Comox Valley REGIONAL DISTRICT

Staff Report

DATE: September 29, 2021

FILE: 1700-02/2021/308

TO: Chair and Directors
Electoral Areas Services Committee

FROM: Russell Dyson
Chief Administrative Officer

Supported by Russell Dyson
Chief Administrative Officer

R. Dyson

RE: Union Bay Water Service Budget Amendment – Water Master Plan

Purpose
To present an amendment to the 2021 adopted budget for the Union Bay water service to include provincial grant funding for the completion of the Union Bay Water Master Plan.

Recommendation from the Chief Administrative Officer:
THAT the 2021 approved budget for the Union Bay Water Service, Function 308, be amended to include the addition of $50,000 of grant funding from the BC Ministry of Municipal Affairs and a corresponding increase in Other Professional Fees, towards the completion of a Union Bay Water Master Plan.

Executive Summary

- On April 30, 2021, Koers and Associates Engineering Ltd. provided a quote to the Comox Valley Regional District (CVRD) for the completion of a Water Master Plan for the Union Bay water system (Appendix A).
- The Water Master Plan will involve detailed analysis of the water distribution system for existing and future demand conditions related to development in the settlement node and will identify any required upgrades.
- On June 7, 2021, the CVRD wrote to the Ministry of Municipal Affairs requesting financial assistance towards the completion of a Water Master Plan for the Union Bay water supply and distribution system.
- As mentioned in the July 9, 2021 staff report titled "Union Bay Local Service Areas Financial Overview" (link), the completion of a Water Master Plan to assess the Union Bay water service water supply and distribution infrastructure has been identified as a priority project.
- On August 11, the Ministry of Municipal Affairs approved a $50,000 restructure implementation grant to support the CVRD to complete the Water Master Plan (Appendix B).
- Only the completion of the core tasks identified in the Koers and Associates Engineering Ltd. proposal will be completed at a cost of $47,475.
- Unused grant funding will be returned in the form of a cheque made payable to the Minister of Finance no later than June 30, 2022.

Prepared by:	Concurrence:	Concurrence:
C. Leimert	***K. La Rose***	***M. Rutten***
Caley Leimert, EIT Engineering Analyst	Kris La Rose, P.Eng. Senior Manager of Water/ Wastewater Services	Marc Rutten, P.Eng. General Manager of Engineering Services

Government Partners and Stakeholder Distribution (Upon Agenda Publication)

Union Bay Advisory Group	✔

Attachments: Appendix A – Union Bay Water Master Plan Proposal
Appendix B – Successful Funding Letter

KOERS & ASSOCIATES ENGINEERING LTD.
Consulting Engineers

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194 MEMORIAL AVENUE
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April 30th, 2021
File: 2122P-01

Comox Valley Regional District
770 Harmston Avenue
Courtenay, B.C. V9N 0G8

Attention: **Mr. Kristian La Rose, P.Eng.**
Senior Manager of Water/Wastewater Services

Re: Proposal for Consulting Engineering Services for:
Union Bay Improvement District – Development of a Water Master Plan

Further to your request, we are pleased to provide our proposal covering the tasks we anticipate having to carry out in order to develop a comprehensive Water Master Plan for the Union Bay Improvement District water system.

1 SCOPE OF WORK

We have developed a scope of work based on:

- discussions with yourself,
- Water Master Plans we have completed for other Vancouver Island municipalities, and
- our working knowledge of the Union Bay Improvement District water system.

Detailed analysis of the water distribution system for existing and future demand conditions will be carried out using the computer program WaterGEMS Connect Edition Update 3 and our in-house model of the Union Bay Improvement District water system.

We have identified a group of "core tasks" we consider to be the minimum scope of work required to assess the capacity of the existing system and identify upgrading works necessary, if any, to meet current design standards, and the upgrading works necessary to meet projected future growth up to the point when the existing water licence on Langley Lake is fully utilized.

We have also identified a list of "optional tasks" that would be of benefit to the CVRD in long range planning as it takes over the ownership and operation of the water system. We have included the modelling and assessment of system improvements needed at full OCP build-out as an optional task at this stage because it is unclear whether the information needed to complete this task is currently available. Information required includes conceptual piping network layouts for the future subdivisions, the location(s) of any future institutional/commercial/industrial developments (including fire flow estimates for these

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facilities), and conceptual plans for an additional water supply source that will be connected after the licence capacity of Langley Lake has been fully utilized.

The "core tasks" and "optional tasks" that we anticipate having to carry out are presented in **Table 1** along with the corresponding fees associated with these tasks. The fees listed for the "optional tasks" should be considered estimates until such time as the scope of work for each task can be confirmed. General notes describing the currently anticipated scope of work for each task are also provided.

