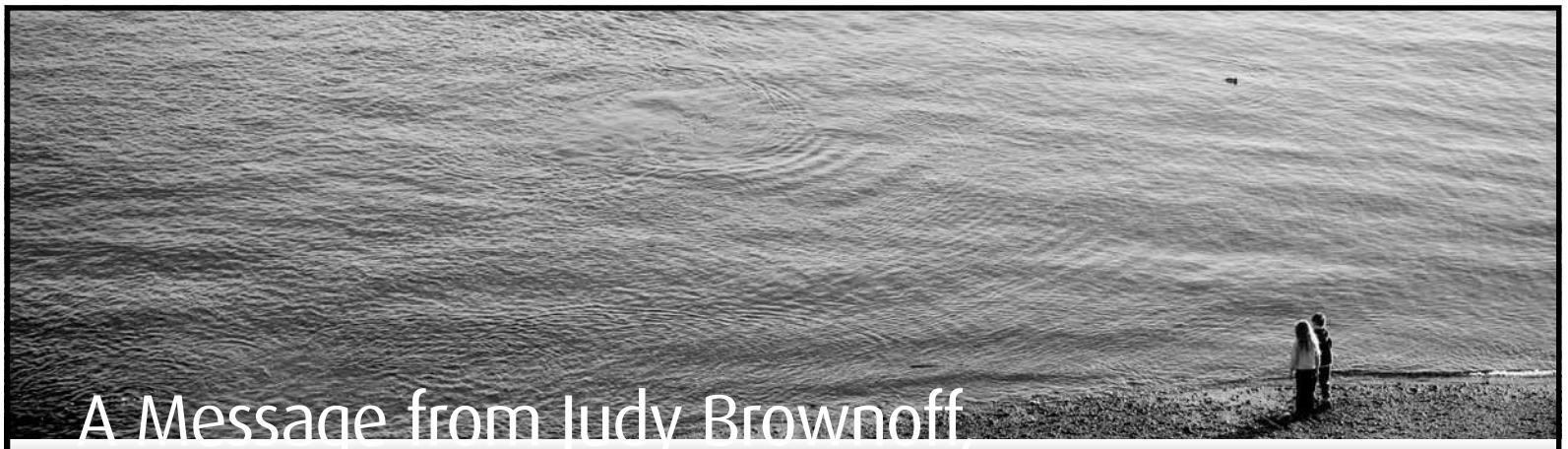
WASTEWATER TREATMENT MADE CLEAR

OCTOBER 2009

Wastewater Update

Core Area Wastewater Treatment Program Newsletter

Making a difference...together



A Message from Judy Brownoff,

Chair of the Core Area Liquid Waste Management Committee (CALWMC)

Welcome to the second issue of *Wastewater Update*, a new forum for information on the wastewater treatment project for the CRD's Core Area, which was suggested by members of the public at an open house earlier this year. The first issue was distributed to residents in the Saanich East-North Oak Bay area in July 2009, during a series of open houses and neighbourhood workshops designed to educate and inform adjacent neighbourhoods on the three siting options for a Saanich East-North Oak Bay (SENOB) liquid only treatment facility. This issue provides an update on the recently selected system design, known as Option 1A, and what this design means for the communities identified in this option.

Included in Option 1A is a Saanich East-North Oak Bay liquids only plant, treatment plants at McLoughlin Point and the West Shore, a Clover Point wet weather facility and a remote biosolids facility. Key in the committee's decision to select Option 1A was the increased emphasis on resource recovery opportunities and the low cost. Option 1A is estimated at $965 million with annual resource recovery revenues estimated at $5.7 million by 2030 and $13 million by 2065. This system design includes the potential for more than 18,000 tonnes of carbon offsets per year, primarily from gas and heat sales recovered from wastewater.

I am very pleased with both the cost estimate and the potential for carbon offsets, which will help create an environmentally sustainable system. I am confident that this decision will give the committee more focus and bring the Core Area closer to a sustainable, affordable wastewater treatment system.

Please refer to the website for CALWMC Reports, Updates and Information on the Wastewater Treatment Program. **www.wastewatermadeclear.ca**

The Necessity of Treating Our Region's Wastewater

Scientific Reports

There are many views on the necessity of treating Core Area's liquid waste using secondary treatment. Some scientific reports, including the CRD's own SEATAC report on the health of ocean ecosystems around outfalls, argue that marine ecosystems suffer no ill effects from the discharge of screened wastewater. Though some current studies may have determined few detrimental effects to ocean mammals and marine colonies, the fact remains that our population in the Core Area is increasing; continuing to treat wastewater using only preliminary screening may not be adequate as our population grows and evolves.

