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Report #EHQ 09-39

REPORT TO CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE
MEETING OF WEDNESDAY 13 MAY 2009

SUBJECT **SUSTAINABILITY ASSESSMENT FRAMEWORK (SAF) UPDATE – CORE AREA WASTEWATER TREATMENT PROJECT**

PURPOSE

To consider the triple bottom line in the evaluation of the three options of the distributed management scenarios.

BACKGROUND

The SAF is an enhanced triple bottom line (TBL) approach. It includes three distinct yet inter-dependent elements which are multi-objective alternative analysis (MOAA); risk identification and analysis; and decision process. The MOAA is a procedure to evaluate, screen and select a preferred alternative.

The consulting team identified three wastewater management strategies to the Core Area Liquid Waste Management Committee (CALWMC) in the 28 January 2009 presentation of discussion paper 036 DP-1 *Identification and Evaluation of Resource Recovery Opportunities*.

The three wastewater management strategies are:

1. Three wastewater treatment plants (WWTP) with a wet weather facility at Clover Point.
2. Five WWTP with a wet weather facility at Clover Point
3. Ten WWTP with wet weather facilities at Clover and Macaulay / McLoughlin points.

The consultant's presentation and briefing paper provides a description and graphical illustrations of capital costs versus the number of WWTP along with the corresponding annual costs and revenue potentials for the year 2030. This information shows that the increase in capital costs with the increasing number of WWTP does not yield the same increase in revenue potential. It also shows that the annual operating costs increase with the number of WWTP. The briefing memo indicates that the discussions over the next few months, along with triple bottom line analysis, will establish the preferred strategy.

Seven open houses were held throughout the core area and west shore and this information was displayed and staff members were available to answer questions. On total, approximately 550 people attended these sessions. Five public dialogue sessions were held, along with other outreach efforts to secure public input into the triple bottom line and assist the CALWMC in evaluation of the options.

The SAF Update (Attachment A) incorporates findings from the consultation process as well as least cost options for treatment.

SUMMARY/CONCLUSIONS

A SAF has been developed and updated to assist the CALWMC in the evaluation of three options for a distributed treatment system. These three options were presented at the committee meeting of 28 January 2009. Capital costs, operating costs and resource recovery revenues were provided at the meeting of 25 February 2009. Information has been provided to the public through a series of open houses, with specific input on the triple bottom line gathered at a series of public dialogue sessions. The updated SAF incorporates these findings.

RECOMMENDATION

That the Core Area Liquid Waste Management Committee receive this report for information.

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DK:ta
Attachment: 1

MEMO

Date:	May 6, 2009	**File No.:**	
To:	CRD Core Area Liquid Waste Management Committee		
From:	John Spencer		
Project:	Core Area Wastewater Treatment Project		
Subject:	Sustainability Analysis Framework (SAF) Application Update – Briefing Memo for CALWMC Meeting – May 13, 2009		

1 OBJECTIVE

The sustainability assessment framework (SAF) is currently being updated to incorporate findings from the community consultation process that has been underway over the last month and to incorporate least cost options for sewage treatment. On March 25, the CALWMC adopted a motion directing staff to prepare a least cost option:

> *That the staff be directed to request that the consultants prepare a least cost option for sewage treatment that will meet both the requirements of the Provincial Government and the standards agreed to by the Council of Environment Ministers*.

This memo discusses the update process and application of the Sustainability Analysis Framework (SAF) to the newly formed variations of Option 1 and changes to the framework to incorporate community dialogue results and requirements of the Provincial Government and the Council of Environmental Ministers.

The SAF is being prepared to assist the CALWMC reach a decision on a preferred option that will lead to a Liquid Waste Management Plan amendment by year's end to build capacity toward sustainable infrastructure.

2 OVERVIEW OF SAF

The SAF is the enhanced triple bottom line (TBL) approach that considers the economic, social and environmental effects of different options in an asset management context (full life-cycle costing). It includes the three distinct yet interdependent elements of a multi-objective alternative analysis; measuring the achievement of objectives; risk identification and analysis; and a decision process.

