

SITE INSPECTION FORM

SITE NUMBER AND NAME: GP032 South Curve Realignment		HIGHWAY & KM: 40:34, 16.385	PREVIOUS INSPECTION DATE: May 25, 2020	INSPECTION DATE: June 13, 2022
LEGAL DESCRIPTION: SW 13-57-07-W6M	NAD 83 COORDINATES: UTM Northing Easting 11 5976757 374408		RISK ASSESSMENT: PF: 8 CF: 2 TOTAL: 16	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 1320 (west) & 1290 (east) (Reference No. 70000102, 2021)			CONTRACT MAINTENANCE AREA (CMA): 504	

SUMMARY OF SITE INSTRUMENTATION: There is no instrumentation at the GP032 site. LAST READING DATE: N/A	INSPECTED BY: Chris Gräpel (KCB) Courtney Mulhall (KCB) Ed Szmata (AT) Kristen Tappenden (AT) Max Shannon (AT) Dwayne Lowen (AT MCI)
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PRIMARY SITE ISSUE: Several areas of (geotechnical) distress/concern along channel upstream/south of Hwy 40:34 embankment, including a series of slope failures, rill and gully erosion, and areas of seepage (moist, no visible flow) and leakage (visible flow).
APPROXIMATE DIMENSIONS: Highway embankment approximately 40 m to 50 m high with an approximate 3H:1V slope. Channel upstream of culvert/toe of highway embankment is approximately 180 m long.
DATE OF ANY REMEDIAL ACTION: 2017/2018 – repair completed, including lining channel with riprap, constructing several riprap-lined finger and slope drains, and constructing a catch basin and buried smooth-walled-steel-pipe (SWSP) slope drain.

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress		X	None observed at time of 2022 inspection.		X
Slope Movement	X		Several slope failures on both west and east valley slopes as described below.	X	
Erosion	X		Rill erosion and gullies on slope of east valley slope as described below.	X	
Seepage	X		Seepage and leakage on valley slopes as described below.	X	
Culvert Distress	X		Erosion between catch basin and crest of east valley slope indicates catch basin has previously overflowed likely due to ice blocking culvert flow.	X	

COMMENTS
Highway re-aligned in 2003/2004. Current highway embankment is approximately 40 m high with a 3-m diameter, 350-m long bridge-sized culvert (BF76751) at its base. During construction of channel repairs, high groundwater was encountered in the valley slopes, and several finger drains and ditches were constructed along the channel/valley slopes.
South slope of highway embankment and culvert inlet appear to be in good condition. Slope well vegetated.
North slope of highway embankment and culvert outlet not inspected.
Slope drains along highway embankment abutments generally appear to be in good condition.

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Riprap-lined channel and 3.0-m diameter corrugated-steel-pipe (CSP) culvert inlet:

- These generally appear to be in good condition.
- Riprap at base of channel was grouted.

West valley slope:

- Three slope failures/slumps observed on slope above finger drains. Otherwise, finger drains appear to be in good condition.
- AT noted west slope was so wet during construction equipment could not track area. Surface conditions improved after finger drains were constructed.

East valley slope:

- Two slope failures, rill and gully erosion (including a well-formed “Y-shaped” gully at WP184), and seepage/leakage observed on slope. North slope failure at WP183 is within trees and difficult to assess. South slope failure at WP185 may consist of three separate slope failures, one of which extends to the slope crest and is within 5 m of the buried slope drain.
- Mid-slope bench (approximately 1 m to 2 m wide) has insufficient freeboard and requires grading.
- Slope is poorly vegetated in areas with rolled erosion control product exposed.

Riprap-lined catch basin and 1.2-m diameter smooth-walled-steel-pipe (SWSP) slope drain inlet:

- Slope drain installed at shallow depth and is possibly freezing. Rill and gully erosion on crest of slope adjacent to catch basin and down east valley slope indicates catch basin has overflowed likely due to ice blocking culvert flow.
- Trash rack over slope drain inlet.

Maintenance/Repair/Monitoring Recommendations:

- KCB requested by AT to prepare a proposal for a “sketch” design package for a highway maintenance contractor (HMC) repair. The repair will include:
 - Construction of a berm around the riprap-lined catch basin and culvert inlet at the crest of the east valley slope with swales if catch basin were to overflow again.
 - Armoring the “Y-shaped” gully on the east valley slope to the toe of the slope/creek to create a slope drain.
 - Drainage improvements along the mid-slope bench on the east valley slope, which may include installation of a half-section of corrugated-steel pipe (CSP) along the bench.
 - Regrading of the slope failures on the east valley slope.
 - Reseeding the east valley slope.
 - Removal of silt fence, which is falling down.

