities.
- 2) The resource recovery opportunities are maintained with the hybrid options. There is a transfer of available effluent heat from the Westshore to the core area.

- 3) Alternative 4 reduces the total capital cost of the CAWTP to \$960.8 million, a 1% decrease.
- 4) Alternative 4 provides additional flexibility to the Westshore and the core area to meet future wastewater flow increases.
- 5) The capital and operating costs for one central biosolids are significantly lower for the CAWTP with no net loss in revenues or market potential.

At its meeting of 12 January 2009, the WSSC confirmed its desire to move forward with Alternative 4.

RECOMMENDATIONS

That the Core Area Liquid Waste Management Committee approve:

- 1) Alternative 4 as the preferred Westshore wastewater treatment strategy;
- 2) the Colwood City Hall site as the preferred Westshore wastewater treatment plant location for the next Liquid Waste Management Plan amendment and federal funding submission;
- 3) that the Westshore Wastewater Treatment Subcommittee continue to explore siting opportunities that may provide economic (both operating and capital), social and environmental benefits to the project.

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