Through these elements, the SAF provides a method of developing and evaluating options that address multiple objectives. The evaluation provides a base for identifying and mitigating risks and incorporating management across all resources.

This enhanced triple bottom line analysis is referred to as multi-objective alternative analysis (MOAA). The MOAA begins with the establishment of objectives (Goals, Objectives and Criteria), and uses established performance measures to assess how each option achieves or meets the goals and objectives. Weighting is sometimes used to differentiate the relative importance of objective. Once each alternative is assessed on how well it performs against each objective, scores and weights can be assigned. In the assessment to be provided on May 13th, equal weighting will be used for each objective.

Performance scores display information to help the PRT optimize the return on the investment. Using a MOAA the CALWMC can evaluate both financial and non-financial factors in a balanced fashion in-lieu of attempting to reduce all factors to financial measures.

The risk identification and analysis (RIA) is a specific, and separate, effort that analyzes risks associated with each option against each objective. The MOAA and the RIA provide the basic framework for assessing options under consideration to achieve resource integrated and sustainable secondary treatment.

Taken together, the MOAA and RIA inform decision makers as they take into account other local and regional policy considerations (i.e., "Living Smart" and "Climate Action Plan") to make a strategic decision and adopt an a Liquid Waste Management Plan Amendment..

The CALWMC reviewed the application of these tools at past meetings and workshops. That application was specific to three options. What has changed since that review is the motion by this committee to create a least cost option and community consultation. This memo discusses the incorporation of a least cost option into the MOAA as well as revisions to the goals and objectives, criteria and weighting that reflect the results of community consultation to date. Analytic results will be provided to the Committee on May 13.

3 THE LEAST COST OPTION – VARIATIONS ON OPTION 1

Development of a least cost option followed from comments received from the Peer Review Team (PRT).

The PRT asked the consultant team to develop the costs for two variations on Option 1, which would combine the two wastewater treatment plants (South Colwood and McLoughlin Point) into a single larger plant in South Colwood (called the "gravel pit" site). These variations were termed Options 1B and 1C (the original Option 1 was termed 1A). The difference between the two variations is how the wet weather flows are handled.

Pending a decision by the CALWMC regarding options 1B and 1C, a SAF analysis can be performed.

4 COMMUNITY DIALOGUES

Community dialogues have taken place over the past several weeks. A separate memo characterizes these results has been delivered to the committee under separate cover. A large portion of the community dialogue comments point to how the communities would like to be involved in the process and what they expect from the implementation of the solution and leading a sustainable future. A number of dialogue items point to principles that citizens expect to be considered in the selection of a preferred option. The list below captures these items and references their origin in the community dialogues summary:

- Equal Weighting: Equal consideration and respect for each component (economic, social, environmental) of the triple bottom line (no weighting) and the need to make a balanced decision [Key Theme]
- Adaptable: To be adaptive enough to embrace future opportunities [Key Themes]

- Enabling: To incorporate resource recovery in a strategic and well thought out way, not necessarily out of a rushed need [Key Theme]
- Phased implementation or staging: For the overall project to take a phased approach for a number of widespread reasons [Key Theme]
- Carbon Footprint: The need and opportunity to reduce our collective carbon footprint and think progressively and innovatively [Opportunities Expressed]
- Good Neighbour: Ensure the facility(ies) is aesthetically designed and acceptable to fit into neighbourhoods
- Mitigated: Limit impact to adjacent homeowners and businesses [Social: Respect for the Community Character]
- Compliance Assurance: Stringent monitoring and limit the noise or smell impact from facility(ies) [Social: Respect for the Community Character]
- Efficient and effective: The need for the public confidence in knowing their money is being well spent while achieving optimum efficiencies in the treatment process [Economic: Value and Performance]
- Resource Utilization: Maximize opportunities to generate revenues from resource recovery in a responsible fiscal manner [Economic: Value and Performance]
- Rate Impact: Clearly understand the negative financial impacts to residents and communicate them [Economic: Accountable and Responsible]
- Resource Utilization: Incorporate multifaceted resource recovery technologies such as heat, energy, water and all in the most effective and efficient manner possible [Environment: Ensure Environmental Best Practices]
- Carbon Footprint: Ensure the carbon footprint of the facility(ies) respects the environmental impacts it creates in its surroundings [Environment: Protect and Reduce Long Term Environmental Impact]
- Flexible: Build in flexibility to ensure maximizing of future opportunities [Environment: Demonstrate “Green” Leadership]
- Innovative: Integrate innovative and leading edge technologies for treatment and resource recovery [Environment: Demonstrate “Green” Leadership]