Table 1 – Master Plan Tasks & Fee Summary

Task No.	Description	Fee (not including GST)
CORE TASKS		
1	Water System Overview	$ 8,390
2	Current Water Demands	$ 6,750
3	Existing Distribution System Modelling	$ 4,515
4	Future Growth & Demand Projections	$ 9,790
5	Future Distribution System Modelling to Water Licence Limit	$ 13,070
6	Preparation of Report	$ 4,960
	Core Tasks Total:	**$ 47,475**
OPTIONAL TASKS		
7	Future Distribution System Modelling to OCP Build-Out	$ 13,000
8	Water Treatment & Distribution System Major Components Asset Inventory	$ 10,000
9	Water Supply Overview & Asset Inventory	$ 11,000
10	Condition Assessment (System Leakage)	$ 13,000
11	Capital Plan, 10 Year Horizon	$ 10,000
12	Uni-Directional Flushing Program	$ 25,500
13	Calibration of Water Model Using Flow Testing in the Field	$ 5,500

Table 1 Core Task Notes:

1 **Water System Overview**
Work carried out in this task includes an overview of the existing surface supply, lake intake, raw water supply main, treatment, treated water storage reservoirs, pressure reducing valves, booster pumps, distribution piping, and pressure zones. This task also includes the development of a Schematic Water System Map of the entire system which shows these existing system components as well as the pressure zone boundaries.

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2 Current Water Demands

Work carried out in this task includes a detailed review of the existing bulk and individual water meter records to establish current demands and estimate the level of system leakage occurring within the distribution system at this time. The design capacity of the water treatment plant will be reviewed against historical peak day production records as well as the current water licence withdrawal limit. This will help establish the available supply capacity for the future developments that will be considered in Task 4.

3 Existing Distribution System Modelling

Work carried out in this task includes calculation of system pressures under peak hour demands, determining available fire flows under maximum day demands, and comparing the current reservoir storage volume with the recommended minimum reservoir storage volume. Available fire flow and peak hour pressure maps will be produced for the entire water system. A plan showing the proposed improvement works will also be provided.

4 Future Growth & Demand Projections

Work carried out in this task includes establishing future growth projections associated with infill of existing service areas and any proposed land development projects that are currently under review (Union Bay Estates, Upper Island Developments, & District Lot 7). Estimating how future growth will occur is going to be critical because we will have to distribute future demands throughout the water system as realistically as possible when we perform the modelling for this future demand condition.

5 Future Distribution System Modelling at Water Licence Limit

Work carried out in this task includes calculation of system pressures under peak hour demands, available fire flows under maximum day demands, and assessment of water storage volume capacity compared to the recommended minimum volume when system demands reach the withdrawal limit of the existing water licence. Available fire flow and peak hour pressure maps will also be produced for this future demand condition. A plan showing the proposed improvement works will also be provided.

6 Preparation of Report

The work carried out in Tasks 1 through 5 will be presented in a report along with detailed conclusions and recommendations. The report would include tables, figures, drawings, and commentary associated with Tasks 1 – 5.

Table 1 Optional Task Notes:

7 Future Distribution System Modelling to OCP Build-Out

Work carried out in this task would include calculation of system pressures under peak hour demands, available fire flows under maximum day demands, and assessment of water storage volume capacity compared to the recommended minimum volume at OCP Build-Out. Fire flow maps, peak hour pressure maps, and a drawing showing the proposed improvements (similar to Tasks 3 and 5) would also be provided.

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8 Water Treatment & Distribution System Major Components Asset Inventory

Work carried out in this task would include updating the asset inventory listing presented in the UBID Capital Plan Update Report, Feb 2009 to include subsequent upgrading works (e.g., water treatment plant, reservoir, PRVs). Infrastructure replacement costs will be updated to current year (Year 2021) utilizing our in-house record of costs from similar projects.

No allowance has been included to recreate the Feb 2009 asset inventory table if it is not available in Excel format. The cost to do so can be provided if this work is required.

9 Water Supply Overview & Asset Inventory

Work carried out in this task would include development of an asset inventory of the main components of the surface water supply system (intake, dam and raw water supply main). Infrastructure replacement costs will be developed utilizing our in-house record of costs from similar projects.

Unless carried out recently, the following investigations should be undertaken as part of this task:

- dive inspection report of the submerged intake
- video inspection report of the submerged piping in the lake and through the dam
- geotechnical inspection report of the dam on Langley Lake

No allowance has been included for retaining the services of qualified contractors and/or consultants to undertake these investigations and prepare the three reports noted above.