A Mandate to Treat

The BC Ministry of Environment has placed a mandate on the CRD to plan and initiate secondary treatment for the region. A final plan must be in place by the end of 2009. Additionally, new regulations, put forward by the Federal Government, will mandate secondary treatment across the country by 2020. These regulations cannot be compromised, and it is to the CRD's best advantage to proceed with treatment before the mandate comes into effect, thereby giving the region adequate planning and research time. Choosing to plan for treatment today will also help ensure that funding commitments are honoured by the Provincial and Federal Governments; these commitments will fund up to two-thirds of the capital cost of treatment.

Current Outfall Measurements

Current measurements of the Clover Point and Macaulay Point outfalls place biological oxygen demand (BOD) and total suspended solids (TSS) at levels above the soon to be adopted national standard of 25 mg/L. Current BOD at Clover is between 130 and 280 mg/L and between 120 and 265 mg/L at Macaulay. TSS is three or more times the standard at both locations. Secondary treatment will enable the CRD to meet these standards for discharge of wastewater effluent, helping the marine ecosystem and allowing our region to comply with upcoming Federal regulations.

It is up to the CRD to plan for wastewater treatment for the region using the timelines stipulated by the Provincial and Federal Governments. Wastewater treatment will serve the region's residents, but it will also serve the region's ecosystems, flora and fauna, ensuring our region remains a beautiful place to live into the future.

Wastewater Treatment in the Core Area

The Capital Regional District is working toward providing cost effective, innovative and environmentally responsible wastewater treatment for its residents. This project will see the upgrading of treatment practices in the Core Area to account for the demands of our increasing population. At every step of the way, we will be carrying through triple bottom line analysis incorporating community principles and considering the social, environmental and economic impacts of treatment options.

As the region moves into Fall, planning for wastewater treatment is entering a particularly important time. Considerations are taking place for presentative technologies that could be used, the number and size of plants and the options for biosolids management and resource recovery.

2009: A Recap

On June 2, 2009, the Core Area Liquid Waste Management Committee (CALWMC) voted in favour of proceeding with Option 1, a distributed management system which included three treatment plants plus wet weather flow management. This treatment option had three variations (1A, 1B, or 1C), as recommended by the Peer Review Team in May 2009.

Of the three treatment strategies originally proposed, Option 1 provided the most economical approach for meeting regulatory requirements today while providing flexibility to take advantage of future changes in technology and region-wide resource recovery opportunities.

Summer 2009 included a series of workshops for CALWMC members and significant research by the CRD's new consultants, Stantec. Consultants brought forward a number of options for treatment plant configuration; the CRD has remained flexible to take advantage of these new ideas.

Choosing an Option for Treatment

After consideration of the new options presented by CRD consultants, CALWMC narrowed its focus in the consideration of a distributed treatment configuration. The Committee decided to pursue Option 1A with Option 1B being retained as a backup configuration in the event that land acquisition is unsuccessful for 1A.

Option 1A provides a number of potential benefits for the region:

Operating costs for this option is significantly lower than first estimated by the CRD's previous consultants. Option 1A is estimated at $965 million and annual operating costs of approximately $20 million.

Resource recovery opportunities for this option are high, with potential for heat, water and energy reuse both on and off site. Potential resource recovery revenues are projected at $3.2 million by 2030 and $9.6 million by 2065, depending on the demand and market for such resources.

Site acquisition is possible for 1A and a number of flexible choices exist which could see less money spent.

Details of Option 1A

Option 1A would operate liquid treatment facilities in Saanich East-North Oak Bay and McLoughlin Point with a Biosolids Energy Centre in the Upper Victoria Harbour. Option 1A would also see a plant in the West Shore area. Option 1A would also see the potential elimination of the Clover Point wet weather facility.

SAANICH EAST-NORTH OAK BAY (SENOB)

A liquids stream only wastewater treatment plant would be located in SENOB with a new outfall into Haro Strait. The plant would include preliminary settling tanks and a secondary treatment suspended growth bioreactor and membrane tank. Sludges from the facility would be transported by sewer for processing at the downstream Biosolids Energy Centre. Treated effluent from the SENOB plant would be of a quality suitable for water reuse. In addition, thermal energy could be recovered from the wastewater.

MCLOUGHLIN POINT

A liquids treatment plant would be located at McLoughlin Point and include preliminary treatment and a biological aerated filter design secondary treatment. No space would be available for biosolids processing due to site size limitations. Biosolids would instead be pumped to a local Biosolids Energy Centre in the Upper Victoria Harbour. The treatment plant would also be able to produce up to 12 million litres per day of reclaimed water.