These elements specifically relate to the communities’ expectations in applying the multi-objective alternative analysis.

Consultation with the Ministries of Community Development and Environment staff as well as incorporation of guidance from Provincial Policy Documents such Climate Action Plan have resulted in further changes to the MOAA criteria and performance measures.

5 REFRESHED MOAA APPLICATION

The formation of additional options and the consultation/community dialogues results require a refreshed MOAA application to determine the social, economic, and environmental return on investment. The three variations of option 1 are added to the MOAA. The comments created by the community dialogues require two major changes: equal weighting among the three fundamental criteria; and modifications to the criteria set to clearly reflect the communities’ interests.

The weighting of the three fundamental criteria (social, economic, and environmental) was originally unequal in weight. They were unequal because the belief that the cost (economic element) of delivering the solution would be of equal importance to the combination of social and environmental elements. The community dialogues clearly indicate this is not the case. All three fundamental elements should be of equal weight.

The weight of the fundamental element should then be equally distributed among the criteria that refine that fundamental element.

A sensitivity analysis will continue to be performed in which the weighting will be adjusted to between the three fundamental criteria to identify how significant a change in weighting must be before the options change position in a ranking of their overall performance. Each element (social, economic and environmental) is "stressed" in this analysis.

The original criteria have been modified to reflect the results of the community dialogues. These modifications have been made to ensure all of the community expectations are captured. The tables below display the criteria within the three fundamental elements of environment, social, and economic. The words highlighted in red are either additions or modification to criterion. One criterion has been removed – Ensure support of future growth in the social element. The community dialogues did not point to this need. One criterion has been added, the revenue generation criterion (F3) to the economic element.

Environment - Protect Public Health and the Environment		
E1	**E2**	**E3**
Compliance assurance in meeting regulatory targets	Minimize the impact of the facilities footprint with respect to environmental impacts to surroundings	Maximize use of strategic, flexible, and multi-faceted resource recovery

Social - Manage Wastewater in a Sustainable Manner		
S1	**S2**	**S3**
Ensure facilities are and acceptable to fit into neighbourhoods (aesthetics, noise, odour)	Maximize adaptation and flexibility to current and future technology opportunities	Maximize opportunity to reduce the carbon footprint progressively and innovatively

Economic - Provide Cost Effective Wastewater Management		
F1	**F2**	**F3**
Minimize lifecycle costs	Maximize phasing or staging potential to reduce rate impact	Maximize revenue from resource recovery

6 NEXT STEPS

The Sustainability Assessment Framework (SAF) analysis should be applied to the six options – Options 1A, 1B, 1C, 1D, 2 and 3 – with the refreshed set of criteria and weighting that is reflective of the community dialogues in the MOAA. This will ensure the input from the public consultation process to be considered in the criteria selection and weighting. The Committee will consider the rating of the options against the criteria set and use the results of the MOAA method to gauge option overall performance. A decision can then be made on the preferred strategy of the Core Area Wastewater Treatment Project. This entire process will ensure that today's expectations of sustainable infrastructure performance and integrated program management across resources are tomorrow's standards.

