

**REPORT TO CORE AREA WASTEWATER TREATMENT PROJECT BOARD
MEETING OF FRIDAY, APRIL 12, 2019**

SUBJECT Refinement of Project Scope

ISSUE

The vast majority of the Wastewater Treatment Project is now under construction, and only four components of the conveyance system remain to be procured. The remaining four components were identified in 2004 and are all proposed additions to the eastern branch of the CRD's core area conveyance system. The components were designed to convey excess wet weather flows to Clover Point, where they could be discharged out of the long outfall rather than through a number of shorter overflows in Oak Bay.

Since 2004 there have been significant changes to factors influencing the need for these components, including a substantial reduction in water use per person and the collection of a considerable amount of flow data, allowing for more accurate estimates of inflow and infiltration.

The Project Team therefore engaged Kerr Wood Leidal to build an updated model of the core area's wastewater system in order to allow the CRD to make informed decisions regarding capital investments required to meet future demands, including as a result of population growth.

KWL have built the model and the results show that there is no benefit to building three of the remaining Project components, and only one of the remaining components (extension of the Trent Forcemain) is required to meet the Project's goal of meeting regulations.

The Project team are therefore seeking the Project Board's approval to refine the Project scope by removing three components of the conveyance system as they do not provide a benefit to the CRD's residents and businesses, and are not required to meet the Project's goals.

BACKGROUND

On May 25, 2016 the Regional Board of the CRD:

- i) Adopted by resolution the Core Area Wastewater Treatment Project Board Terms of Reference (Project Board Terms of Reference) for the purposes of establishing principles governing the Core Area Wastewater Treatment Project (the Wastewater Treatment Project or the WTP);
- ii) Established the Core Area Wastewater Treatment Project Board (Project Board) under Bylaw 4109 (the CRD Core Area Wastewater Treatment Board Bylaw No. 1, 2016) for the purposes of administering the Core Area Wastewater Treatment Project; and
- iii) Delegated certain of its powers, duties and functions to the Project Board under Bylaw 4110 (the CRD Core Area Wastewater Treatment Project Board Delegation Bylaw No. 1, 2016).

Schedule A of the CRD Core Area Wastewater Treatment Project Board Bylaw No. 1, 2016 defined four goals for the Project Board (the Project's Goals):

- i) Meet or exceed federal regulations for secondary treatment by December 31, 2020;
- ii) Minimize costs to residents and businesses (life cycle costs) and provide value for money;

- iii) Optimize opportunities for resource recovery and greenhouse gas reduction; and
- iv) Deliver a solution that adds value to the surrounding community and enhances the livability of neighbourhoods.

On September 14, 2016 the Regional Board of the CRD:

- i) Received the final report of the Project Board with respect to its recommendation for the WTP, dated September 7, 2016 (the Final Report); and
- ii) Approved the business case attached as Appendix 1 (the Business Case) to the Final Report.

The Business Case established the WTP control budget (the Control Budget) of \$765M, and defined the scope of the Project.

With respect to the conveyance part of the Project, the Business Case stated:

The conveyance component of the Program includes:

- a) *upgrades to the sewage collection system consistent with the Seatterra Program, including an attenuation tank in Saanich East, improvements to various pump stations and to the headworks at Macaulay Point and Clover Point;*
- b) *a new treated water outfall at McLoughlin Point and wet weather outfalls at Clover Point and Macaulay Point; and*
- c) *residual solids conveyance system, consisting of a pipeline and pump stations from the wastewater treatment plant to Hartland Landfill in Saanich.*

The vast majority of the Wastewater Treatment Project is now under construction and only four conveyance components remain to be procured. The four components remaining to be procured are all proposed additions to the eastern branch of the CRD's core area conveyance system - the Northeast Trunk/East Coast Interceptor (NET/ECI) sewage collection system within the Clover Point catchment. See Appendix A for a depiction of the CRD's core area conveyance system.

The four components remaining to be procured are depicted in Figure 1, and are:

