January 16, 2008

CAPITAL REGIONAL DISTRICT
CORE AREA WASTEWATER MANAGEMENT PROGRAM

PROGRAM DEVELOPMENT PHASE
CONCEPTUAL PLANNING
GENERAL SCOPE

The CRD is planning to carry out conceptual level engineering planning to further refine the strategy adopted by the Board in June 2007. The objectives of this work are two fold:

- To develop more detailed concepts for regional wastewater management and resource recovery. This will allow the CRD to undertake more detailed financial planning and will allow decisions to be made on the implementation of Program elements.

- To develop the responses required by the Minister of Environment, in his letter dated December 14, 2007. The letter requested that the CRD to provide an update on specific items by June 30, 2008 with a more definitive response on Program elements and delivery by December 31, 2008.

This conceptual level engineering planning will be undertaken through eight activities, each focused on a particular Program strategy or element. These activities are described below. As these elements are linked, some of the activities may proceed in parallel. This Conceptual Planning is expected to commence in mid-February 2008 and be completed by December 31, 2008.

1 Integrated Resource Management Strategy

The goal of this activity is to determine the strategy and the goals in both the near term and long term for integrating wastewater management into sustainable water, stormwater, solid waste and energy planning for the community. This activity will also examine how an integrated resource management strategy can best mesh with the concept of "smart" urban growth. Specific tasks include:

- Determine how wastewater flows can best be managed to reduce the consumption of energy. Evaluate potential opportunities to recover hydro power energy.
- Determine the role of heat recovery from the wastewater, both in the first phase facilities and in the future decentralized facilities.
- Evaluate the opportunities for water reuse both in the first phase and in the future facilities. This includes consideration of non-potable water supply, groundwater aquifer recharge and stream flow augmentation.
- Evaluate the energy and resource potential from organic residuals. Consider both a centralized and a decentralized approach. This will include technologies or strategies such as biogas generation, cogeneration of electrical power, and beneficial reuse of the residuals through land application or integration into industrial processes. Determine if augmentation with other organic waste sources, including municipal solid waste, is attractive.

2 Greenhouse Gas Management Strategy

The CRD Board has committed to developing a strategy incorporating the principle of carbon neutrality into the Core Area Wastewater Management Program. This activity will examine ways of accomplishing this commitment. Specific tasks are:

- In conjunction with the Provincial Climate Action Team refine the greenhouse gas management targets and agree on methodologies to assess management performance.
- Based on the agreed methodology and the integrated resource management strategy, develop greenhouse gas emission models that consider both the construction activities and the operations of the Program elements over a defined time frame.
- Refine the integrated resource management strategy as required to best achieve the goal of carbon neutrality.

3 Wastewater Flow Management Strategy

This activity would encompass the detailed planning of the future wastewater flows, based on the expected community development, expected changes due to water conservation and inflow / infiltration management and decisions on distributed treatment. Specific tasks are:

- Determine the flows that will be received at each wastewater treatment facility both at start-up and over the planning horizon. Evaluate if the long term flows to the central facility can be capped or reduced by an aggressive decentralized strategy.
- Determine the flows contributed from each political jurisdiction in order to provide a basis for the development of user rate strategies.
- Assess the frequency, duration and volumes of SSOs at locations other than the treatment facilities, both in the near-term and long-term, based on the proposed strategy.
- Determine what treatment improvements are required in the near term at the SSO points.
- Develop a wet weather flow management strategy to reduce and ultimately eliminate CSOs and SSOs over time.

