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Report # EWW 10-04

REPORT TO CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE
MEETING OF WEDNESDAY 13 JANUARY 2010

SUBJECT **POTENTIAL PROGRAM DELIVERY OPTIONS, CORE AREA WASTEWATER TREATMENT PROGRAM**

PURPOSE

To provide the Core Area Liquid Waste Management Committee (CALWMC) with information and to receive comments regarding potential options for procuring/delivering the Core Area Wastewater Treatment Program (the program).

BACKGROUND

In a letter dated 14 December 2007, and also in subsequent letters, the Minister of Environment requested the Capital Regional District (CRD) to review the use of public-private partnerships as a means of procuring the program compared with other more traditional procurement approaches. The discussion paper, *Core Area Wastewater Treatment Program - Potential Program Delivery Options* dated 06 January 2010, is attached as Appendix A and addresses this request. In summary, this discussion paper:

1. Describes the major program components
2. Outlines potential procurement options for each component.
3. Provides preliminary assessment criteria evaluating environmental, social and financial/risk issues of the potential procurement options.
4. Summarizes feedback received from the market consultation conducted in 2008 on procurement packaging options.
5. Describes potential procurement options identified as feasible during the market consultation process.

This discussion paper does not make recommendations on specific program delivery options or procurement methodologies. This will be included in the business case which will be submitted to the CALWMC in February.

In an effort to engage the community specifically regarding the procurement options for the wastewater project, a public and stakeholder program has been designed to begin in mid February. CRD staff intends to utilize multiple public participation techniques and facilitation styles to ensure all perspectives are heard. Throughout this program, the discussion paper will be available to residents and community stakeholders for comment.

Two public open houses will be scheduled for mid February and will provide opportunity for residents to become more informed on the topic, to engage CRD staff in dialogue about their key issues and for their opinions to be recorded.

A full day community stakeholder's workshop has been specifically designed to allow for in depth discussions to occur on key issues and opportunities brought forward by the participants. To ensure a well balanced discussion occurs, CRD staff is looking to engage a wide spectrum of community stakeholders who represent a range of perspectives on this issue.

Following the open houses and community workshop, a special CALWMC meeting will be scheduled and publicized. This will provide members of the public opportunity to specifically address the CALWMC on this issue.

A staff report will be submitted to the CALWMC meeting of 24 February 2010 which will include the community workshop's key outcomes, a summary of public opinions gathered from the two open houses and any comments received through www.wastewatermadeclear.ca.

Additionally, the CALWMC will receive input from the peer review team on the business case prior to a final decision being made.

FINANCIAL IMPLICATIONS

This work will be funded through the Core Area and Westshore Wastewater Treatment Capital Fund.

SUMMARY

The attached discussion paper describes potential procurement options and means of evaluating them for the wastewater treatment program. It is proposed that the public be consulted through open houses, and that a stakeholder's workshop and a special CALWMC meeting be held prior to making a decision on this issue.

RECOMMENDATIONS

That the Core Area Liquid Waste Management Committee receive for information Appendix A, discussion paper *Core Area Wastewater Treatment Program - Potential Program Delivery Options* dated 06 January 2010.

Dwayne Kalynchuk, PEng
Project Director, Core Area Wastewater Treatment

SM/jta

Attachment: 1

DISCUSSION PAPER

Capital Regional District

Core Area Wastewater Management Program

Potential Program Delivery Options

January 6th, 2010

Introduction

This discussion paper summarizes the procurement delivery options to be analyzed by the Capital Regional District (CRD) in its business case for the Core Area and West Shore Wastewater Program (the "Program"). It also identifies the preliminary evaluation criteria to be used in the business case for procurement analysis purposes.

Importantly, this discussion paper does not evaluate the procurement options. Such evaluation work is ongoing by the CRD and will be included in the final business case submitted to the Province of British Columbia in support of funding for the Program.

The CRD is seeking Provincial funding support of approximately $306-million. In British Columbia, all projects in excess of $50-million must comply with the requirements of the Province's Capital Asset Management Framework (CAMF).[1] CAMF requires the CRD to review the use of alternative procurement methods in its business case including public-private partnerships ("PPP or P3").

The CRD's preferred configuration for the Program is referred to as "Option 1A" and has been documented in the engineering report "*CRD Core Area Wastewater Treatment Program Wastewater Treatment Plant Option 1A*" prepared by Stantec Consulting Ltd. and Brown & Caldwell, December 08, 2009. The biosolids treatment plan is documented in the report entitled "*Core Area Wastewater Program Biosolids Management Plan Option 1*".

The scope of the Program is summarized in Appendix A.

Appendix B contains a summary of the *Market Sounding & Stakeholder Consultation*, April 2008, related to (i) procurement packaging, and (ii) procurement options.

Appendix C contains a summary of potential procurement options considered by CRD.

The actual procurement plans for each of the major components of the Program will not be finalized and implemented until CRD has established funding commitments from the Provincial and Federal governments.

[1] Details on the Province's requirements are documented here: http://www.fin.gov.bc.ca/ocg/fmb/manuals/CPM/05_Capital_Asset_Mgmt.htm

Program Delivery Planning Methodology

The CRD has significant flexibility in the types of procurement approaches it uses for the major components of the Program. Each of the major components can feasibly be delivered using a variety of procurement methodologies – from traditional design-bid-build to public-private partnership. Given the risk profile, overall scale, and specialized technical requirements of certain components of the Program, it is likely that a variety of contracting strategies will be required for successful implementation. There is no one-size-fits-all approach to delivery of wastewater infrastructure. Virtually every type of procurement methodology has been successfully used for delivery of wastewater projects across North America. This was confirmed during the market sounding and stakeholder consultation process conducted by the CRD and its advisors (April 2008).

Thus the CRD and its advisors implemented the following approach to procurement planning:

1. Identified the major components of the Program for procurement planning.

2. Identified the major procurement options to be analyzed in the business case to ensure the CRD's goals for risk transfer, value for money and social, environmental and financial goals will be achieved. A short-list of three[2] (3) major procurement methods are described below – Traditional, Hybrid and Public-Private Partnership.

3. Identified the key evaluation criteria to be used to assess each procurement option.

This discussion paper summarizes all three of the above steps. The actual evaluation of procurement options and a recommendation on the preferred procurement approach will be finalized in the business case submitted by the CRD to the Province.