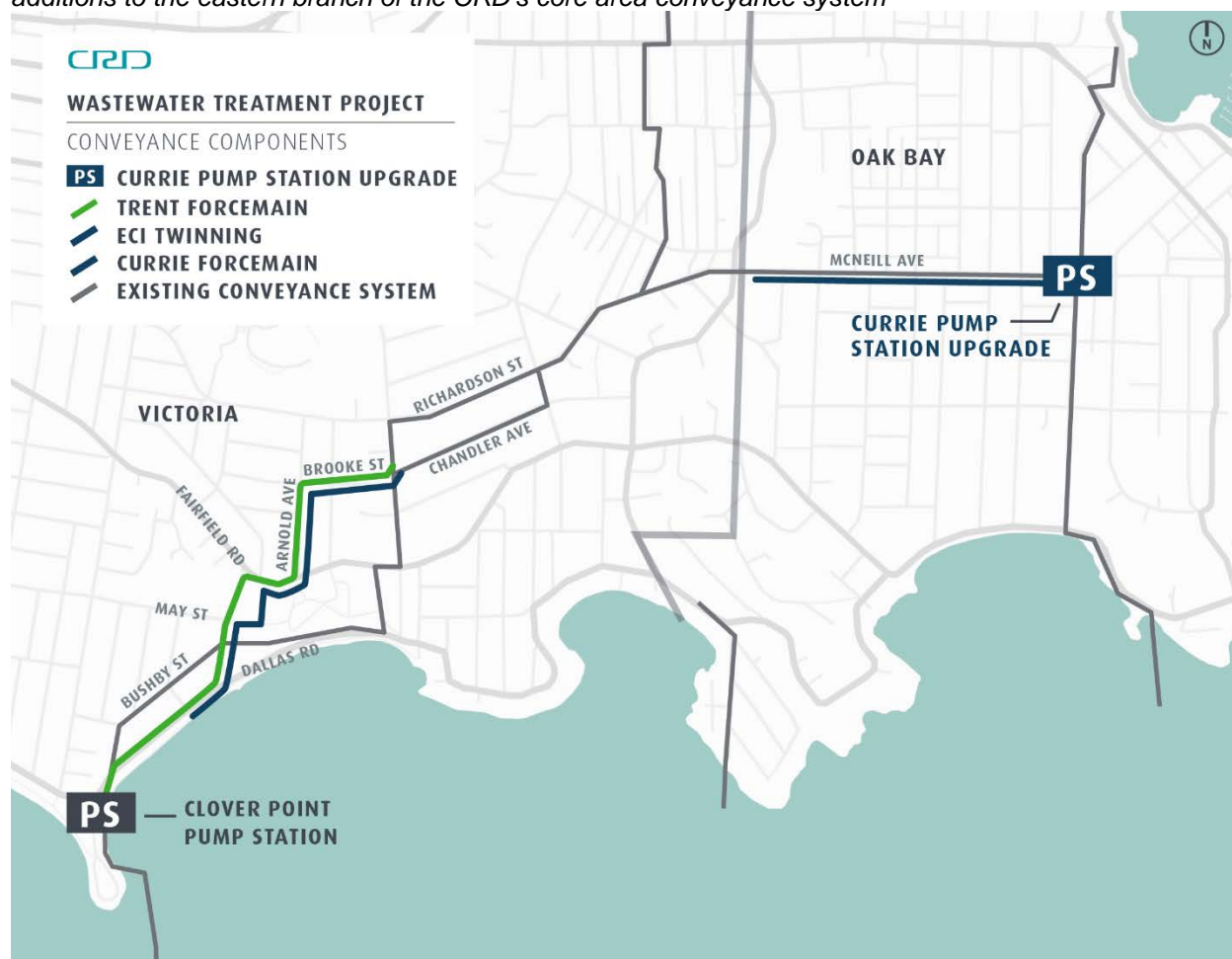
- a) Upgrades to the Currie Pump Station;
- b) Twinning of the Currie Foremain;
- c) Twinning of the East Coast Interceptor; and
- d) Extension of the Trent Foremain.

The scope of the four components is as follows:

- a) Upgrades to the Currie Pump Station: increase in the station's pumping capacity, to allow it to pump flows through the twinned and extended Currie Foremain and East Coast Interceptor;
- b) Twinning of the Currie Foremain: twinning 1.1km of an existing foremain (from Currie Pump Station to the intersection of Foul Bay Road and McNeill Ave);
- c) Twinning of the East Coast Interceptor: twinning 1.3km of an existing gravity sewer (from just downstream of the intersection of Chandler Ave and Saint Charles Street to a junction chamber on Dallas Road approx. 140m west of Memorial Crescent); and
- d) Extension of the Trent Foremain: 1.3km extension of an existing pipe (from just upstream of the intersection of Chandler Ave and Saint Charles Street to a junction chamber on Dallas Road approx. 140m west of Memorial Crescent).

The components were identified in 2004 and designed to convey excess wet weather flows to Clover Point, where they could be discharged out of the long outfall, rather than through a number of shorter overflows in Oak Bay.