4 Macaulay Point Wastewater Treatment Plant

The Macaulay Point Wastewater Treatment Plant will be the major centralized facility. Specific tasks are:

- Finalize the site boundary and identify any constraints or commitments to buffer areas or site development / uses.
- Determine environmental or facility development factors including foundation, archeological or environmental issues.
- Determine flow routing through the facility including influent and effluent pumping and handling of emergency bypasses.
- Evaluate process strategies for meeting the definition of two times ADWF through secondary treatment. Consider the feasibility of a blended treatment strategy (biological processes combined with high-rate clarification processes). Determine how the process strategy can be phased over time given the future flows and changes in technologies.
- Determine how flows over two times ADWFs can be handled. Show how this fits the MoE ultimate goal of all flows through secondary treatment.
- Evaluate options for wastewater residuals processing and dewatering. Consider both on-site and pumping / truck haul off-site approaches. This includes consideration of additional properties in the vicinity of proposed site that may provide advantages in term of resource recovery or residuals transportation.
- Determine how the facility can best be developed (layout, architectural design, odour control, other site use, etc.) to incorporate the goals of the CRD, the Township of Esquimalt and other stakeholders.
- Determine if outfall modifications are required, given the flow management strategy.

- If the current site is not available, determine what are the other site choices are potentially available to maintain the adopted distributed wastewater management strategy.

5 Clover Point Wet Weather Flow Management Plant

The function of the Clover Point facility will be to direct a portion of the flows to the Macaulay Point plant and to treat the remainder of the wet weather flows, prior to discharge out the existing Clover Point outfall. Specific tasks include:

- Determine how this facility can best be implemented to achieve the dry weather flow transmission requirements, the wet weather flow management goals and the site use goals of the CRD and the City of Victoria.
- Evaluate the construction impacts on the neighborhood and determine required mitigation strategies.
- Evaluate environmental or facility development factors including foundation, archeological or environmental issues.
- Develop a design strategy to incorporate technology changes over time, without a major reconstruction program.

6 Decentralized Water Reclamation / Resource Recovery Plants

The distributed wastewater treatment strategy will see decentralized water reclamation / resource recovery plants handle a portion of the existing wastewater flow and the majority of future flow increases. They will also provide one of the major opportunities for water reuse and resource recovery. Specific tasks are:

- Evaluate and determine the number of plants and the optimum locations in the initial phase. Develop a strategy for the construction of additional plants in the future.
- Determine how the capacity of these plants will change over time, including phasing or “just-in-time” expansion concepts.
- Assess how each plant can be incorporated into the surrounding neighborhood.
- Show how each plant will meet the integrated resource recovery goals of the CRD.
- Determine if liquid stream treatment only, with residuals processing at the central plant, is the best strategy for all the plants.
- Evaluate environmental or facility development factors including foundation, archeological or environmental issues.
- Evaluate whether all the plants should be part of the CRD system or whether selected plants could be owned and/or operated by another entity.

7 Biosolids / Resource Management Facility

The strategy, adopted by the Board, assumes a remote biosolids / resource management facility located near the Hartland Road landfill. This is not necessarily a final decision. The conceptual level planning needs to evaluate the options in greater detail. Specific tasks to be addressed are:

- Determine whether the biosolids should ultimately be processed at a remote location, at the central wastewater treatment plant or at a site near the central wastewater treatment plant. Consider the potential for energy use partners near the central wastewater treatment plant, at the Hartland site or at other locations.
- If at a remote facility, determine the optimum location of the facility. Assess residuals dewatering at a central plant followed by truck haul or pumping to the biosolids / resource recovery facility.

- Determine the strategies or technologies that can be considered to meet the CRD resource recovery goals. These include anaerobic digestion with the production of biogas, electrical power cogeneration, composting and thermal reduction technologies. As noted above, assess whether additional waste streams, such as municipal solid waste or agricultural / industrial organic wastes, should be incorporated into this strategy.
- Review the environmental implications (GHG, air emissions, residual product reuse or management) of the strategy.
- Evaluate environmental or facility development factors including foundation, archeological or environmental issues.

8 Financial Planning

Implementing the Program in an affordable manner is a primary goal of the CRD. This information is also required to assist the business case consultant team in carrying out their assessment on Program element delivery options. This activity needs to undertake the following tasks.

- Develop the capital costs and cash flow. This needs to meet the costing level of detail required by the funding agencies.
- Determine the expected changes in current annual administration, operations and management costs.