[2] Appendix C summarizes the procurement approaches considered. These approaches were reviewed and matched to each major component by the CRD and its advisors based upon the stakeholder consultation and market sounding process.

Program Major Components

The table below breaks out the Program into its major components. Some of the major components have a unique risk profile, technical requirement or other characteristic allowing for stand-alone procurement (e.g. tunnel and outfalls). Other major components can be feasibly packaged together for bulk procurement at the discretion of the CRD (e.g. wastewater treatment facilities and the energy centre).

Program Major Component	Description
A. Conveyance system, pumping stations and storage facilities	The CRD currently operates the conveyance and pumping infrastructure for the main trunk lines within the region. CRD will continue to operate and maintain the new conveyance, pumping and storage facilities. New facilities will be procured in a conventional design bid build procurement. It is anticipated that pumping, conveyance and storage facilities will be procured in separate contracts because each type of work requires specialized contractors with different skill sets.
B. Wastewater treatment plants (liquids only)	The Core Area Program includes two main wastewater treatment facilities at Saanich East and McLoughlin Point, with a third pumping station and limited wet weather primary treatment facility at Clover Point. The existing Macaulay Point pumping station must be closely integrated into these wastewater treatment plants ("WWTP"). The West Shore Program includes an additional WWTP. Each of the WWTPs could be procured separately or all the WWTPs could be bundled together as a single procurement.
C. Energy Centre / Biosolids Facility	The Energy Centre could be procured separately or as part of a bundled procurement with the WWTP facilities. Based upon feedback received during the market sounding process, it would be desirable to have the main Core Area WWTP facility and biosolids facility operated by a single entity because the operation of these processes must be carefully coordinated.
D. Specialized construction work (Outfalls and Tunnel)	The outfalls and tunnel in the Program require specialized engineering and building expertise and thus the CRD has determined that they should be procured separately to "de-risk" the other major work packages and also foster competition among the small number of specialized firms that can provide these services.

E. Resource recovery which includes the following	The key factor in determining packaging and procurement options is the level of assumed integration with each WWTP and the Energy Centre. Resource recovery that can be physically separated from the WWTPs can be procured more flexibly than components that are integrated directly into the WWTP treatment process. The major resource recovery opportunities are anticipated to be as follows: • Biogas from Energy Centre digesters • Collection of fats, oils and greases (FOG) as well as other kitchen wastes and organics for inclusion in the digestion process • Biosolids reuse for energy generation of digested biosolids (e.g. cement kilns) • Struvite recovery • Water recovery from WWTPs • Heat recovery from wastewater effluent • Energy usage in heating district • Other (e.g. energy from digested biosolids used on-site for heat generation) See the table below for details on the bundling of each resource recovery component.
F. Special agreements with BC Hydro, University of Victoria and Terasen gas etc.	The CRD will review these special opportunities on a case-by-case basis and determine if direct negotiations and arrangements should be established between the CRD and each possible partner. Business arrangements for such opportunities will be reviewed as the Program moves forward. Under such special arrangements, the CRD will require any third party wastewater/service provider seeking to partner with such organizations to do so (i) on a non-exclusive basis, (ii) to inform CRD of all discussions related to work on the Program, and (iii) to provide CRD with the right, but not the obligation, to be a joint signatory to any agreement relating to the CRD Program.
G. Long-term plans to manage inflow and infiltration	Given complexity and overlapping jurisdiction issues of I&I, the CRD anticipates that I&I will continue to be managed by each client municipality within the CRD.
H. Demand Management and Source Control Programs	The CRD manages a variety of source control and demand management programs to control contaminants entering the wastewater system and also manage water consumption during summer dry months. All such programs shall remain controlled and managed by CRD.

Resource Recovery Bundling Assumptions

Resource Recovery Component	**Bundling with Other Major Component(s)**
Biogas from Energy Centre digesters	Can be structured as stand-alone procurement arrangement with clarification of interfaces with Energy Centre operator (if different from biogas service provider). Interface issues to be managed related to access to digesters, quality and quantity of biogas generated by digesters, etc. During the market sounding process Terasen indicated an interest in providing such a stand-alone biogas arrangement. There are also likely other parties who would be interested in purchasing biogas from the Energy Centre. These could include fleet vehicle operators and new developments or industry in close proximity of the Energy Centre.
FOG and Organics Collection	Current collections in the region are provided by private sector firms and the CRD is currently reviewing potential options. It is anticipated that the Energy Centre operator (or CRD) would receive a tipping fee for accepting such organic and kitchen wastes. It is also expected that any required pre-treatment and mixing of such organics prior to blending with the digester would be provided by the Energy Centre operator.
Biosolids reuse for energy generation of digested biosolids (e.g. cement kilns)	This component can be structured as a stand-alone arrangement between the Energy Centre operator (the CRD or other party) and the end-user of the biosolids (e.g. cement kiln operators). Alternative innovative applications could be considered during the procurement phase through use of an "alternative bid" process under a Design-Build or DBFO procurement approach.
Struvite recovery	Preliminary investigations suggest at least one party may be interested in providing this service on a stand-alone basis.
Water recovery from WWTP's	The membrane bioreactor (MBR) technology currently contemplated for water recovery is fully integrated into the WWTP. Thus separation of this service from general WWTP operations would be challenging. If implemented, water recovery is anticipated to be the responsibility of the WWTP operator with users being charged on a consumption basis. A separate water delivery contractual arrangement and sales program

	could be implemented by the CRD if desired to pre-sell and distribute such water to the end-user.
Heat recovery from wastewater effluent	Heat recovery may be used on-site for buildings. Such uses are clearly integrated into WWTP and Energy Centre operations. Heat recovery could be implemented as an option within a WWTP proposal as an add-on alternative bid.
Energy usage in heating district	Generation of energy for use in a heating district could be structured as an extension of the WWTPs or Energy Centre. The CRD would provide access to treated effluent for heat recovery (within the lot lines of each WWTP) to a potential third party partner. A service provider would be responsible for implementation of the heating district outside the lot lines of each WWTP – including piping ambient or hot water to users and, where necessary, retrofitting buildings or integrating into new buildings. The CRD anticipates such arrangements could be structured as stand-alone agreements, possibly as an allowed "alternative bid" during the procurement process if a Design-Build or DBFO approach to procurement is used. These opportunities would be subject to ensuring sufficient demand or market is available for this heat.