CRD Option Analysis

Weights and Ratings input sheet, scales and notes are found below

	Triple Bottom Line Goal	Environment - Protect Public Health and the Environment			Social - Manage Wastewater in a Sustainable Manner			Economic - Provide Cost Effective Wastewater Management		
	Goal Weight	0.333						0.3330		
		E1	E2	E3	S1	S2	S3	F1	F2	F3
	Criteria	Compliance assurance in meeting regulatory targets	Minimize the impact of the facilities footprint with respect to environmental impacts to surroundings	Maximize use of strategic, flexible, and multi-faceted resource recovery	Ensure facilities are and acceptable to fit into neighbourhoods (aesthetics, noise, odour)	Maximize adaptation and flexibility to current and future technology opportunities	Maximize opportunity to reduce the carbon footprint progressively and innovatively	Minimize lifecycle costs	Maximize phasing or staging potential to reduce rate impact)	Maximize revenue from resource recovery
	Criterion Weight	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111
Option 1A (previously Option 1)	Macaulay/Mcloughlin Clover Point (Wet Weather) Saanich East West Shore B Royal Roads (solids)									
Option 2	Macaulay/Mcloughlin Clover Point (Wet Weather Screen) Saanich East West Shore B Royal Roads (solids) Ogden point (Victoria Harbor) JDF Recreation (STP Base Load, Outfall, No Solids)									
Option 3	Macaulay/Mcloughlin Clover Point (Wet Weather Screen) Saanich East West Shore B Royal Roads (solids) Ogden point (Victoria Harbor) JDF Recreation (STP Base Load, Outfall, No Solids) West Shore C Bear Mountain									

Description	How well does the option meet regulatory targets for return of effluent to environment? How well will the option assure continued long-term regulatory compliance?	How well does the option minimize impacts at treatment plant sites and conveyance routes on plant and animal habitats?	How well does an option enable use of available energy and reclaimed water?	How well does an option reduce both construction phase and long-term impacts (odour, visual, noise, and traffic concerns) on residences and adjacent land-uses?	How well does the option present the opportunity for technological adaptation?	How well does the option minimize the carbon footprint?	Minimize net present value	Minimize Stage 1 capital costs	What revenue can be generated by the option in resource recovery?
Scale	1=likely non-compliance over time, 3=occurrence of non-compliance will be minimal, 5=high certainty of maintaining compliance over time	1=likely significant reduction in habitat or taking of endangered species habitat 3=no taking of endangered species habitat and minimal impact to other habitat 5=no taking of endangered species habitat or other plants/animals habitat	1=Low existing demand, and continued low demand through 2020 3=Moderate existing demand, moderate growth after 2010 5=Low existing demand, substantial opportunity after 2010	1=Major disruption to residential activities during construction and long-term operation and minimal mitigation possibilities 3=Disruption during construction with minimal or mitigated long-term operational impacts 5=no noticeable impact from construction or operations	1=Facility structures are highly constrained and unique in design not allowing for future technological changes highest difficulty 3=Facility structures are not unique 5=Facility implementation is staged over time to capture developing technologies over long period	1=least carbon offset. 3=moderate carbon offset. 5=greatest carbon offset	1=highest 3=moderate 5=lowest	1=highest 3=moderate 5=lowest	1=highest 3=moderate 5=lowest
Notes	How well do the options assure compliance with regulatory requirements over time. All options will be designed to meet regulatory requirements. The question is, how well do each of the options assure maintaining compliance over time. Each of the options must manage wet weather flows. All options are designed to meet secondary treatment standard using a "blended approach". . This criterion is designed to measure how effectively each of the options provides for management of wet weather flows.		While each of the options is designed to capture all the heat available and the cost of doing so is calculated in the net present value, this criteria measures the extent to which an option will enable future heat recovery and water re-use. Results from environmental assessment of opportunity areas were used to create this rating. It is the average of the environmental performance of all the opportunity areas that are associated with each option.	While odor control and visual/aesthetic impacts are minimized through use of odor control technologies and application of low profile and/or architectural and landscape improvements, this criterion measures the how well an options achieves low impact.	This criterion is a measure of how an option may allow for future technological improvements. Examples of improvements may include technology to increase removal of pharmaceutical products or constituents such as nutrients.	Thousands of tons of reduced CO2 emissions translated to 1-5 scale	This cost in $CDN translated to 1-5 scale. Total NPV in 2008 dollars for the Base Scenario for the 3 Options		