Figure 1: The four Project scope components remaining to be procured (Currie Pump Station upgrades; Trent Forcemain extension; East Coast Interceptor twinning; Currie Forcemain twinning): all are proposed additions to the eastern branch of the CRD's core area conveyance system



DISCUSSION

The need for the four conveyance system components remaining to be procured was identified in 2004, and over the last 15 years there have been significant changes to factors influencing the need for these components. The Project Team therefore engaged Kerr Wood Leidal (KWS) to build an updated model of the core area's wastewater system. This updated model will allow the CRD to make informed decisions regarding capital investments required to meet future demands, including as a result of population growth.

The results of KWL's work are outlined in Appendix B and summarised herein.

The updated model takes into account the CRD's extensive flow monitoring data and population and employment projections, and shows that:

- the provincial regulation and Core Area Liquid Waste Management performance requirements will be met with the construction of all of the components currently underway and just one of the components remaining to be procured (being the extension of the Trent Forcemain, with the twinning of a 250m stub of the East Coast Interceptor); and
- the construction of the other three components remaining to be procured would not provide a benefit to the CRD and is not required to meet the Project's Goals.

The relevant provincial regulation is that an overflow must not occur during storm or snowmelt events with a return period of less than five years (other than, as allowed by the CALWMP, through the Macaulay or Clover Point outfalls). The model forecasts that this provincial regulation will be met up to and beyond 2045, without constructing three of the four components that are remaining to be procured.

The reduction in infrastructure required to meet the provincial regulatory requirement is primarily attributable to the following three factors:

- the average dry weather flow has fallen significantly: in the Clover Point catchment the dry weather flows measured in 2018 are approximately 63% of the dry weather flows measured in 2003;
- the contribution from non-residential sources (industrial, commercial and institutional) hasn't been as great as was previously-forecast; and
- the projected amount of rainwater and groundwater that enters the system has fallen significantly: in the Clover Point catchment it has fallen approximately 17% under a five-year storm, from that projected in 2003.

The reduction in the average dry weather flow has occurred even as the population has increased, and is a result of reduced water consumption. As reported to the Core Area Liquid Waste Management Committee (CALWMC) in November 2017¹, the reduced water consumption is primarily a result of the replacement of old water fixtures and appliances, driven by public education, changing building codes and incentive programs through the CRD's water conservation efforts.

Projected Flows

The model forecasts flows to 2045 based on the CRD's traffic zone model, which provides for an average annual growth of approximately 0.6% in the Clover Point catchment (and 1.3% for the sewered population of the core area as whole), from the 2016 population census to 2045.

When the hydraulic capacity of the system is reached (which is forecast to be after 2045), it would likely be preferable to expand the Arbutus Attenuation Tank rather than build the remaining conveyance components, as this would allow excess wet weather flows to be temporarily stored and then treated at the McLoughlin Point Wastewater Treatment Plant, rather than simply being discharged untreated out of the Clover Point outfall.

Project Goals

The CRD Board defined four goals for the Project Board in Schedule A of the CRD Core Area Wastewater Treatment Project Board Bylaw No. 1, 2016:

- i) Meet or exceed federal regulations for secondary treatment by December 31, 2020;
- ii) Minimize costs to residents and businesses (life cycle costs) and provide value for money;
- iii) Optimize opportunities for resource recovery and greenhouse gas reduction; and
- iv) Deliver a solution that adds value to the surrounding community and enhances the livability of neighbourhoods.

Given that three of the remaining components of the Project are not required to meet the Project's

¹ Core Area Liquid Waste Management Committee (8 November 2017) *Low-Flow Household Appliances* Staff Report #EFE 17-55

goals, and would provide no benefit to the CRD's residents and businesses, the Project team are seeking the Project Board's approval to remove the following three components from the scope of the Project:

- a) Upgrades to the Currie Pump Station;
- b) Twinning of the Currie Forcemain; and
- c) Twinning of the East Coast Interceptor.

Project Board's Delegated Authority

The CRD Core Area Wastewater Treatment Project Board Delegation Bylaw No. 1, 2016 established that CRD Board approval is required for any alteration in the Project's scope, schedule or budget that would result in:

- i) the Core Area Wastewater Treatment Project not meeting provincial and federal regulations governing the Core Area Wastewater Treatment Project;
- ii) the Capital Regional District exceeding all approved sources of funding for the Core Area Wastewater Treatment Project; or
- iii) increased costs to taxpayers from those contemplated in the business case.

It is within the Project Board's delegated authority to approve the proposed amendment to the scope of the Project, as the proposed scope refinement would not result in any of the events specified in the CRD Core Area Wastewater Treatment Project Board Delegation Bylaw No. 1, 2016.

