August 13, 2024

Attn: Zoltan Schafer, RPF
MaMook Natural Resources
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Subject: Road Deactivation and Reactivation Assessment: Stewardson Camp Road Network

Onsite File #: 988-5-4
EGBC PERMIT TO PRACTICE: 1002678

At the request of MaMook Natural Resources (MaMook), Onsite Engineering Ltd. (OEL), including Jaime Eggers, P.Geo., Jon Kroon, P.Geo., Richard Norman, P.Geo., Tim Wickman, P.Geo., Luke Wagner, GIT, Liam Giblin, GIT, Aidan Hoffman, and Allison Stubbs carried out road deactivation and upgrade assessments across the Stewardson Camp Road Network that runs from Hot Springs Cove to Mooyah Bay, on the west coast of Vancouver Island. The assessments were completed on June 10 to 14, July 1 to 5, and July 15 to 19 2024. As outlined in the Blackwell review of the TFL54 Roads, all Short-term roads (branch and spur roads) were assessed for permanent deactivation. Long-Term roads including Hot Springs Mainline, Satchie Mainline, Stewardson Mainline, HE780 (0+000 – 0+625), HE600 (0+000 – 0+530), and HE610 (0+000 – 0+280 m) were assessed for reactivation and maintenance concerns. A rockfall assessment was completed on Zuciarte Mainline, that connects Stewardson Mainline to Mooyah Bay on the north side of the Escalante River.

The assessments were carried out to reduce the liabilities associated with the roads held within the TFL54 road permit during the transfer to conservancy. The assessments evaluated the existing stability conditions of the roads, and effective road deactivation and maintenance/reactivation prescriptions were developed. Road deactivation and reactivation recommendations for Short-Term Roads are provided in **Appendices A and B**. Road reactivation recommendations for Long-Term Roads are provided in **Appendices C, D, and E.** The Zuciarte rock slope failure and rockfall assessment is detailed in **Appendix F.**

Roads not listed as active roads, i.e., not considered to be part of the road permit, were excluded from the assessment. One exception to this was made at the start of North Escalante Main where an inactive road parallels the mainline. Due to the potential for drainage from North Escalante Main to disrupt the lower road, it was assessed concurrently and drainage management recommendations were applied where required. The remaining "inactive roads" are outside of the project scope and are not included in this report. Roads included in the assessment are listed in **Table 1**.

Deactivation works as prescribed in this report are provided in a manner consistent with the "Best Management Practices Handbook, Hillslope *Restoration in British Columbia" (BC Ministry of Forests, 2001).* Adherence to recommendations provided will reduce the hazard of landslides initiating due to road instabilities. Expect the landslide hazard to become closer to the natural hazard levels for the area slopes.

Conditions at the time of the assessments were variable with mild temperatures, sun and rain and moderate surface flows in June. Conditions in July were warm to hot and sunny with low surface flows.

1.0 OBJECTIVES

The objective is to permanently deactivate the Short-Term roads to restore natural hillslope drainage paths, reduce slope instability, and enhance site productivity (where safe and practical and where access is no longer needed). As discussed below, the prescriptions to attain these objectives were marked directly in the field as well as documented in this report.

2.0 BACKGROUND

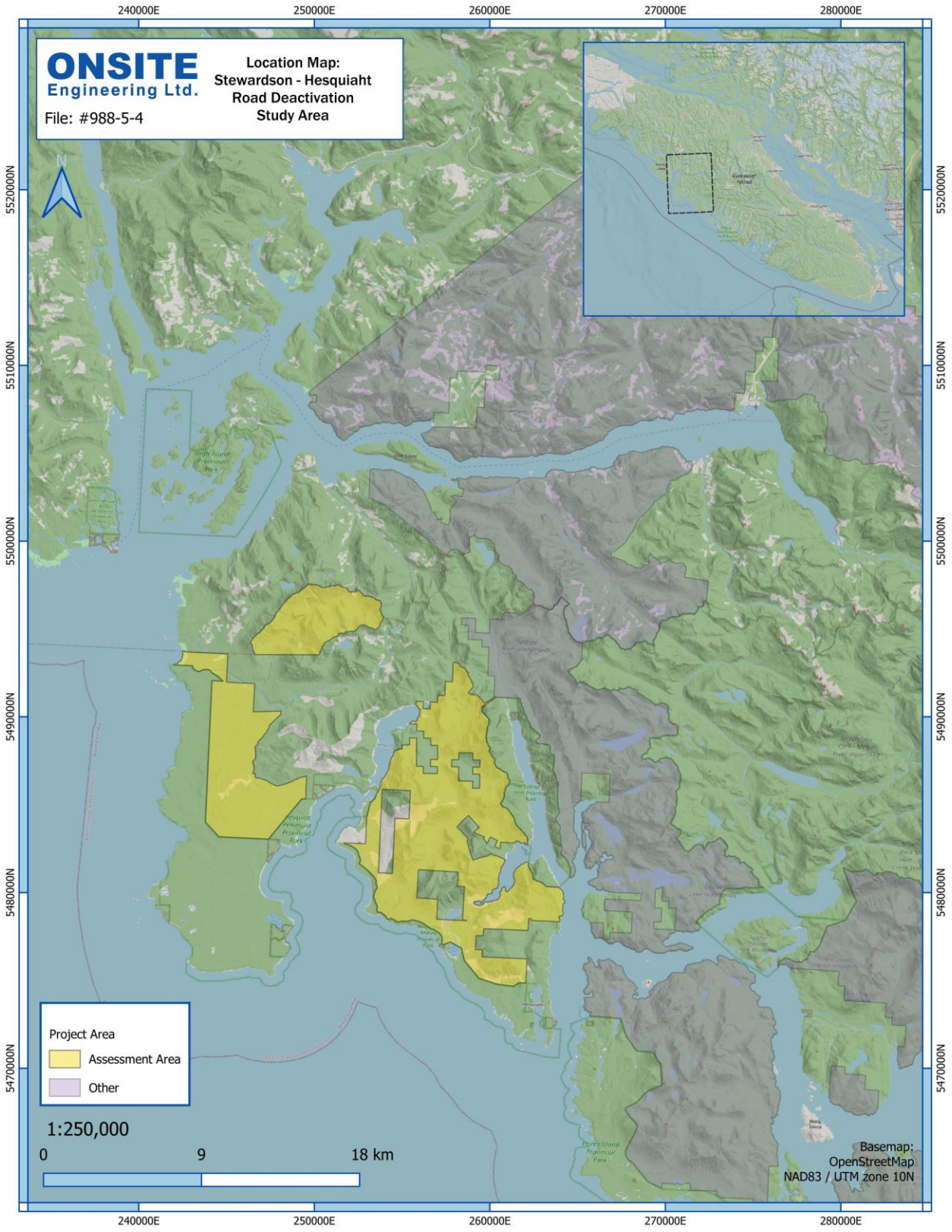
The roads extend from Hot Springs Cove in the south, to Mooyah Bay in the north and can be accessed centrally from Stewardson Camp, at the head of Stewardson Inlet. Stewardson Camp is located 6 km northwest of Hot Springs Village and 42 km northwest of Tofino, BC (Figure 1).

Road construction began in the late 1960's from Stewardson Camp, heading north towards Escalante River. The mainline and its spurs, including Satchie Mainline, had been constructed to just beyond the Escalante River crossing by the late 1970's and by the early 1980's Stewardson Mainline and Zuciarte Mainline were constructed allowing access to Mooyah Bay. North Escalante Main was also constructed in the early 1980's. Hot Springs Mainline was not constructed until sometime in the late 1990's to early 2000's. Most roads within the study area were built using pre-Code methods but information of exact construction methods or year of construction was not available for this assessment.

A road deactivation program was completed in the area in the late 1990's through Forest Renewal BC (FRBC). Many roads were deactivated during this time and have since been removed from the active road permit. Several roads that were listed as short-term roads on the provided maps had already been deactivated at the time of OEL's field assessments. Roads deemed to be deactivated or not requiring any works are listed in Table 1.

Resources at risk across the study area include site productivity and fish resources. Fish bearing reaches are located throughout the study area and were determined based on identification points on HabitatWizard paired with existing LiDAR data. In general, fish reaches extend to the toe of the slope and occur within Kanim Lake, Hesquiaht Point Creek, Satchie Creek, Hesquiaht Lake, Rae Lake, numerous unnamed "residual" streams that drain directly into Hesquiaht Harbour, and Escalante River and its tributaries.

Impact to fish reaches is most likely to occur at failed stream crossings, such as collapsed woodboxes or bridges, plugged culverts, or other sites of drainage disruption but may also occur through fill slope failures.


ONSITE
Engineering Ltd.
File: #988-5-4
Location Map:
Stewardson - Hesquiaht
Road Deactivation
Study Area
N
240000E
250000E
260000E
270000E
280000E
5520000N
5510000N
5500000N
5490000N
5480000N
5470000N
Project Area
Assessment Area
Other
1:250,000
0
9
18 km
Basemap:
OpenStreetMap
NAD83 / UTM zone 10N

3.0 WORK CARRIED OUT

A high-level helicopter fly over of the study area was completed by Jaime Eggers and Marty Locker on March 21st, 2024. The fly-over was completed to narrow down the "on-ground" assessment areas. Where it was clear that drainage structures (culverts, woodboxes, bridges) had been pulled, cross-ditches had been installed, and pullback or recontouring of the road surface had been carried out, the road was deemed to be deactivated and no further action was taken. If the level of deactivation was either unclear or not deactivated, the road was assessed in the field. Roads deemed to be deactivated in the field and during the fly-over assessment are noted in Table 1 below.

During the field assessments, stability conditions were inferred from observed conditions of the road, such as existing landslides, tension cracks, road drainage conditions and existing drainage structures, the amount and composition of the road fill and the stability conditions downslope and in proximal terrain. In the field, pink flagging marks stations and prescriptions along the road. These field markings correspond directly to those in **Appendix A.**

The deactivation tables should be used to re-establish the field markings if necessary. **The site supervisor must verify, and where necessary replace, the field marks immediately before starting deactivation.**

4.0 SHORT TERM ROADS

It is understood the information contained in the *Best Management Practices Handbook: Hillslope Restoration in British Columbia* will be used as the standard when carrying out the work contained in the prescriptions. Failing to follow these standard operating procedures will result in inadequate pullback and potentially unsafe working situations for the excavator operator as well as the potential for future fill slope failures.

4.1 Existing Conditions

The existing stability hazard and resulting likelihood of spatial impact to fish resources for the Short-Term roads are outlined below in Table 1. Spatial impact to fish resources is rated based on the occurrence of stream crossings along the roads. If there are no stream crossings and no streams mapped in proximity, the spatial impact is rated as low; if there are stream crossings through fish habitat, the likelihood of spatial impact is rated as high; if the road is located in close proximity to fish reaches but does not cross any streams, the likelihood of spatial impact is rated as moderate. Roads are listed in rough order from south to north through the study area.

Table 1: Short Term Roads: Hazard and Likelihood of Spatial Impact

Road	Start Stn.	End Sta.	Stability Hazard	Likelihood of Spatial Impact to Fish Reaches	Deactivation Level, Comments
HS 7.8	Deactivation completed, no works required				
HS 7.0	Deactivation completed, no works required				
HS 6.7	-	-	Low	Low	Permanent
BR2080, BR2070	No work deemed necessary				
BR2061, BR2060	-	-	Low	Low	Permanent
HS 4.3, HS 4.3A	Deactivation completed, no works required				
BR2050	No work deemed necessary				
BR2031, HS3.5, BR2030	-	-	Low	Moderate	Permanent
BR2020, BR2031	Deactivation completed, no works required				
BR2010	No work deemed necessary				
K1020	Deactivation completed, no works required				
K1010	-	-	Low	Moderate	Permanent
K1000	-	-	Low	Moderate	Permanent
Kanim Main	Road does not exist, no action required				
H1000	JK101	JK117	Low	Moderate	Permanent
	JK118	JK119	Moderate	Moderate	
	JK122	JK125	High	Moderate	
	JK131	JK132	Moderate	Moderate	
H520	No work deemed necessary				
HS50	JK72	JK79	Low	Low	Permanent
	JK79	JK80	High	Low	
	JK80	JK82	Moderate	Low	
	JK82	JK84	Moderate	Moderate	
HS100	No work deemed necessary				
HS200	JK194	JK192	Low	Moderate	Permanent
	JK192	JK190	High	Moderate	
	JK190	JK179	Moderate	Moderate	
	JK179	JK178	High	Moderate	
	JK178	JK167	Moderate	Moderate	
HS240	JK166	JK151	Moderate	Low	Permanent
	JK151	JK150	Moderate	Low	
	JK150	JK137	Moderate	Moderate	
HS246, HS243	No work deemed necessary				
HS300	-	-	Low	Low	Permanent
HS310	-	-	Low	Low	Permanent
HS300-OEL-A	-	-	Low	Low	Permanent

HS311, HS311-1, HS311-2	JK198	JK200	Moderate	Low	Permanent
	JK200	JK208	Low	Low	
	JK208	JK209	Low	Low	
	JK209	JK211	Moderate	Low	
HS310	-	-	Low	Low	Permanent
STE502-1	Deactivation completed, no works required				
H10A, H10R	-	-	Moderate	High	Permanent
HE785, HE789, HE786,HE787, HE788	No work deemed necessary				
H220, H221	Road not built, no works required				
HE600, HE605	No action required				
HE610	-	-	Low	Low	Permanent
HE610A	Deactivation completed, no works required				
H710	-	-	Low	Low	Permanent
H770, H790, H770-OEL-A	-	-	Low	Low	Permanent
H771	No work deemed necessary				
H760	No work deemed necessary				
H4000 (R07675), H1500	Road does not exist, no action required				
H4000 (R13813), H1500	Deactivation completed, no works required				
H4100	Deactivation completed, no works required				
H1610	-	-	Low	Moderate	Permanent
H1615	No work deemed necessary, no drainage concerns				
H1625	No work deemed necessary, no drainage concerns				
H1620	-	-	Low	Moderate	Permanent
H1600	-	-	Low	Moderate	Permanent
H1645	-	-	Low	Moderate	Permanent
H1640	-	-	Low	Moderate	Permanent
H1650	-	-	Low	Moderate	Permanent
H1660	No work deemed necessary, no drainage concerns				
H1670	-	-	Low	Low	Permanent
H1680	-	-	Low	Moderate	Permanent
H103, H105, H107, H1110	Deactivation completed, no works required				
H1080	-	-	Low	Low	Permanent
HE1081	-	-	Low	Low	Permanent
HE1085	-	-	Low	Low	Permanent
HE1083, HE1087	Deactivation completed, no works required				
H800	Deactivation completed, no works required				
500	-	-	Low	Moderate	Permanent
512	-	-	Low	High	Permanent
510, 522,524, 514	No work deemed necessary, no drainage concerns				

520	-	-	Low	Moderate	Permanent
530	-	-	Low	Moderate	Permanent
550	-	-	Low	Moderate	Permanent
H5600	-	-	Low	Moderate	Permanent
H5700	-	-	Low	Moderate	Permanent
BR5900	-	-	Low	High	Permanent
H4610	Deactivation completed, no works required				
BR6000, BR6010	-	-	Low	High	Permanent
BR6200	-	-	Low	High	Permanent
BR6220, BR6240	Deactivation completed, no works required				
H6280	Deactivation completed, no works required				
BR6300	-	-	Low	High	Permanent
BR6301	-	-	Low	Moderate	Permanent
E19	Deactivation completed, no works required				
North Escalante	-	-	High	Moderate	Permanent
E510	-	-	High	Moderate	Permanent
B110, BR100	Deactivation completed, no works required				
Z1900, Z1901, Z1902	-	-	Low	High	Permanent

4.2 Deactivation

Culvert removal and cross ditching is required along many sections of the roads to reestablish the natural drainage patterns. All corrugated metal pipes (CMPs), wood box culverts (WBCs) and corrugated plastic pipes (CPPs) should be removed from the site and scheduled for recycling.

Road fill pullback is recommended along some sections to stabilize the roads for the long term. The length of pullback is indicated in the prescriptions (i.e. light (P3), moderate (P6), heavy (P9), and heavy+ (P12)) as an estimate of slope distance from the crest of the fill slope/edge of the road (Figure 1a). Additional pullback may be needed at some locations if more road fill is present than evident from the visual inspection during the work.

Pullback Prescriptions

Light pullback – Tension cracks and settling on outer 1-2 m of road, windrows or large berms present; likely only a thin wedge of fill material present. Remove side cast material built up on the outside shoulder. All side cast with the potential to start a landslide must be retrieved. (Figure 1b).