10 Condition Assessment (System Leakage)

Work carried out in this task would include development of an AC pipe replacement schedule based on a review of:

- distribution system leak repair records for the past five years (2016-2020)
- laboratory testing results of AC pipe test sections removed from the distribution system.
-

No allowance has been made for the removal and testing of the AC pipe test sections.

11 Capital Plan, 10 Year Horizon

Work carried out in this task would include development of a 10-year capital plan complete with cost estimates (Class D) which would be developed utilizing our in-house record of costs from similar projects.

12 Uni-Directional Flushing Program

Work carried out in this task would include the development of a uni-directional flushing program of the water distribution system. The sequence of opening and closing of valves and the flushing of water through hydrants in a uni-directional manner will be detailed on coloured water distribution system map sheets.

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13 Calibration of Water Model Using Flow Testing in the Field

Work carried out in this task would include calibration of the water model using flow testing information obtained from the water system. Typically flows and residual pressure readings are taken at fire hydrants during a known system demand condition. This field data is then compared to the theoretical results that are calculated by the water model. Adjustments are then made to the model if required.

No allowance has been included for retaining the services of a flow testing company.

2 DELIVERABLES

2.1 CORE TASKS DELIVERABLES

Reports

- Draft Report, electronic (pdf) submission
- Final Report, three hard copies and an electronic (pdf) copy

Drawings (to be included in the reports)

- Schematic Water System Map
- Peak Hour Pressure and Available Fire Flow Maps
- Required Improvement Works for Existing Conditions Demands
- Required Improvement Works for Licenced Withdrawal Limit Demands

2.2 OPTIONAL TASKS DELIVERABLES

For any Optional Tasks authorized at this time, the findings, conclusions, and recommendations would be incorporated into the Core Tasks report, with the exception of the Uni-Directional Flushing Program.

7 Future Distribution Modelling to OCP Build-Out

- Peak hour pressure map, fire flow map, and plan drawing of the required improvement works for OCP build-out demands

8 Water Treatment & Distribution System Major Components Asset Inventory

- Infrastructure inventory table

9 Water Supply Overview & Asset Inventory

- Infrastructure inventory table

10 Condition Assessment (System Leakage)

- AC Pipe Laboratory Testing Results
- Table listing AC pipe annual replacement
- Plan drawing showing location of annual AC pipe replacement projects

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11 Capital Plan, 10 Year Horizon

- Table listing capital plan works in order of priority with cost estimates
- Plan drawing of the 10 year capital plan proposed works

12 Uni-Directional Flushing Program

- Uni-Directional Flushing Program map book as a stand-along document

13 Calibration of Water Model Using Field Flow Testing Data

- Table comparing flow and residual pressure measurements recorded at fire hydrants by flow testing company to calibrated model results

3 INFORMATION TO BE PROVIDED BY CVRD/UBID

3.1 FOR CORE TASKS

Water Meter Reading Data

- Treated water bulk meter readings that are available for at least two years before the Water Treatment Plant was put into service
- All Water Treatment Plant meter data for the raw water flow meter, the backwash flow meter, the recycle flow meter, and the treated water flow meter
- Individual water meter readings (every customer) for the past three years (2018-2019, 2019-2020, 2020-2021)

Future Growth

- Infill development (location, type, and amount) within the existing water service area
- Details of the Kilmarnock Area boundary that could become part of Royston Water Local Service Area and timing of when this may occur
- Water licence spare capacity allocation for future development (location and amount)
- OCP Build-Out land-use map with projected number of residential dwelling units and projected service populations for future development areas, including, but not limited to:
  - Union Bay Estates
  - Upper Island Developments
  - District Lot 7
- Growth projections (population, residential dwelling units, institutional/commercial/industrial lands) in 10-year increments to OCP-Build-Out.

3.2 FOR OPTIONAL TASKS

Task 7 Future Distribution System Modelling to OCP Build-Out

- Conceptual plan layouts of future developments (to be used for location of future watermains within and for servicing to the developments)

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Task 8 Water Treatment & Distribution System Asset Inventory

- Any record drawings for the distribution system and water storage reservoirs not previously provided to Koers
- Leak repair history for past five years (2016 – 2020)
- Digital copy (Excel format) of water system inventory tables from UBID Capital Plan Update Report, Feb 2009 by McElhanney

Task 9 Water Supply Overview & Asset Inventory

- Any record drawings of dam, water supply intake, and raw water supply main to water treatment plant not previously provided to Koers
- Any information available on Langley Lake such as bathymetric surveys
- Most recent dam inspection report(s)
- Watershed assessment report if available

Task 10 Condition Assessment (Pipe Leakage)

- Leak repair history for the past five years (2016 – 2020)

Task 13 Calibration of Water Model

- Flow and pressure data provided by a flow testing company at specific times and at specific locations throughout the distribution system
- Water Treatment Plant meter data for the treated water flow meter, the backwash flow meter, and reservoir levels at the times the flow testing takes place

4 SCHEDULE

Based on our current work load we will be able to commence work on this assignment within 2 to 3 weeks of receiving authorization to proceed. We anticipate being able to accommodate the following project schedule:

Table 2 – Project Schedule

Description	Schedule
CORE TASKS	
Draft Report submission	3 to 4 months after starting work on assignment
Final Report submission	1 month after receipt of draft report comments

The time frame to carry out the optional task items can be provided upon confirmation from the CVRD on which optional tasks are to be carried out at this time.

