Stoltz Bluff Sediment Remediation – Sept. 2017 Maintenance Project

Stoltz Sediment Containment Overwhelmed by Major Debris Torrent from ‘Clearwater’ Creek Gully (late March 2017)

Rest of Sediment Containment Pond Network at Capacity April 2017

Cowichan Partners Rally to Investigate Major New Slope Failure and Identify ‘Emergency’ Mitigation Options

British Columbia
Conservation
Foundation

McQuarrie Geotechnical Consultants Ltd. – Slope Hazard Assessment and 2017 Work Plan for Stoltz Bluff Maintenance & Mitigation

STOLTZ BLUFF
SLOPE HAZARD ASSESSMENT

Prepared by:

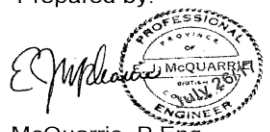
McQuarrie Geotechnical Consultants Ltd.

For

BC Conservation Foundation
&
Cowichan Watershed Board

July 26, 2017
Project #17-4

Prepared by:



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STOLTZ BLUFF SLOPE HAZARD ASSESSMENT	MEMORANDUM

TO:	BC Conservation Foundation	DATE:	September 12, 2017
ATTN:	James Craig	FILE:	17-4
SUBJECT:	**2017 WORK PLAN**	COPIES:	Cowichan Watershed Board DFO

1. BACKGROUND

The report by McQuarrie Geotechnical Consultants Ltd dated July 26, 2017 outlined general measures to mitigate the landslide and sedimentation hazards affecting the river. Further field work was conducted on August 29, 2017 and a more detailed work plan for September 2017 is attached along with figures and cross-sections.

The work is focused on the gully of Clearwater Creek, which has become the main sediment source in this reach of the river. The gully banks are severely over-steepened, highly unstable, and cannot be stabilized. Instead, the objective of mitigation is to reduce down-cutting along the base of the gully and to reconstruct some capacity within the sediment basins at the mouth of the gully so as to reduce the amount of sediment reaching the river. The gully should be re-assessed each spring and the mitigation measures revised and repeated accordingly each summer for several years until the amount of debris and sediment reduces.

The bluffs are expected to continue to fail with almost constant raveling and larger failures during the wetter months. The August field assessment confirmed that a significant proportion of the creek flow is due to groundwater discharge in the headwalls of this gully. Further mitigation beyond the seasonal work described in this work plan must involve a detailed study of the upslope groundwater regime.

2. RECOMMENDED MEASURES

The existing site features are shown on the Location Map, attached as Figure 1 while Figure 2 illustrates the recommended mitigation measures. These measures vary along the gully in accordance with a series of stations staked in the field. Cross-sections are shown through each station in Figures 3A to 3C, illustrating the recommended measures.

The stations are marked from upstream to downstream for clarity but the sequence of the work should begin at the downstream end, as explained in the work plan.

Please contact me if you have any questions.

Eric J. McQuarrie, P.Eng.

Attachments:
Figures 1 through 5

For Unstable Clearwater Creek Gully – Must first stabilize creek bed elevation as exists now to avoid future erosion/down-cutting – requires minimal excavation and installation of log check dams for future gradient control