Moderate pullback (discretionary) – Failing fill slope, tension cracks and settling on outer +2m of road; likely a thicker wedge of fill. Comb fill slope material back to original ground surface or until coarse and rocky material remains. **The objective is to comb-back the fill, ensuring that there is no lip remaining at the toe of the pullback.** This may require all fill material to be pulled back. All side cast with the potential to start a landslide must be retrieved.

Heavy pullback (full) – In thick fills where entire fill slope is or may become unstable and large tension cracks or fill slope failures are present or starting to fail, pull back fill slope material to original ground. All

side cast with the potential to start a landslide must be retrieved. Where full (heavy+) pullback is prescribed and where safety permits, benching downslope to retrieve all fill material may be required.

All fill should be placed along the inside edge of the road, removing the ditch line completely.

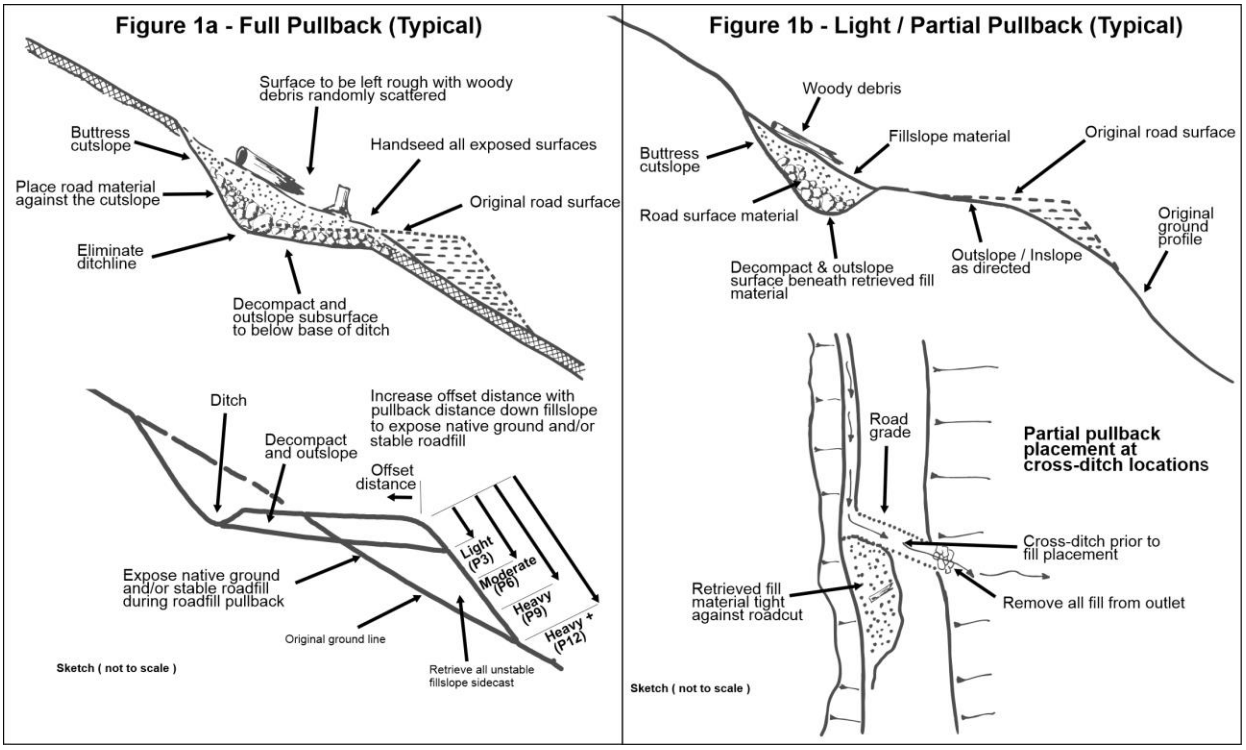


Figure 1: Typical pullback methods (*1999 FRBC, Technical Standards and Guidelines for Road Deactivation/Restoration Activities)*

4.3 Reactivation of short-term roads (by request)

Branch HE780 is a short-term road that branches off Stewardson Mainline at 5.3 km. It was selected for reactivation by Ahousaht Nation for future use within the conservancy. The road and its spurs were not assessed beyond the mapped junction with branch H220 due to the level of forest regeneration. Conifers growing on HE780 are estimated to be more than 20-years old beyond the 7 m all-steel portable bridge at JE6.

A landslide initiated from HE780 near the junction with HE786 during a storm event in 2017. The slide is 230 m long by 15 m wide and terminated onto gentle gradient terrain over 400 m upslope of Stewardson Mainline. Very minor fines may have been transported to the ocean. To deactivate the back end of the road network, conifer removal is required and the road crossing at the slide requires repairs. Disturbance associated with reactivation and deactivation works would set the natural recovery of the road back several decades. Due to the gentle terrain located between the roads and elements at risk (Stewardson Mainline, fish habitat) it was deemed best to leave the road to continue recovering naturally. H220 was also requested to be retained for future use. However, this road and its spur H220A were never constructed. Reactivation recommendations for HE780 are included in **Appendix B**.

Roads HE600 and HE610 that branch off Stewardson Mainline just past 8 km were also selected to be retained for future use within the conservancy by Ahousaht Nation. Reactivation recommendations for these roads are included in **Appendix B**.

4.4 Reconstruction (for access)

One short term road requires reactivation to gain access to the back end of the work area.

Z1900 (0.4 Km): Bridge has been washed away > survey completed; draft designs underway by OEL.

Bridge inspections have been completed by OEL engineers along North Escalante Mainline and Br.500 and its spur roads. Bridge inspections are required along short-term roads prior to deactivation activities commence to ensure structures are safe for excavator, rock truck, and light vehicle access.

5.0 LONG TERM ROADS

5.1 Reactivation

Hot Springs Mainline, Satchie Mainline, Stewardson Mainline and Zuciarte Mainline are slated as long-term roads that will be retained for future use. Hot Springs Mainline, Satchie Mainline, and Stewardson Mainline from 0 Km to the Escalante Bridge at 34.4 Km were assessed for reactivation and are included in this report and the attached maps. Stewardson mainline was assessed beyond the bridge at 34.4 km by helicopter only for any glaring road concerns due to its location on gentle benched terrain. Culverts along this portion of the mainline will be picked up and catalogued during P.Eng. bridge inspections prior to road reactivation.

Several stream crossings along Stewardson Mainline were impacted during a storm event in 2017 and require significant repairs:

- 3.5 km debris flow > ford design completed by OEL
- 7.5 km bridge washed out > draft road realignment and bridge designs completed by OEL
- 15.9 km road washed out on woods side of woodbox > survey completed, draft designs underway by OEL
- 21.7 km debris flow has impacted bridge > survey completed, draft designs underway by OEL
- 22.2 km debris flow has impacted bridge > survey completed, draft designs underway by OEL

Zuciarte Mainline was assessed by air by Jon Kroon, P.Geo. on June 11th, 2024. Several areas with loose boulders and one significant rockfall zone at 5 Km were observed. An on-ground inspection of the 5 Km rockfall was completed on July 17th, 2024, by Jon Kroon, P.Geo. and is detailed in an attached report (Appendix F). A safe work procedure is also included in **Appendix F**.

Reactivation recommendations for Hot Springs Mainline, Stewardson Mainline and Satchie Mainline are outlined in **Appendices C, D and E**, respectively.

Bridge inspections have been completed by OEL engineers along Hot Spring Mainline, several portions of Stewardson Mainline, and most of Satchie Mainline. Inspections will be completed prior to reactivation activities commence.

6.0 INSPECTIONS AND VERIFICATION

Senior personnel familiar with the deactivation techniques in the Best Management Practices Handbook should carry out inspections during the deactivation work and **a qualified registered professional should review the deactivation work prior to completion and sign off on the same** (Appendix 2 in Guidelines for Professional Services in the Forest Sector – Forest Roads, June 2012).

Wooden bridges along Short-Term Roads should be assessed by a qualified professional prior to use to ensure they are safe for use and to determine their load ratings.

In areas where road fill cannot be safely retrieved, and some residual hazard is expected to remain, an inspection by a qualified registered professional is prudent. The size and extent of such an area, as well as the downslope / downstream risks, are important considerations regarding the timing of the inspection. Smaller areas, or areas of lesser risk, can be inspected following completion of the work. For larger areas, or areas with high downslope / downstream risks, inspections concurrent with the work are recommended to address deficiencies in conjunction with full time supervision.

7.0 LIMITATIONS AND CLOSURE

These permanent deactivation prescriptions and reactivation recommendations are made based on a visual inspection of the Hot Springs Mainline, Satchie Mainline, and Stewardson Mainline road networks using the techniques described in the Best Management Practices Handbook. If site conditions change, or the prescriptions are not expected to meet the objectives discussed in this report, some on-site changes may be needed for the prescriptions. If any significant changes are required, contact a qualified registered professional with proven knowledge and experience in road deactivation and terrain stability assessment.

We trust this report outlines the requirements for deactivation and reactivation along the assessed roads. If you have any questions regarding this report, please contact our office at your convenience.

Respectfully submitted,
Onsite Engineering Ltd.

Prepared by: Allison Stubbs and Jaime Eggers, P.Geo.

2024-08-13

Reviewed by: Tim Wickman, P.Geo.

Attached:

Appendix A: Road Deactivation Recommendations for Short-Term Roads
Appendix B: Road Reactivation Recommendations for Short-Term Roads
Appendix C: Road Reactivation Recommendations for Hot Springs Mainline
Appendix D: Road Reactivation Recommendations for Stewardson Mainline
Appendix E: Road Reactivation Recommendations for Satchie Mainline
Appendix F: Zuciarte 5.0 Km Rockfall Assessment & Work Safe Procedures

Road Deactivation and Reactivation Maps will be sent as separate packages due to file size.

Appendix A: Road Deactivation Recommendations for Stewardson Short-Term Roads

Road/#	Station	Recommendation	Comments
HS7.8			
Deact Map 1	JK 2	No recommendations	Road is deactivated with pulled CMPs and no fill issues
HS7.0			
Deact Map 1	JK 6	No recommendations	Road is deactivated, creek down ditched is okay, flows through CKP at StewML, no need for XD at road start
HS6.7			
Deact Map 1	JK 7	Add XD	Low point in road
BR2080			
Deact Map 1	JK 9	No recommendations	Landing spur, no action
BR2070			
Deact Map 1, 2	JK 10	No recommendations	Small spur, no action
BR2061			
Deact Map 2	JK 16	No recommendations	Shallow XD here, captures water effectively, road heavy brush and trees, no action
Deact Map 2	JK 17	No recommendations	Ditch from both roads converge in sump, overflow would go belowditch below fill at switch, is all okay, not much water
BR2060			
Deact Map 2	JK 13	Add XD	No flow in ditch here a little wet, heavily treed and over grown
Deact Map 2	JK 14	No recommendations	Existing XD
Deact Map 2	JK 15	Add XD	Light road erosion below on switch
Deact Map 2	JK 18	Add XD	Add XD to capture future XD water from above
Deact Map 2	JK 19	Add XD	Shallow low point
Deact Map 2	JK 20	Remove ditchblock	Ditchblock, not a good spot
Deact Map 2	JK 21	Enhance XD	Shallow XD, needs bigger and longer
BR2050			
Deact Map 2	JK 22	No recommendations	Road on flats, no action
HS3.5			
Deact Map 2, 3	JK 26	No recommendations	shallow XD, okay
Deact Map 2, 3	JK 27	No recommendations	creek is flowing well,looks debuilt beyond
BR2031			
Deact Map 2, 3	JK 25	No recommendations	Existing XD, good but shallow
BR2030			
Deact Map 2, 3	JK 28	No recommendations	Spur or end of rd has been deactivated with XD at start
Deact Map 2, 3	JK 29	Add XD	Steep grade, minor erosion
Deact Map 2, 3	JK 30	Add XD	Top of hill
BR2020			
Deact Map 2, 3	JK 31	No recommendations	Spur is deactivated with XD at start

Appendix A: Road Deactivation Recommendations for Stewardson Short-Term Roads

Road/#	Station	Recommendation	Comments
BR2010			
Deact Map 3	JK 32	No recommendations	Spur is landing, used for milling, okay to leave as is
K1020			
Deact Map 3	JK 35	No recommendations	spur is deactivated
K1010			
Deact Map 3	JK 37	No recommendations	road has no XDs but is okay, small quarry with water is okay
Deact Map 3	JK 38	Add XD	low point
K1000			
Deact Map 3, 5	JK 39	Enhance XD	partial XD, at low point
Deact Map 3, 5	JK 40	Add XD	depression
Kanim Main			
Deact Map 3, 5	JK 71	No recommendations	no road, mature second growth
HS311			
Deact Map 4	JK 198	Start MPB	steep fills above steep ground
Deact Map 4	JK 199	Pull back woody debris pile, remove waterbar	WB and LWD pile
Deact Map 4	JK 200	End MPB	
Deact Map 4	JK 201	Enhance XD	Existing low XD
Deact Map 4	JK 202	Enhance XD	Existing low XD
Deact Map 4	JK 203	Enhance XD	Existing low XD
Deact Map 4	JK 204	Enhance XD	Existing low XD
Deact Map 4	JK 205	Enhance XD	Existing low XD
Deact Map 4	JK 206	Enhance XD	Existing low XD
Deact Map 4	JK 207	Enhance XD	Existing low XD
Deact Map 4	JK 208	Start LPB	
Deact Map 4	JK 209	End LPB	
Deact Map 4	JK 210	Add XD	
Deact Map 4	JK 211	Add XD	
HS310			
Deact Map 4	JK 195	Pull CMP, add XD	1000 CMP, road is deactivated beyond this point
Deact Map 4	JK 196	Add XD	deep ditch with standing water
Deact Map 4	JK 197	Add XD	
Deact Map 4	JK 212	Pull CMP, add XD	Existing CMP
Deact Map 4	JK 213	Pull CMP, add XD	Existing 1000 CMP
Deact Map 4	JK 214	Add XD	
Deact Map 4	JK 215	Pull CMP, add XD	Existing CMP
Deact Map 4	JK 216	Pull CMP, add XD	Existing CMP
Deact Map 4	JK 217	Add XD	ponding ditch water, seep creek here
Deact Map 4	JK 218	Add XD	Ditch water
Deact Map 4	JK 219	Pull CMP, add XD	Existing CMP

Appendix A: Road Deactivation Recommendations for Stewardson Short-Term Roads

Road/#	Station	Recommendation	Comments
HS300-OEL-A			
Deact Map 4	JK 220	Pull CMP, add XD	CMP
HS300			
Deact Map 3, 4	JK 221	Pull WBC	Existing WBC
Deact Map 3, 4, 5	JK 222	Pull WBC	Existing WBC
Deact Map 3, 4, 5	JK 223	Pull WBC	Existing WBC
Deact Map 4, 5	JK 224	Add XD	
HS240			
Deact Map 4	JK 166	Pull CPP, add XD	landslide path, 1000 CPP
Deact Map 3, 4	JK 165	Pull CPP, add XD	800 CPP
Deact Map 3, 4	JK 164	Add XD	steep grade, sberry site
Deact Map 3, 4	JK 163	Add XD	location stream should be?
Deact Map 3, 4	JK 162	Pull CPP, add XD	1000 CPP
Deact Map 3, 4	JK 161	Pull WBC	shallow WB
Deact Map 3, 4	JK 160	Pull CPP, can leave XD or replace with fill	1000 CPP
Deact Map 3, 4	JK 159	Add XD	Low point in road
Deact Map 3, 4	JK 158	Pull CPP, add XD	1000 plastic pipe (CPP)
Deact Map 3, 4	JK 156	Add XD	
Deact Map 3, 4	JK 154	Pull CMP, add XD	1000 CMP
Deact Map 3, 4	JK 153	Pull CMP, add XD	800 CMP
Deact Map 3, 4	JK 152	Add XD	start of PB, seepage
Deact Map 3, 4	JK 151	Start HPB	natural stump in fiil, seep from cut
Deact Map 3, 4, 5	JK 150	End HPB	fills above steep, not really settling yet but steep below, a lot of Sberry
Deact Map 3, 4, 5	JK 149	No recommendations	Thick tills, high cut, ravelling and slumping on road, access failure fine too
Deact Map 3, 4, 5	JK 148	Add XD	1000 CMP
Deact Map 3, 4, 5	JK 147	Pull CMP, add XD	800 CMP
Deact Map 3, 4, 5	JK 146	Pull CMP, add XD	800 CMP
Deact Map 3, 4, 5	JK 145	Pull CMP, add XD	800 CMP
Deact Map 3, 4, 5	JK 144	Pull bridge	7m log bridge
Deact Map 3, 4, 5	JK 143	Pull CMP, add XD	800 CMP
Deact Map 3, 4, 5	JK 142	Pull WBC	WBC, with creek
Deact Map 4, 5	JK 141	Pull WBC	WBC, brushy rd right is HS240
Deact Map 4, 5	JK 140	Add XD	start of hill, above quarry
Deact Map 4, 5	JK 139	Pull WBC	seep with WBC
Deact Map 4, 5	JK 138	Add XD	steep grade with road wash
Deact Map 4, 5	JK 137	Pull WBC	WBC