We propose to undertake this assignment in accordance with our standard Client Services Agreement, a copy of which is attached. The fees we have presented in our proposal are currently based on the use of this agreement.

April 30th, 2021 8 of 8
File: 2122P-01

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We appreciate the opportunity to offer our services to you on this important assignment. Please do not hesitate to contact us to discuss in greater detail any aspect of the core and optional tasks. We look forward to your response.

Yours truly,

KOERS & ASSOCIATES ENGINEERING LTD.

Matt Palmer, P. Eng.
Principal

CONFIDENTIAL

This proposal is submitted at the request of the recipient and in confidence as defined under Section 21 of the Freedom of Information and Protection of Privacy Act. It is intended only for use by the recipient in confirming the scope of work meets the recipients needs. Any use of it in the development of a Request of Proposal is not permitted without the written agreement of Koers & Associates Engineering Ltd.

August 11, 2021

Ref: 258489

James Warren, Deputy Chief Administrative Officer
Comox Valley Regional District
770 Harmston Avenue
Courtenay, BC V9N 0G8

Dear James:

With the dissolution of the Union Bay Improvement District on July 1, 2021, the Ministry of Municipal Affairs (Ministry) appreciates that the Comox Valley Regional District (CVRD) will need to begin planning, in earnest, for the needs of the Union Bay water service area and developing a longer-term operating and capital plan.

Your letter of June 7, 2021 indicated that the CVRD is challenged to acquire this information through a water master plan process until the work can be included in the first service budget under the regional district budget process.

The Ministry has therefore approved a $50,000 restructure implementation grant to support the CVRD with accelerating the initiation of the water master plan process to acquire information needed to manage the Union Bay water system and integrate its needs into the regional planning context. It is the Ministry's understanding and expectation that the CVRD will organize resources to complete the Union Bay water master plan process through its 2022 budget process.

This letter provides information and requirements for the following approved project:

Project	**Amount**	**Commitment No.**
Comox Valley Regional District – Union Bay Water Master Plan	$50,000	51 RI 2201

The grant has been approved under the Restructure Implementation Grant Program, pursuant to the *Local Government Grants Act* and Regulations. Please cite this commitment number in all correspondence.

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Ministry of Municipal Affairs
Governance and Structure Branch
Local Government Division

Mailing Address:
Po Box 9839, STN PROV GOVT
Victoria, BC V8W 9T1
Phone: 250 387-4020
Fax: 250 387-7972

Location:
4th Floor, 800 Johnson Street

www.gov.bc.ca/muni

The following stipulations must be met in order to retain this funding:

1) The CVRD must use the grant funding solely for the purpose of undertaking a water master plan for the Union Bay water system and for defraying the costs of undertaking, completing, and providing written reports to the Ministry;

2) The grant funding must be used only for reasonable costs and expenses related to the water master plan work that are incurred between the July 1, 2021 and March 31, 2022; and

3) CVRD must submit the following reports to the Ministry program staff:

    a) An *Interim Progress Report*, on or before September 15, 2021, demonstrating that the CVRD has entered into a contract to complete the work described as within scope for phase 1 of the water master plan in your letter dated June 7, 2021.

    b) A *Final Project Report*, on or before March 31, 2022, conveying a copy of the water master plan phase 1 report accepted by the CVRD as fulfillment of the contract noted above, or those portions of work that have been completed by that date.

    c) An *Account of Study Expenses*, on or before June 30, 2022,
        i) summarizing the water master plan project expenses between July 1, 2021 and March 31, 2022, and
        ii) confirming that either all grant funding has been expended or an unused portion of the grant funding that will be returned to the Province.

4) Unused grant funding should be returned in the form of a cheque made payable to the Minister of Finance no later than June 30, 2022.

Ms. Catherine Lee will continue to be the Ministry contact, as she has been for other matters related to the conversion of the Union Bay Improvement District. Please direct the required reports to Ms. Lee.

Sincerely,

Marijke Edmondson
Director, Governance Structures

pc Catherine Lee, Senior Program Analyst