

June 7, 2019

Derek Sutherland
Columbia Shuswap Regional District
555 Harbourfront Drive NE
PO Box 978
Salmon Arm, BC V1E 4P1

Dear Mr. Sutherland:

**RE: Newsome Creek Erosion Mitigation Options
Our File 3234.013**

We are pleased to submit herewith our technical memorandum which documents a feasibility study to mitigate erosion on Newsome Creek below Highway 1. This project was performed by Kerr Wood Leidal (KWL) and Westrek Geotechnical Services Ltd. (Westrek). The project results are summarized below.

The study area is the creek reach from Highway 1 to Shuswap Lake, a length of approximately 520 m, with a focus on the reach between Highway 1 and Dieppe Road. Thirteen properties are within the study area, eleven on Caen Road (right bank) and two on Passchendaele Road (left bank). This section of Newsome Creek mostly flows through a ravine with nearly vertical side walls, and has been subjected to erosion, channel destabilization, and bank instability. Eroding banks and falling trees, especially on the right bank (looking downstream) of the ravine, have resulted in a slope stability risk to houses along Caen Road.

In October 2018, Westrek¹ documented four properties on Caen Road (2809, 2819, 2821 and 2823) that could be affected by imminent bank failure, and therefore were at high risk of foundations being undermined. The underlying cause of the ravine instability is the creek undercutting the silty sand layers of the ravine, leading to progressive collapse of the ravine walls. The Westrek report documents the fact that the ravine instability is progressing downstream.

Nine potential mitigation options were identified and evaluated. After consideration of construction practicality, design life, and community feedback, three options remain for consideration. These options and associated indicative cost estimates are as follows:

| Mitigation Option | Cost Estimate |
|--|---------------|
| Rock-Lined Channel | \$4,800,000 |
| Culvert (2700 mm Diameter) | \$5,000,000 |
| Sheet Pile Wall with Bed Stabilizers | \$6,200,000 |
| Note: Cost estimate includes construction cost, engineering / construction management, environmental compensation/enhancement and contingency. | |

¹ Westrek Geotechnical Services Ltd, 2018. Monitoring Results and Summary Recommendations. Newsome Creek Erosion below Highway 1. Prepared for Columbia Shuswap Regional District – Shuswap Emergency Program.



The objective of mitigation works would be to stabilize the creek channel to reduce undercutting of the ravine slopes. While each of these options would limit further destabilization of the ravine, none of the options would fully stabilize the upper ravine slopes. In the end, some combination of these three options would probably provide the optimum approach to channel stabilization.

Once funding is secured, detailed engineering work would be needed to refine the final combination of options, prepare detailed design, and provide an updated cost estimate. A safe construction approach would also need to be developed.

Please contact us with any questions that arise.

Yours truly,

KERR WOOD LEIDAL ASSOCIATES LTD.

A handwritten signature in black ink, appearing to read 'J. Miller', is positioned above the printed name and title.

Jason Miller, P.Eng.
Water Resources Engineer

/dwm

Encl.
KWL Technical Memorandum, June 7, 2019
Westrek Technical Memorandum, June 7, 2019