WEST SHORE

A consolidated liquids and solids processing treatment plant would be located in the West Shore, using conventional activated sludge treatment with the ability to produce 6 million litres of reclaimed water per day.

UPPER VICTORIA HARBOUR

A biosolids management facility and energy centre would be located in Upper Victoria Harbour. The site for this facility is still under consideration. An energy centre would allow for proximity to resource recovery markets and the ability to use waterways to transport materials. There is significant potential for integration of liquid and solid wastes and at this waste to energy facility.

CLOVER POINT

The requirement for a wet weather treatment plant at Clover Point is under review with the Ministry of Environment. It could be argued that the significant costs of $68.5 million would be better spent on collection system improvements to reduce inflow and infiltration. If required, a compact ballasted flocculation high rate clarifier would operate only during wet weather conditions, when flows were in excess of 2.0 times dry weather flow, and discharge through the outfall to Juan de Fuca Strait. Solids removed from the treated wet weather stream would be passed on to the McLoughlin Point plant for processing.

How Does Option 1A Measure Up?

Creating a Positive Carbon Footprint

Wastewater Treatment Option 1A would operate in the region not only as carbon neutral, but could be carbon positive, offsetting 18,860 tonnes of CO2/ year. Resource recovery is the key to this positive carbon footprint. Offsets will occur through gas and heat sales, creating a cleaner region and helping to combat climate change.

The Triple Bottom Line

The Triple Bottom Line (TBL) approach provides a very dependable and robust structure for evaluating wastewater management options. It is designed to provide decision makers with a framework to understand the cost and benefits of alternatives across a spectrum of social, economic and environmental goals and objectives.

Cost

Costs for Option 1A are estimated at $965 million. Yearly operating costs would be approximately $20 million for this scenario.

Clover Point & West Shore: Pending Decisions

Why might the wet weather facility at Clover Point be eliminated?

Currently, the Clover Point Pump Station experiences infrequent overflows each year. Stormwater overflows are caused by inflow and infiltration (I&I), which is rainwater and groundwater that enters the sanitary sewer. A certain amount of I&I is unavoidable and is accounted for in routine sewer design. However, when I&I exceeds normal amounts, during storm events, sewer capacity is overwhelmed and may result in overflows at Clover Point and upstream of Clover Point. The plan is to eliminate upstream overflows and develop I&I improvements to reduce frequency of overflows at Clover Point.

The most effective way to mitigate overflows is through improvements in sewer infrastructure. If a portion of the estimated $68.5 million in costs projected for the Clover Point wet weather treatment facility were redirected to sewer infrastructure improvements, stormwater overflows on the eastern shoreline of the CRD could be significantly reduced, potentially making the facility unnecessary. Further research by the CRD's consultants will help to determine the best course of action for Clover Point.

West Shore Treatment Plans

The CRD municipalities of Colwood and Langford, referred to as the West Shore, have the same requirements for wastewater treatment as other municipalities across the region. However, the West Shore has indicated it has an interest in planning for its own treatment, including siting, technology choice and procurement options. If the West Shore chooses to complete its own research, it may choose to submit a joint or a separate application for funding from the provincial and federal governments. Treatment plants would be owned and operated by a separate utility, run by the West Shore municipalities, including Colwood and Langford.

Decisions have yet to be made regarding the West Shore's best course of action. It is unknown whether sufficient time remains to complete siting studies and make siting choices, as well as choose appropriate technologies by the end of 2009. One of the key features of the CRD's October Open House sessions is to inform residents on the options currently under consideration in the West Shore, and how decisions will affect the future design of a Core Area wastewater treatment system.

An Innovative Facility: the Biosolids/Organic Energy Centre

Current research on biosolids management allows for maximum beneficial reuse of biosolids through energy recovery and reuse. Biosolids could be co-digested with food waste and fats, oils and grease (FOG), then dried for use as a coal substitute for a cement kiln; resources from the digestion process would include biogas, biomethane and heat. Following digestion, biosolids could also be dewatered and used as a soil amendment. Struvite (phosphate) recovery could be included as part of the anaerobic digestion process. Future possibilities could include the management of solid and liquid waste streams in an integrated energy centre. The biosolids management plan will be submitted to the committee in the near future.

Resource Recovery: Enabling Sustainable Operations

Resource recovery will allow the CRD to maximize economic and financial benefits through the reuse of resources and the generation of offsetting revenue. Inherent in the idea of resource recovery is the recognition that wastewater is not a waste product. It is a resource containing rejected energy from homes, businesses, institutions and factories, and contains reclaimable water for non-potable use.

