

DATE: September 7, 2017 **FILE:** 5360-20/CV

TO: Chair and Directors
Comox Valley Regional District (Comox Strathcona Waste Management) Board

FROM: Russell Dyson
Chief Administrative Officer

RE: Project Status Report - August 2017
CVWMC New Engineered Landfill - Cell 1 Construction and Leachate Treatment Facility

Purpose

To provide a project status report for the Comox Valley Waste Management Centre (CVWMC) new engineered landfill - cell 1 construction (cell 1) and the leachate treatment facility design and construction.

Policy Analysis

At the June 16, 2016 Comox Valley Regional District (CVRD), Comox Strathcona waste management board (CSWM board) meeting the board approved the following resolution:

THAT a contract be awarded to New Lining Solutions Inc. for the Comox Strathcona waste management service new engineered landfill – cell 1 project in an amount not to exceed \$5,756,081.30 plus applicable taxes;

AND FURTHER THAT in the event that New Lining Solutions Inc. does not execute the contract within ten days of its receipt of the Notice to Award in accordance with the Instructions to Tenderers, that a contract be awarded to the second lowest bidder, Wacor Holdings Ltd., for the Comox Strathcona waste management service new engineered landfill – cell 1 project in an amount not to exceed \$5,808,830.12 plus applicable taxes.

At the September 15, 2016 CSWM board meeting the board approved the following resolution:

THAT as a result of a competitive process the contract for the design and construction of the Comox Valley waste management centre leachate treatment facility be awarded to Maple Reinders Inc. in an amount not to exceed \$7,444,600 plus applicable taxes.

Executive Summary

The expansion of the CVWMC is a large and complex project required to provide additional air-space volume to the Comox Strathcona solid waste (CSWM) service. The project is included in the 2012 Comox Strathcona solid waste management plan (CS-SWMP) and meets or exceeds all of the current provincial requirements for landfill design, construction, and operation. The project is made up of two main components – cell 1 design and construction and the leachate treatment facility design and construction.

Construction of the first cell is now complete with placement of select waste beginning in late August 2017. Going forward, all select waste at the CVWMC is now being diverted to the new cell. The construction of the leachate treatment facility is on schedule for completion in September 2017 followed by commissioning in early October.

Total cell 1 and leachate treatment facility (LTF) costs at completion are estimated at \$15,866,000 which is slightly lower than the \$16,139,000 estimated in the April status report. This is primarily due to unit items coming in under the estimated amount for the Cell 1 contract.

The projects have provided an estimated \$3.6 million towards the local economy with the purchase of locally supplied services, materials and equipment. The construction of cell 1 has resulted in approximately 20 full-time workers from Vancouver Island and the construction of the LTF is expected to provide an additional approximately 9 full-time and part-time workers from Vancouver Island for the duration of the project. This equates to approximately 5,528 work days of local employment.

In addition to the economic and social benefits of the project, a number of positive community impacts are expected as a result of the cell 1 and LTF implementation. These benefits include surface and groundwater protection as well as a small amount of landfill gas end-use (to heat leachate prior to treatment).

The following sections highlight project progress for each of the main components:

Cell 1 Construction:

A certificate of substantial performance was issued on June 20th for cell 1. The cell 1 construction was a large capital project with a tight construction schedule. The project was essentially an earthworks project consisting of the excavation of 430,000m³ for the cell and equalization pond, the installation of a 66,000m² geomembrane liner system, the installation of a leachate collection and pumping system as well as construction of new service access roads.

In support of Wacor’s contract for the construction of the new landfill cell, Tetra Tech (TT) has been providing construction management and construction quality assurance services throughout the duration of the project.