Potential Procurement Methods

Appendix C summarises the procurement methodologies considered by the CRD for the components of the Program. Based upon the feedback from the *Market Sounding and Stakeholder Consultation*[3] and input from CRD's engineering and business advisors, the CRD has identified the following three major procurement methods to be analyzed in the business case.

Each of these options is summarized in the table below with procurement assumptions for each major Program component identified.

Option A: Traditional Approach

This option generally uses Construction Management at Risk ("CMAR") or design bid build for elements of the Program.

The CMAR approach would involve the CRD engaging an Engineering Consultant and Construction Manager at the early project stages to refine the concept design, develop the detailed design and prepare a comprehensive project budget and schedule. Through a competitive process the owner would hire a construction manager on a fee basis to work with the engineer to provide preconstruction services including constructability, innovation, schedule and cost estimating input as the design progresses. Construction can start on early work packages on a sequential tender bases and once the overall design reaches the 80 to 90% stage the construction manager would provide a Guaranteed Maximum Price ("GMP") for the project. The construction manager typically enters a guaranteed maximum price and schedule with CRD under a cost-plus arrangement or stipulated price contract.

The construction manager would tender each package and enter multiple trade contracts with suppliers and sub-contractors and be responsible for ensuring the project is brought in at or below the GMP. The construction manager assumes responsibility for the performance of the trade contracts (subcontracts) much as a general contractor would under traditional procurement.

Under a design bid build approach the CRD engages an engineering consultant to prepare the design and contract documents. The consultant tenders the project, evaluates tenders and administers the construction contract. Under this arrangement the Owner assumes risks for unknowns or design omissions.

[3] Appendix B includes a summary of the results of the *Stakeholder Consultation and Market Sounding Process*. The full report is available online at the CRD's document archive: http://www.wastewatermadeclear.ca/media/archived-documents/

The CRD will be responsible for operating all facilities upon completion of construction.

The CRD will also retain the risk for long-term maintenance of the facilities and overall integration of the various components.

Delivery and operations of resource recovery components of the Program would vary by type of resource as described in more detail in the table below.

Option B: Hybrid Approach

This option utilizes a variety of procurement methodologies. The option generally uses the Design-Build approach to procurement for the wastewater treatment facilities, plus a design, build, finance, operate and maintain ("DBFO") approach for the Energy Centre and West Shore treatment plant. Construction Management at Risk or design bid build is assumed for the conveyance system, outfalls and tunnel. Depending on scheduling requirements it is also possible that some of the treatment facilities could be delivered using CMAR.

The CRD would operate the WWTP's developed as design-build or CMAR, and would also be responsible for all maintenance and repair risks beyond the warranty period (typically two years from completion of construction). The CRD would also operate and maintain the conveyance system and pumping stations. Components developed using a DBFO approach would be operated and maintained by a third-party service provider under a long-term contract. The CRD would own all facilities regardless of the procurement method.

The Design-Build approach to procurement is described in Appendix C.

Delivery and operations of resource recovery components of the Program would vary by type of resource as described in more detail in the table below.

Option C: Public-Private Partnership Approach

This option generally uses a DBFO approach to procurement for the WWTP's and Energy Centre. One large DBFO procurement package would be used for the Core Area components of the Program, with a separate DBFO for the West Shore WWTP.

The conveyance system, pumping stations, outfalls and tunnel would be procured using a Construction Management at Risk approach or conventional design bid build approach. The CRD would be responsible for operating and maintaining the conveyance system, tunnel and outfalls.

Resource recovery responsibility would generally be managed by DBFO service providers as described below.

Procurement Options for Each Major Program Component

Procurement Packages	Procurement Option A "Traditional"	Procurement Option B "Hybrid"	Procurement Option C "PPP/DBFO"
A. Conveyance System - trunk conveyance - pumping stations - storage facilities - monitoring & control	Design-Bid-Build CRD operates and maintains	Design-Bid-Build CRD operates and maintains	Design-Bid-Build CRD operates and maintains
B1. West Shore WWTP	Construction Management at Risk CRD operates and maintains	Stand-alone DBFO[a]	Stand-alone DBFO[a]
B2. Saanich East WWTP	Construction Management at Risk CRD operates and maintains	Progressive Design-Build or Construction Management at Risk CRD operates and maintains	Bundled DBFO[a] package including: Saanich East McLoughlin Point Clover Point Energy Centre/Biosolids Facility
B3. McLoughlin Point WWTP	Construction Management at Risk CRD operates and maintains	Design-Build[b] CRD operates and maintains	
B4. Clover Point WWTP	Construction Management at Risk CRD operates and maintains	Design-Build[b] CRD operates and maintains	
C. Energy Ctr./Biosolids Ctr.	Construction Management at Risk CRD operates and maintains	Stand-alone DBFO[a]	
D1. Outfalls	Traditional Procurement (either Design-Bid-Build or Construction Management at Risk) CRD operates and maintains	Traditional Procurement (either Design-Bid-Build or Construction Management at Risk) CRD operates and maintains	Traditional Procurement (either Design-Bid-Build or Construction Management at Risk) CRD operates and maintains

[a] Note all DBFO options are anticipated to generally use a maximum of up to 1/3 private sector financing for capital costs. The other 2/3 of financing for capital costs are assumed to be provided by the CRD and the Federal government.

[b] For McLoughlin Point, Clover Point and the Energy Centre under the Hybrid Option, two general approaches to design-build are under review: Performance Design Build and Progressive Design Build (both are described in Appendix C). At this point the CRD anticipates the Progressive Design-Build approach to be used if the Option B - Hybrid approach is selected for implementation.