Appendix A: Road Deactivation Recommendations for Stewardson Short-Term Roads

Road/#	Station	Recommendation	Comments
HS243			
Deact Map 4, 5	JK 157	No recommendations	spur overland construction, no action
HS246			
Deact Map 4, 5	JK 155	No recommendations	spur is fine, no action
HS200			
Deact Map 4	JK 194	No recommendations	Large stream, XD good
Deact Map 4	JK 193	No recommendations	Existing XD
Deact Map 4	JK 192	Start HPB, preserve conifers	
Deact Map 4	JK 191	Enhance XD	existing XD, shallow, with water from ditch
Deact Map 4	JK 189	End HPB, preserve conifers	steep fills 8m to mature second growth
Deact Map 4	JK 188	Add XD	seep at landing
Deact Map 4	JK 187	Add XD	
Deact Map 4	JK 186	Pull CMP, add XD	possible WB or CMP
Deact Map 4	JK 185	Add XD	possible culvert
Deact Map 4	JK 184	Pull CMP, add XD	CMP
Deact Map 4	JK 183	Pull CMP, add XD	CMP
Deact Map 4	JK 182	Pull CMP, add XD	CMP
Deact Map 4	JK 181	Add XD	Top of hill
Deact Map 4	JK 180	Pull CMP, add XD	CMP
Deact Map 4	JK 179	Start HPB	
Deact Map 4	JK 178	End HPB	
Deact Map 4	JK 177	Add XD	Seep
Deact Map 4	JK 176	Pull CMP, add XD	Existing CMP
Deact Map 4	JK 175	Pull CMP, add XD	CMP
Deact Map 4	JK 174	Add XD	seep, water in ditch
Deact Map 4	JK 173	Pull CMP, add XD	600 CMP
Deact Map 4	JK 172	Add XD	seepage
Deact Map 4	JK 171	Pull WBC	burried WBC
Deact Map 4	JK 170	Add XD	more seep, no culvert
Deact Map 4	JK 169	Add XD	continued seep from cuts, possible CMP burried
Deact Map 4, 5	JK 168	Add XD	seepage, no culvert
Deact Map 4, 5	JK 167	No recommendations	Existing XD good
HS50			
Deact Map 4, 5	JK 72	Add XD	bottom of switch, ditchline fill below
Deact Map 4, 5	JK 73	Pull WBC	WBC
Deact Map 4, 5	JK 74	Add XD	
Deact Map 4, 5	JK 75	Pull WBC	WBC
Deact Map 4, 5	JK 76	Add WB	Road wash
Deact Map 4, 5	JK 77	Add WB	
Deact Map 4, 5	JK 78	Pull WBC	WBC

Appendix A: Road Deactivation Recommendations for Stewardson Short-Term Roads

Road/#	Station	Recommendation	Comments
Deact Map 4, 5	JK 79	Start HPB	rocky fill down to 45% slopes, rd in FB with SC of rock, might be difficult to retrieve, PB what is possible and preserve mature conifers where sensible
Deact Map 4, 5	JK 80	Pull WBC, end HPB, start MPB	
Deact Map 4, 5	JK 81	Add XD	double seepage from cut
Deact Map 4, 5	JK 82	End MPB, start HPB, preserve conifers	
Deact Map 4, 5	JK 83	Add XD, continue HPB, preserve conifers	WBC
Deact Map 4, 5	JK 84	End HPB	
Deact Map 3, 4, 5	JK 85	Pull WBC	WBC
Deact Map 3, 4, 5	JK 86	Pull WBC	WBC
Deact Map 3, 4, 5	JK 87	Pull bridge	6m log bridge
Deact Map 3, 4, 5	JK 88	Add XD	Top of hill
Deact Map 3, 4, 5	JK 90	Add XD	bit of ditch water
Deact Map 3, 4, 5	JK 91	Pull WBC	WBC
Deact Map 3, 4, 5	JK 92	Add XD	downslope of quarry
Deact Map 3, 4, 5	JK 93	Pull WBC	WBC
Deact Map 3, 4, 5	JK 94	Add XD	road start, water in ditch
HS100			
Deact Map 3, 4, 5	JK 89	No recommendations	No road
H1000			
Deact Map 3, 4, 5	JK 95	Add XD	Seep onto road
Deact Map 3, 4, 5	JK 96	Pull WBC	Seepage from cut, WBC here
Deact Map 3, 4	JK 97	Pull WBC	Small creek 10m back, WBC here
Deact Map 3, 4	JK 98	Pull WBC	WBC
Deact Map 3, 4	JK 99	Add XD	Road wash
Deact Map 3, 4	JK 101	Pull WBC	Minor ditch water, WBC
Deact Map 3, 4	JK 102	Add XD	Small creek
Deact Map 3, 4	JK 103	Pull WBC	WBC
Deact Map 3, 4	JK 104	Add XD	Seep
Deact Map 3, 4	JK 105	Pull WBC	WBC
Deact Map 3, 4	JK 106	Pull bridge	15m long log bridge
Deact Map 3, 4	JK 107	Add XD	Seep
Deact Map 3, 4	JK 108	Pull WBC	WBC
Deact Map 3, 4	JK 109	Add XD	Wet ditch, possible WBC
Deact Map 3, 4	JK 110	Pull WBC	WBC, no outlet
Deact Map 3, 4	JK 111	Add reverse WB, into ditch	Road wash on switch
Deact Map 3	JK 112	Add reverse XD off end of switch	More road wash down switch, flows around on road currently
Deact Map 3	JK 113	Pull WBC	Large WBC

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Road/#	Station	Recommendation	Comments
Deact Map 3	JK 114	Add XD	Small creek
Deact Map 3	JK 115	Pull WBC	Creek and WBC
Deact Map 3	JK 116	Add XD	Steep grade
Deact Map 3	JK 117	Pull bridge	15m long log bridge
Deact Map 3	JK 118	Start HPB	Fill slope slump 5m below road, undercuts fill
Deact Map 3	JK 119	End HPB	Gully edge
Deact Map 3	JK 120	Add reverse XD, back into ditch	Road erosion, through cut so cant do normal XD
Deact Map 3	JK 121	Pull bridge	15ish m long log bridge
Deact Map 3	JK 122	Start HPB	9m HPB, 20m to bench
Deact Map 3	JK 123	Pull CMP, add XD	CMP, burried intake, downslope ditch mostly infilled with high till cuts
Deact Map 3	JK 124	Add XD	Water accumulating in ditch from multiple seepage, ditch now 1.2m deep
Deact Map 3	JK 125	End HPB	
Deact Map 3	JK 126	Add XD	
Deact Map 3	JK 127	Add XD	Steep grade
Deact Map 3	JK 128	Add XD	Ditch water
Deact Map 3, 5	JK 129	Pull CMP, add XD	CMP 500
Deact Map 3, 5	JK 130	Add XD	Steep grade, no culvert
Deact Map 3, 5	JK 131	Start MPB	
Deact Map 3, 5	JK 132	End MPB	vet Cw below rd starts here
Deact Map 3, 5	JK 133	Add XD	
Deact Map 3, 5	JK 134	Add XD	
H520			
Deact Map 3	JK 100	No recommendations	Existing big XD near start, has creek, mid road has tracks directing water across, beyond is only hoe trail, no surface
H10A			
Deact Map 5	JK 55	Add XD	Creek upslope, cant find CMP, water goes sub at road
Deact Map 5	JK 56	Add XD	Ditch water, probably where creek goes, security XD here
Deact Map 5	JK 57	Add XD	Steep slope starts here and below, but seep here with reverse WB, should cross rd here
Deact Map 5	JK 58	Pull CMP, add XD	CMP 1000
Deact Map 5	JK 59	Add XD	Second seep, needs back up XD
Deact Map 5	JK 60	Add XD	
Deact Map 5	JK 61	Add XD	
Deact Map 5	JK 62	Pull CMP, add XD	Existing CMP
Deact Map 5	JK 63	Add XD	

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Road/#	Station	Recommendation	Comments
HE610			
Deact Map 6	JE 42	Pull CMP add XD	No deact required beyond big bench no drainage issues well veg with alder
Deact Map 6	JE 43	Deepen existing XD	
Deact Map 6	JE 44	Deepen existing XD	
Deact Map 6	JE 45	Deepen existing XD	
Deact Map 6	JE 46	Pull CMP add XD	Existing CMP
Deact Map 6	JE 47	Deepen existing XD	
Deact Map 6	JE 48	Add XD	Several large holes in road no sign of cmp
Deact Map 6	JE 49	Pull CMP add XD	Exisiting CMP
HE600			
Deact Map 6	JE 41	No recommendations	Spur is well vegetated and on bench no reccs aside from xd ar jcn
HE605			
Deact Map 6	JE 40	No recommendations	Road taken back by forest on bench no deact necessary
H771			
Deact Map 7	JE 100	No recommendations	No road found
H790			
Deact Map 7	JE 97	No recommendations	Alder up to 20 cm diameter dont bother doing anything
H770			
Deact Map 7	JE 98	Pull CMP add XD	Could leave 800 CMP with little flow very brushy with 20 cm dr to here. Can see end of road
Deact Map 7	JE 96	Add XD	Jcn
Deact Map 7	JE 95	Pull CMP, add XD	existing CMP
Deact Map 7	JE 94	Bring saw	Large tree across log
Deact Map 7	JE 93	Pull CMP, add XD	existing CMP
Deact Map 7	JE 92	Add XD	
Deact Map 7	JE 91	Add XD	Jcn
Deact Map 7	JE 90	Add XD	Str comes out here
Deact Map 7	JE 89	Pull CMP, add XD	existing CMP
Deact Map 7	JE 88	Add XD	
Deact Map 7	JE 87	Pull CMP, add XD	existing CMP
Deact Map 7	JE 86	Pull CMP, add XD	existing CMP
Deact Map 7	JE 85	Pull CMP, add XD	existing CMP
Deact Map 7	JE 84	Pull CMP, add XD	Road becomes v brushy here
Deact Map 7	JE 83	Pull CMP, add XD	existing CMP
Deact Map 7	JE 82	Add XD	
Deact Map 7	JE 81	Pull CMP, add XD	existing CMP
Deact Map 7	JE 80	Add XD	
Deact Map 7	JE 79	Pull CMP, add XD	existing CMP

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Road/#	Station	Recommendation	Comments
Deact Map 7	JE 78	Pull CMP, add XD	Str parallels old unnamed grade then flows through cvt here. Leave old spur as is very grown over
Deact Map 7	JE 76	Add XD	
Deact Map 7	JE 75	Add XD	
Deact Map 7	JE 74	Pull WBC	1*2 appears to be settling on woods side
Deact Map 7	JE 73	Add WB	SE
Deact Map 7	JE 72	Add XD	
Deact Map 7	JE 71	Add XD	
Deact Map 7	JE 70	Pull CMP, add XD	Existing CMP
Deact Map 7	JE 69	Add XD	
Deact Map 7	JE 68	Pull CMP, add XD	Existing CMP
Deact Map 7	JE 65	No recommendations	Existing WB
Deact Map 7	JE 64	Add XD	Existing WB
Deact Map 7	JE 63	No recommendations	Existing WB
Deact Map 7	JE 62	No recommendations	Existing WB
Deact Map 7	JE 61	Add XD	
H770-OEL-A			
Deact Map 7	JE 77	Remove debris to access	Pile of till
H710			
Deact Map 7	JE 66	No recommendations	Very over grown and flat, no drainage concerns. No deact required
Deact Map 7	JE 67	Add XD	
H760			
Deact Map 7	JE 107	No recommendations	20-30 cm diameter dr short road on bench do no recommend deact
H107			
Deact Map 9	RN 78	No recommendations	Wide landing, no road, no deact required
H1110			
Deact Map 9	RN 79	No recommendations	Crossing removed
Deact Map 9	RN 80	Add XD	
H1080			
Deact Map 9	RN 97	No recommendations	Existing XD
Deact Map 9	RN 96	No recommendations	Existing XD
Deact Map 9	RN 95	No recommendations	Existing XD
Deact Map 9	RN 94	No recommendations	Existing XD
Deact Map 9	RN 93	No recommendations	Existing XD
Deact Map 9	RN 92	No recommendations	Existing XD
Deact Map 9	RN 91	No recommendations	Existing XD
Deact Map 9	RN 90	No recommendations	Existing XD
Deact Map 9	RN 89	No recommendations	Deep XD, woodbox pulled

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Road/#	Station	Recommendation	Comments
Deact Map 9	RN 87	Pull CMP, add XD	Backup WB
Deact Map 9	RN 86	Pull CMP, add XD	Backup WB
Deact Map 9	RN 85	Add XD	Existing RWB, add XD drain to out slope
Deact Map 9	RN 84	Pull WBC	3m high, 4mx4m
Deact Map 9	RN 88	Enhance XD	
Deact Map 9	RN 83	Add XD	
Deact Map 9	RN 82	Pull CMP, add XD	Existing CMP
Deact Map 9	RN 81	Pull CMP, add XD	Existing CMP
H1083			
Deact Map 9	RN 99	No recommendations	crossing pulled around main stream, road deactivated
Deact Map 9	RN 98	No recommendations	Existing XD
H1081			
Deact Map 9	RN 111	No recommendations	Large log pile, road deactivated past here. Existing XD
Deact Map 9	RN 110	No recommendations	Existing XD
Deact Map 9	RN 109	No recommendations	Large log pile, existing XD
Deact Map 9	RN 108	Add XD	
Deact Map 9	RN 107	Add XD	End Deact
Deact Map 9	RN 105	Add XD	
Deact Map 9	RN 104	Add XD	
Deact Map 9	RN 103	Pull CMP, add XD	Existing CMP
Deact Map 9	RN 102	No recommendations	Existing XD
Deact Map 9	RN 101	Add XD	
Deact Map 9	RN 100	Enhance XD	
H105			
Deact Map 9	RN 115	No recommendations	Stream crossing removed, road is deactivated
Deact Map 9	RN 114	No recommendations	Existing XD
Deact Map 9	RN 113	No recommendations	Existing XD
Deact Map 9	RN 112	Add XD	
H103			
Deact Map 8	RN 4	No recommendations	Road deactivated with XD
Deact Map 8, 9	RN 6	No recommendations	Road resloped, need to re-open
H1500			
Deact Map 7	JE 118	No recommendations	No sign of new road all structures pulled on old road
H1640			
Deact Map 8	TW 45	Add XD	
Deact Map 8	TW 46	Add XD	Wet site
Deact Map 8	TW 47	Add XD	Draw
Deact Map 8	TW 48	Pull CMP, add XD	Existing 600 cmp

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Road/#	Station	Recommendation	Comments
H1645			
Deact Map 8	TW 44	Pull CMP, add XD	Existing 600 CMP
H1650			
Deact Map 8	TW 50	Pull CMP, add XD	Existing CMP
Deact Map 8	TW 49	Pull CMP, add XD	Existing CMP
H1660			
Deact Map 8	TW 43	No work deemed necessary	
H1670			
Deact Map 8	TW 37	No worked needed except XD @ start	No drainage structures or concerns
Deact Map 8	TW 38	Add XD	Ditch from spur & branch join w no CMP
H1680			
Deact Map 8	TW 33	Pull CMP, add XD	Existing 800 CMP
Deact Map 8	TW 34	Pull CMP, add XD	Existing 800 CMP
H1600			
Deact Map 8	TW 35	Pull CMP, add XD	Existing 800 CMP
Deact Map 8	TW 36	Add XD	
Deact Map 8	TW 39	Pull CMP, add XD	Existing 800 CMP
Deact Map 8	TW 40	Pull CMP, add XD	Existing 600 CMP
Deact Map 8	TW 41	Add XD	Ncd draw
Deact Map 8	TW 42	Pull CMP, add XD	Existing 600 CMP
Deact Map 8	TW 51	Add XD	Ensure connects to H1540 ditch which joins branch here
Deact Map 8	TW 52	Pull CMP, add XD	Existing 800 CMP
Deact Map 8	TW 53	Add XD	Ncd draw
Deact Map 8	TW 54	Pull WBC	Existing 4 m WBC
Deact Map 8	TW 55	Pull CMP, add XD	Existing 800 CMP
Deact Map 8	TW 56	Add XD	Draw
Deact Map 8	TW 57	Pull CMP, add XD	Existing 600 CMP
Deact Map 8	TW 58	Add XD	Draw
Deact Map 8	TW 59	Pull CMP, add XD	Existing 600 CMP
Deact Map 8	TW 60	Add XD	Existing CMP
Deact Map 8	TW 82	Add XD	
Deact Map 8	TW 86	Add XD	
Deact Map 8	TW 87	Add XD	Real thick cover, likely missed CMP first few hundred of rd
H1620			
Deact Map 8	TW 85	Pull CMP, add XD	Existing 800 CMP
Deact Map 8	TW 84	No recommendations	OG Cw
Deact Map 8	TW 83	No recommendations	OG Cw blocking rd

