Comox Valley REGIONAL DISTRICT

Staff report

DATE: July 5, 2017

FILE: 5340-02

TO: Chair and Members
Comox Valley Sewage Commission

FROM: Russell Dyson,
Chief Administrative Officer

RE: Comox No. 2 Pump Station Project – Pre-Implementation Phase Investigations

Purpose
To update the Comox Valley Sewage Commission on preliminary results of the investigations completed during the Comox No. 2 pump station (Comox No. 2) project pre-implementation phase in advance of final reports being submitted in September 2017.

Policy Analysis
The Comox Valley Regional District (CVRD) operates a sewerage service primarily for the City of Courtenay and Town of Comox, established by Bylaw No. 2541, being the "Comox Valley Sewerage Service Establishment Bylaw No. 2451, 2003".

At its January 21, 2017 meeting, the Comox Valley Sewage Commission approved the following recommendation:

> *THAT as a result of a competitive process, the contract for the owners engineer services for the pre-implementation phase of the Comox No. 2 pump station project be awarded to Opus International Consultants (Canada) Ltd. in the amount of $168,496 excluding GST;*
>
> *AND FURTHER THAT subsequent phases of the work including the implementation, construction and post-construction phases be awarded to Opus International Consultants (Canada) Ltd. at the Comox Valley Regional Districts discretion for a total overall cost of $491,336 excluding GST;*
>
> *AND FINALLY THAT the chair and corporate legislative officer be authorized to execute the contract.*

At its March 28, 2017 meeting, the CVRD Board approved the following recommendation:

> *THAT as a result of a competitive process, the contract for the investigation and condition assessment of the raw wastewater forcemain be awarded to Pure Technologies Ltd. in the amount of $449,123 excluding GST.*

Executive Summary
Staff and consultants have been working to deliver the final results of the three pieces of investigation in time to inform a decision on Comox No. 2 project implementation in July, however the work has taken longer than expected. This report provides an update on the work. Final results will be brought forward to inform an implementation decision by the Comox Valley Sewage Commission in September 2017.

Potential red flags remaining at the beginning of the pre-implementation phase included:

1. The condition of the foreshore forcemain from the Courtenay pump station to the location of the tie-in to a new Comox No. 2 pump station;

2. The total up to date capital costs of the Comox No. 2 project, including the costs of all new associated forcemains;
3. The potential for the Comox No. 2 project to negatively impact the quality or quantity of well water in the surrounding neighborhood.

Preliminary results from the investigations are summarized in this report.

Wastewater from the City of Courtenay and the Town of Comox is transmitted to the Comox Valley Water Pollution Control Centre (CVWPCC) through a large diameter forcemain that follows the shoreline from the Courtenay River estuary to Goose Spit, along Willemar Bluff and then on to the CVWPCC. The section along Willemar Bluff has deteriorated and must be decommissioned to eliminate the risk of a catastrophic failure of the forcemain.

The Comox No. 2 project was initially conceived of in 2005 as part of the "Forcemain re-alignment Study" completed by CH2MHill in response to the uncovering of the forcemain along Willmar Bluffs in 2003. The project was further supported during the sewer master planning process as a way to decommission the Willemar Bluffs section of forcemain by instead redirecting the wastewater flows through a new pump station up and over the Comox peninsula directly overland to the CVWPCC. This project would also serve to address capacity issues at the Courtenay and Jane Place pump stations.

The Comox No. 2 project is to be delivered as a design-build (DB) project. Under the DB model, a single bid team is responsible for both the design and construction of the project. As part of the DB process the Comox Valley Sewage Committee at its January 2017 meeting approved the contract award to Opus International Consultants (Canada) Ltd. (Opus) for phase one of the owners engineer services.

The owners engineer role is divided into four phases with phase one being the pre-implementation phase. The purpose of the first phase is to develop the indicative design for the project which includes resolving any potential red flags and development of technical, architectural and urban design criteria.