Work completed as part of the cell 1 contract includes:

- Clearing and grubbing of area for cell 1
- Bulk excavation of cell 1 and construction of stockpiles 1, 2, 3 and 4
- Screening and production of subgrade material for cell 1 and equalization pond
- Placement of subgrade material
- Installation of cell 1 liner
- Leachate collection pipe installation
- Drainage stone placement in cell 1
- Equalization pond excavation
- Installation of equalization pond liner
- Installation of riser pipes for equalization pond
- Leachate force main installation
- Commissioning of the leachate pump
- Electric fencing
- Service road construction and road surfacing

Upcoming work includes:

- Hydro seeding (to occur in Fall 2017)

The construction of cell 1 has resulted in approximately 20 full-time workers from Vancouver Island, and 5 full-time workers off Vancouver Island representing approximately 4,700 work days. Locally supplied services, materials and equipment are estimated to be \$1.5 million out of the \$7.3 million cell 1 total estimated cost at completion.

Transition from the Existing Landfill to Cell 1:

In order to best manage the quantity and strength of leachate generated for commissioning of the leachate treatment facility, and reduce future operational costs, a temporary berm in cell 1 was constructed to divert clean stormwater out of the cell prior to contact with waste. This diversion of stormwater will reduce the total volume of leachate generated in cell 1, thereby helping to ensure sufficient storage capacity in the equalization pond and sufficient strength of leachate for commissioning of the facility, and potentially reducing operational treatment costs. Following completion of the berm in mid-August, cell 1 was commissioned in late August with the placement of select waste.

Leachate Treatment Facility:

The proposed leachate treatment facility is based on membrane bioreactor technology, and includes a bioreactor, followed by membrane filtration, and finally a metals removal stage before effluent is discharged to an onsite infiltration bed. This particular technology is proposed because of its ability to treat leachate to strict effluent quality guidelines, and the compactness, robustness, and flexibility of the system.

The detailed design of the new leachate treatment facility was carried out by Maple Reinders, and was substantially complete in May 2017. TT is providing design and construction review services for the project, and will also be providing oversight for the commissioning of the facility.

The construction of the leachate treatment facility is on schedule for completion in September 2017, with commissioning of the facility planned for early October 2017.

Work completed since the beginning of the leachate treatment facility design-build contract includes:

- 100 per cent design and detailed design review,
- Foundation and Development permit applications submitted and approved,
- Site preparation and delineation of contractor work area,
- Excavation and foundation/wall construction for the bioreactor tanks, membrane tanks, sludge storage tank, and pre-engineered building,
- Quality assurance and quality control testing for tanks and concrete work,
- Pre-engineered building fabrication and assembly,
- Backfilling and site grading around concrete works,
- Relocation of BC Hydro electrical poles,
- Installation of effluent forcemain from leachate treatment facility to infiltration bed,
- Construction of infiltration bed,
- Equipment purchase and installation.

Work underway includes:

- Ongoing equipment and process piping installation,
- Completion of BC Hydro electrical upgrade,
- Laboratory equipment purchase,
- Chemical purchase for commissioning,
- Finalization of commissioning plan for October 2017.

Upcoming work includes:

- Final site grading,
- Equipment start-up and testing,
- Commissioning of leachate treatment facility.

The number of people working on the leachate treatment facility construction was approximately 20 in July (full-time and part-time), with workers from Vancouver Island making up 75% per cent of the total July workforce, and the remaining 25% per cent coming from elsewhere in British Columbia. This equates to approximately 223 work days, with 144 work days from local workers and 79 work days from workers outside of British Columbia. The number of people working on the leachate treatment facility construction is expected to remain in the same range for the duration of the project.

The economic and social benefits of the leachate treatment facility design-build project extend well beyond job numbers. The project to date has purchased equipment, products, and services from a wide range of island suppliers, including concrete, fencing, surveying and geotechnical services, accommodation, and restaurants, supporting businesses and services across Vancouver Island. It is expected that locally supplied services, materials and equipment will be approximately \$2.1 million by the end of the project out of the \$8.5 million LTF total estimated cost.