Schematic of Clearwater Creek Gully – Plan View

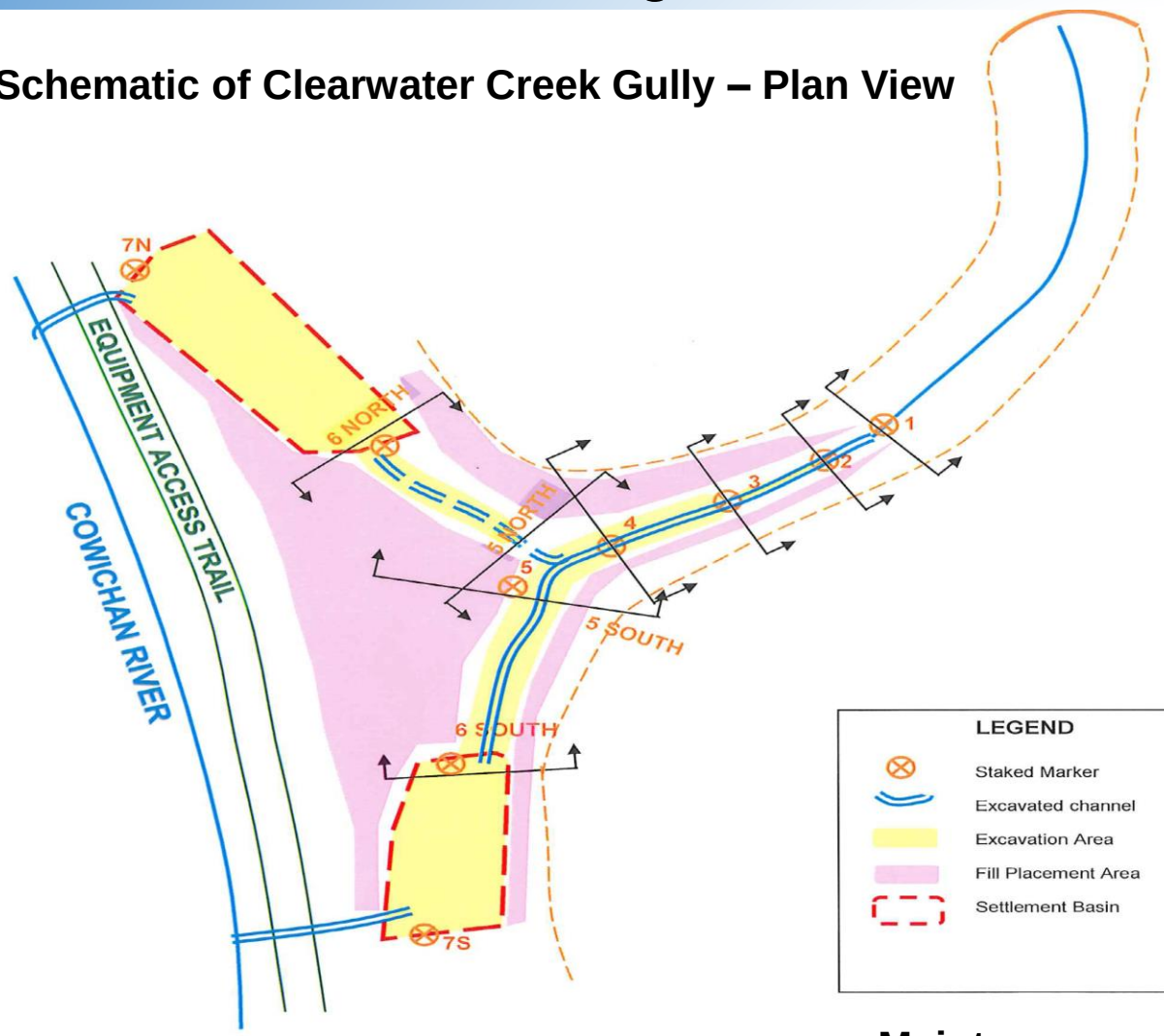
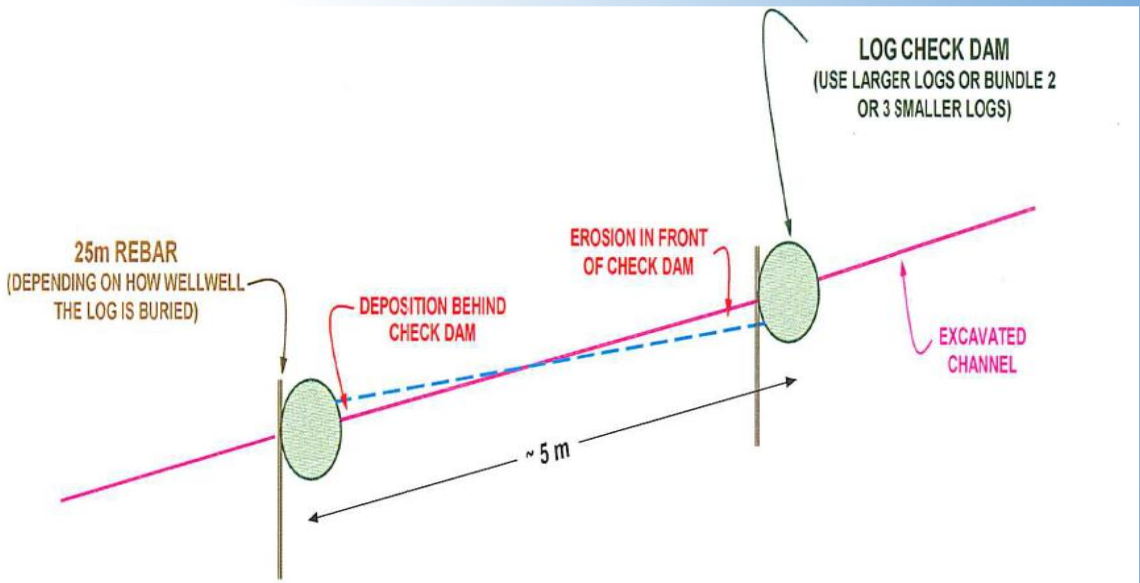