There is significant potential for resource recovery using Option 1A. Recovering energy, water and chemicals, such as phosphate from wastewater, can offset plant operation costs and provide excellent opportunities to lower the region's energy consumption and greenhouse gas emissions. Clean generation of heat, biomethane, fuel for waste to energy facilities and water for reuse in irrigation will help make the region more sustainable, encourage the development of alternative energy markets and allow us to make the most of wastewater treatment infrastructure.

Resource recovery revenues for the selected option could attain gross revenues of $3.2 million a year by 2030 and $9.6 million a year by 2065. The market for these resources is being investigated and capital works will be included in the initial construction to provide the opportunity if the market for these resources develop.

What can be done with wastewater using Option 1A?

- Heat extraction for use in buildings, digester heating and district heating
- Biomethane generation and bio-cell biomethane production to reduce reliance on natural gas
- Dried sludge as fuel for cement kilns, waste to energy facility or as a soil amendment
- Phosphorus (struvite) and metals recovery
- Power generation
- Effluent reuse for irrigation and toilet flushing
- Biosolids resource opportunities

Biosolids Resource Opportunities

Using anaerobic digestion, the CRD's Biosolids Energy Centre would produce approximately 22 tonnes of treated biosolids every day. During the process, gases, particulates and liquid would be scrubbed from wastewater sludges, producing pipeline grade biogas (biomethane) and treated biosolids. Key in the optimum production of biosolids would be the use of effluent heat to help digestion take place and the addition of organic food wastes and fats, oils and grease. Biosolids could be used as a soil amendment, for nutrient recovery or as a coal substitute in cement kilns.

Biogas Recovery & Use

Expected revenues from biogas sales are $1.3 million by 2030 and $1.6 million by 2065. A product of biosolids production, biogas is methane that has been scrubbed clean; the resulting gas could be sold to Terasen Gas or used for power generation as well as space and wastewater process heating. As markets developed for this gas, it could play a greater role in reducing our region's dependence on fossil fuels.

Heat Recovery

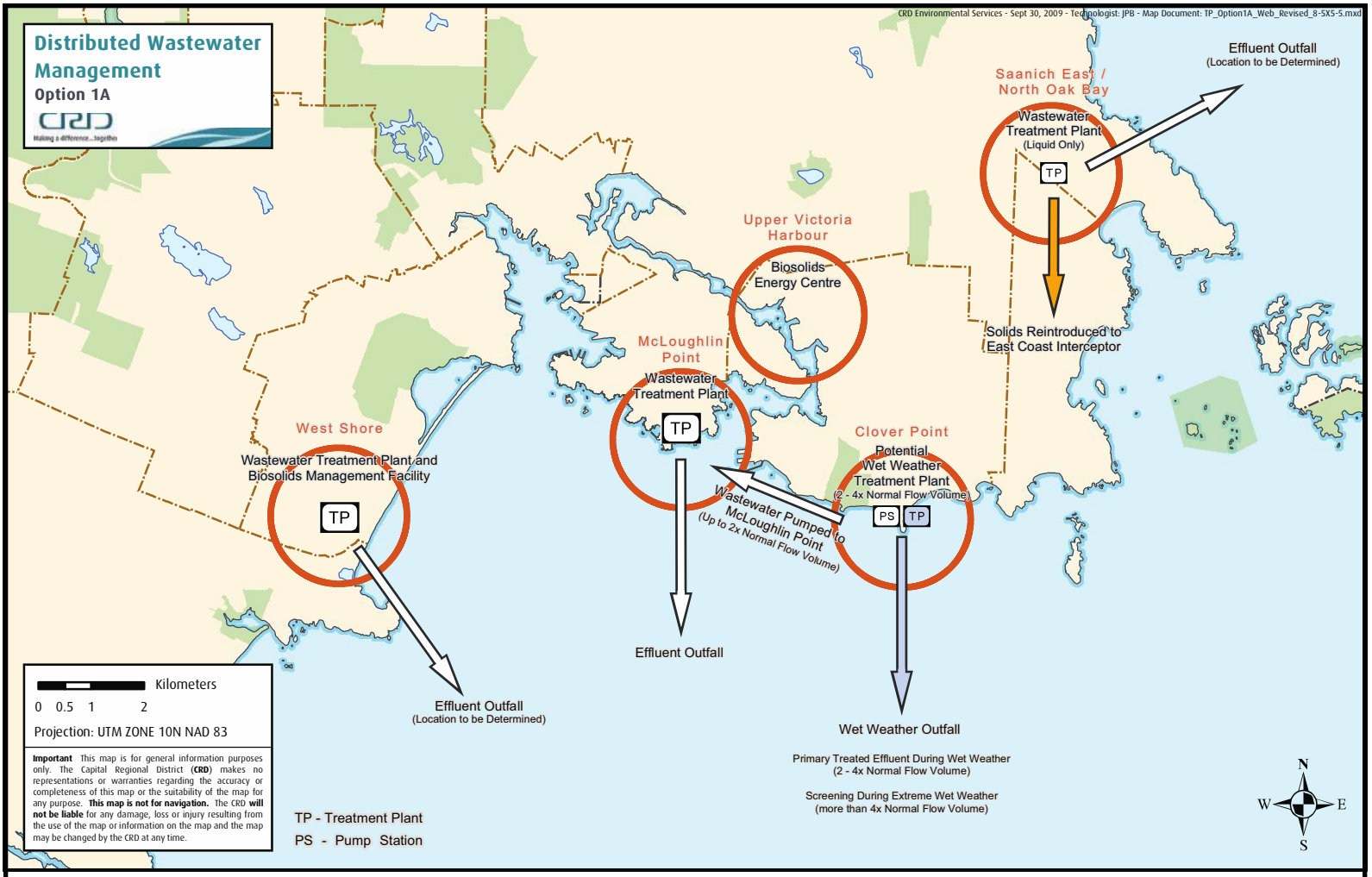
Heat recovery potential using Option 1A could be utilized with district heating and process heat. District heating supplies heat from wastewater to a large institution or building—in this case, the University of Victoria, the Victoria downtown core government buildings and new West Shore developments. Heat pipeline loops, using heat pumps, can be constructed up to 10 kilometres long, providing adequate distance to reach many new and existing developments. Process heat would deliver heat to the wastewater facility itself, to aid in anaerobic digestion and drying of wastewater sludges.