In addition to the economic and social benefits of the project, a number of positive community impacts are expected as a result of the CVWMC leachate treatment facility implementation. The facility will treat all leachate collected from cell 1 and the future cell expansions, preventing potential groundwater contamination derived from the future landfilling operations. Also the facility will provide an end-use (fuel to pre-heat the leachate prior to treatment) for a portion of the landfill gas currently generated on site.

Project Costs

The cell 1 project costs consist of detailed engineering design, construction works, construction management, construction quality assurance and overall project management. The total cell 1 project cost is estimated to be complete at \$7,321,049 reduced from the April report of \$7,593,820. This is primarily due to unit items coming in under the estimated amount for the cell 1 construction.

The leachate treatment facility project costs consist of detailed engineering design, construction, full commissioning of the facility, construction management, construction quality assurance, and contingency. The total leachate treatment project cost is estimated to be completed at \$8,545,000.

A summary of project costs up to August 14, 2017 is provided in appendix A. As the project progresses, the attached cost summary table will be updated to show actual costs to date as well as the estimate to complete.

The current estimated costs at completion is \$15,866,049 which is below the previous report provided in April of \$16,138,820.

Communications

In an effort to provide timely project information to the CSWM board and the community, a “project update” newsletter will be regularly published on the Comox Valley Regional District website throughout the project until completion. The latest project update newsletter is attached as Appendix B.

Recommendation from the Chief Administrative Officer:

This report is for information purposes only.

Respectfully:

R. Dyson

Russell Dyson
Chief Administrative Officer

Concurrence:

G. Bau Baiges

Gabriel Bau Baiges, P.Eng
Manager of CSWM Projects

Concurrence:

M. Rutten

Marc Rutten, P.Eng
General Manager of
Engineering Services

Attachments: Appendix A – “CVWMC Cell 1 and Leachate Treatment Cost Summary”
Appendix B – “September 2017 Project Newsletter”

Appendix A

Date: September 6, 2017

Key Task Description	Project Status	Actual Costs to Date (A)	Estimate to Complete (B)	Estimate at Completion (A+B)
Wacor - Contract for New Engineered Landfill Cell 1 Construction				
General Construction and Civil Works	Substantial completion June 20th	\$ 5,026,537	\$ 33,348	\$ 5,059,885
Provisionals (equalization pond, force main)	CO executed with Wacor	\$ 538,017	\$ 61,983	\$ 600,000
Change orders		\$ 217,367	\$ 106,761	\$ 324,128
Sub Total		\$ 5,781,922	\$ 202,092	\$ 5,984,014
Tetra Tech EBA - Contract for Construction Management and Construction Quality Assurance				
Project Management	In progress	\$ 23,750	\$ -	\$ 23,750
Contract Management	Complete	\$ 110,565	\$ -	\$ 110,565
CQA	Complete	\$ 268,259	\$ -	\$ 268,259
Reporting	In progress	\$ 19,483	\$ 9,124	\$ 28,607
Contingency for Provisional Items	Complete	\$ 221,735	\$ 37,480	\$ 259,214
Other Engineering Services (weather delays, additional scope)	Complete	\$ 5,015	\$ -	\$ 5,015
Sub Total		\$ 648,808	\$ 46,604	\$ 695,411
Other				
Other Consulting Services (design, tender preparation and review)	Complete	\$ 263,514	\$ -	\$ 263,514
Transition/Fill Plan	Complete	\$ 86,506	\$ 26	\$ 86,531
Other Fees	Surveying, Well Drilling, Legal, Borehole Decom.	\$ 90,450	\$ 13,717	\$ 104,167
Berm Construction	In Progress	\$ 5,812		\$ 127,412
Contingency				\$ 60,000
Sub Total		\$ 446,282	\$ 13,743	\$ 641,624
Total		\$ 6,877,011	\$ 262,439	\$ 7,321,049