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Road/#	Station	Recommendation	Comments
H1610			
Deact Map 8	RN 117	Add XD	
Deact Map 8	RN 116	Add XD	
H800			
Deact Map 8	TW 25	No work deemed necessary	S6 w drainage pulled, rd heavily overgrown, not worth reopening
500			
Deact Map 11	TW 90	Pull bridge	10 m wood bridge, no notable issues
Deact Map 11	TW 91	Add XD	Steep grade into fish draw
Deact Map 11	TW 92	Add WB	Southeast
Deact Map 11	TW 93	Add XD	Topo low
Deact Map 11	TW 94	Add WB	Northwest, Steep grade down to draw
Deact Map 11	TW 95	Pull bridge	10 m wood bridge, no notable issues
Deact Map 11	TW 96	Add WB	south
Deact Map 11	TW 97	Pull bridge	9 m wood bridge
Deact Map 11	TW 98	Add WB	North
Deact Map 11	TW 99	Add WB	West
Deact Map 10, 11	TW 100	Pull bridge	9 m wood bridge
Deact Map 10, 11	TW 101	Pull bridge	8m wood bridge
Deact Map 10, 11	TW 102	Add WB	Southwest
Deact Map 10, 11	TW 103	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 104	Pull bridge	9 m wood bridge , minor subsistence on wood side
Deact Map 10, 11	TW 105	Pull bridge	8m portable steel bridge
Deact Map 10, 11	TW 106	Add XD	Ncd draw
Deact Map 10, 11	TW 107	Pull CMP, add XD	600 cmp ncd
Deact Map 10, 11	TW 108	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 109	Add XD	Draw
Deact Map 10, 11	TW 110	Pull bridge	9 m wood bridge
Deact Map 10, 11	TW 111	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 112	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 113	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 114	Pull bridge	9 m wood bridge
Deact Map 10, 11	TW 115	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 125	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 130	Add XD	
Deact Map 10, 11	TW 131	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 132	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 133	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 134	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 135	Add XD	Wet site
Deact Map 10, 11	TW 136	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 138	Add XD	Water from spur goes to ditch on 500

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Road/#	Station	Recommendation	Comments
Deact Map 10, 11	TW 139	Add XD	
Deact Map 10, 11	TW 140	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 141	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 142	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 143	Add XD	
Deact Map 10, 11	TW 144	Add XD	Small draw
Deact Map 10, 11	TW 145	Add WB	Northwest. Steep grade back to XD
Deact Map 10, 11	TW 146	Pull WBC	Existing 5 m WBC
Deact Map 10, 11	TW 147	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 148	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 152	Pull CMP, add XD	Existing cmp
Deact Map 10, 11	TW 153	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 154	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 155	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 156	Add XD	
Deact Map 10, 11	TW 167	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 168	Pull CMP, add XD	Existing 600 cmp
Deact Map 10	TW 179	Add XD	
Deact Map 10	TW 180	Pull CMP, add XD	Existing 600 cmp
Deact Map 10	TW 181	Add XD	
Deact Map 10	TW 182	Pull CMP, add XD	Existing 600 cmp
Deact Map 10	TW 183	Pull CMP, add XD	Existing 600 cmp
Deact Map 10	TW 184	Pull CMP, add XD	Existing 600 cmp
Deact Map 10	TW 185	Pull bridge	10m wood bridge
Deact Map 10	TW 186	Add XD	
Deact Map 10	TW 187	Add XD	
Deact Map 10	TW 188	Add XD	
Deact Map 10	TW 189	Pull bridge	7 m wood bridge
H5700			
Deact Map 10	TW 124	Add WB	Northwest. Steep grade runoff
Deact Map 10	TW 123	Pull CMP, add XD	Existing 600 cmp
Deact Map 10	TW 122	No recommendations	0.5 m dbh Cw blocking access
Deact Map 10	TW 121	Add WB	Southwest
Deact Map 10	TW 120	Add XD	
Deact Map 10	TW 119	Pull CMP, add XD	Existing plastic 600 cmp
Deact Map 10	TW 118	Pull CMP, add XD	Existing 600 cmp
Deact Map 10	TW 117	Pull CMP, add XD	Existing 600 cmp
Deact Map 10	TW 116	Pull CMP, add XD	Existing 600 cmp
H5600			
Deact Map 10	TW 126	Pull bridge	8 m wood bridge, assessed by heli, no work required beyond here
Deact Map 10	TW 127	Pull CMP, add XD	Existing 600 cmp

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Road/#	Station	Recommendation	Comments
Deact Map 10	TW 128	Add XD	Poor visibility, likely CMP in here somewhere
Deact Map 10	TW 129	Pull CMP, add XD	Existing 600 cmp
550			
Deact Map 10	TW 137	Pull CMP, add XD	Existing 600 CMP
530			
Deact Map 10	TW 149	Pull CMP, add XD	Existing 600 CMP
Deact Map 10	TW 150	Add XD	
Deact Map 10	TW 151	Add XD	
524			
Deact Map 10, 11	TW 158	No recommendations	If existed is now a large quarry
520			
Deact Map 10, 11	TW 157	No recommendations	Big landing no work needed
Deact Map 10, 11	TW 159	Add XD	
Deact Map 10, 11	TW 160	Pull CMP, add XD	Existing 800 cmp
Deact Map 10, 11	TW 162	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 163	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 164	Pull CMP, add XD	Existing 600 cmp
Deact Map 10, 11	TW 165	Add WB	Northeast. Steep grade
Deact Map 10, 11	TW 166	Add XD	
522			
Deact Map 10	TW 161	No recommendations	Existing XD here and 15 m back, no work needed
514			
Deact Map 10, 11	TW 170	No recommendations	
512			
Deact Map 10, 11	TW 173	Pull CMP, add XD	Existing 600 CMP
510			
Deact Map 10, 11	TW 169	No recommendations	End of rd Flat grade, only 1m fill & no water issues
Deact Map 10, 11	TW 171	Pull CMP, add XD, no work required	Existing 600 CMP
Deact Map 10, 11	TW 172	Pull CMP, add XD	Existing 600 CMP
Deact Map 10	TW 174	Add XD	
Deact Map 10	TW 175	Add XD	
Deact Map 10	TW 176	Add XD	
Deact Map 10	TW 177	Add XD	
Deact Map 10	TW 178	Pull CMP, add XD	Existing 600 CMP
BR5900			
Deact Map 12	LW 5	No recommendations	Road is overgrown with deciduous and some coniferous; follows benched terrain; nothing to do back here; 1 WBC observed on way here
Deact Map 12	LW 6	Pull WBC	1x3 m
Deact Map 12	LW 7	No recommendations	Existing XD
Deact Map 12	LW 8	Add XD	at junction; overgrown with forest but good access otherwise

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Road/#	Station	Recommendation	Comments
BR6300			
Deact Map 12	LG 5	No recommendations	Existing XD
Deact Map 12	LG 6	Add XD	
Deact Map 12	LG 7	Add XD	
Deact Map 12	LG 8	Add XD	
Deact Map 12	LG 9	Add XD	
Deact Map 12	LG 10	Add XD	
Deact Map 12	LG 11	Pull CMP, add XD	Existing CMP
Deact Map 12	LG 12	No recommendations	Existing XD
Deact Map 12	LG 13	Add XD	
Deact Map 12	LG 14	Add XD	
Deact Map 12	LG 15	Enhance XD	Existing low XD
Deact Map 12	LG 16	Add XD	
Deact Map 12	LG 17	Pull CMP, add XD	Existing CMP
Deact Map 12	LG 18	Add XD	
Deact Map 12	LG 4	No recommendations	Borrow pit into bench above steep sw leaving narrow ridge. No water accumulation, ok to leave.
Deact Map 12	LG 19	Add XD	
BR6301			
Deact Map 12	LG 36	Enhance XD	Exisiting low XD
Deact Map 12	LG 35	Add XD	
Deact Map 12	LG 34	Add XD	
Deact Map 12	LG 33	Add XD	
Deact Map 12	LG 32	Add XD	
Deact Map 12	LG 31	Add XD	
Deact Map 12	LG 30	Enhance WB	Existing WB southwest
Deact Map 12	LG 29	Pull CMP, add XD	Existing CMP
Deact Map 12	LG 28	Add XD	
Deact Map 12	LG 27	Add XD	
Deact Map 12	LG 26	No recommendations	Cross ditch drains into burrow pit
Deact Map 12	LG 25	Add reverse WB	South
Deact Map 12	LG 24	Pull CMP, add XD	Existing CMP
Deact Map 12	LG 23	Pull CMP, add XD	Existing CMP
Deact Map 12	LG 22	Pull CMP, add XD	Existing CMP
Deact Map 12	LG 21	Pull CMP, add XD	Existing CMP
Deact Map 12	LG 20	Pull CMP, add XD	Existing CMP
Deact Map 12	LG 3	Pull CMP, add XD	Existing CMP
Deact Map 12	LG 2	Pull CMP, add XD	Existing CMP
BR6200			
Deact Map 12	LW 49	No recommendations	Existing XD; forest is very thick with large alder and decid trees for past 50 m and thicker forward; Road is all good and has been deactivated

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Road/#	Station	Recommendation	Comments
Deact Map 12	LW 48	No recommendations	Existing XD
Deact Map 12	LW 47	No recommendations	Existing XD
Deact Map 12	LW 46	No recommendations	Existing XD
Deact Map 12	LW 45	No recommendations	Existing XD, road is elevated and flat so far. looks good
Deact Map 12	LW 43	No recommendations	Existing XD; signs of flow through
Deact Map 12	LW 42	No recommendations	Existing XD
Deact Map 12	LW 41	No recommendations	Existing XD
Deact Map 12	LW 37	No recommendations	Existing XD across junction
Deact Map 12	LW 36	No recommendations	Big existing XD; Old pipe pulled; Will need to walk machine through; Shift to larger alder and looks like older roads ahead
Deact Map 12	LW 35	Add XD	start of deact, no work required beyond here
Deact Map 12	LW 34	Add XD	
Deact Map 12	LW 33	Add XD	existing reverse waterbar
Deact Map 12	LW 32	No recommendations	Road roughing/loosening ends
Deact Map 12	LW 31	Pull CMP, add XD	Existing CMP
BR6240			
Deact Map 12	LW 44	No recommendations	Road is good- overgrown with coniferous forest
BR6220			
Deact Map 12	LW 40	No recommendations	Road is deactivated- all good
Deact Map 12	LW 39	No recommendations	Existing XD
Deact Map 12	LW 38	No recommendations	Existing XD
BR6010			
Deact Map 12	LW 23	No recommendations	Established con forest along road; all good up to here with XD at beginning
Deact Map 12	LW 24	Add XD	At beginning of road
BR6000			
Deact Map 12	LW 30	Pull CMP, add XD	Exisiting CMP
Deact Map 12	LW 29	Pull CMP, add XD	Exisiting CMP
Deact Map 12	LW 27	Add XD	
Deact Map 12	LW 26	Pull CMP, add XD	Existing CMP
Deact Map 12	LW 25	Add XD	
Deact Map 12	LW 22	Pull CMP, add XD	Existing CMP
Deact Map 12	LW 21	Add XD	
Deact Map 12	LW 20	Pull CMP, add XD	Existing CMP
Deact Map 12	LW 19	No recommendations	no more signs of flow on road prism
Deact Map 12	LW 18	Add XD	
Deact Map 12	LW 17	Add XD	flow continues down road; erosion into prism 0.25-0.5 m D; 0.5 m W
Deact Map 12	LW 16	Add XD	Flow from CMP continues down road
Deact Map 12	LW 15	Pull CMP, add XD	Existing CMP

Appendix A: Road Deactivation Recommendations for Stewardson Short-Term Roads

Road/#	Station	Recommendation	Comments
Deact Map 12	LW 14	Add XD, QP to assess section of road for deactivation forward due to high flow rates in ditch	signs of flow in ditch via gravel and slight scouring; cut is upslope of ditch 1-3 m height and cut into a till blanket
Deact Map 12	LW 13	Pull CMP, add XD	Existing CMP
Deact Map 12	LW 12	Add XD	road is in good condition overall
Deact Map 12	LW 11	Pull CMP, add XD	Existing CMP
Deact Map 12	LW 10	Add XD	Settling in road has created holes 0.25-0.5 m D; WSA for potentially unstable road surface
Deact Map 12	LW 9	Add XD	Junction is good; road is built up on 30-40% bench
North Escalante			
Deact Map 15, 16	LG 38	Pull WBC	Existing WBC
Deact Map 15, 16	LG 39	Pull WBC	Existing WBC
Deact Map 15, 16	LG 40	Pull WBC	Existing WBC
Deact Map 15, 16	LG 41	Add WB	Southwest
Deact Map 15, 16	LG 42	Pull WBC	Existing WBC
Deact Map 15, 16	LG 43	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 44	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 45	Pull WBC	Existing WBC
Deact Map 15, 16	LG 46	Pull WBC	Existing WBC
Deact Map 15, 16	LG 47	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 48	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 49	Add WB	West
Deact Map 15, 16	LG 50	Add WB	West
Deact Map 15, 16	LG 51	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 52	Add XD	
Deact Map 15, 16	LG 53	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 54	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 55	Add XD	
Deact Map 15, 16	LG 56	Pull bridge	metal, 12m. good condition
Deact Map 15, 16	LG 57	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 58	Pull bridge	wooden, 8m.
Deact Map 15, 16	LG 59	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 60	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 61	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 62	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 63	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 64	Add XD	
Deact Map 15, 16	LG 65	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 66	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 67	Start MPB	Above fish bearing lake. -90% slope. Minor amount of settling on shoulder

Appendix A: Road Deactivation Recommendations for Stewardson Short-Term Roads

Road/#	Station	Recommendation	Comments
Deact Map 15, 16	LG 68	End MPB	
Deact Map 15, 16	LG 69	Add XD	
Deact Map 15, 16	LG 70	Add XD	
Deact Map 15, 16	LG 71	Add XD	
Deact Map 15, 16	LG 72	Start LPB	Above fish bearing lake. -90% slope. Failures present in
Deact Map 15, 16	LG 73	End LPB	
Deact Map 15, 16	LG 74	Add XD	
Deact Map 15, 16	LG 75	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 76	Pull WBC	Existing WBC
Deact Map 15, 16	LG 77	Add XD	
Deact Map 15, 16	LG 78	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LG 79	Enhance WB	Existing low WB
Deact Map 15, 16	LG 80	Pull WBC	Existing WBC
Deact Map 15	LG 81	Add XD	
Deact Map 15	LG 82	Add XD	
Deact Map 15	LG 83	Pull CMP, add XD	Existing CMP
Deact Map 15	LG 84	Pull WBC	Existing WBC
Deact Map 15	LG 85	Add WB	West
Deact Map 15	LG 86	Add WB	West
Deact Map 15	LG 87	Pull WBC	Existing WBC
Deact Map 15	LG 88	Pull bridge	wooden, 6m.
Deact Map 15	LG 89	Pull CMP, add XD	Existing CMP
Deact Map 15	LG 90	Pull CMP, add XD	Existing CMP
Deact Map 15	LG 91	Pull CMP, add XD	Existing CMP
Deact Map 15	LG 92	Pull CMP, add XD	Existing CMP
Deact Map 15	LG 93	Pull bridge	wooden, 15m.
Deact Map 15	LG 94	Enhance WB	Existing low northeast WB
Deact Map 15	LG 95	Add XD	
Deact Map 15	LG 96	Add XD	
Deact Map 15	LG 97	Pull WBC	Existing WBC
Deact Map 14, 15	LG 98	Pull CMP, add XD	Existing CMP
Deact Map 14, 15	LG 99	No recommendations	small slide down slope. 10m wide by 25m long. -55%
Deact Map 14, 15	LG 100	Enhance XD	Exisiting low XD
Deact Map 14, 15	LG 101	Pull CMP, add XD	Existing CMP
Deact Map 14, 15	LG 102	Pull CMP, add XD	Existing dual pipe
Deact Map 14, 15	LG 103	Start MPB	Tension cracks 0.5m back from shoulder
Deact Map 14, 15	LG 104	End MPB	
Deact Map 14, 15	LG 105	Pull CMP, add XD	Existing CMP
Deact Map 14, 15	LG 106	Pull CMP, add XD	Existing CMP
Deact Map 14, 15	LG 107	Add XD	
Deact Map 14, 15	LG 108	Enhance WB	Existing low WB
Deact Map 14, 15	LG 109	Pull CMP, add XD	Existing CMP