Water Reuse

In the CRD, we are fortunate to live in an area of consistent water availability. Water conservation, however, may become more of a necessity in the future, due to climate change and an increasing population. A principle issue with wastewater treatment will be our ability to store adequate quantities of water throughout increasingly hot, dry summers. Highly treated wastewater can supplement our water demands throughout the year.

Reclaimed wastewater has gone through a number of processes to ensure that it is free of pathogens, micro-organisms and contaminants. Reclaimed wastewater can be treated to the point of being potable but would likely be employed for non-potable uses.

Potential irrigation uses for reclaimed water using Option 1A include golf courses, parks, university grounds, government buildings and new development residential lots (using purple pipes for non-potable water in toilet flushing). Reclaimed water would be primarily used in summer months, when irrigation is in demand; in winter months, water would be discharged via outfall into the sea. Approximately 34.6 million litres per day could be available as reclaimed water; capacity would initially outstrip demand, providing for future market expansions as the region's water needs increase.



Cost:	$965 million
Annual Carbon Offsets:	18,000 tonnes from gas and heat sales recovered from wastewater
Plant Locations:	Saanich East-North Oak Bay liquids only plant
	McLoughlin Point treatment plant
	West Shore treatment plant
	Clover Point wet weather facility
	Remote biosolids facility

Annual resource recovery revenues are estimated at $5.7 million by 2030 and $13 million by 2065.

What happens next?

Consultation & Decision Making

The CRD is holding two open houses in Victoria (Fairfield) and Esquimalt in late October 2009. These sessions will provide residents with a chance to ask questions about Option 1A of CRD staff and consultants, learn more about wastewater treatment planning in the region and give feedback.

In Fall 2009, the CRD will reach a decision on the preferred location for the Saanich East-North Oak Bay facility site. It will also complete further analysis of and research on Option 1A, in order to determine the best wastewater treatment system for the region. Two key analyses that will need to be completed include:

- Determining the feasibility of deferring or eliminating the wet weather facility at Clover Point
- Determining how the West Shore will participate in a Core Area Wastewater Treatment Program

The CRD is committed to further consultation with residents as CALWMC advances its plan for a wastewater treatment program.

Consultation and public involvement will be key when deciding how to best manage biosolids in the region.

Further engagement will also take place in Saanich East-North Oak Bay, once a candidate site is chosen.

How to Stay Informed

The most comprehensive source for information on the wastewater project is the CRD's wastewater website, www.wastewatermadeclear.ca. Designed to spearhead the project, the website is continually updated with the latest discussion papers, reports, notices on upcoming consultation sessions and general advancements of the project.

You can also contact the CRD to submit comments or ask a question. Fill out our online feedback form, call or write to us:

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