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<tr><td>D2. Tunnels</td><td>Traditional Procurement (either Design-Bid-Build or Construction Management at Risk)
CRD operates and maintains</td><td>Traditional Procurement (either Design-Bid-Build or Construction Management at Risk)
CRD operates and maintains</td><td>Traditional Procurement (either Design-Bid-Build or Construction Management at Risk)
CRD operates and maintains</td></tr>
<tr><td>E. Resource Recovery</td><td></td><td>Same as Traditional Approach except for more flexible “alternative bid” process in procurement implementation.</td><td>For analysis purposes, similar resource recovery assumptions have been used in the DBFO option, however all such applications are assumed to be rolled under the large DBFO contract. An “alternative bid” process will also be used to allow further flexibility in resource recovery under this option.</td></tr>
<tr><td></td><td><table>
<tr><td>Biogas from Energy Centre digesters</td><td>Stand-alone DBFO for gas upgrading and sales to distribution network.</td></tr>
<tr><td>FOG and Organics Collection</td><td>CRD outsources collection under rolling contract.</td></tr>
<tr><td>Biosolids reuse for energy generation of digested biosolids (e.g. cement kilns)</td><td>Cement kiln sales CRD negotiates and manages</td></tr>
<tr><td>Struvite recovery</td><td>Stand-alone DBFO</td></tr>
<tr><td>Water recovery from WWTPs</td><td>CRD builds, manages, operates</td></tr>
<tr><td>Heat recovery from wastewater effluent</td><td>Used on-site at WWTPs to heat buildings</td></tr>
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<tr><td>Biogas from Energy Centre digesters</td><td>Part of DBFO contract.</td></tr>
<tr><td>FOG and Organics Collection</td><td>Responsibility for collections transferred to DBFO service provider.</td></tr>
<tr><td>Biosolids reuse for energy generation of digested biosolids (e.g. cement kilns)</td><td>Part of DBFO contract. Assumes cement kiln, no land uses.</td></tr>
<tr><td>Struvite recovery</td><td>Part of DBFO contract.</td></tr>
<tr><td>Water recovery from WWTPs</td><td>Part of DBFO contract.</td></tr>
<tr><td>Heat recovery from wastewater effluent</td><td>Part of DBFO contract. Assume used on-site at WWTPs to heat buildings</td></tr>
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Resource Recovery ….continued	Other	No additional resource recovery currently included in analysis.	Other	CRD to consider limited "alternative bid" proposals for other resource recovery at Biosolids/Energy Centre as well as WWTPs built as design-build during procurement. No additional resource recovery currently included in analysis.	Energy usage in heating district	Optional part of DBFO contract. No heating district assumed implemented in current analysis.
					Other	CRD to consider limited "alternative bid" proposals for other resource recovery during procurement. No additional resource recovery currently included in analysis.
F. Special Agreements (for example, such parties may include one or more of the following: BC Hydro, Terasen Gas, UVic, Royal Roads etc.)	CRD negotiates special off-take agreements directly with each party.		CRD negotiates special off-take agreements directly with each party.		CRD enters tri-partite negotiations with DBFO service provider and each special party.	
G. Inflow & Infiltration Management	CRD and Client Municipalities to coordinate maintenance and repairs over long-term.		CRD and Client Municipalities to coordinate maintenance and repairs over long-term.		CRD and Client Municipalities to coordinate maintenance and repairs over long-term.	

Preliminary Assessment Criteria of Delivery Options

The business case will use a multiple-criteria assessment ("MCA") approach for evaluation of procurement options. The MCA approach is flexible and takes into consideration a variety of qualitative issues when making procurement decisions. The preliminary list of assessment criteria are identified below. Criteria are selected based upon CRD's overall goals and objectives for the Program as well as input from CRD staff and advisors[4].

Environmentally-Orientated Criteria

Criteria	Issues Considered
a) Regulatory Compliance	The extent to which each delivery option complies with regulatory requirements and can adapt to meet changes in regulatory requirements in the future.
b) Sustainability and greenhouse gas emissions impacts including for Resource Recovery etc.)	The extent to which each delivery option incorporates measures for resource recovery and also reduces impacts on climate change.
c) Opportunities to adopt best practices	The extent to which each delivery option offers opportunities to adopt best practices in design, construction or operations.
d) Permitting	The extent to which each delivery option allows for timely achievement of the required Federal and Provincial permits to begin construction.

Socially-Orientated Criteria

Criteria	Issues Considered
a) Staff recruitment and retention	The extent to which each delivery option allows for the recruitment, training and retention of qualified and competent staff.
b) Ownership of Facilities	Who will own the facilities (land, buildings and engineering equipment)?
c) Existing staff impact	The extent to which each delivery option has an impact on relationships with existing staff, their collective agreements, and staff in other CRD areas of work.

[4] CRD also utilized evaluation from other wastewater projects including the Pima County report entitled *Regional Optimization Master Plan Alternative Delivery Methods*, August 2008.

d) Public acceptance and communications impact	Consideration of the likely public acceptance of each of the delivery options.
e) Flexibility to make changes during the development phase	The extent to which each delivery option allows the CRD to make changes during the development phase of the project whilst not impacting adversely on schedule or cost.
f) Flexibility to make changes during the operations phase	The extent to which each delivery option allows the CRD to make changes during the operations phase of the project whilst not impacting adversely on schedule or cost (e.g. changes for inflow and infiltration, resource recovery technologies, a more distributed collection and treatment, future changes in regulation, expansion, plus input from neighbours surrounding facilities).
g) Level of CRD control over the project (during design and construction and during operations)	The ability of the CRD to protect the public interest during both the design and construction phase and during long term operations.
h) Customer Service	How each delivery option provides the required levels of service to the member municipalities in a timely manner (including changes in growth patterns and service requirements, septic tank utilization etc.) and how concerns of local residents can be addressed?
i) Economic impact	The ability for the delivery option to provide maximum economic benefit to the CRD and British Columbia in terms of jobs and other economic benefits.

Financial and Risk-Orientated Criteria

Criteria	Issues Considered
a) Risk Allocation Goals	Consideration of how the proposed delivery option allocates risks with the objective of transferring risks to the party best able to manage each risk. This would include consideration of the guarantees that the public sector entity would receive in respect of long-term performance of the assets and the ability of the CRD to enforce the risk allocation over the duration of the contract.
b) Procurement and Implementation Schedule	How each delivery model affects the proposed project procurement and implementation schedule? This criterion considers financial incentives for timely completion together with levels of complexity associated with

	each delivery option. It also considers budget and schedule risks during the procurement phase.
c) Level of competition during the procurement	The extent to which each delivery option impacts on the likely market interest in the project to ensure that there is competitive tension in the procurement process.
d) Cost certainty	The extent to which each delivery option provides the CRD with price certainty during the design and construction phase as well as over the long-term operational period.
e) Complexity of immediate and future procurement	Feasibility of procurement packaging plan and ability to implement with CRD's multi-year, multi-component build-out Program.
f) Lifecycle maintenance	The extent to which each delivery option manages and provides for long-term lifecycle costs and minimises deferred maintenance of the facilities.
g) Risk adjusted capital cost	The risk adjusted capital costs of each delivery option.
h) Operational efficiencies	The potential for operational efficiencies that could be achieved by each delivery option.
i) Risk adjusted whole life cost (NPC)	The risk adjusted net present cost of the project over the life of the contract.