Estimated cost: \$100,000 to \$200,000.

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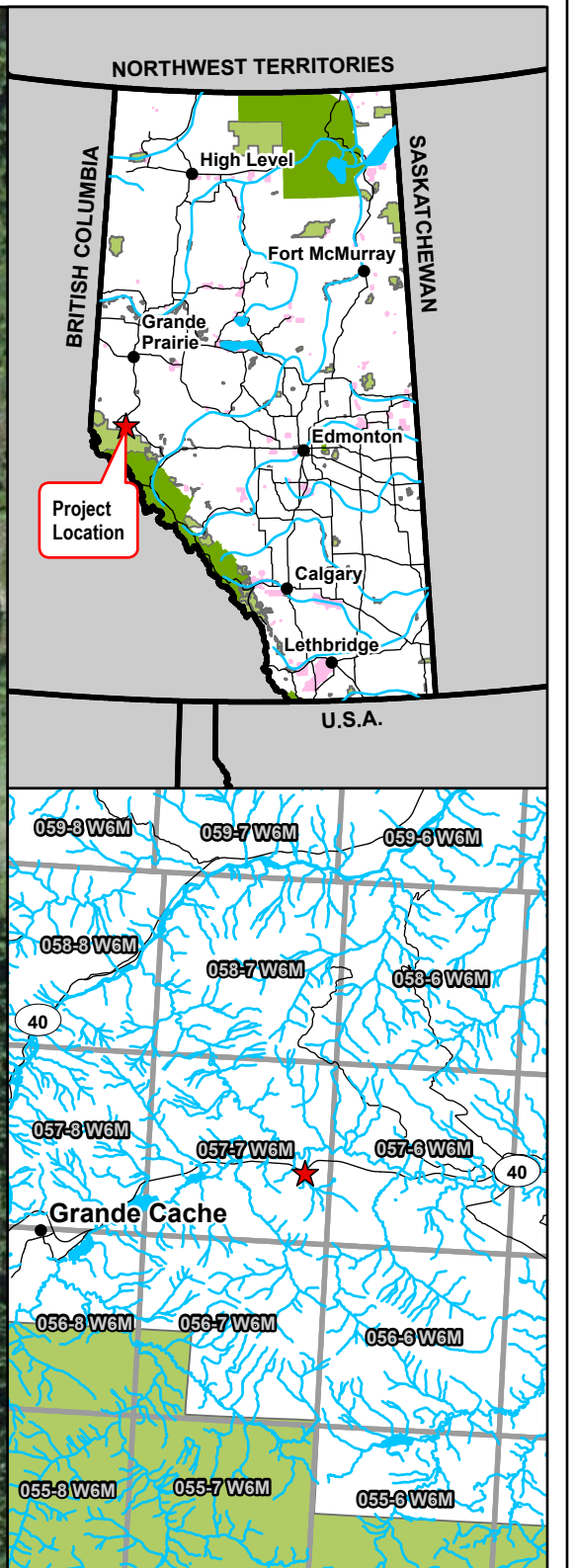
