



**REPORT TO CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE
MEETING OF WEDNESDAY, OCTOBER 16, 2019**

SUBJECT Wastewater Treatment Project Options to Further Mitigate Costs

ISSUE

At the July 2019 Core Area Liquid Waste Management Committee meeting, staff were directed to report back on options to further mitigate ongoing costs related to the Core Area Wastewater Treatment Project, including challenges.

BACKGROUND

The development, construction and operation of the Core Area Wastewater Treatment Project (Wastewater Treatment Project, WTP or the Project) results in capital, debt servicing, operating and maintenance costs.

On April 17, 2019, the Core Area Liquid Waste Management Committee recommended the Capital Regional District (CRD) Board approve an increase of \$10M to the Project; a revision of the control budget from a business case approval of \$765M to \$775M. Subsequently, the Board approved the increase at the May 8, 2019, meeting. During the meetings, staff were asked to provide a comprehensive update on both ongoing and one-time impacts.

On July 17, 2019 the Core Area Liquid Waste Management Committee received a comprehensive update on both ongoing and one-time impacts (Appendix A). The transition from capital construction to operations will begin in 2020 with a number of project roles converting to operational roles. In addition, hiring of treatment plan operators will begin in 2020 to commence training and commissioning. 2020 operations costs will begin to budgeted and considered as part of the provisional budget review on October 30. The forecasted impact for 2021 is expected to increase from \$40M to \$42.7M (or 7%). The Committee directed staff to report on options on how to further mitigate ongoing impacts.

ALTERNATIVES

Alternative 1

That the Core Area Liquid Waste Management Committee recommend to the Capital Regional District Board:

That the Wastewater Treatment Project Options to Further Mitigate Costs report be received for information.

Alternative 2

That the report be referred back to staff for more information.

IMPLICATIONS

Table 1 summarizes the options evaluated and a brief context statement for each constraint. Following the table, additional detail for each option is provided.

Table 1 – Summary of Cost Mitigation Options Evaluated

Option	Consideration
Changing Chemical Coagulant	Specific chemical coagulant is defined to meet contractual performance obligations in an agreement with the vendor
Installation of Solar Panels	Evaluation and viability of solar as a sustainable power source to reduce ongoing impacts
Land Application of Biosolids	Board resolution banning land application
Reduce Regulatory Reporting Requirements	Subject to approval from Federal and Provincial regulators
Reducing Annual Debt Payments	Board approval of financing strategy and lengthening terms of debt would result in increases to total cost of borrowing
Delay Transfers to Asset Replacement Reserves	Board approval of a corporate asset management strategy, including lifecycle management, maintenance and replacement

Changing Chemical Coagulant

In 2016, Stantec Consulting Ltd. reviewed 34 treatment options that had been developed for the Core Area Liquid Waste Management Plan (CALWMP) since 2006. This review included a preliminary screening to short list the top 10 options which were further analyzed using a Triple Bottom Line (TBL) evaluation. During the TBL evaluation, Stantec updated capital and operating cost estimates from previous studies which were incorporated in the 2016 Business Case. These estimates were at a conceptual level for the purposes of screening technology and system configuration options, and were based on the assumptions that alum would be used as the coagulant for wet weather and backwash treatment and that coagulant would not be required for the tertiary disc filters.

Prior to financial close in early 2017, HRP completed pilot plant testing for the disc filters and concluded that continuous coagulant dosage of ferric chloride plus polymer was needed to meet their contractual performance obligations.

As both alum and ferric chloride are acceptable coagulants in WWTP application, the decision of using one instead of the other chemical and /or the specific dosage rate (to the treatment process) are often determined at the time of commissioning or during operation depending on the availability and fluctuating commodity market price of chemicals at the time of operation. The general principle in process design is to design flexibility to accommodate various potential chemicals in the future operation.