The final business case will analyze each procurement method and assess each component of the Program against these criteria. Only after completion of the financial analysis, risk analysis and MCA analysis will a recommendation be feasible on procurement matters.

APPENDIX A

Summary Scope of Program

The Program includes the following work that is scheduled for completion by the end of 2016.

Summary of the Core Area Program

Major Core Area Components	Scope of Work in Component
Conveyance & Trunk Sewer Upgrades	• Upgrades to existing forcemain at Clover Point pump station • Upgrades to the Macaulay outfall • Conveyance works between Macaulay Point and McLoughlin Point • Conveyance works between Clover Point and McLoughlin Point.
Macaulay Point Pump Station	• Upgrade and expansion of Macaulay Point Pump station to transfer flows to the McLoughlin Point plant. • A new forcemain to transfer flows from Macaulay pump station to McLoughlin WWTP.
Wastewater Treatment Facilities	• A new 16.1 Ml/d Saanich East (liquids only) secondary treatment plant for flows up to 1.75 times average dry weather flow (**ADWF**). Flows between 1.75 ADWF and up to four times ADWF shall receive primary treatment. Biosolids are returned to the conveyance system for downstream treatment. Note effluent up to two times ADWF will satisfy secondary-level treatment requirements through the use of an innovative strategy of blending flows from membrane bioreactor in this facility. A new outfall is proposed at this facility. • A new 84.2 Ml/d McLoughlin Point secondary treatment plant serving the Macaulay sewerage catchment for flows up to two times ADWF from the northwest trunk (Macaulay catchment) and from Clover Point, and primary treatment for flows up to four times ADWF. • Some expansion work of the existing Macaulay Point pump station linking to the Macaulay Point outfall. Treated effluent from the new McLoughlin treatment facility will be conveyed to the Macaulay Point pump station for discharge through the existing and new outfall at that location.
Clover Point Pumping Station	• A pump station at Clover Point that will pump two times the ADWF at this location to McLoughlin Point for secondary treatment.

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- Wet weather flows over two times ADWF up to four times ADWF will receive primary treatment.
- Extreme wet weather flows over four times ADWF shall be screened and discharged.

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<tr><td>Biosolids Treatment Facility</td><td>

A centralized biosolids facility will be implemented for the Combined Program. The current biosolids management plan (**BMP**) contemplates a centralized biosolids facility at the Hartland Landfill site. The plan includes a sludge conveyance pipe from the McLoughlin Point WWTP to the Hartland Landfill biosolids facility. (As noted later, a biosolids processing and resource recovery facility at an upper harbour industrial site is also under consideration.)

The CRD has conducted an extensive analysis of alternatives for the BMP. The current plan for the BMP is referred to as Option 1. The CRD's biosolids facility will process the biosolids generated by primary and secondary treatment in a manner that will optimize opportunities for beneficial use by:

- using thermophilic anaerobic digestion to stabilize and reduce solids, kill pathogens and generate methane gas (biogas) for use onsite or offsite in the natural gas distribution system,
- drying some or all of the digested biosolids and selling it as a fuel for cement kilns, paper mills or other energy facilities; and / or
- Extraction of Struvite (phosphate) from dewatering centrate for use as fertilizer.

The biosolids facility will treat sludge to produce equivalent USEPA Class "A" standard. The BMP uses year 2030 as the design horizon. The table below shows the expected flows and loads for the CAWTP. The flows shown represent the dry weight per day of the estimated biosolids generation. These estimates are based on Option 1A system configuration with a population equivalent of 493,000 (342,000 population plus 151,000 population equivalent, industrial, commercial and institution). See to Appendix 3 for details.

Item	Average Day (kg/day)	Peak day (kg/day)
Primary Solids	12,700	20,200
Secondary Solids	16,800	24,500
Total Raw Solids	29,400	44,700
Total Raw Volatile Solids	24,700	37,500

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</table>

Outfalls and Tunnels	Treated wastewater from the WWTPs will be discharged to the marine environment through existing outfalls. Some upgrade work on the outfalls is necessary, including: • Twinning of the existing major marine outfall at Macaulay Point, and • Expansion and extension of the existing marine outfall at Finnerty Cove. • Tunnel works for conveyance between Clover Point and McLoughlin Point.
Resource Recovery & Sustainability Initiatives	• Each secondary treatment plant will produce reclaimed water suitable for irrigation, toilet flushing and other uses. • Generation of methane gas at the biosolids facility for use onsite or offsite in the natural gas distribution system. • Biosolids digesters shall include adequate capacity to accept clean food waste and/or fats, oils and greases (**FOG**) to enhance production of biomethane by up to 50%. • Will recover waste heat from the digesters to pre-heat sludge feed (reducing heat required by digesters). • Reuse of digested biosolids for sale as fuel for cement kilns, paper mills, or other energy facilities, Extraction of Struvite (phosphate) from biosolids for use as fertilizer. • Possible implementation of heat recovery exchangers for heating district (under review).
Operations	• CRD shall ensure ongoing operations of the facilities (including the possibility of contracting with third party providers for certain services).

Summary of West Shore Program

The CRD is working with the West Shore communities of Colwood and Langford to establish a plan for the implementation of wastewater management systems in those areas. The current plan includes the following facilities for the West Shore Program:

Major West Shore Components	Scope of Work in Component
Wastewater Treatment Facilities	• A 14 Ml/d West Shore secondary treatment plant for liquid-only flows up to two times ADWF from the northwest trunk, and primary treatment for flows up to four times ADWF.
Biosolids Facility	• The current plan assumes biosolids are returned to the conveyance system for downstream treatment at the Core Area centralized biosolids facility.
Conveyance & Trunk Sewer Upgrades	• Conveyance works between West Shore and McLoughlin Point. • Onshore conveyance from WWTP to shoreline of outfall.
Outfall	• A new outfall extending from West Shore WWTP shoreline to southern marine discharge.
Resource Recovery & Sustainability Initiatives	• Resource recovery components of West Shore Program expected to be similar in breadth to planned Core Area Program initiatives.

Appendix B

SUMMARY OF THE MARKET SOUNDING AND STAKEHOLDER CONSULTATION REPORT, April 2008

The CRD conducted an extensive industry and stakeholder consultation in 2008 to obtain market feedback on procurement packaging options. The results of the market sounding were documented in the report "*Market Sounding & Stakeholder Consultation*", April 11, 2008. This report is available on the CRD's website at www.WastewaterMadeClear.com.