Other Findings

The model shows that all components of the Project, other than three of those remaining to be procured, are required to meet the Project's goals.

The updated wastewater flow projections forecast that, with either the original or the refined Project scope:

- the McLoughlin Point Wastewater Treatment Plant will have capacity to treat the core area's wastewater to 2041; and
- the conveyance system will have capacity to meet and exceed the following CALWMP commitments past 2045:
 - all wet weather flows up to four times the average dry weather flow (4 x ADWF) from the Macaulay Point catchment will be conveyed to McLoughlin Point for treatment; and
 - all wet weather flows up to 3 x ADWF from the Clover Point catchment will be conveyed to McLoughlin Point for treatment;
 - no overflows will occur for a wet weather event with less than a 100-year return period at any of the high sensitivity receiving waters along the East Coast (i.e. Broom Road or Bowker Creek); and
 - no overflows will occur for a wet weather event with less than a 5-year return period at any of the receiving waters along the East Coast (i.e. Finnerty and McMicking Points), with the exception of those associated with the combined sewer system.

Regardless of whether the Project is built as originally-defined or with the refined scope, there will continue to be overflows at Humber and Rutland. These overflows occur as portions of the collection system in Oak Bay have combined sewer systems that carry both sanitary (municipal wastewater) and storm flows. Amendment No. 12 to the CALWMP is intended to address this, and was submitted to the Ministry in February 2017. The Minister conditionally-accepted aspects

of Amendment No. 12 in June 2018, with conditions to the approval including the submission a cost/benefit analysis of separating the combined sewer system on different timeframes.

Next Steps

If the Project Board approves the refinement in the Project's scope the Project Team will:

- inform the provincial and federal funding partners of the model findings and confirm whether any amendments are required to the scope definitions in the Project's funding agreements – the Project Team has informed the provincial and federal funding partners that an assessment of the need for some of the unprocured Project components was being undertaken, and neither have anticipated any barriers to amending the funding agreements to remove components of the conveyance scope that aren't required; and
- discuss with the Ministry of Environment and Climate Change Strategy the appropriate process and timing for amending the CALWMP (as the scope under consideration was included in Amendment No. 4 to the CALWMP) – the Project Team has been working with the Ministry of Environment and Climate Change Strategy towards the registration of the Project under the Municipal Wastewater Regulation (MWR) and does not anticipate any barriers to amending the CALWMP to remove components of the conveyance scope that are no longer required, as the *Environmental Management Act* allows the Minister to amend approved waste management plans.

BUDGET IMPLICATIONS

The cost of each of the conveyance components procured to-date has exceeded the applicable amount included in the Control Budget (and required a contingency draw to be made), primarily as a result of greater than forecast escalation in the Vancouver Island construction market. The Project Team therefore asked KWL to refresh the cost estimates for the four remaining Conveyance components. In line with the escalation evident on the other components, the cost estimate for the remaining scope is greater than that included in the Control Budget.

Removing three of the components from the Project scope would therefore reduce the total cost of the Project, but is not expected to result in a savings on the Project's \$765M budget: the status of the Project's budget is the subject of a separate staff report on the Project Board's April 12, 2019 meeting agenda.

If the three components were removed from the Project's scope there would be a reduction in operating and maintenance costs as well as avoided capital costs and avoided stakeholder impacts associated with the construction, operations and maintenance.

The federal and provincial governments are funding 60% of the Project's \$765M budget. As noted earlier in this report, the Project Team have informed the provincial and federal funding partners that an assessment of the need for some of the unprocured Project components was being undertaken, and neither have anticipated any barriers to amending the funding agreements to remove components of the conveyance scope that aren't required. The recommended scope refinement is therefore not expected to impact the federal and provincial funding contributions to the Project.

RECOMMENDATION

That the Core Area Wastewater Treatment Project Board approve the following resolution:

RESOLVED that:

1. The Project's scope, as defined in the business case (Appendix 1 to the Project Board's September 7, 2016 report entitled 'Final Report'), be refined to remove the following components from it:
 - (a) Upgrades to the Currie Pump Station;
 - (b) Twinning of the Currie Forcemain; and
 - (c) Twinning of the East Coast Interceptor.
2. This report be forwarded to the Core Area Liquid Waste Management Committee and CRD Board for information.



Elizabeth Scott, Deputy Project Director
Wastewater Treatment Project



Dave Clancy, Project Director
Wastewater Treatment Project
Concurrence

Appendix A: CRD's Core Area Sewer Systems and Outfalls

Appendix B: Kerr Wood Leidal's March 28, 2019 Memo entitled '2019 Sanitary Model Update and Flow Study'