Appendix A: Road Deactivation Recommendations for Stewardson Short-Term Roads

Road/#	Station	Recommendation	Comments
Deact Map 14, 15	LG 110	Add XD	
Deact Map 14, 15	LG 111	Add XD	
Deact Map 14, 15	LG 112	Start HPB	settling fill
Deact Map 14, 15	LG 113	End HPB	
Deact Map 14, 15	LG 114	Add XD	
Deact Map 14, 15	LG 115	Add XD	
Deact Map 14, 15	LG 116	Start MPB	settling fill
Deact Map 14, 15	TW 271	No recommendations	25 m w fill failure joins last & river
Deact Map 14	TW 270	No recommendations	30 m w fill failure ran out to river
Deact Map 14	TW 269	End MPB	Windrow & fill 7 m long w cracks on steep, 2 fill failures, see JK for start
Deact Map 14	TW 268	Start LPB	Short section spoil piled against timber on steep
Deact Map 14	TW 267	End LPB	
Deact Map 14	TW 266	Add XD	
Deact Map 14	TW 265	Pull CMP, add XD	Existing 600 cmp
Deact Map 14	TW 264	Pull CMP, add XD	Existing 600 cmp
Deact Map 14	TW 263	Pull WBC	4m WBC
Deact Map 14	TW 262	Add XD	
Deact Map 14	TW 261	Pull WBC	5 m WBC
Deact Map 14	TW 260	Add XD	
Deact Map 14	TW 258	Pull CMP, add XD	Existing 600 cmp
Deact Map 14	TW 257	Start LPB	3-5 m keyed in fill on 80-90%
Deact Map 14	TW 256	Add XD	continue LPB
Deact Map 14	TW 255	End LPB	Edge of thru cut back to steep
Deact Map 14	TW 254	Add XD	
Deact Map 14	TW 253	Start LPB	Rd on 80-120% w sliver fill above river
Deact Map 14	TW 252	Add XD	continue LPB, Ncd off bluff
Deact Map 14	TW 251	Add XD	continue LPB, Ncd off bluff
Deact Map 14	TW 250	End MPB	
Deact Map 14	TW 249	Pull bridge	25 m steel bridge
Deact Map 14	TW 248	Add WB	North. No ditch, draw below
Deact Map 14	TW 247	Add XD	Draw
Deact Map 14	TW 246	Add XD	
Deact Map 14	TW 245	Start LPB	
Deact Map 14	TW 244	No recommendations	Rd now 3/4 approx, 3 m long fills w cracks starting @ shoulder
Deact Map 14	TW 243	End LPB	Steep, rd essentially fb but w sliver fill, s cracks on steep into river
Deact Map 14	TW 242	Add XD	
Deact Map 14	TW 241	Add XD	
Deact Map 14	TW 240	Pull bridge	10 m wood bridge
Deact Map 14	TW 239	Add XD	Alder slide maybe, no visible str or structure

Appendix A: Road Deactivation Recommendations for Stewardson Short-Term Roads

Road/#	Station	Recommendation	Comments
Deact Map 14	TW 238	Pull CMP, add XD	Existing 800 cmp
Deact Map 14	TW 237	Add XD	Rd runoff onto fill @ Ncd
Deact Map 14	TW 236	Pull WBC	5 m WBC
Deact Map 14	TW 235	Pull bridge, confirm has been inspected	7m wood bridge w subsistence 2m from low edge
Deact Map 14	TW 234	Pull CMP, add XD	Existing 400 Cmp
Deact Map 14	TW 233	Add XD	
Deact Map 14	TW 232	Add XD	
Deact Map 14	TW 231	Start LPB	2m fill on near vertical, old fill failure alder
Deact Map 14	TW 230	End LPB	Steep transitions ridge nose
Deact Map 13, 14	TW 228	Add XD	
Deact Map 13, 14	TW 227	Start LPB	Sliver fill to 1-3m long, discontinuous t cracks on steep into
Deact Map 13, 14	TW 229	No recommendations	Tension cracks present shoulder / 1-3 m long fills now
Deact Map 13, 14	TW 226	End LPB	End of outer 2 m rd surface settling on steep above river, 1-
Deact Map 13, 14	TW 225	Pull CMP, add XD	Existing 600 cmp
Deact Map 13, 14	TW 224	Pull CMP, add XD	Existing 600 cmp, jnc to here through cut
Deact Map 13, 14	TW 223	Add XD	
Deact Map 13	TW 221	Pull CMP, add XD	Existing 600 cmp
Deact Map 13	TW 220	Pull CMP, add XD	Existing 600 cmp
Deact Map 13	TW 219	Add XD	
Deact Map 13	TW 218	Pull CMP, add XD	Existing 600 cmp
Deact Map 13	TW 217	Pull CMP, add XD	400 plastic cmp
Deact Map 13	TW 216	Pull WBC	4m WBC
Deact Map 13	TW 215	Pull CMP, add XD	Existing 600 cmp
Deact Map 13	TW 214	Pull CMP, add XD	Existing 600 cmp
Deact Map 13	TW 213	Pull CMP, add XD	Existing 600 cmp
Deact Map 13	TW 212	Pull CMP, add XD	Existing 600 cmp
Deact Map 13	TW 211	Pull CMP, add XD	Existing 800 cmp
Deact Map 13	TW 210	Pull CMP, add XD	Existing 600 cmp
Deact Map 13	TW 209	Add XD	Draw
Deact Map 13	TW 208	Add XD	Draw
Deact Map 13	TW 207	Pull bridge	Existing 10 m wood bridge
Deact Map 13	TW 206	Pull CMP, add XD	Existing 1000 cmp
Deact Map 13	TW 205	Add XD	
Deact Map 13	TW 204	Pull CMP, add XD	Existing 600 cmp
Deact Map 13	TW 203	Pull CMP, add XD	600 cmp ncd
Deact Map 13	TW 202	Pull CMP, add XD	Existing 600 cmp
Deact Map 13	TW 201	Pull CMP, add XD	Existing 600 cmp
Deact Map 13	AS 3	Add XD	
Deact Map 13	AS 2	Add XD	
Deact Map 13	TW 196	Add XD	

Appendix A: Road Deactivation Recommendations for Stewardson Short-Term Roads

Road/#	Station	Recommendation	Comments
Deact Map 13	TW 197	Add XD	
Deact Map 13	TW 195	Add WB	Southeast
Deact Map 15	TW 194	Add XD	End of deact
E510			
Deact Map 16	LW 97	No recommendations	bridge has been pulled forward; all good forward; no point on coming to deactivated section of road
Deact Map 16	LW 96	No recommendations	Existing XD
Deact Map 16	LW 95	No recommendations	Existing XD; end of resloped road
Deact Map 16	LW 94	No recommendations	recountouring continues
Deact Map 16	LW 93	No recommendations	Road has been resloped forward and woody debris placed upon moving forward
Deact Map 16	LW 92	No recommendations	Existing XD
Deact Map 16	LW 91	No recommendations	Existing reverse waterbar
Deact Map 16	LW 90	No recommendations	Existing large XD
Deact Map 16	LW 89	No recommendations	Existing XD
Deact Map 16	LW 88	No recommendations	Existing XD
Deact Map 16	LW 87	No recommendations	Junction to other spur is here and is very overgrown with coniferous and decid trees- all good
Deact Map 16	LW 86	Add XD	
Deact Map 16	LW 85	Pull CMP, add XD	Existing CMP
Deact Map 16	LW 84	Start HPB	WSA for rockfall throught HPB section; pulled back material can be used to buttress ravelling slope
Deact Map 16	LW 83	Add XD	
Deact Map 16	LW 82	Pull CMP, add XD	Existing CMP
Deact Map 16	LW 81	End HPB	Contine WSA- TC extend 3-4 m into road with displacement 0.5 -1 m on outside 2 m of road
Deact Map 16	LW 80	Add XD	
Deact Map 16	LW 79	Add XD	
Deact Map 16	LW 78	No recommendations	Some TC become visible but likely is woody debris settling; downslope is 55-65% for 15 m then becomes gentle
Deact Map 16	LW 77	Pull CMP, add XD	Existing CMP
Deact Map 16	LW 76	Add XD	no signs of recent flow here; stream has been diverted somewhere upstream to forward Xing
Deact Map 16	LW 75	Start LPB	
Deact Map 16	LW 74	End LPB	WSA for rockfall on approach to xing; Continue WSA- Fill is above stream; TC extend 0.5-2 m into road; slight displacement 0.25-0.5 m; till irreg overlies R on approach and outcrops in areas on approach
Deact Map 16	LW 73	Add XD	

Appendix A: Road Deactivation Recommendations for Stewardson Short-Term Roads

Road/#	Station	Recommendation	Comments
Deact Map 16	LW 72	Add XD	
Deact Map 16	LW 71	Add XD	
Deact Map 16	LW 70	Start LPB	
Deact Map 16	LW 69	End LPB	Blocky material between pullback isn't easy to retrieve which is why we stopped pullback
Deact Map 16	LW 68	Add XD	
Deact Map 16	LW 67	Start LPB	TC extend 2-3 m into road; some settling and displacement; till veneer over bedrock 0.1-1 D with CW overlying
Deact Map 16	LW 66	Add XD	Continue LPB, pooled water
Deact Map 16	LW 65	Add XD	continue LPB
Deact Map 16	LW 64	End LPB	
Deact Map 16	LW 63	Add XD	
Deact Map 16	LW 61	Add armoured XD	
Deact Map 16	LW 62	Start HPB	slopes were -60-80%; Cm in cut. 0-5 m D; mostly rubbly fill; R starts outcropping forward
Deact Map 16	LW 60	Add armoured XD	WSA- rockfall
Deact Map 16	LW 59	Add armoured XD	Continue HPB; TC start extending 1-2 m into road forward and then increase to 3 m
Deact Map 16	LW 58	No recommendations	Continue HPB- continue WSA for rockfall; WSA for holes in road prism 1-2 m D 0.5 m W on outside 2-3 m of road starts. Cut is switching more to rock instead of colluvium; blocky rubble is deposited amongst second gen forest; TC continue extending up to 4 m into prism; 3-4 m W for excavator
Deact Map 16	LW 57	Add armoured XD	Continue HPB. TC extend 2-3 m into prism; Cm upslope of road in cut could be encorporated into failure; small cones on road overlapping ditch and onto 2 m of inside road prism; HPB will help buttress
Deact Map 15, 16	LW 56	Start LPB End HPB and Add XD; WSA for rockfall forward	settling on outside edge extends 1 m into road prism with up to 0.5 m is displacement; 3/4 bench over bedrock with rubbly fill and small windrow on outside edge to pull back; TC start forward; C start depositing on road forward
Deact Map 15, 16	LW 55	Pull CMP, add XD	Existing CMP
Deact Map 15, 16	LW 54	End LPB	starting E510 assessment from this point and will finish area behind while walking back
Deact Map 15, 16	LW 98	Add XD	Steep downslope -80-100%; cut is into bedrock and ~5 m tall
Deact Map 15, 16	LW 99	Add XD	
Deact Map 15, 16	LW 100	Add XD	
Deact Map 15, 16	LW 101	Add XD	

Appendix A: Road Deactivation Recommendations for Stewardson Short-Term Roads

Road/#	Station	Recommendation	Comments
Deact Map 15, 16	LW 102	Enhance XD	small ditch eroded into road from flow
Deact Map 15, 16	LW 103	Start MPB	TC extend 2-4 m into road; 0.5 m displacement;
Deact Map 15, 16	LW 104	End MPB	bit of a windrow with settling/TC
Deact Map 15, 16	LW 105	Add XD	
Deact Map 15, 16	LW 106	Start LPB	TC extend 0.5-2 m into road; some settling with slight displacement
Deact Map 15, 16	LW 107	Add XD	
Deact Map 15, 16	LW 108	End LPB	
Deact Map 15, 16	LW 109	Add XD	
B110			
Deact Map 13	TW 222	No works required	Mature conifers no rd surface visible
BR100			
Deact Map 13	TW 259	No works required	Bridge pulled
Z1900			
Deact Map 17	DM 1	Installation of All-Steel Portable bridge required for access, pull following deactivation of up-chain bridge	Survey and design completed by OEL
Deact Map 17	DM 2	Pull bridge	wood bridge

Appendix B: Road Reactivation Recommendations for HE780 and HE600/610

Road/Map #	Station	Recommendation	Comments
HE780			
React Map 5	JE 1	clean inlet	existing CMP
React Map 5	JE 4	clean inlet	existing CMP, plastic pipe
React Map 5	JE 5	clean inlet	existing CMP, plastic pipe
React Map 5	JE 6	P.Eng inspection required	7 m all steel portable
React Map 5	JE 7	clean inlet	existing CMP, plastic pipe
React Map 5	JE 9	clean inlet	existing CMP
React Map 5	JE 10	clean inlet	existing CMP, plastic pipe
React Map 5	JE 11	no recommendation	End React
HE600			
React Map 6	JE 39	no recommendation	Large alder on road edges small on driving surface no pick up access
React Map 6	JE 60	clean inlet	existing CMP
React Map 6	JE 58	retain existing XD	existing XD
React Map 6	JE 57	retain existing XD	existing XD
React Map 6	JE 55	retain existing XD	existing XD
HE610			
React Map 6	JE 53	clean inlet, start excavate and reconstruct	holes in road
React Map 6	JE51 + 20	End excavate and reconstruct	
React Map 6	JE 50	retain existing XD	existing XD

Appendix C: Road Reactivation Recommendations for Hotsprings Mainline

Road/Map #	Station	Recommendation	Comments
Hotsprings Mainline			
React Map 1	**JK 1**	Clean and SC debris	small rock fall in ditch
React Map 1	**JK 3**	Start LPB	pile of debris on road corner, possible settling
React Map 1	**JK 4**	End LPB	
React Map 1	**JK 5**	Start clean & brush ditchline	6m long wood bridge, bridge inspection completed
React Map 1	**JK 8**	No recommendations	steel bridge 20m looks good
React Map 1	**JK 11**	clean CMP	partially plugged plastic culvert
React Map 1	**JK 64**	No recommendations	till cut, shallow ditch
React Map 2	**JK 12**	No recommendations	steel bridge, 20m long, minor rail damage, missing delineators
React Map 2	**JK 66**	No recommendations	brushy ditchline
React Map 2	**JK 67**	No recommendations	brush & clean ditch
React Map 2	**JK 68**	No recommendations	brush & clean ditch
React Map 2	**JK 23**	No recommendations	steel bridge, looks good, 17m
React Map 2	**JK 24**	No recommendations	good CMP
React Map 3	**JK 69**	No recommendations	brushy ditch and fill, brush & clean ditch
React Map 3	**JK 70**	No recommendations	brushy ditch and fill, brush & clean ditch
React Map 3	**JK 36**	No recommendations	brushy ditch, but all CMPs seem to be clean
React Map 3	**JK 41**	End clean & brush ditchline	brushy ditches continue
React Map 3	**JK 42**	Add WB	bit of road wash down steep grade, road edge waterbars
React Map 3	**JK 43**	Add WB	
React Map 4	**JK 44**	Add WB	
React Map 4	**JK 45**	Add WB	steep grade continues
React Map 4	**JK 46**	Add WB	
React Map 4	**JK 48**	Add reverse WB	East. Road slopes a bit other way
React Map 4	**JK 47**	Add WB	
React Map 4	**JK 49**	Add WB	
React Map 4	**JK 50**	Add reverse WB	East
React Map 4	**JK 51**	Add reverse WB, start brush & clean ditch	RWB (east), clean ditch (east side), bursh
React Map 4	**JK 52**	End brush & clean ditch	brush west side
React Map 4	**JK 53**	Start clean ditch	west side
React Map 4	**JK 54**	End clean ditch	steep colluvial cuts will continue to ravel