FIGURE 2.
MITIGATION PLAN MAP
Scale 1:1,000



NOTES:

1. Ensure logs are well buried at both ends to prevent it from being washed downslope (see cross-sections). Sidewall failures should increase burial before peak winter flow.
2. Initially bury at least 50% of log diameter below the channel grade. The stream will tend to erode immediately downstream of the log and deposit on the upstream of the next log.
3. If needed, rebar can be installed for additional anchorage on the downstream side of the logs. Use 25M bars minimum 1.2 m long, driven roughly 2 m o/c.

Maintenance of existing creek bed elevation will help with sediment retention and gradual ‘shallowing’ of gradient for increased channel resilience

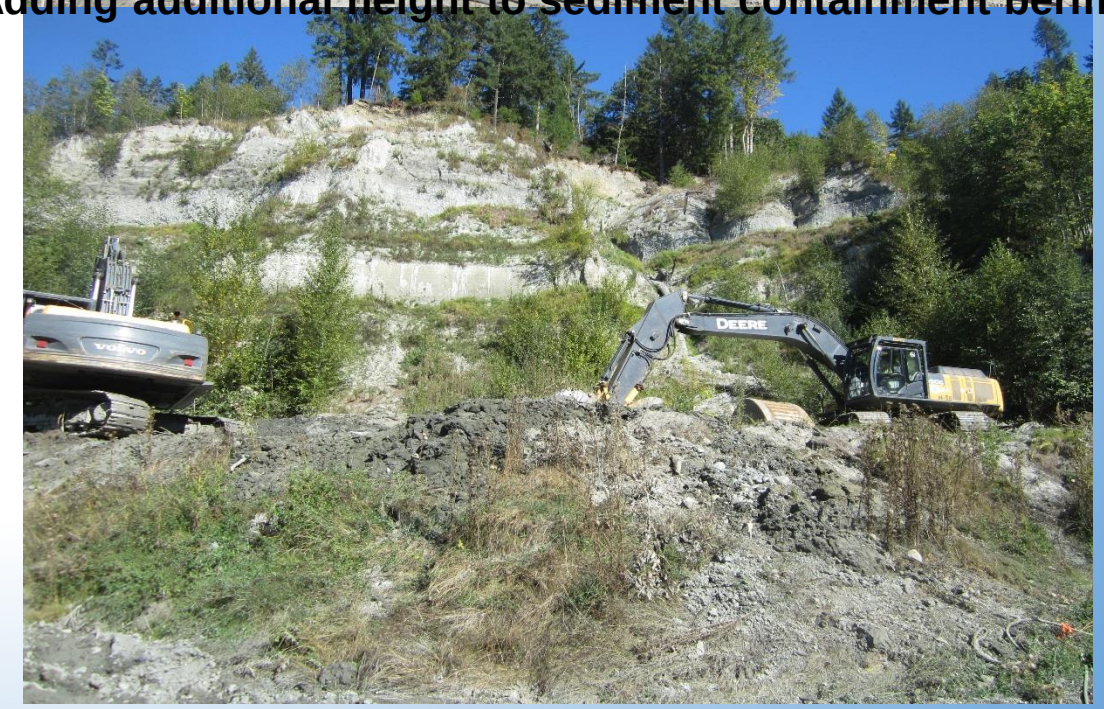
With Sept. 22/17 Announcement of Successful Cowichan Tribes CRF Proposal – Work Begins at Stoltz Bluff on Sept. 26th (supervised by BCCF)

Begin excavating sediment retention ponds

Clearing access trail and service road at toe of Bluff

Excavating sediment retention ponds

Adding additional height to sediment containment berms



Clearwater Creek Running ‘Silty’ Even Before Start of Work On-Site

(e.g., small gully headwall failure observed/video-recorded by BCCF on Sept 28th)

Clearwater Creek Flows Through ‘Drain’ in Stoltz Bluff Access Road (upstream of Cowichan River)

Raised elevation of containment berm

Partially excavated sediment retention pond

Excavating accumulated sediment and preparing route for overflow channel from Clearwater Creek

Maintenance will continue in the week of October 2nd!

March 2003 ‘Before’

January 2008 ‘After’

June 2010 ‘After’