HRP has provided Performance Guarantees for the McLoughlin Point WWTP based on their pilot testing using ferric chloride. Therefore, it is not recommended to change the type of coagulant proposed by HRP during the two year Performance Period to ensure the treatment processes

operate as designed. However, as soon as the WWTP is operational and during the Performance Period, the CRD and Stantec will be conducting an evaluation and pilot testing using alum and potentially other alternative coagulants. If the effectiveness of the treatment process using a different coagulant can be confirmed during pilot testing, the resulting chemical cost adjustments could be reflected in the operating budget as early as 2023. HRP has confirmed that the proposed piping, valves, storage tanks and chemical feed pumps are compatible with the identified alternative coagulants.

Installation of Solar Panels

The Committee specifically requested that staff report on the feasibility of installing a sustainable power source, namely, solar panels on the roof of the treatment plant to mitigate ongoing utility costs. Analysis included the economic vitality to support the electrical loads at the WWTP and whether a reasonable return on investment could be achieved.

The Capital Regional District commissioned Stantec to investigate the feasibility of installing solar panels as an alternative energy source at the McLoughlin Point treatment plant. The investigation included an analysis of solar as an energy source including specific locations where it could be installed. The investigation found that due to current technology and environmental conditions, solar power is not viable due to low annual solar potential at 1110 kWh/kW in Victoria, BC; this does not allow for solar generation to be installed with a positive return on investment. The maximum solar power that could be generated from the McLoughlin site was estimated to be 459kw, the ability to generate approximately 3% of the required annual usage. The capital cost is approximately \$1.5M (+100%/-35%) resulting in an estimated pay-back period of 49 years.

Other non-monetary factors such as environmental awareness and leadership in energy conservation may be future considerations.

Land Application of Biosolids

The CRD Biosolids Beneficial Use Strategy (Definitive Plan) was received by the CRD Board at its meeting on June 12, 2019, and submitted to the BC Ministry of Environment and Climate Change Strategy for consideration. Under this Definitive Plan, the CRD is proposing for the short-term to contract with the cement industry in the BC lower mainland to utilize biosolids as an alternative fuel for the cement kilns. This approach is in alignment with both with CRD Board policy to ban the land application of biosolids generated at a CRD facility and with provincial guidelines for beneficial reuse. At this time, the Definitive Plan has not been approved by the BC Ministry of Environment and Climate Change Strategy.

Staff retained Sylvis Environmental to explore the options and potential costs for utilizing the dried biosolids for land application, in the event the Board reversed the land application policy. A series of white papers prepared by the consultant are appended in Appendix B. Local non-agricultural land applications could include turf and landscaping management for areas such as golf courses, sod farms and nurseries. Other options, including mine reclamation, ecosystem restoration and forest fertilization, are also possible but would involve longer trucking distances.

Actual handling and transportation costs, as well as with market interest in the product, cannot be confirmed until the CRD issues a formal RFP. Based on information gathered and presented in the white papers, and in discussion with other jurisdictions that apply biosolids to land, total costs including capital for storage, trucking and handling are estimated to be comparable to utilizing the biosolids at cement kilns on the lower mainland, and in some cases are projected to be higher.

Reduce Regulatory Reporting Requirements

Under the Core Area Liquid Waste Management Plan, the CRD has commitments designed to meet provincial and federal regulatory requirements.

The Core Area Wastewater and Marine Assessment program assesses the effects of wastewater discharges on the marine receiving environment and reports information to provincial and federal regulators. The shift from primary to tertiary treatment and improved effluent quality is anticipated to support a significant reduction in overall monitoring efforts. The provincial regulator requires demonstration of improved receiving environment quality before initiating discussions of reduced monitoring efforts. Staff anticipate those discussions towards the end of the current 5 year budget cycle (i.e., 2023-2024). Discussion to harmonize provincial and federal requirements have stalled; federal wastewater monitoring requirements will not be reduced under the reconfigured treatment plan. In the event that the two regulatory schemes are harmonized in the future, monitoring and reporting efforts will be further reduced.

The budget for liquid waste management planning in the core area has been decreased by approximately 22% (\$94k) for the next budget cycle to align with anticipated reduced planning requirements.

Reducing Annual Debt Payments

In January 2019 the CRD Board approved a financing strategy for the WTP including approval of a \$60M long-term debt issuance to ensure that the CRD is able to leverage current market conditions, mitigate risk of interest rate fluctuation, minimize short-term financing expense, continue to meet cash flow requirements and optimize on the lowest cost financing structure to its participants.

