SOUTHERN REGION GRMP
SITE INSPECTION FORM

SITE NUMBER AND NAME: **S041 East Coulee Slide**	HIGHWAY & KM: 564:10, 32.353	PREVIOUS INSPECTION DATE: June 10, 2020	INSPECTION DATE: **June 24, 2021**
LEGAL DESCRIPTION: 04-21-27-18 W4M	NAD 83COORDINATES: UTM 12 Northing 5686022 Easting 396402	RISK ASSESSMENT: PF: 9 CF: 5 TOTAL: 45	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 130 (south), (Reference No. 113210)		CONTRACT MAINTENANCE AREA (CMA): 521	

SUMMARY OF SITE INSTRUMENTATION:	INSPECTED BY:
No functional instruments. LAST READING DATE: Unknown	Chris Gräpel (KCB) James Lyons (KCB) Roger Skirrow (AT) Tony Penney (AT)

PRIMARY SITE ISSUE: A natural slope failure on the west side (southbound lane) of Hwy 564 that was triggered by highway widening (i.e., cut and fill placement) in 1979.

APPROXIMATE DIMENSIONS: The slide is approximately 120 m wide at the crest and 250 m wide near the mid-slope. Below where the slope was previous repaired, the slope is approximately 50 m high sloped at 3H:1V.

DATE OF ANY REMEDIAL ACTION: 2008: 800 soils nails were launched, and a geosynthetic reinforced toe berm was constructed to support the highway; 2011: the highway was realigned to the south into the upslope ditch.

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Gravel appears to be added to road surface and periodically regraded.	X	
Slope Movement	X		Guardrail continuing to subside. Slide head scarp is outflanking the existing soil nail wall to the northeast.	X	
Erosion	X		Erosion caused by surface water flow (i.e., flow erosion)		X
Seepage		X	None observed		X
Culvert Distress		X			X

COMMENTS

The guardrail appears to have subsided further since the 2020 inspection as the slope below the crest of the highway continues to fail. The top of the guardrail is now below the crest of the road. Note: the severity of guardrail subsidence may be accentuated by additional gravel placement on roadway.

The slide appears to be a translational slide with some rotation that is sliding on a weak layer (depth of weak layer is unknown due to lack of instrumentation data, but a depth of between 6 m and 17 m below ground surface has been estimated based on visual observations).

The downslope crest of the slide tips back towards the highway. Tension cracks observed during 2017 inspection appear to have been filled. Since the 2017 inspection, the slide is starting to outflank the existing soil nail wall to the northeast.

A “Road Narrows – 35 km/hr” sign was installed in the westbound lane at the east end of the site.

Drainage at the site is poor. A shallow ditch exists on the south side of the highway but is periodically filled with gravel during grading. The old geocell in the ditch has also been damaged and buried during grading operations. Where the highway is subsided, surface water from the ditch flows across the highway onto the slide area. Slope movements are likely exacerbated by infiltration of this surface water flow into cracks at the crest of the slide. Erosion is occurring at the culvert outlet northeast of the soil nail reinforced slope.

Candidate repair options for this site are:

Short-Term

- Raising the elevation of the roadway to create a proper ditch on the south side of the highway (would require limited and carefully executed cutting into the existing backslope to create additional width for a ditch) and protect the ditch from being infilled.
- Raise subsided guardrail on north side of highway to prevent motorists from driving over the edge of the slope.