Appendix D: Road Reactivation Recommendations for Stewardson Mainline

Road/Map #	Station	Recommendation	Comments
Stewardson Mainline			
React Map 4	AH 9	No recommendations	Bridge - 5m wood
React Map 4	AH 10	P. Eng inspection. Start clean ditch	Bridge - Wood bridge, downstream edge minor subsidence
React Map 4	AH 11	End clean ditch line	
React Map 4	AH 12	Replace CMP	Plugged 600 CMP
React Map 4	AH 13	Clean CMP	Partially obstructed 800 CMP, 15% full of gravels. Still functional.
React Map 4	AH 14	No recommendations	Bridge - 5 m wood in good condition
React Map 4	AH 16	Start brushing & clean ditch	Brushing may be required starting here (continues from here to at least 7.5k bridge).
React Map 4	AH 17	Clean CMP inlet	Existing CMP - Low to nonexistent ditch between here and intersection on N side
React Map 4	AH 18	Add CMP	Concave wet site
React Map 4	AH 20	P. Eng inspection of bridge, Start resurfacing	Bridge - 5m wood, 1m of outer lower rd surface sagging
React Map 4	AH 21	End resurfacing	1200 CMP functional, prism looks good. This culvert to last bridge may require resurfacing.
React Map 4	AH 22	Clean CMP inlet	Existing CMP
React Map 4	AH 23	No recommendations	Existing CMP
React Map 4	AH 24	Clean CMP inlet	Existing 800 CMP
React Map 4	AH 25	No recommendations	Existing CMP
React Map 4	AH 26	No recommendations	Existing CMP
React Map 4	AH 28	Construct engineered ford	P.Eng Ford Design completed by OEL
React Map 4	AH 31	Start LPB of fills + 0.5m shoulder, move road in 0.5m	4.5 m usable road width. 4-5 m vert R cut, +70 above. 2m w ditch line, approx 6m long fill @ 85% on 60-70% slope. Outer 0.5m of shoulder and fs settling.
React Map 4	AH 32	End LPB of fills + 0.5m shoulder, move road in 0.5m	Plenty of room in oversized ditch to move road in
React Map 4	AH 33	No recommendations	Existing CMP
React Map 4	AH 34	No recommendations	Existing CMP
React Map 4	AH 35	Start MPB, including 1-1.5m outer rd surface, move road in 1m.	4.5m usable rd with 2m ditch. 5-6m bedrock cut. Outer 2m rd surface settling. +50%.
React Map 4	AH 36	End MPB, including 1-1.5m outer rd surface, move road in 1m.	

Appendix D: Road Reactivation Recommendations for Stewardson Mainline

Road/Map #	Station	Recommendation	Comments
React Map 4, 5	AH 37	Start excavate outer edge, remove fines and woody material. Rebuild outer edge.	4-4.5m usable rd width. 4-5m vert R cut, +40-50% above. 6m fill on 15m l 75% slope to bench. Outer 1-1.5m resurface settling.
React Map 4, 5	AH 38	End excavate outer edge, remove fines and woody material. Rebuild outer edge.	
React Map 4, 5	AH 39	No recommendations	Existing CMP
React Map 5	AH 40	No recommendations	Existing WBC
React Map 5	AH 41	No recommendations	Alder across road approx 0.3m dbh
React Map 5	AH 44	No recommendations	2x small Hw across rd
React Map 5	AH 46	No recommendations	Existing 600 CMP x2, overhanging by 3m
React Map 5	AH 47	P. Eng inspection required	12m wooden bridge, ponding on E side
React Map 5	AH 48	No recommendations	Cw 0.35m dbh + 6-7 smaller trees down across road
React Map 5	AH 49	Add CMP	S6 to NCD runs into ditch line and ponds here, no culvert.
React Map 5	AH 50	No recommendations	Existing CMP
React Map 5, 6	AH 51	No recommendations	Existing CMP
React Map 5, 6	AH 52	No recommendations	Existing CMP
React Map 6	AH 54	No recommendations	2x small conifers across rd
React Map 6	AH 55	No recommendations	0.3m dbh Hw high across rd
React Map 6	AH 57	No recommendations	Existing CMP
React Map 6	AH 58	Collapsing downstream side prism, daylighting to stream, P. Eng to inspect and possibly replace.	
React Map 6	AH 59	No recommendations	0.25 m dbh alder across rd
React Map 6	AH 61	Start MPB	See AH60
React Map 6	AH 60	Relocate 2x CMP. Place woods side +2m. Armour intakes. End MPB across draw. Place guard log on outside edge.	Big fill around existing 2x existing 800 CMP, one is fully plugged other open. Some retrogression on ditch side of road prism. 7m l x 3m h section of -80% fill through stream draw. Depth of fill unknown likely 10m w x 5m h but bottom 2m is blocks and ok. Fill slope minor retrogression.
React Map 6	AH 62	No recommendations	0.3m dbh alder across rd
React Map 6	AH 63	No recommendations	0.4m dbh alder across rd

Appendix D: Road Reactivation Recommendations for Stewardson Mainline

Road/Map #	Station	Recommendation	Comments
React Map 6	AH 64	Add CMP	Will likely require ditch cleaning. 8-10m till cut slope above rd is ravelling. Multiple alder across rd. Windthrow off till cutslope.
React Map 6	AH 65	Add CMP, end brushing & clean ditch	Saturated road continues from last, wet draw
React Map 6	JE 13	Start LPB	Tc and settling 1-2 m from road edge
React Map 6	JE 12	End LPB	Sufficient too. To move road in if reqd
React Map 6	JE 14	Install new bridge	Draft P.Eng bridge design completed by OEL
React Map 6	JE 15	Start excavate and reconstruct	Minor setting and 10 cm hole in road. Suspect old fill. Only 50% below
React Map 6	JE 16	End excavate and reconstruct	
React Map 6	JE 17	Start LPB	Settling now over steep sufficient road width to move in if reqd. 2 m H by 0.3 V
React Map 6	JE 19	End LPB	
React Map 6	JE 20	Bring saw	WT across road. Bring saw can't see any settling
React Map 6	JE 21	Install CMP if not already installed creek is flowing across road below wt	
React Map 6	JE 22	Clean inlet excavate and repack around cmp	Existing CMP. holes in road
React Map 6	JE 23	Clean inlet	Existing CMP
React Map 6	JE 24	Clean inlet	Existing CMP
React Map 6	JE 25	Clean inlet	Existing CMP
React Map 6	JE 26	Start LPB, move road into slope as reqd	5-6 m of road width will remain after pb cutslope is 5 m of tills
React Map 6	JE 27	End LPB	
React Map 6	JE 28	Clean inlet	Existing CMP
React Map 6	JE 29	Clean inlet	Existing CMP
React Map 6	JE 30	Clean inlet	Existing CMP
React Map 6	JE 31	Bring saw	Tree across road
React Map 6	JE 32	Discuss during react	Settling of rock fill very localized. Could excavate and reconstruct-80% beyond road edge
React Map 6	JE 33	Clean inlet	Existing CMP
React Map 6	JE 34	Clean inlet	Existing CMP
React Map 6	JE 37	Clean inlet	Existing CMP
React Map 6, 7	JE 201	Start excavate to bench and kir	

Appendix D: Road Reactivation Recommendations for Stewardson Mainline

Road/Map #	Station	Recommendation	Comments
React Map 6, 7	JE 35	End excavate and reconstruct	Bit slopey but no tension cracks. Reassess when opening up road very brushy. -80% fill slope 3 m of slopes road edge at 25%. Cutslope is 5 m high. Alternatively MPB and move road in
React Map 7	JE 36	Clean inlet	Existing CMP
React Map 7	JE 101	Start excavate and reconstruct	Road is outsloped/setteling with 0.5 m dia hole .5 m from road edge -35%
React Map 7	JE 102	End excavate and reconstruct	
React Map 7	JE 103	Clean inlet	Existing CMP
React Map 7	JE 104	Start excavate and reconstruct	Hole from water or rotted out log or combo
React Map 7	JE 106	P.Eng. inspection required	WBC
React Map 7	JE 105	End excavate and reconstruct	Stop at WBC
React Map 7	JE 108	excavate and reconstruct	0.5 m hole in road. No drainage structure no stream above no water in ditch gentle below
React Map 7	JE 109	No recommendations	Pit and potential Heli pad
React Map 7	JE 110	excavate and reconstruct	Large fill failing 2-3 m at 80%; bench 1-2 m hole at least 0.5 m deep no WBC no water issues
React Map 7	JE 112	excavate and reconstruct, start clean ditch	0.5 m deep hole in fill/ middle of road
React Map 7	JE 113	Excavate and replace pipe	Hole on fill side at cmp. Inlet is crushed
React Map 7	JE 114	End clean ditch	Existing WBC 1*3
React Map 7, 8	JE 115	No recommendations	Existing WBC 1*4 under sized?
React Map 7, 8	JE 200	Start excavate and reconstruct	5 m of road inside tension cracks
React Map 8	JE 199	End excavate and reconstruct	Tension cracks -60%(5m);bench
React Map 8	JE 198	Clean inlet	Existing CMP
React Map 8	JE 197	P.Eng. inspection required	bridge collapsing two large holes
React Map 8	JE 196	Clean inlet	Existing CMP in old WBC
React Map 8	JE 195	Clean inlet	Existing CMP
React Map 8	JE 194	Clean inlet	Existing CMP in old WBC
React Map 8	JE 193	Clean inlet	Existing CMP
React Map 8	JE 192	Clean inlet	Existing CMP in old WBC
React Map 8	JE 191	Clean inlet	Existing CMP in old WBC
React Map 8	JE 190	Clean inlet	Existing CMP

Appendix D: Road Reactivation Recommendations for Stewardson Mainline

Road/Map #	Station	Recommendation	Comments
React Map 8	JE 189	Clean inlet	Existing CMP
React Map 8	JE 188	Start excavate and reconstruct	
React Map 8	JE 187	End excavate and reconstruct	Settling above bench
React Map 8	TW 32	Replace bridge, P.Eng design required	9 m collapsing log bridge
React Map 8	TW 31	Replace wbc	5 m WBC collapsing lower edge
React Map 8	TW 30	No recommendations	1000 CMP functioning
React Map 8	TW 29	No recommendations	1000 CMP functioning
React Map 8	TW 28	No recommendations	1000 CMP functioning
React Map 8, 10	TW 27	P.Eng. inspection required	20m log bridge
React Map 10	TW 26	No recommendations	5 m WBC, no obvious instability, assess if hauling
React Map 10	TW 24	No recommendations	1000 CMP functioning
React Map 10	TW 23	P.Eng. inspection required	6m WBC, no obvious instability
React Map 10	TW 21	P.Eng. inspection required	10.5m wood bridge, no obvious instability
React Map 10	TW 20	No recommendations	600 CMP functioning
React Map 10	TW 19	No recommendations	600 CMP functioning
React Map 10	TW 18	No recommendations	600 CMP functioning
React Map 10	TW 17	Replace 600 cmp	600 CMP appears to have holes, water enters pipe but comes out not in pipe
React Map 10, 11	TW 16	Start brushing & cleaning	600 CMP functioning
React Map 10, 11	TW 13	Start MPB, including 1-1.5m outer rd surface, move road in 1m.	
React Map 10, 11	TW 14	End MPB,start HPB+ place guard log, move rd into ditch if required	10 m long 0.1 m w crack in dead middle of rd
React Map 10, 11	TW 15	End HPB+, start HPB, move rd 1m into ditch	Rd narrows here, no longer crack in centre, but still unstable fill & cracks in shoulder , 10 m long 0.1 m w crack in dead middle of rd
React Map 10, 11	TW 12		continue HPB
React Map 10, 11	TW 11	End HPB	include outer 4 of rd surface, could rebuild or move rd 1m into ditch
React Map 10, 11	TW 10	Start HPB	Start unstable outer edge
React Map 10, 11	TW 9	No recommendations	Shift to 10 m vert R cut w filled ditch, still 3m sagging outer rd surface w similar sized oversteepened fills,

Appendix D: Road Reactivation Recommendations for Stewardson Mainline

Road/Map #	Station	Recommendation	Comments
React Map 10, 11	TW 8	End HPB, move rd into ditch if required, place guard log on outside edge	No cut work required plenty of room, Outer 3m of rd including surface & 7 m long fill settling w discontuous cracks
React Map 10, 11	TW 7	Excavate fill including 0.5m of outer shoulder, remove fines & wdb, repack	
React Map 10, 11	TW 6	Brushing & resurfacing required	
React Map 10, 11	TW 5	Replace wbc	5 m WBC w sagging down str edge
React Map 10, 11	TW 4	No recommendations	0.65 DBH Hw on rd, too slow to measure meters in field, get in office
React Map 10, 11	TW 3	End brushing & cleaning	5m g ch +-5% mtp, already surveyed, bridge out
React Map 10, 11	TW 2	Install cmp	2m g ch flowing subsurface below rd, no visible structure, stays subsurface below rd
React Map 11	RN 8	Add CMP	Natural drainage, water pooled on road
React Map 11	RN 9	No recommendations	Existing woodbox culvert functioning
React Map 11	RN 10	Add CMP	
React Map 11	RN 11	No recommendations	Existing 600 CMP
React Map 11	RN 12	Start LPB, end haul	Slumping and tension cracks 1m back
React Map 11	RN 13	End LPB, end haul	
React Map 11	RN 14	No recommendations	Existing 600 CMP
React Map 11	RN 15	No recommendations	Existing woodbox culvert, functioning
React Map 11	RN 16	No recommendations	Existing 800 CMP, stream flowing
React Map 11	RN 17	No recommendations	Existing stream crossing
React Map 11	RN 19	Add CMP	End of active road, road grassed in but still useable
React Map 11	RN 20	No recommendations	Existing 1000 CMP, functioning
React Map 11, 12	RN 21	Add CMP	Road degrades, not easily accessible by vehicle
React Map 12	RN 22	Add CMP	Water flowing along ditchline
React Map 12	RN 23	Add CMP	Cross drain
React Map 12	RN 24	Add CMP	
React Map 12	RN 25	Add CMP	Cross drain
React Map 12	RN 26	Add CMP	Cross drain
React Map 12	RN 27	Add CMP	Cross drain
React Map 12	RN 28	No recommendations	Existing 1000 CPP, functioning well
React Map 12	RN 29	Add CMP	
React Map 12	RN 30	Add CMP	Check for existing CMP once cleared
React Map 12	RN 31	Add CMP	
React Map 12	RN 32	Add CMP	
React Map 12	RN 33	Add CMP	Cross drain

Appendix D: Road Reactivation Recommendations for Stewardson Mainline

Road/Map #	Station	Recommendation	Comments
React Map 12	RN 34	Add CMP	
React Map 12	RN 35	Add CMP	Edge of slide
React Map 12	RN 36	Add CMP	Slide debris, large woody debris across road reconstruct and clear debris. Stream crossing at RN36. RN36 photo looking upslope towards head. RN (1) photo looking downslope toward toe
React Map 12	RN 37	Add CMP	Edge of slide, clean woody debris
React Map 12	RN 38	No recommendations	Existing CMP , stream crossing
React Map 12	RN 39	Clean inlet and reinstall CMP	Small slide deposition on road
React Map 12	RN 40	Add CMP	Water flowing across the road
React Map 12	RN 41	No recommendations	Road settling, rework/rebuild
React Map 12	RN 42	No recommendations	Existing 1000 CMP, functioning well, stream crossing
React Map 12	RN 43	Add CMP	Stream crossing
React Map 12	RN 44	No recommendations	End of stream divergence, stream heads downslope, end of slide edge
React Map 12	RN 45	No recommendations	Armour and realign channel to stay in main channel. Stream diverges
React Map 12	RN 47	Rebuild	Bridge 1, wiped out by debris slide, 5m span. P.Eng bridge design
React Map 12	RN 48	No recommendations	Slide edge
React Map 12	RN 49	P.Eng. inspection required	Existing WBC/log bridge. 3 trees stacked for 6m along on either side. Stream down below
React Map 12	RN 50	No recommendations	Existing CMP
React Map 12	RN 51	P.Eng. inspection required	Log Bridge over stream
React Map 12, 13	RN 52	No recommendations	Existing stream crossing
React Map 12, 13	RN 53	No recommendations	Existing 600 CMP, stream crossing
React Map 12, 13	RN 54	No recommendations	Existing 800 CMP, stream flowing
React Map 13	RN 55	No recommendations	Existing CMP
React Map 13	RN 56	No recommendations	Existing woodbox culvert functioning
React Map 13	RN 57	No recommendations	Guard logs end coming out of crossing
React Map 13	RN 58	No recommendations	P.Eng bridge design, buried log bridge due to slide debris
React Map 13	RN 59	No recommendations	Road blocked, end of passable road due to slide
React Map 13	RN 60	No recommendations	Existing 600 CMP
React Map 13	RN 61	No recommendations	Existing 1000 CMP, functioning well, stream crossing
React Map 13	RN 62	Add CMP	Stream crossing
React Map 13	RN 63	Excavate and reconstruct to repair hole in road	Existing 800 CMP, stream flowing, hole in road near crossing
React Map 13	RN 64	No recommendations	Existing 600 CMP