The overall Core Area and West Shore system being planned by CRD can generally be grouped into four distinct physical components (the "Technical Components"):

1. Wastewater Treatment Plants ("WWTP's") generally assumed at Macaulay Point area, Clover Point area, West Shore plus Saanich East in accordance with *The Path Forward* report;
2. Biosolids Plant and Plant Management;
3. On-Shore Linear Structures (conveyance systems and associated pumping stations); and
4. Marine outfalls (generally assumed on West Shore plus Finnerty Cove).

Subject Area of Interest to CRD	Summary of Feedback
Contract Packaging	• There was broad divergence in views on recommendations for the procurement packaging strategy. Eight (8) respondents stated that they recommended the overall Project be procured as a single system or a small number of large component packages, whereas twelve (12) respondents recommended breaking it down to a number of well-defined components. Six (6) of the respondents hedged their opinions by presenting arguments for both single and multiple procurement packages. • Respondents that favored the consolidated large-scale approach typically assumed the new linear infrastructure to be constructed would most likely be operated and maintained by the CRD.
Benefits & Weaknesses of Large-Scale Packaging Procurement	• The arguments in favour of procuring the Technical Components in a large package included lower life-cycle costs through integration efficiencies, greater risk transfer, single source accountability, and reduced procurement costs. • The weaknesses of packaging the work into a single large procurement included the need for a large contract bond by the prime contractor (thereby limiting the number of firms who could bid); insufficient due diligence information available to allow firms to bid; difficulty for firms locking-in costs over a long-term contract and procurement phasing plan; and, the nature of CRD's plan requires some flexibility and phasing which is not well suited to single

	package procurement.
Benefits & Weaknesses of Multi-Component Packaging Procurement	• The arguments in favour of breaking procurement into multiple packages are that it would increase the number of firms that could bid (smaller firms); it would allow CRD more flexibility for procurement (using different procurement approaches for components); and it may diversify risk across multiple parties during implementation. • The weaknesses of using multiple procurement packages were that it would require CRD to manage interface risk among packages; it would require CRD to manage multiple procurement contracts; it may lead to scheduling challenges and delays; it may limit innovation across the overall system (but innovation within each package may be improved); and, there may be higher procurement costs.
Procurement Options	• Overall, there was no clear preferred procurement option among respondents. Respondents argued convincingly in their submissions and follow-up discussions for a variety of procurement methodologies – from traditional procurement to full public-private partnership approaches. • Multiple respondents supported a DBFO for one or more components of the project as long as the CRD could address key issues related to: o supply of additional due diligence materials, o establishment of reasonable risk transfer expectations, and o confirmation of clear political-level support for the procurement. • The design-bid-build traditional procurement approach was generally acknowledged as providing CRD with the most flexibility. • Those respondents supporting a DBFO approach to contracting and procurement cited the following reasons: o Risk transfer o Lowest life-cycle cost o Greater potential for innovation o Greater cost certainty o Single point of accountability • Respondents who suggest a mixed approach to procurement for each Technical Component cited the following reasons:

	○ CRD flexibility. ○ Control over procurement scheduling. • Respondents who preferred more traditional approaches to procurement like design-bid-build (DBB) cited the following reasons: ○ Allows more public input and discussion. ○ Complexity of CRD's system requires flexibility in procurement over multiple years for phasing of components, integration of new technologies and accommodation of water reuse and renewable technologies. ○ Allows CRD to achieve scheduling targets.
Operations	The arguments in support of <u>CRD assuming responsibility</u> for operations and maintenance of all WWTP's included: • The historically positive Canadian experience with public sector responsibility for operations and maintenance, • Allowing continuation of existing CRD responsibilities of maintaining resources and current operations and maintenance, and • Public operation allows flexibility to accommodate future advances in treatment technology, water reuse and sustainability targets (as noted "*One of the disadvantages of multi-decade [*DBFO contracts*] is that changes in technology or requirements are not easily accommodated*…"). The arguments in support of the <u>private sector assuming</u> responsibility for operations and maintenance of WWTP's included: • Ability of CRD to transfer risk to private sector, • A perception that the private sector may be able to provide better career opportunities for personnel (thus easier to hire and retain senior, qualified staff), • Perception of improved innovation, • Clear delineation of responsibilities for performance and control/regulation, and • CRD realizes greater cost certainty.

Appendix C

Description of Potential Delivery Options

The CRD conducted an extensive industry and stakeholder consultation on procurement as described in the report "*Market Sounding & Stakeholder Consultation*", April 2008. The following table summarizes the potential delivery options identified as feasible during the market sounding process.

Procurement option	Strengths	Weaknesses
Design-Bid-Build ("DBB") Under a design bid build approach the CRD engages an engineering consultant to prepare the design and contract documents. The consultant tenders the project, evaluates tenders and administers the construction contract. Under this arrangement the Owner assumes risks for unknowns or design omissions. Such arrangements require design work to be completed to a high level and thus there is limited room for innovation once design documents have been approved by CRD. Associated project and construction management services are either included in the scope of the Engineering Consultant responsible for the design or awarded as a separate contract(s). Operation and maintenance of the completed facilities is either the responsibility of the CRD or a private sector operator(s).	• Common approach used by public sector agencies. • Understood by advisors and supplier community. • CRD retains control of the bidding process for each sub-component of the Program. • Bonding flexibility. Allows CRD to break up the bidding of the Program into smaller pieces that can be delivered by smaller firms (with lower bonding capacity). • Allows more public input and discussion. • Provides flexibility in procurement over multiple years for phasing of components, integration of new technologies and accommodation of renewable technologies. • Allows CRD to achieve scheduling targets.	• Integration risks. CRD remains responsible for ensuring integration of the components of each facility plus the overall Program. • Cost and Schedule Risks. Sometimes leads to scope expansion and changes, creating both delays and higher costs. • Requires CRD to hire new operators for all new facilities. • Commissioning and transition from development phase to operations phase can be challenging (and at CRD risk). • Lifecycle risks. CRD will be responsible for all costs after expiry of warranties in 1-2 years after completion.
Construction Management at Risk (Construction Manager as Constructor, not Agent) ("CMAR") The CMAR approach would involve the CRD engaging an Engineering Consultant and Construction Manager at the early project stages to refine the concept design, develop the detailed design and prepare a comprehensive project budget and schedule. Through a competitive process the owner would hire a construction manager on a fee basis to work with the engineer to provide preconstruction services including	• Allows fast-tracking (over-lapping permitting, design and construction). • Allows for early construction start with early price predictability. • CRD maintains control and ability to influence design. • Flexibility for change. • Allows CRD to achieve schedule targets. • Allows more public input and discussion.	• Cost certainty not known before construction commencement. • Integration risks. CRD remains responsible for ensuring integration of the components of each facility plus the overall Program. • Cost and Schedule Risks. Sometimes leads to scope expansion and changes, creating both delays and higher costs. • Requires CRD to hire new operators for all new facilities. • Commissioning and transition from development phase to