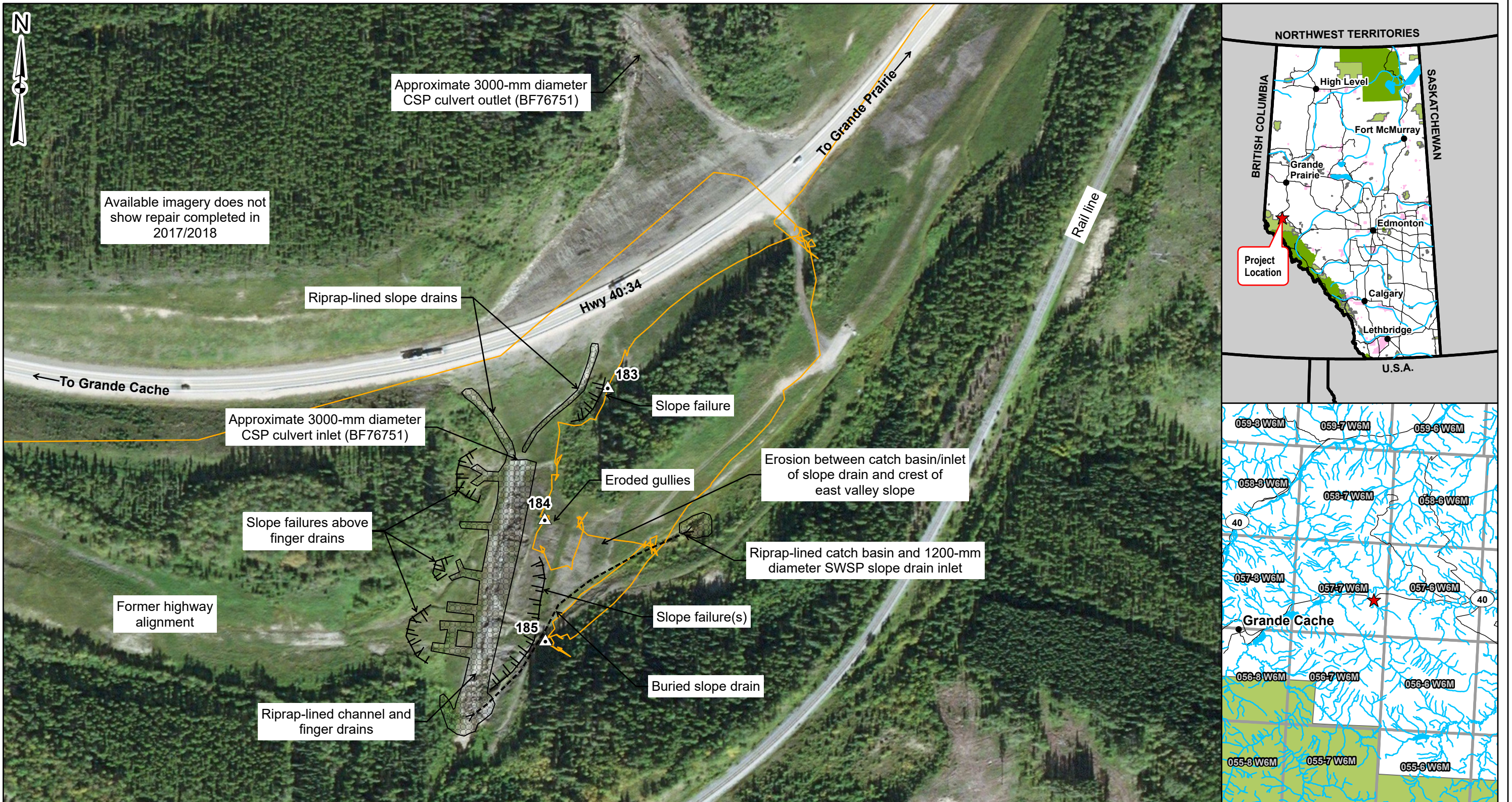
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Chris Gräpel, M.Eng., P.Eng.
Senior Civil Engineer, Associate