Key Task Description	Project Status	Actual Costs to Date (A)	Estimate to Complete (B)	Estimate at Completion (A+B)
Maple Reinders - Contract for Design-Build of Leachate Treatment Facility				
General Design and Construction Works	In progress	\$ 4,318,730	\$ 3,125,870	\$ 7,444,600
Change Orders	In progress	\$ 17,441	\$ 22,287	\$ 39,728
Sub Total		\$ 4,336,171	\$ 3,148,157	\$ 7,484,328
Consulting Services				
Engineering Services (RFP assistance, consulting/advisory services)	In progress	\$ 314,706	\$ 41,234	\$ 355,940
Sub Total		\$ 314,706	\$ 41,234	\$ 355,940
Other				
BC Hydro (electrical design and construction for leachate treatment facility)	In progress	\$ 33,200	\$ -	\$ 33,200
Camera	In progress	\$ 391	\$ -	\$ 391
Sub Total		\$ 33,591	\$ -	\$ 33,591
Remaining Project Contingency	In progress	\$ -	\$ 671,141	\$ 671,141
Total		\$ 4,684,469	\$ 3,860,531	\$ 8,545,000

Total (Leachate and Cell 1)		\$ 11,561,480	\$ 4,122,970	\$ 15,866,049
Authorized Borrowing for the New Engineered Landfill Cell 1 and Leachate Treatment Facility, Loan Authorization (Bylaw No. 351, 2014). Debt expenses not included.				\$ 21,550,000
Remaining Unallocated Debt				\$ 5,683,951

Update

September 2017

on the Comox Valley Waste Management Centre Engineered Landfill Cell 1 Construction

Overview:

The Comox Strathcona Waste Management (CSWM) service is constructing a new engineered landfill and leachate treatment facility at the Comox Valley Waste Management Centre in Cumberland to serve the waste disposal needs of the region. Work has been ongoing on this exciting project and we are pleased to share some stories and images from the past couple of months. The information in this newsletter details the construction process and helps explain the project and how it benefits our community.

Latest News:

The construction of Cell 1 and the equalization pond reached substantial completion on June 20, 2017. The placement of select waste in the new landfill began in August.

The detailed design of the leachate treatment facility was completed in May 2017 and construction is progressing on schedule. It is expected the facility will be complete by the end of September, with commissioning beginning in October.

Highlights:

The finalized Cell 1 can be seen in [Photo 1](#). A temporary berm has been constructed to divert clean storm water away before it contacts any waste. The diversion of clean storm water will reduce the total volume of leachate generated in Cell 1. This helps to ensure sufficient storage capacity in the equalization pond and potentially reduces operating costs at the leachate treatment facility.

The finished equalization pond can be seen in [Photo 2](#). Leachate will be stored in this pond before being treated in the future onsite leachate treatment plant. A leak detection layer has been installed between the two lining systems in the equalization pond to continually monitor the performance of the liner and ensure environmental protection.

The pre-fabricated leachate treatment facility building is now assembled on site ([see Photo 3](#)). All of the treatment process equipment and machinery has been delivered and installation of the equipment, machinery, and piping is currently underway ([see Photo 4](#)).

The construction of the infiltration bed – where treated leachate will be returned as clean water to the environment – has been completed including excavation, piping installation and drain rock placement ([see Photo 5](#)). Testing and commissioning of the leachate treatment facility, including the infiltration bed, is expected to begin in October 2017.

The total Cell 1 and leachate treatment facility cost is estimated at \$15,858,000. An estimated \$3.6 million will be spent in locally supplied services, materials and equipment. The construction of Cell 1 has resulted in jobs for approximately 20 full-time workers from Vancouver Island. The construction of the leachate treatment facility is expected to result in work for approximately nine full-time/part-time workers from Vancouver Island. Approximately 5,528 work days will be created for the local workforce for the duration of the project.



1 Finished Cell 1 with storm water diversion berm



2 Finished equalization pond



3 Pre-fabricated leachate treatment facility building



4 Equipment and piping installation underway inside the leachate treatment facility



5 Excavation and construction of the infiltration bed