Appendix D: Road Reactivation Recommendations for Stewardson Mainline

Road/Map #	Station	Recommendation	Comments
React Map 13	RN 65	No recommendations	Small hole in road, rework road surface
React Map 13	RN 66	No recommendations	Existing 800 CPP, stream flowing
React Map 13	RN 67	No recommendations	Existing 600 CMP
React Map 13	RN 68	No recommendations	Existing 1000 CPP, functioning
React Map 13	RN 69	No recommendations	Existing 600 CMP
React Map 13	RN 70	No recommendations	Existing woodbox culvert functioning
React Map 13	RN 71	No recommendations	Existing 1000 CPP, functioning well
React Map 13	RN 72	Clean ditchline	Old slide debris
React Map 13	RN 73	No recommendations	Existing 600 CMP
React Map 13, 14	RN 74	No recommendations	Existing woodbox culvert functioning over stream, 4m long
React Map 13, 14	RN 75	No recommendations	Existing 600 CMP
React Map 13, 14	RN 76	Clean inlet	Existing woodbox culvert functioning
React Map 13, 14	RN 119	No recommendations	Existing 600 CMP
React Map 13, 14	RN 120	Clean inlet	Existing 600 CMP
React Map 13, 14	RN 121	Replace CMP and clean inlet	Damaged CMP
React Map 13, 14	RN 122	No recommendations	Existing 600 CMP
React Map 13, 14	RN 123	No recommendations	Existing 600 CMP
React Map 13, 14	RN 124	P.Eng. inspection required	Functioning 5m WBC over 7m wide road with collapsed hole, S5 stream crossing
React Map 13, 14	RN 125	No recommendations	Existing 600 CMP
React Map 14	RN 126	No recommendations	Existing 600 CMP, Intake damaged, still functioning , stream crossing
React Map 14	RN 127	No recommendations	Existing 600 CMP
React Map 14	RN 128	No recommendations	Existing 600 CMP
React Map 14	RN 129	No recommendations	Existing 1000 CMP, functioning
React Map 14	RN 130	No recommendations	Existing 800 CMP
React Map 14	RN 131	No recommendations	Existing 1000 CMP
React Map 14	RN 132	No recommendations	Existing 600 CMP, damaged intake
React Map 14	RN 133	Start clean ditchline, P.Eng. inspection required	Log bridge/WBC 5-6m long, soft sediments on the downstream shoulder settling,
React Map 14	RN 134	No recommendations	Existing 800 CMP
React Map 14	RN 135	End clean ditchline	Existing CMP
React Map 14	RN 136	No recommendations	Existing 600 CMP
React Map 14	RN 137	No recommendations, P.Eng. inspection required	Log bridge, 8-10m long, stream crossing
React Map 14	RN 138	No recommendations	Existing 800 CMP
React Map 14	RN 139	No recommendations	Existing 800 CMP, functioning, NCD stream crossing
React Map 14	RN 140	No recommendations	Existing 600 CMP, functioning

Appendix D: Road Reactivation Recommendations for Stewardson Mainline

Road/Map #	Station	Recommendation	Comments
React Map 14	RN 141	No recommendations	Existing 1000 CPP, functioning
React Map 14	RN 142	Start clean ditchline	Existing 600 CMP, functioning
React Map 14	RN 143	End clean ditchline	
React Map 14	RN 144	No recommendations	Existing CMP, functioning
React Map 14	RN 145	No recommendations	Existing CMP, functioning
React Map 14	RN 146	No recommendations	Existing 1000 CMP, functioning well, stream crossing
React Map 14	RN 147	No recommendations	Existing 600 CMP , stream crossing
React Map 14, 15	RN 148	No recommendations	Existing 1000 CMP, functioning well, stream crossing
React Map 14, 15	RN 149	No recommendations	Existing 600 CMP, NCD crossing, down trees across road
React Map 14, 15	RN 150	No recommendations	Existing 600 CMP, functioning
React Map 15	RN 151	No recommendations	Existing 1000 CMP, functioning
React Map 15	RN 152	No recommendations	Existing 600 CMP, functioning
React Map 15	RN 153	No recommendations	Existing 1000 CMP, functioning
React Map 15	RN 154	P.Eng. inspection required	Log bridge, 14m long, ravelling soft material on sides
React Map 15	RN 155	No recommendations	Existing 600 CMP, functioning
React Map 15	RN 156	No recommendations	Existing 400 rusted CMP, functioning
React Map 15	RN 157	No recommendations	Existing cross drain
React Map 15	RN 158	No recommendations	Existing 600 CMP , stream crossing
React Map 15	RN 159	No recommendations	Existing 1000 CMP, functioning
React Map 15	RN 160	No recommendations	Existing 600 CMP, functioning
React Map 15	JE 272	Clean inlet	Existing cmp inlet is infilled
React Map 15	JE 271	Clean inlet	Existing CMP
React Map 15	JE 270	Clean inlet	Existing CMP
React Map 15	JE 269	Clean inlet	Existing CMP
React Map 15	JE 268	Clean inlet and infill hole on upstream side of cmp	Existing CMP
React Map 15	JE 267	Clean inlet	Existing cmp inlet completely inilled
React Map 15	JE 266	Clean inlet	Existing CMP
React Map 15	JE 265	Clean inlet	Existing CMP
React Map 15, 16	JE 264	Add new guard log	Existing cmp upstream guard log has settled vehicles could get pulled down road edge
React Map 15, 16	JE 263	Clean inlet	Existing CMP
React Map 16	JE 262	Clean inlet	Existing CMP
React Map 16	JE 261	Clean inlet	Existing CMP
React Map 16	JE 260	Clean inlet	Existing CMP
React Map 16	JE 259	Clean inlet	Existing plastic pipe
React Map 16	JE 258	Clean inlet	Existing plastic pipe
React Map 16	JE 257	Start LPB	Cutslope is ravelling here.
React Map 16	JE 256	End LPB	More mat pushed over steep fills. Old slide here
React Map 16	JE 255	Start LPB	

Appendix D: Road Reactivation Recommendations for Stewardson Mainline

Road/Map #	Station	Recommendation	Comments
React Map 16	JE 254	Clean ditch	Cutslope failure has infilled ditch water is flowing down road
React Map 16	JE 253	End LPB	Material pushed over steep fills again
React Map 16	JE 252	Clean inlet	Existing CMP
React Map 16	JE 251	Start LPB	
React Map 16	JE 250	End LPB	Material pushed over steep again. Remove and end haul
React Map 16	JE 249	Start LPB	Tc 1-2 m in from road edge along interval
React Map 16	JE 248	End LPB of material pushed over fill slope	Debris has been pushed down steep fill slope and is at risk of sliding into fish
React Map 16	JE 247	Start LPB. Move road into slope if required. Install guard log	
React Map 16	JE 246	End LPB	7m wide fill slope failure. Debris has been pushed to the outside road edge -80% cut is 3 m high till with dr up to 30cm dbh
React Map 16	JE 245	Replace existing cmp	Broken and infilled cmp. Start of 6-7 m high till cutslope ravel l filling ditch
React Map 16	JE 244	Clean inlet	2*800 an avulsion upstream is flowing into ditch and then pipes wedge of sediment ready to plug pipes.
React Map 16	JE 243	P.Eng. inspection required	Existing wooden bridge no guard log on downstream side
React Map 16	JE 242	No recommendations	Old fill slope failure has been repaired
React Map 16	JE 241	Replace existing cmp	800 is ripped apart at inlet 1.5 into road
React Map 16	JE 240	Clean inlet	Existing CMP
React Map 16	JE 239	Clean inlet	Existing CMP
React Map 16	JE 238	Clean inlet	Existing CMP
React Map 16	JE 237	Clean inlet	Existing CMP
React Map 16	JE 236	Clean inlet	Existing CMP
React Map 16	JE 235	Clean inlet	Existing CMP
React Map 16	JE 234	P.Eng. inspection required	Existing wooden bridge 13 m
React Map 16	JE 233	Clean inlet	Existing CMP
React Map 16	JE 232	Clean inlet	Existing CMP
React Map 16, 17	JE 231	Clean inlet	Existing CMP
React Map 17	JE 230	Clean inlet	Existing plastic pipe
React Map 17	JE 229	Clean inlet	Existing plastic pipe
React Map 17	JE 228	Add more fill and guard log on high side	Sharp drop to ditch
React Map 17	JE 227	Clean inlet	Existing CMP
React Map 17	JE 226	P.Eng. inspection required	6-7 m wooden bridge

Appendix D: Road Reactivation Recommendations for Stewardson Mainline

Road/Map #	Station	Recommendation	Comments
React Map 17	JE 225	P.Eng. inspection required	1*5 wbc
React Map 17	JE 224	Add cmp	Only if long term road.
React Map 17	JE 223	Clean inlet	Existing CMP
React Map 17	JE 222	Clean inlet	Existing CMP
React Map 17	JE 221	Clean inlet	Existing CMP
React Map 17	JE 220	Start LPB	Material from ditch has been pushed over steep fills
React Map 17	JE 219	End LPB	Endhaul to suitable spot
React Map 17	JE 218	Clean inlet	Existing CMP
React Map 17	JE 217	Clean inlet	Existing cmp
React Map 17	JE 216	Clean inlet	Existing plastic pipe
React Map 17	JE 215	Clean inlet	Existing CMP
React Map 17	JE 214	Clean inlet	Existing CMP
React Map 17	JE 213	Clean inlet	Existing cmp plugged water only trickling through
React Map 17	JE 212	Clean inlet	Existing CMP
React Map 17	JE 211	Clean inlet	Existing plastic pipe
React Map 17	JE 210	Clean inlet	Existing CMP
React Map 17	JE 209	Clean inlet	Existing CMP
React Map 17	JE 208	Clean inlet	Existing cmp in old wbc
React Map 17	JE 207	Clean inlet	Existing CMP
React Map 17	JE 206	Clean inlet and outlet	Existing CMP
React Map 17	JE 205	Clean inlet	Standing water at inlet. Looks plugged
React Map 17	JE 204	Clean ditch and inlet	Inlet completely infilled
React Map 17	JE 203	Add fill	0.3 m settled area with coarse rock
React Map 17	JE 202	P.Eng. inspection required	Escalante bridge guard rails are all busted

Appendix E: Road Reactivation Recommendations for 9501-2 Satchie Mainline

Road/Map #	Station	Recommendation	Comments
9501-2 Satchie Mainline			
React Map 7	**JE 119**	No recommendations	Depression on high side of road water ponding. No cvt found large fill water drains down ditch
React Map 7	**JE 120**	Clean inlet	
React Map 7	**JE 121**	Clean inlet, start clean ditch	Existing CMP water on surface of road from upchain
React Map 7	**JE 122**	End clean ditch	Source of water down road
React Map 7	**JE 123**	Clean inlet	
React Map 7	**JE 124**	Clean inlet	
React Map 7, 8	**JE 127**	Clean inlet	
React Map 7, 8	**JE 125**	Existing CMP	Drainage from old spur runs onto ml benches below. Connect large xd to this CMP. Alternatively move CMP to camp side of spur
React Map 7, 8	**JE 128**	Clean inlet	
React Map 8	**JE 129**	No recommendations	Landing
React Map 8	**JE 130**	Repack, excavate if required	Hole in road at CMP
React Map 8	**JE 131**	Clean inlet	
React Map 8	**JE 132**	Requires P.Eng inspection	Existing all steel portable 9m
React Map 8	**JE 133**	P.Eng to include in bridge assessment	Avulsion channel from upstream feeds into ditch and then rejoins main stem. Overflows road at high flows maybe install large CMP here? Or larger bridge?
React Map 8	**JE 134**	Clean inlet	
React Map 8	**JE 135**	Install CMP	Lots of water in ditch several small draws feed this area
React Map 8	**JE 136**	Clean inlet	
React Map 8	**JE 137**	Start LPB	Settling shifting to tc. 5 m of road will remain cut is 3 m bouldery tills
React Map 8	**JE 138**	End LPB	Seepage part way along ensure ditch is clean and sufficiently deep
React Map 8	**JE 139**	Clean inlet	
React Map 8	**JE 140**	Start LPB	Settling shifting to tc. 5 m of road will remain cut is 4-5 m bouldery tills
React Map 8	**JE 141**	End LPB	No comments
React Map 8	**JE 142**	Start no additional spoil on fill slope, Clean inlet	
React Map 8	**TW 63**	End no additional spoil on fill slope, start LPB	Road prism in take, fill is steep
React Map 8	**TW 64**	No recommendations	Continue LPB of fills & 2m of outer rd surface, Move rd 1m into cut, fills settling, discontinuous cracks on shoulder extending p to 2 m into outer rd surface

Appendix E: Road Reactivation Recommendations for 9501-2 Satchie Mainline

Road/Map #	Station	Recommendation	Comments
React Map 8	**TW 66**	Add 600 CMP, start clean ditch	Water piping out of dense till
React Map 8	**TW 65**	Install CMP, continue LPB, clean cut slump & ditch line, EH spoil	5m w cut slide block CMP, flow across rd, tension cracks on fill & 2 m from outer shoulder, main flow here, water piping out of dense till, needs , multi CMP
React Map 8	**TW 67**	End LPB of fill, end clean ditch, start brushing & ditching	LPB including shoulder 0.5-1.5m w, eh spoil, may have to move rd into ditch, Fills settling & 0.5-1m shoulder
React Map 8	**TW 68**	Add 600 CMP, armor outlet	3-4 m w Ncd draw w flows, no visible CMP, no obvious draw below steep fills on 55% benched 30m below, steep fills need to be armoured
React Map 8	**TW 69**	No recommendations	Existing functioning 800CMP, no str
React Map 8	**TW 70**	No recommendations	Existing 600 cm, intake fine, outlet is armoured, slopes decrease
React Map 8	**TW 71**	Add 600 CMP	Seepage Ncd
React Map 8	**TW 72**	Install 600 CMP, clean ditch	3 m by 1m draw w 0.75m g ch, no visible CMP but ditch line infilled, is down chain surface flow, no slide concern
React Map 8	**TW 73**	Clean ditch	Double 600 CMPs, ditch infilled & partially blocking intakes
React Map 8	**TW 74**	Add 600 CMP	Wet draw no CMP
React Map 8	**TW 75**	No recommendations	Existing 600 CMP
React Map 8	**TW 76**	End brushing & ditching, start excavate outer shoulder & fills, remove fines & wood, repack	No fill or cut instability, here @76 start settling fill
React Map 8	**TW 77**	No recommendations	Continue excavate and repack outer 2m of road, Settling g now 2 m of outer rd surface, including shoulder
React Map 8	**TW 79**	No recommendations	Continue excavate and repack outer 2m of road, Fill & outer 2 m rd surface settled , existing CMP functioning , infilled ditch causing settling
React Map 8	**TW 80**	No recommendations	Continue excavate and repack outer 2m of road
React Map 8	**TW 81**	Start LPB, end excavate and repack outer 2m of road	Settling along shoulder extending cracks 0.5-2 m into outer rd surface
React Map 8	**JE 186**	End LPB	Tension cracks 0.5-2 m from road edge. 5 m of road will remain
React Map 8	**JE 185**	Clean inlet	
React Map 8	**JE 184**	Clean inlet	
React Map 8	**JE 183**	Clean inlet	
React Map 8	**JE 182**	Clean inlet	
React Map 8	**JE 181**	Clean inlet	