constructability, innovation, schedule and cost estimating input as the design progresses. Construction can start on early work packages on a sequential tender bases and once the overall design reaches the 80 to 90% stage the construction manager would provide a Guaranteed Maximum Price ("GMP") for the project. The construction manager typically enters a guaranteed maximum price and schedule with CRD under a cost-plus arrangement or stipulated price contract. The construction manager would tender each package and enter multiple trade contracts with suppliers and sub-contractors and be responsible for ensuring the project is brought in at or below the GMP. The construction manager assumes responsibility for the performance of the trade contracts (subcontracts) much as a general contractor would under traditional procurement. The Engineering Consultant typically enters a guaranteed maximum price and schedule with CRD under a cost-plus arrangement or stipulated price contract. The CRD will be responsible for operating all facilities upon completion of construction. The CRD will also retain the risk for long-term maintenance of the facilities and overall integration of the various components. Delivery and operations of resource recovery components of the Program would vary by type of resource as described in more detail in the table below.		operations phase can be challenging (and at CRD risk). • Lifecycle risks. CRD will be responsible for all costs after expiry of warranties in 1-2 years after completion.

Alliance Partnering ("AP") Through a competitive process a private sector consortium would be selected to partner with the CRD and its stakeholders working together to develop and deliver the Project. In order to ensure adequate levels of competition exist during the process there would be a series of gateway reviews to ensure competitive tension is maintained and value for money is achieved.	• Good for projects with ambiguous scope. • Good when fast-tracking is required.	• Few precedents in Canada. • Less certainty around costs. • May lead to schedule delays.
Progressive Design-Build Progressive design build involves developing the design to a point where major design requirements are defined to a greater extent or level of detail rather than just providing a high level performance requirements and specifications. Issues such as primary equipment selection, space planning and layouts for maintenance are defined to provide the Owner with better long term operability and performance. This does not preclude the design builder from innovation and providing alternative bids, provided that the proposal meets the Owner's basic facility requirements.	• Allows CRD to maintain schedule flexibility for staging of procurement. • Allows CRD to specify detailed design and clear standards for equipment to reduce the risk of long term maintenance and operability issues. • Provides CRD with price certainty once plans are finalized and fixed price contract entered with design-build firm. • Design builder is responsible for many design and construction risk (mainly equipment and designs no specified in the bid documents). • Allows more input into design phase and facility development. • Allows CRD to provide input into the quality of critical process equipment specified for inclusion in the base design and enables standardization for maintenance purposes.	• For equipment not specified by CRD, bidders may suggest equipment which has a short maintenance lifecycle and thus long-term whole life costs to CRD will be higher. Long-term warranties (beyond 2 years) are not provided by bidders if their staff do not operate the facilities, thus CRD is at risk to equipment failure costs after the expiry of the warranty period. • If extensive design work is specified by CRD as part of the bid documents then innovation and competition may be limited to the construction phase. This may be mitigated by allowing bidders to provide a "base case" bid conforming to such requirements plus "alternative bids" which deviate from the specified plans and include innovative new designs and solutions for consideration by Owner. • The complexity of the CRD Program may make it difficult to the CRD to define end requirements.
Performance Design-Build ▪ Under this approach, tender documents specify the level of quality and performance standards to be achieved (approximately +/-10% of design work is completed along with minimum standards of certain equipment). Flexibility exists as to the specific systems, equipment and materials that may be used. Concept process and equipment plans may be provided though flexibility exists for alternate layouts.	• Allows CRD some flexibility over planning and design process. • Allows CRD to maintain flexibility over schedule and staging of procurement. • Allows CRD to specify a base design and clear minimum standards for equipment. • Provides CRD with price certainty once plans are finalized and fixed price contract entered with design-build firm.	• Bidders may design equipment which has a short maintenance lifecycle and thus long-term whole life costs to CRD will be higher. • The complexity of the CRD Program may make it difficult to the CRD to define end performance requirements. • Bidders tend to cut corners to ensure that they secure contract and maximize profit. • Long-term warranties (beyond 2 years) are not provided by

▪ Detailed plans can be provided for critical areas. Building/process program and details on the functional relationships are provided to bidders. Descriptions of the intended design and character of the facilities can also be provided. The level of detailed design documents provided by CRD can vary from +/-10% design which outlines minimum standards of equipment and leaves significant flexibility for innovation or corner-cutting, to +/-30% design which can lock-down certain technical aspects of the project and focus competition in the construction phase. ▪ Comprehensive proposals are required from bidders. Proposal submissions will include equipment descriptions, conceptual single line drawings, layouts, elevations, compliance check lists and renderings etc. ▪ The CRD then selects a Construction Contractor/Engineering Design team through a competitive process to design and build the Program according to performance specifications and for a guaranteed maximum price.	• Design builder is responsible for many design and construction risk. • Allows less input into design phase and facility development.	bidders if their staff do not operate the facilities, thus CRD is at risk to equipment failure costs after the expiry of the warranty period.
Design-Build-Operate-Maintain ("DBO") ▪ Using a competitive procurement process a "team" comprising an Operator, Engineering Consultant and General Construction Contractor together with specialist service providers is selected to design, build, operate and maintain the facilities over a long-term period.	• Provides integrated solution for CRD and potential for efficiencies through integrated planning of entire system over whole life. • Uses public financing which has lower cost than third party debt and equity. • Achieves some risk transfer for CRD. • Offers potential for innovation. • Offers cost certainty for CRD at bid phase. • One party is accountable for performance. • Government retains ownership and control of assets. • Service provider assumes responsibility for hiring operations staff.	• Lack of flexibility to change design once accepted by CRD. • May require a large contract bond by the prime contractor (thereby limiting the number of firms who could bid). • Requires CRD to conduct further due diligence prior to the procurement phase which could impact on the timeline. • The nature of CRD's plan requires some flexibility and phasing which is not well suited to single package procurement.