Legend

- GPS Waypoint (June 13, 2022)
- GPS Track (June 13, 2022)
- Scarp
- Slope Drain
- Channel
- Riprap



NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM ZONE 11N
 3. IMAGE SOURCE: 2022 MICROSOFT CORPORATION, 2022 MAXAR CNES, DISTRIBUTION AIRBUS DS
 4. SATELLITE IMAGERY PRE-DATES REPAIR WORK SHOWN IN PHOTOS.

CLIENT

PROJECT PEACE REGION (GRANDE PRAIRIE DISTRICT-SOUTH) GEOHAZARD RISK MANAGEMENT PROGRAM		
TITLE Site Plan GP032 - South Curve Realignment Hwy 40:34, km 16.385		
SCALE 1:2,500	PROJECT No. A05116A01	FIG No. 1

Inspection Photographs

Photo 1 Overview of channel upstream/south of Hwy 40:34. Note riprap-lined channel and finger drains. As well as location of cracking and slope movement along valley slopes (circled in white/indicated with dotted white lines) (Photos 2, 4 and 6), and. Photo taken June 13, 2022, facing southwest.

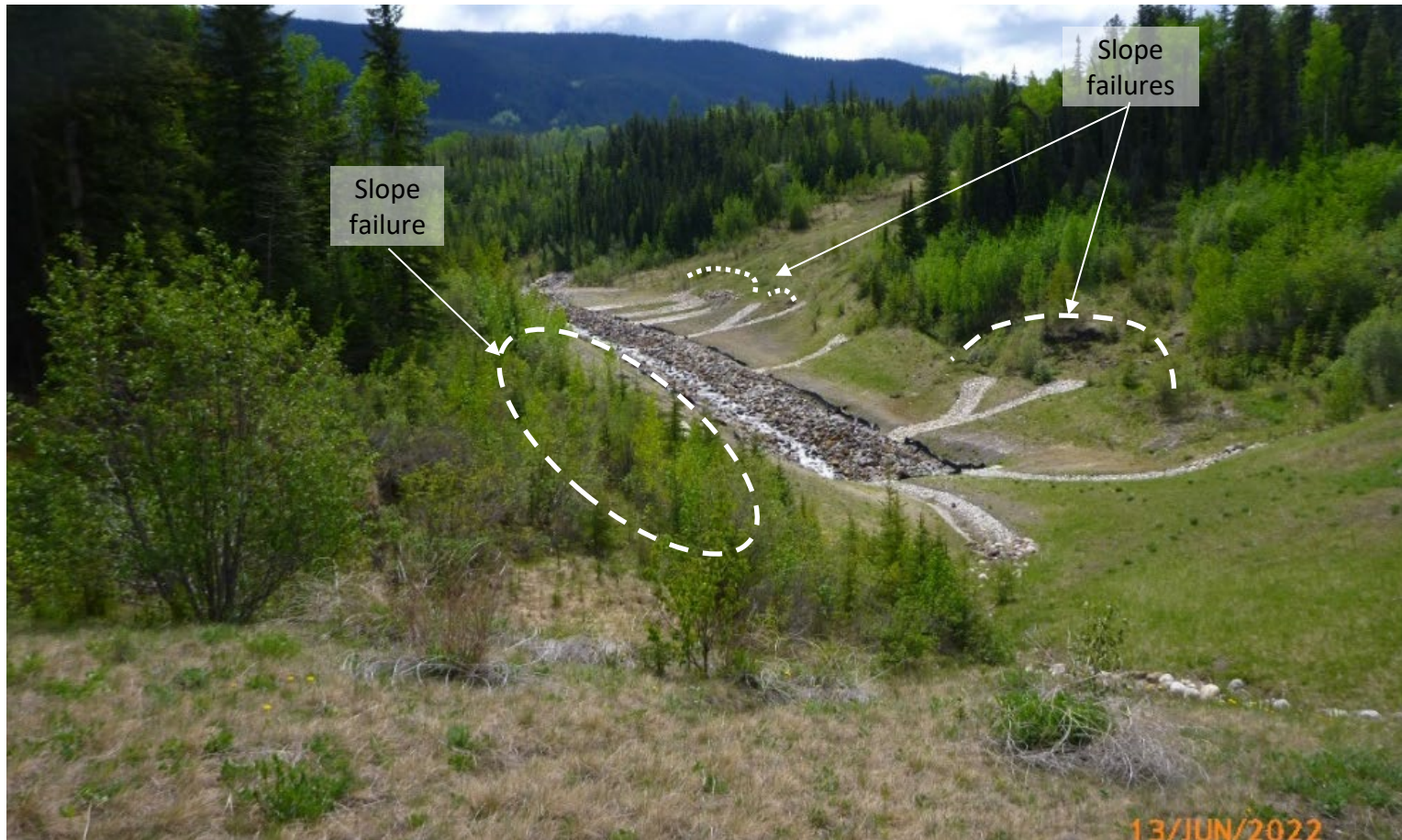


Photo 2 **Cracking along valley slope near southeast abutment of highway embankment.**
Photo taken June 13, 2022, facing south.



Photo 3 **Upstream/south slope of Hwy 40:34 embankment above culvert inlet. Photo taken**
June 13, 2022, facing west.



Photo 4 Upstream/south slope and toe of Hwy 40:34 embankment. Note culvert inlet (circled black) and slope failure above “Y-shaped” finger drain on west valley slope (indicated with dotted white line). Photo taken June 13, 2022, facing northwest.