The financing strategy included a plan to apply \$12M of the annual requisition to annual debt servicing and to a debt servicing reserve (DSR), allowing for the repayment of long-term debt issuances at the first renewal option (10-years). The overall strategy resulted in all MFA long-term debt (excluding FCM debt) being repaid by 2032, or in 13 years.

Table 2 summarizes the net savings to its participants if debt is repaid by 2032 versus amortizing over 25-year terms.

Table 2 – Financing Options Evaluated

	Approved Strategy	Lower Annual Payment	Variance
Total Debt	\$114.1	\$114.1	-
Annual Debt Servicing	\$7.0	\$7.0	-
Annual DSR	\$5.0	-	\$5.0
Total Annual Requisition	\$12.0	\$7.0	\$5.0
Debt repaid by	2032 (13 years)	2046 (28 years)	15 years
Total cost of financing	\$28.6	\$50.0	\$21.4

While annual debt payments would be reduced from \$12M to \$7M, the total cost of borrowing would increase by \$21M as debt would now be paid off in 2046 instead of 2032.

Delay Transfers to Asset Replacement Reserves

On March 13, 2019, the Board approved a Corporate Asset Management Strategy. This strategy outlines how the CRD will apply an integrated approach, evidence-based decision-making, life cycle management and continuous improvement to maintain the service levels across the capital region. It established seven asset management principles, developed in alignment with industry practices and organizational values and priorities, including full life cycle costs in financial decisions.

The key objectives of the Corporate Asset Management Strategy are to:

1. Establish asset management guidelines and targets to ensure all divisional activities are in alignment with organizational priorities.
2. Specify tasks in a detailed Improvement Action Plan to achieve the objectives of the Corporate Asset Management Policy and to improve the CRD's asset management program.
3. Provide a baseline understanding of asset management practices.

Risks for consideration:

- The current WTP was built with significant funding support from the provincial and federal governments across Canada and our financial strategy moving forward will be key in sustaining the delivery of the service at the end of the equipment's expected life cycle.
- Climate change is impacting risk management of service delivery, with a need to ensure sustainability and asset replacement in the future.
- Service life of assets may be impacted by changes in treatment and conveyancing demand.

To mitigate these risks, staff will develop a Sustainable Service Delivery Plan (also known as an asset management plan) for the service. Key outputs of this plan will include in-depth knowledge of risks associated in managing these assets throughout its lifecycle by way of a risk register, enabling financial decisions that are risk-based such as reserves balances. As a general benchmark, the [Canadian Infrastructure Report Card](#) recommends an average 2% re-investment rate on wastewater infrastructure.

As shown in the July report to committee, staff have deferred the transfers to the asset replacement reserve in consideration of the financial implications and risk management of a new asset.

CONCLUSION

With capped funding agreements from senior governments in place, all increases to both the control budget and ongoing impacts are the responsibility of the CRD. The requisition ramp up was anticipated to stabilize at \$40M. Based on decisions and Board direction to date, the \$40M requisition is allocated to debt servicing, asset management, RTF capital and operating payments.

Based on current forecasts, ongoing impacts are expected to exceed \$40M in 2021. Staff will continue to refine estimates and forecasts through project completion, including monitoring of assumptions, variable costs, and their impact to total ongoing costs.

RECOMMENDATION(S)

That the Core Area Liquid Waste Management Committee recommend to the Capital Regional District Board:

That the Wastewater Treatment Project Options to Further Mitigate Costs report be received for information.

Submitted by:	Nelson Chan, MBA, CPA, CMA, Chief Financial Officer
Concurrence:	Ted Robbins, B.Sc., C.Tech., General Manager, Integrated Water Services
Concurrence:	Larisa Hutcheson, P.Eng., General Manager, Parks & Environmental Services
Concurrence:	Robert Lapham, MCIP, RPP, Chief Administrative Officer

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Attachments

Appendix A – Staff Report re: Wastewater Treatment Project Capital and Operating Budget

Appendix B – Executive Summary re: Biosolids as a Tool in Agricultural Land Application Management Options