Design-Build-Finance-Operate-Maintain "("DBFO") ▪ A DBFO is an arrangement between a public sector body and a private sector party, resulting in the private sector party providing infrastructure and/or services that are traditionally delivered by the public sector. A key element of a DBFO is transfer of risk from the public partner to the private sector partner. ▪ Bidders are responsible for assembling a team of firms – from wastewater engineering/designers to operators and financiers. All would collaborate for the delivery of the performance requirements of CRD.	• Provides integrated solution for CRD and potential for efficiencies through integrated planning of entire system over whole life. • Achieves greater risk transfer at some cost for CRD. • Offers potential for innovation. • Offers cost certainty for CRD at bid phase. • One party is accountable for performance. • Government retains ownership and control of assets. • Service provider assumes responsibility for hiring operations staff. • Lenders will carry out on-going diligence and monitoring throughout the term of the project.	• Lack of flexibility to change design once accepted by CRD. • Costly and complex bidding process. • Significant time required to prepare bid documents to ensure interests of CRD are protected. • May be a lack of capacity in the marketplace to deliver the larger components. • May require a large contract bond by the prime contractor (thereby limiting the number of firms who could bid). • Requires CRD to conduct further due diligence prior to the procurement phase which could impact on the timeline. • The nature of CRD's plan requires some flexibility and phasing which is not well suited to single package procurement. • Availability of third party financing remains uncertain in post-credit crisis environment. • Cost of third party financing will be higher than CRD cost of MFA funds. • If length of operating contract exceeds five years then voter assent may be required to enter such contract, further delaying the implementation process.

APPENDIX D

GLOSSARY

These definitions are taken from the BC Municipal Sewage Regulations as well as AE et al 2008-2009 discussion papers prepared by Associated Engineering Ltd. and CH2M Hill.

"**Average Annual Flow**" or "**AAF**" – an estimate of the total flow at a given site for an entire year, including both dry and wet weather periods.

"**Average Domestic Flow**" or "ADF" – the average flow coming purely from the "Total Population Equivalents", i.e. excludes all sources of I&I.

"**Average Dry Weather Flow**" or ADWF means the daily municipal sewage flow to a sewage facility that occurs after an extended period of dry weather such that the inflow and infiltration has been minimized to the greatest extent practicable and is calculated by dividing the total flow to the sewage treatment facility during the dry weather period by the number of days in that period. In CRD this typically occurs between the months of April to September.

"**Biosolids**" means inorganic or organic solid residuals from a sewage facility, or septic tank sludge, resulting from a municipal sewage treatment process which has been sufficiently treated to reduce vector attraction and pathogen densities, such that it can be beneficially recycled.

"**BOD**" biochemical oxygen demand.

"**cBOD5**" carbonaceous 5-day biochemical oxygen demand.

"**CEPT**" chemically-enhanced primary treatment.

"Core Area Program" composed of Victoria, Esquimalt, View Royal, Oak Bay and Saanich plus two First Nations communities.

"**DBB**" means Design Bid Build.

"**DBFO**" means Design, Build, Finance, Operate and Maintain.

"**DB"** means design-build with design drawings and planning to approximately the +/-10% level.

"**DB 30%"** means design-build with design drawings and planning to approximately the 25% to 30% level (high level of detail).

"**DBO**" means design, build, operate and maintain.

"**Effluent**" means the liquid resulting from the treatment of municipal sewage;

"**ICI Equivalents**" or "**ICI**" – an estimate of the contribution of flow from industrial, commercial, and institutional activities, expressed as a number of fulltime residential population equivalents.

"**Inflow & Infiltration**" or "**I&I**" means water that enters the sanitary sewer system from direct stormwater connection (inflow) or indirectly through the land (infiltration), or both. Can be expressed as a return period based value (i.e. 25-Year Return I&I).

"**Microconstituents**" include hundreds of compounds, which encompass endocrine disrupting compounds (EDC's), pharmaceutically-active compounds (PhAC's) and Personal Care Products (PCP's). These compounds are typically present in raw wastewater at ng/L to ug/L concentrations, 5 to 6 orders of magnitude less than the concentration of conventional pollutants.

"**Peak Domestic Flow**" or "PDF" – the peak flow coming purely from the "Total Population Equivalents", i.e. excludes all sources of I&I. Expressed as a short duration average, (i.e. 15-minutes), suitable for use in hydraulic design.

"**Peak Dry Weather Flow**" is the peak daily flow that usually occurs once in the morning and then again in the evening.

"**Peak Wet Weather Flow**" is the peak flow rate that occurs at the height a rainfall or snowmelt event. "**PWWF**" = PDF + I&I. Expressed as a return period based value (i.e. 25-Year Return PWWF).

"**Per-Capita Rate**" – the average flow associated with each "Total Population Equivalent", expressed as L/per/day.

"**Primary Treatment**" means any form of treatment, excluding dilution, that consistently produces an effluent quality with a BOD5 not exceeding 130 mg/L and TSS not exceeding 130 mg/L.

"**Septic Tank**" means a watertight vessel into which municipal sewage is continually conveyed such that solids within the municipal sewage settle, anaerobic digestion of organic materials occurs and an effluent is discharged;

"**Sewage**" or "**Base Sanitary Flow**" refers to water that is contaminated with waste matter of domestic, commercial, industrial, or natural origin. The average person uses almost 225 litres of water per day performing routine activities such as bathing, recreation and body waste elimination.

"**Secondary Treatment**" means any form of treatment, excluding dilution, that consistently produces an effluent quality with a BOD5 not exceeding 45 mg/L and TSS not exceeding 45 mg/L, except for lagoon systems for which the effluent quality is not to exceed a BOD5 of 45 mg/L and a TSS of 60 mg/L.

"**Total Population Equivalents**" = "Residential Population" + "ICI". Also known as "**Contributory Population Equivalent**" means the number of persons and equivalent commercial and industrial contribution connected to the municipal sewage collection system based on the most current census data.

"**Tributary Area**" or "Area" – the estimated sewered land area associated with a catchment.

"**TSS**" means total suspended solids or non-filterable residue.

"West Shore Program" composed of the communities of Colwood and Langford.

"**WWTP**" wastewater treatment plant.