1. Forcemain Condition Assessment

The forcemain is exposed to severe operational conditions (raw wastewater on the inside, exposure to a marine environment on the outside) and to better understand the condition of the forcemain a request for proposals was issued in February 2017. The intent of this work is to gain an improved understanding on the condition of the forcemain including the degree of deterioration, structural integrity of the pipe and future serviceability of each individual section of pipe.

Pure Technologies initiated the project in early April 2017, including acoustical investigation of the forcemain from the Courtenay pump station to the CVWPCC (base scope and provisional item one), and an electromagnetic investigation of the forcemain from the Courtenay pump station to the Jane Place pump station (revised provisional item two). The acoustical investigation provides the CVRD with information on any leaks or gas pockets that may be present within the forcemain. The electromagnetic investigation of the section of pipe from the Courtenay pump station to the Jane Place pump station provides insight on the condition of the pipe and remaining service life.

The completed condition assessment will be presented in report form and will provide a condition rating for each section of pipe, the likelihood of failure for each pipe, a failure analysis of any damaged sections of pipe, and prioritization and recommendations for rehabilitation of pipe.

Preliminary results have been received, and indicate that the pipe is in good condition with no leaks or broken reinforcing wires. Final results will be communicated to the Comox Valley Sewage Commission in September.

2. Indicative Design and Class B Cost Estimate

Under a design-build project delivery method, the owner's engineer develops an indicative design rather than a detailed design. The indicative design is developed to approximately a 30 per cent level of detail, rather than the 100 per cent detailed design developed under the traditional design-bid-build methodology typically used locally. The purpose of the indicative design is to lay out a possible solution for the project, which in combination with the project specification, will provide the parameters that the design-build team will use to create their own design for the project. The specification will have largely performance based requirements, with specific elements of the indicative design more or less prescriptive based on an assessment by staff and consultants. For example, the design workshop process undertaken with the local neighborhood will result in a particularly prescriptive approach to the architecture of the pump station to ensure that the final design satisfies the intent of the feedback from the public.

The level of detail design performed through the indicative design process allows for a Class B cost estimate to be developed, with an accuracy of +/- 15 per cent. Preliminary results from the indicative design indicate that the estimated capital costs for the project have increased by approximately 70 per cent above what was previously budgeted for the project, largely due to the level of redundancy required for a pump station of this type, the complexity of the foreshore tie-in to the existing forcemain, and the constraints imposed by the small size of the property and lack of construction lay down area. The final indicative design and cost estimate will be communicated to the Comox Valley Sewage Commission in September 2017.

3. Further Hydrological Work

GW Solutions was originally hired by the local neighborhood to evaluate the potential risks to their groundwater wells from the Comox No. 2 project. Due to the shallow nature and age of most of the wells in the area, they concluded that there was a risk to the wells in the event of a failure of the pump station or forcemain. Seeking further detail on the matter, the CVRD subsequently hired GW Solutions to undertake further work.

In their December 2016 report GW Solutions concluded that a wastewater leak from a forcemain or pump station in the neighborhood would be likely to impact the quality of water in the local residential wells, but recommended that a survey of the local wells be performed to better understand the method of construction and history of the local wells. The work nearing now completion includes that survey of local wells, installation of new monitoring wells in the road right of way, and establishment of baseline water quality and groundwater levels. This work is almost complete and results are expected shortly. It should be noted that actual risk is a combination of probability and impact. GW Solutions has been working to qualify the impact of a leak in the neighborhood, but the strength of the project specifications, including multiple levels of redundancy means the probability of a leak occurring will be very low resulting in a low risk of impacting water quality in the neighborhood.

In addition to the survey, GW Solutions has been working to establish a baseline for water quality and groundwater levels in the area which would then be used to monitor for impacts to water quality and quantity during and after construction. In the event that impacts do occur, the CVRD is committing to addressing any impacts by providing temporary or permanent water connections depending on the prognosis. The results of this hydrological work will be communicated to the Comox Valley Sewage Commission in September 2017.

Recommendation from the Chief Administrative Officer:
This report is provided for information only.

Respectfully:

R. Dyson

Russell Dyson
Chief Administrative Officer

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