Appendix E: Road Reactivation Recommendations for 9501-2 Satchie Mainline

Road/Map #	Station	Recommendation	Comments
React Map 8	**JE 180**	No recommendations	Existing wooden bridge. Has been assessed by OEL
React Map 9	**JE 179**	Clean inlet	
React Map 9	**JE 178**	Clean inlet	
React Map 9	**JE 177**	Clean inlet	
React Map 9	**JE 176**	Clean inlet	
React Map 9	**JE 175**	Clean inlet	
React Map 9	**JE 174**	Clean inlet	
React Map 9	**JE 173**	No recommendations	Existing wooden bridge. Has been assessed by OEL
React Map 9	**JE 172**	No recommendations	Existing reverse WB into ditch berm on outside road edge
React Map 9	**JE 171**	Clean ditch	Clean inlet
React Map 9	**JE 170**	No recommendations	Erosion of road surface will be fixed once ditches are clean
React Map 9	**JE 169**	No recommendations	Existing WBC has been assessed by OEL
React Map 9	**JE 168**	Clean inlet	
React Map 9	**JE 167**	Repack road at inlet and clean inlet	Drainage down road flows into ditch and through CMP. Has eroded the road edge at inlet
React Map 9	**JE 166**	Add CMP	Water is eroding road below here with infilled ditch
React Map 9	**JE 165**	Clean inlet	
React Map 9	**JE 164**	Clean inlet	
React Map 9	**JE 163**	Clean ditch	Water down road again. Will be fixed with clean ditch
React Map 9	**JE 162**	Clean inlet	
React Map 9	**JE 161**	Clean inlet	
React Map 9	**JE 160**	Add CMP	Could be a pipe here already?
React Map 9	**JE 159**	Clean inlet	outlet CMP may need replacement, water leaves road and flows into draw on low side
React Map 9	**JE 158**	Clean ditch resurface road	Ditch is infilled with water down road cuts are dense block rubble Boulder sand silt till >4 m this will require maintenance
React Map 9	**JE 157**	Add CMP	Existing WB
React Map 9	**JE 156**	Clean inlet	
React Map 9	**JE 155**	Start clean road and ditch	Just in ditch for most of interval
React Map 9	**JE 154**	Clean inlet if existing	Possible pipe little draw
React Map 9	**JE 153**	End clean road continue clean ditch	Boulders and cobbles have infill ditch from cutslope one 0.5-1 m Boulder on road
React Map 9	**JE 152**	Retain WB	Existing WB
React Map 9	**JE 151**	Clean inlet	
React Map 9	**JE 150**	No recommendations	Existing WBC has been inspected
React Map 9	**JE 149**	Clean ditch	Few 0.5 m boulders in ditch from cutslope will get remove when ditches are cleaned
React Map 9	**JE 148**	No recommendations	French drain? Seems to be working ok
React Map 9	**JE 147**	Clean inlet	
React Map 9	**JE 146**	Clean inlet if existing	Possible buried pipe

Appendix E: Road Reactivation Recommendations for 9501-2 Satchie Mainline

Road/Map #	Station	Recommendation	Comments
React Map 9	**JE 145**	Clean inlet	
React Map 9	**JE 144**	Pull wooden bridge	If not opening beyond pull wooden bridge 8 m
React Map 9	**JE 143**	No recommendations	Outside of scope but tension cracks. Would deposit into upper bowl

ONSITE
Engineering Ltd.

APPENDIX F

Rockfall Hazard Assessment
Zuciarte Main – 5.0 km
Zuciarte Channel, B.C.

Prepared for:
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MaMook Natural Resources

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July 29, 2024
File: 988-5-4

EGBC PERMIT TO PRACTICE: 1002678

Table of Contents

Attached

Photo Plates
Work Safe Procedures

ONSITE Engineering Ltd.

1.0 Introduction

At the request of MaMook Natural Resources (MaMook), Onsite Engineering Ltd. (OEL) was retained to carry out a rockfall assessment of and an existing cut slope at 5.0 km on Zuciarte main, near Zuciarte Channel, 3.2 km southwest of Mooyah Bay, Vancouver Island, B.C., (the "Subject Site"). The field work was completed on July 17th, 2024, by Jon Kroon, P.Geo., and Liam Giblin, GIT, of OEL.

Access along Zuciarte Mainline is blocked at 5.0 km due to rockfall debris from a cut slope failure. The date of the failure is unknown. The purpose of this assessment is to determine if access can be gained for reactivation and deactivation works planned in the Escalante and Stewardson Camp areas and to provide safe work procedures for works around the failure site. A professional assessment has been completed to mitigate the remaining rockfall hazard. Planned operations include the excavation of the existing rock debris and access for pickups, a rock truck, a low bed, and an excavator for road works beyond; no hauling is currently planned along Zuciarte Main.

This report discusses the findings of the field assessment and the corresponding slope stability review conducted. Recommendations to mitigate risk to workers from the identified potential slope instability are included below. The rockfall location and associated hazard area is included on road deactivation/reactivation maps for the Strewardson Camp area (sent as a separate document).

A previous assessment of Zuciarte Mainline was completed for International Forest Products in 2014 by the author that assessed rockfall hazards at this location. This specific cut face was identified as having the potential to detach and deposit on the mainline, blocking access. The estimated volume of unstable rock was 85 m^3. Additional sites were also identified as having potential for rock fall of varying volumes, including 0.0 km, 2.8 km, 8.1 km. 8.7 km, 9.2 km, 10.0 km, 11.2 km, 12.2 km.

This assessment has been prepared in accordance with generally accepted geotechnical practices in British Columbia.

General observations are made on the existing slope gradients, fracturing, weathering and general stability of the rock outcrop. Variations along the cut face (even over short distances) are inherent and are a function of natural processes. OEL does not represent or warrant that the conditions listed in the report are exact and that variations along the cut face do exist. An estimate of the likelihood of a specific hazardous rockfall or landslide reaching the subject property is provided.

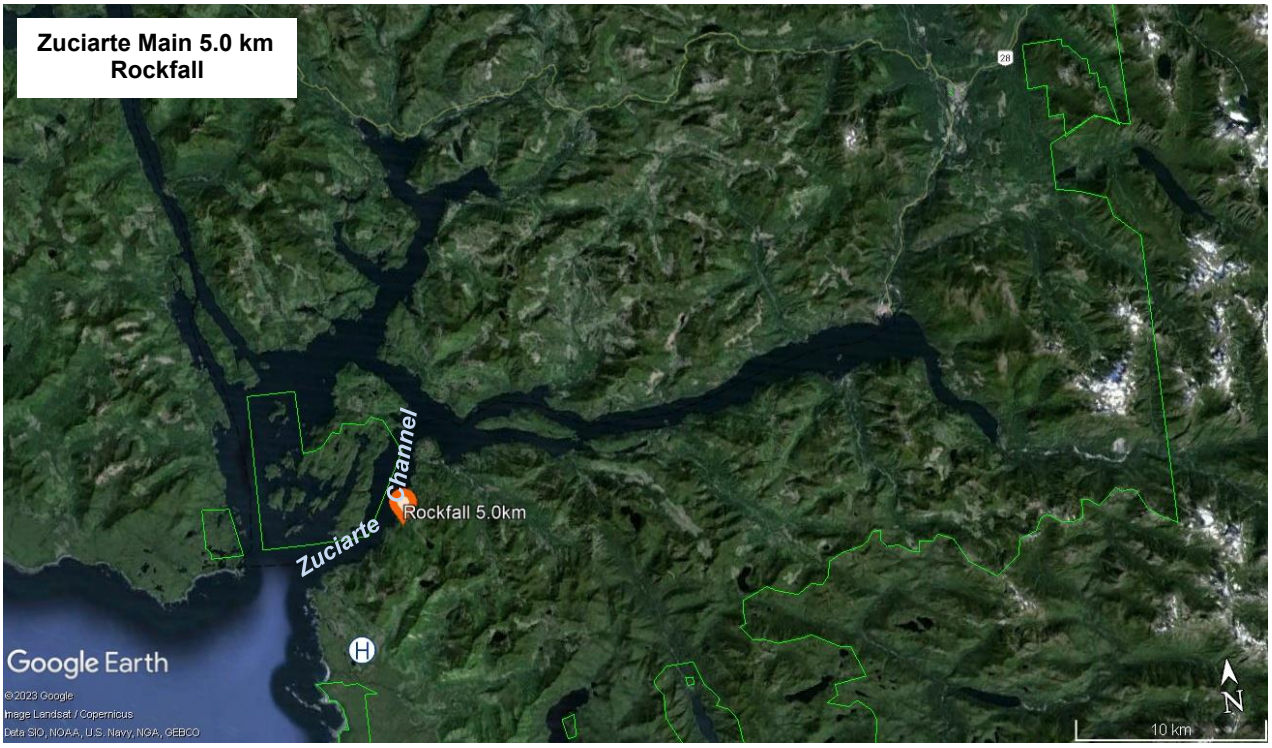


Figure 1: Location Map

2.0 Office and Field Review

Prior to and following the field assessment the following materials were reviewed:

- BC Digital Geology Mapping – compilations of the bedrock geology of BC obtained from https://www.geosciencebc.com/.
- Aztec Geoscience report titled "Cutslope Hazards – Zuchiarte and Escalante Mainlines and Branch Z1" dated 15 October, 2014

The field review consisted of a walk through using a compass, clinometer, range finder, and an iPad with digital applications including Avenza Maps Pro. Measurements contained in this report reflect the precision and accuracy of these tools.

3.0 Geotechnical Site Assessment

The Subject Site is characterized by a road cut slope excavation into bedrock overlain by a thin (<1 m) layer of till soil. The bedrock cut reaches ~12 m high and is composed of a moderately fractured metamorphic rock mass that is thought to belong to the Paleozoic to Jurassic, Westcoast Crystaline Complex. The bedrock has widely spaced fractures that form large potentially unstable blocks. Multiple fractures are visible, but no obvious dominant joint set is apparent, and fractures are largely discontinuous. One fracture appears to be dipping downslope toward the road and a second prevalent fracture appears to be roughly vertical.

The road was approximately 5 m wide at the failure site with road grades generally level. A small ditch exists but it is insufficient to capture rockfall. Slopes below the road are steep reaching -100% and the road appears to be constructed with a full bench cut. No stream or seepage was observed at the site.

The recent rockfall event at the Subject Site initiated from the upper cut face and mostly deposited on the road surface. One block was observed on slope below the road. The estimated volume of rock is 30 m^3 with the largest block estimated to be 10 m^3 and a 5 m^3 block below the road. An estimated 85 m^3 of rock was considered potentially loose during the 2014 assessment leaving an approximately 55 m^3 potentially loose rock mass remaining on the cut slope.

4.0 Discussion and Recommendations

Under the current state, the perched and potentially unstable remaining rock mass has a high likelihood of failure within the expected lifetime of the road. Should the rock mass fail, an estimated volume range of 35 to 70 m^3 of rock would be deposited on the road blocking access. Minor material may over top the road but is not expected to reach the ocean. Approximately 20 m up-chain additional material was observed that has the potential to detach and deposit on the road surface.

Ideally the full hazardous rock mass should be removed, which would eliminate the hazard entirely. Removing this volume of rock may be uneconomical and technically challenging; therefore, leaving the mass in place is considered as a second viable option, *as long no additional cutting or further disturbance to the cut slope is performed at the rock mass location*. Should any cutting of the toe of the rock face be carried out, the likelihood of failure and related hazard is considered **unacceptable**, and the Subject Site will need to be professionally reassessed by a senior engineer or geoscientist.

The following recommendations should be implemented to reduce the likelihood of hazardous rockfall impacting personnel working at the Subject Site:

1. Drill and blast large pieces of the rockfall debris located on the road and end haul material to a suitable spoil site.
2. Follow Safe Work Procedure for operations of removal of rock material.
3. If hazardous rock is not removed, install rockfall hazard/no stopping signage from 5.0 to 5.1 km

The above recommendations are provided based on the site conditions as of July 17, 2024. Any change in site conditions (either due to additional work, or due to natural processes) should trigger further review.

6.0 Closure

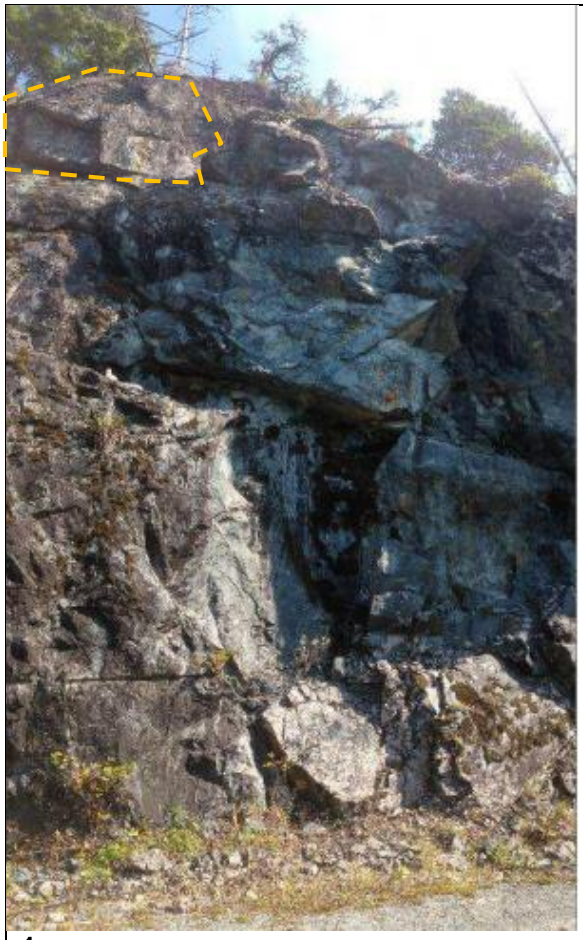
This assessment has been carried out in accordance with generally accepted geotechnical practices. Conclusions and recommendations presented herein are based on visual site inspections. Assessments of rockfall hazards are based on interpretation of surface features; actual ground conditions may vary from those inferred. Should the bedrock conditions encountered differ from those outlined in this report; OEL should be contacted so that the recommendations contained in this report can be reviewed.

Sincerely,
Onsite Engineering Ltd.

Jon Kroon, P.Geo.
Senior Geoscientist

Attached:

1. Photo Plates
2. Safe Work Procedures



1a

1b

Photo 1a:
Conditions of rock face in 2014 during the rock slope assessment by Aztec Geoscience showing block detachment in upper right-hand corner (orange outline). Taken October 15, 2014

Photo 1b:
Conditions of rockface during the 2024 assessment, showing potential additional rockfall (red outline). Taken July 17, 2024

	**Photo 2:** Deep soil filled fracture noted on 2014 site visit, showing possible widening through root growth. Taken July 17, 2024
	**Photo 3:** View looking down-chain. Taken July 17, 2024

	**Photo 3:** View looking up-chain. Taken July 17, 2024
	**Photo 4:** Potential additional rock fall site at 5.2 km.

A SAFE WORK PROCEDURE FOR
Zuciarte Main 5.0 km

The purpose of these instructions is to provide guidance on safe work procedures for the clearing of rock at the 5.0 km rockfall site on Zuciarte Main. These Safe Work Procedures are for the clearing of blocks from the site only.

SAFE WORK PROCEDURE

1.0 All workers on site must sign off on the prime contractor's worksite sheet that they have read and understood these instructions (i.e. during a tailboard meeting).

2.0 A copy of these procedures must be available on site for ALL workers at ALL times.

3.0 All workers must have high visibility clothing and hard hats.

4.0 No worker shall stand or pass between any equipment and the cutslope.

5.0 The times that workers are on or below the road outside of a machine must be limited to necessary work only. When work is required in the area, minimize time spent with your back to the slope. NO WORKERS ARE PERMITTED OUTSIDE MACHINES BELOW THE LOOSE COLLUVIAL SLOPES.

6.0 When working below the site, all workers and machinery must have a clear escape path. The escape path must be made clear to all workers in the work area.

7.0 Working at the toe of the slope is prohibited unless operating machinery.

8.0 Whenever a worker (or workers) are working outside of their machines, another worker not involved in the works, must act as a spotter for raveling/falling materials. It is expected that the only work outside machines will be to load explosives in the holes following drilling.

9.0 Special care shall be considered during heavy rainfall. Follow the reduce rainfall shutdown guidelines as outlined below. Shutdown for the site if drainage systems are overflowing or surface sediments are saturated. Restart work after 24 hours from the cessation of rainfall and inspect the slope for loose material prior to entering the area.

Reduce Rainfall Shutdown Guidelines	**Time Period**			
	At start or before end of shift (12-hr)	**24-hr**	**48-hr**	**72-hr**
Standard Shutdown Levels	50 mm	80 mm	120 mm	160 mm
Snow present Shutdown Levels	30 mm	50 mm	80 mm	110 mm

10.0 If any changed conditions are encountered or any rock movement is noted, all work must stop immediately and the QRP must be called to give further instruction.

11.0 A spotter is required while drilling for overall movement and upslope rockfall.