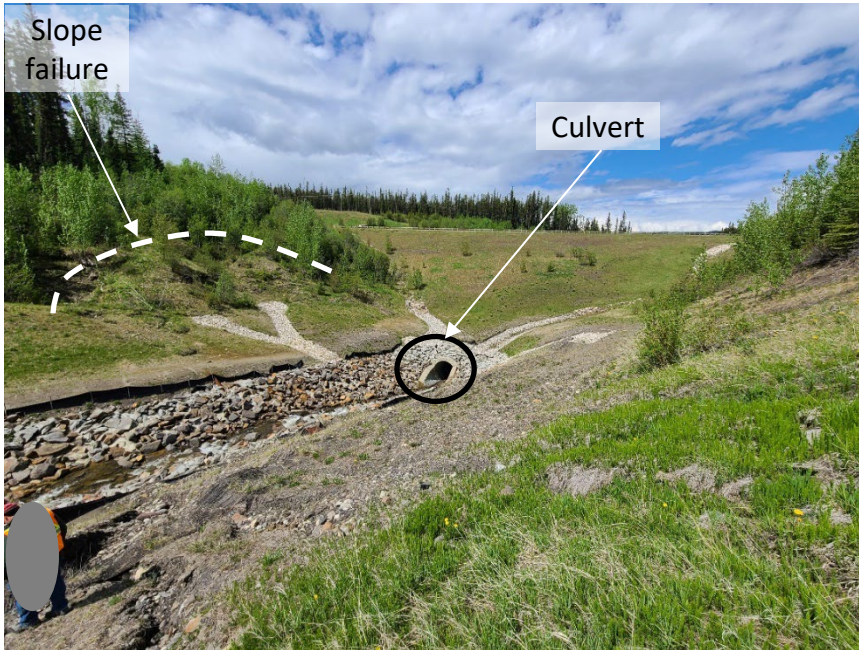


Photo 5 Inlet of 3000-mm diameter CSP culvert at upstream/south toe of Hwy 40:34 embankment. Photo taken June 13, 2022, facing west.



Photo 6 Slope failures/slumps above finger drains on west valley slope (indicated with dotted white lines). Photo taken June 13, 2022, facing west.

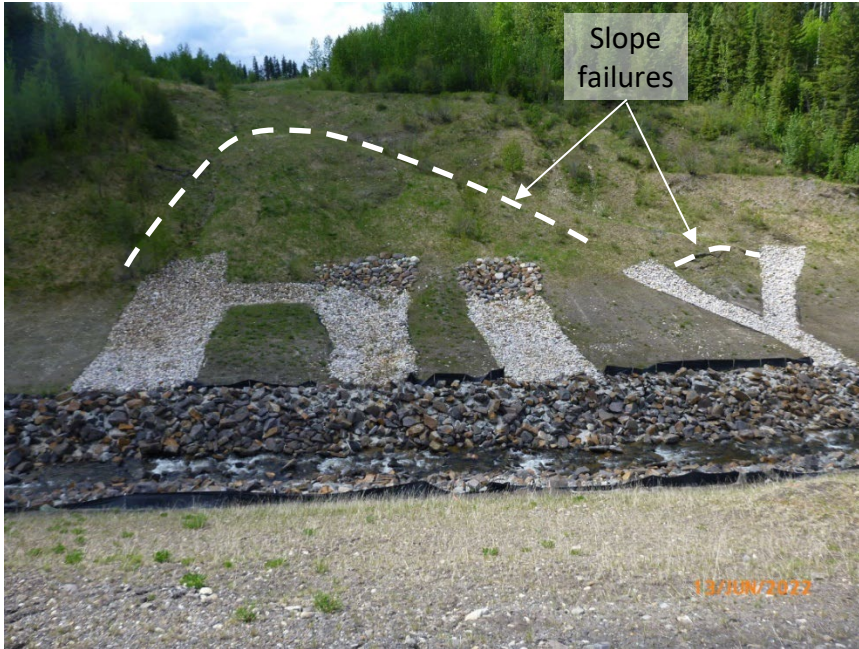


Photo 7 Upstream/south extent of riprap-lined channel. Note rill erosion on east valley slope. Photo taken June 13, 2022, facing southwest.



Photo 8 East valley slope. Note gully erosion and slope failures along slope. Photo taken June 13, 2022, facing south.



Photo 9 Erosion gullies on east valley slope at WP184. Photo taken June 13, 2022, facing west.



Photo 10 Slope failure and rill erosion on east valley slope between WP184 and WP185. Photo taken June 13, 2022, facing southeast.



Photo 11 Mid-slope bench on east valley slope. Photo taken June 13, 2022, facing northwest.



Photo 12 Crest of slope failure along mid-slope bench on east valley slope between WP184 and WP185. Slope failure is about 5 m from buried slope drain. Photo taken June 13, 2022, facing southwest.



Photo 13 Riprap-lined catch basin and buried slope drain inlet. Photo taken June 13, 2022, facing south.



Photo 14 Pond upstream/northeast of riprap-lined catch basin. Photo taken June 13, 2022, facing northeast.



Photo 15 Erosion between catch basin and crest of east valley slope indicates catch basin may have previously overflowed. Photo taken June 13, 2022, facing west.