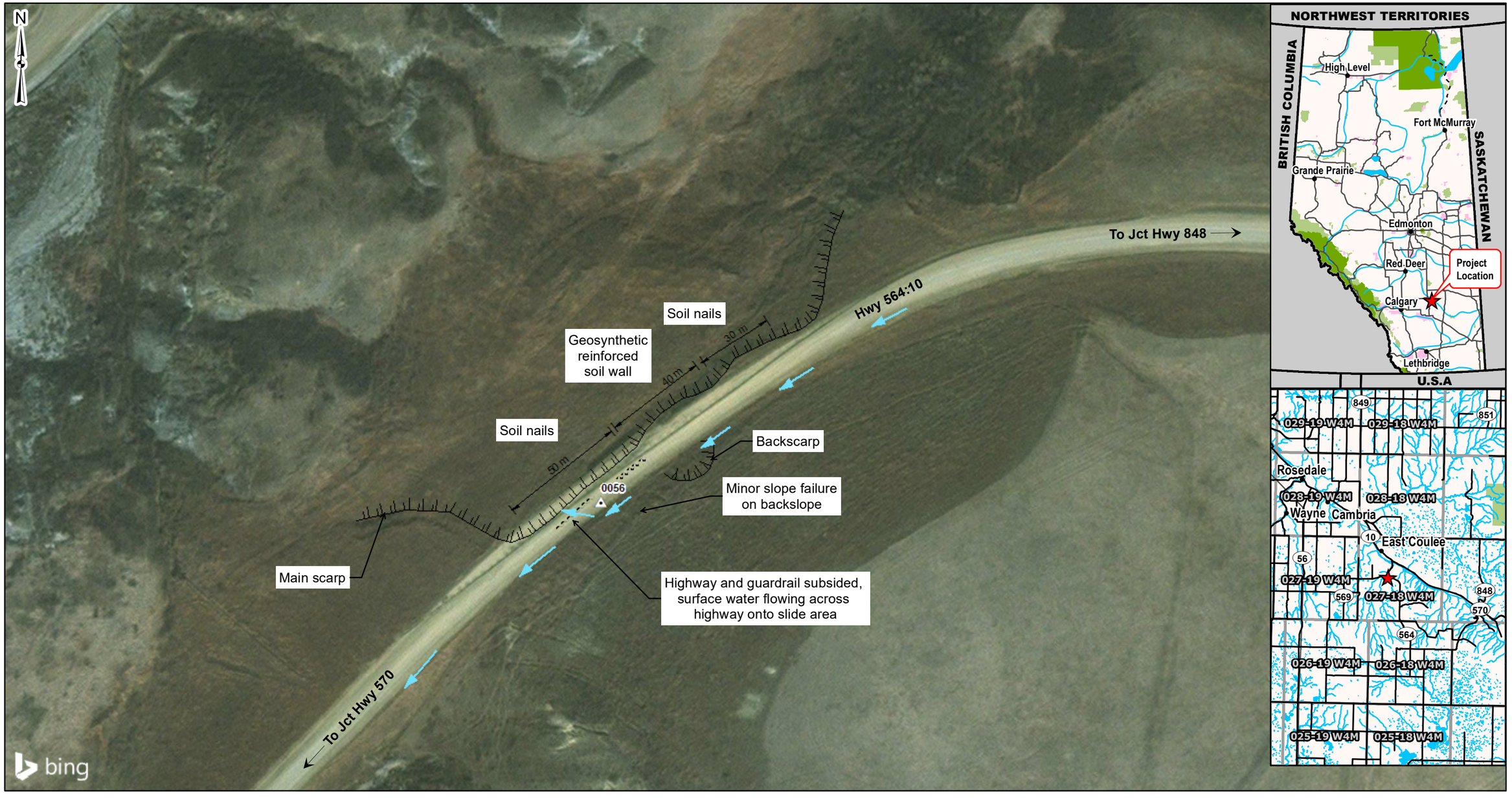
Long-Term

- Installing drainage (e.g., a ditch or culvert) to redirect water away from the slide area using a slope drain with energy dissipater to convey water over the slope and prevent further erosion or saturation of the slide area. A pile wall could be installed to stabilize the road, however the traffic volume may not justify a pile-wall.

2021-11-25

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

PERMIT TO PRACTICE
KLOHN CRIPPEN BERGER LTD.
RM SIGNATURE: Pamela Jones
RM APEGA ID #: 187607
DATE: 25 Nov. 2021
PERMIT NUMBER: P009196
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)



Legend

- GPS Waypoint (June 24, 2021)
- Crack
- Scarp
- Flow Direction

Metres
0 100

NOTES:
1. HORIZONTAL DATUM: NAD83
2. GRID ZONE: UTM Zone 12N
3. IMAGE SOURCE: Bing Maps, Microsoft Corporation 2020 Source date April 3, 2012

CLIENT: Alberta Government

Klohn Crippen Berger

PROJECT: SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE: Site Plan
S041 - East Coulee Slide
Hwy 564:10 km, 32.353

SCALE	PROJECT No.	FIG No.
1:1,500	A05116A03	1

Time: 14:14:54 PM
Date: October 14, 2021
File: Z:\AICGY\Alberta\A05116A03 ABT Southern Region GRMP\400 Drawings\2021\Section B figures\MXD\S041_211014mxd.mxd

Photo 1 **Guardrail has subsided below the surface of the road (red circle). Photo taken facing southwest on June 24, 2021.**

Photo 2 **Shallow ditch on south side of highway has insufficient capacity to carry surface flows without discharging water across the road onto the slide mass. Photo taken facing southwest on June 24, 2021.**

Photo 3 **Shallow ditch on south side of highway has insufficient capacity to carry surface flows without discharging water across the road onto the slide mass. Photo taken facing northeast on June 24, 2021.**

Photo 4 **Surface runoff discharges northwards across the road onto the slide mass due to insufficient capacity in ditch on south side of highway. Photo taken facing southwest on June 24, 2021.**