

SITE NUMBER AND NAME: <b>C055-I &amp; II Galahad Slide and Riverbank Erosion</b>		HIGHWAY & KM: 861:02, 26.00	PREVIOUS INSPECTION DATE: June 13, 2018	INSPECTION DATE: <b>July 12, 2019</b>
LEGAL DESCRIPTION: 13-14-040-14 W4M	NAD 83 COORDINATES: UTM Northing Easting		RISK ASSESSMENT:	
	<b>C055-I</b>	12 5811270 437304	PF: 9 CF: 5	TOTAL: 45
	<b>C055-II</b>	12 5811329 437306	PF: 8 CF: 2	TOTAL: 16
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 90 (north) (Ref No. 70000159)			CONTRACT MAINTENANCE AREA (CMA): 21	

SUMMARY OF SITE INSTRUMENTATION:		INSPECTED BY:
Operational: One slope inclinometer and two vibrating wire piezometers installed in March 2017.		Chris Gräpel (KCB)
Inoperable: One slope inclinometer installed in 2017 and one standpipe piezometer installed in June 2013.		Ryan Gazley (KCB)
LAST READING DATE: May 16, 2019		Rishi Adhikari (AT)
PRIMARY SITE ISSUE: C055 – I: Slide affecting gravel road on south slope of Battle River valley. C055 – II: Erosion of the outside bank of the Battle River approaching H861:02.		
APPROXIMATE DIMENSIONS: C055 – I: Approximately 90 m along H861:02. C055 – II: Approximately 200 m along H861:02.		
DATE OF ANY REMEDIAL ACTION: Road realigned into backslope ditch in 2013 adjacent to slide and culvert installed to convey ditch flows.		

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Gravel surfaced road; cracking observed on shoulder		X
Slope Movement	X		Guardrail has not settled further since 2018 inspection		X
Erosion	X		Bank erosion along Battle River at C055 - II		X
Seepage		X	None observed		X
Culvert Distress	X		Cannot see through culvert in south ditch		X

<b>COMMENTS</b>
At C055 – I:
<ul style="list-style-type: none"> <li>Guardrail did not appear to have settled further since the 2018 inspection.</li> <li>There appears to be two slope failures below the highway, one upper and one lower.</li> <li>Some cracking observed on the backslope above the highway in 2018 (waypoint 523)</li> <li>The toe of the upper slide (toe roll, waypoint 525) appears to be halfway down slope.</li> <li>The slope inclinometer installed at the crest of the slope recorded movement at 7.7 m depth below road surface near the contact between the silty clay till and the mudstone bedrock. The SI has since been sheared and is no longer operable.</li> <li>The lower slide appears to be rotational or translational, with back tilting of the head of the slide or a</li> </ul>

graben at waypoint 524.

- Approximately 25 m of guardrail has settled.
- Trees cleared at crest of natural slope above slide. Timing of tree clearing unknown.
- A ditch culvert was installed at the south ditch to allow for the road to be shifted to the south, away from the slide. Erosion observed at culvert inlet.

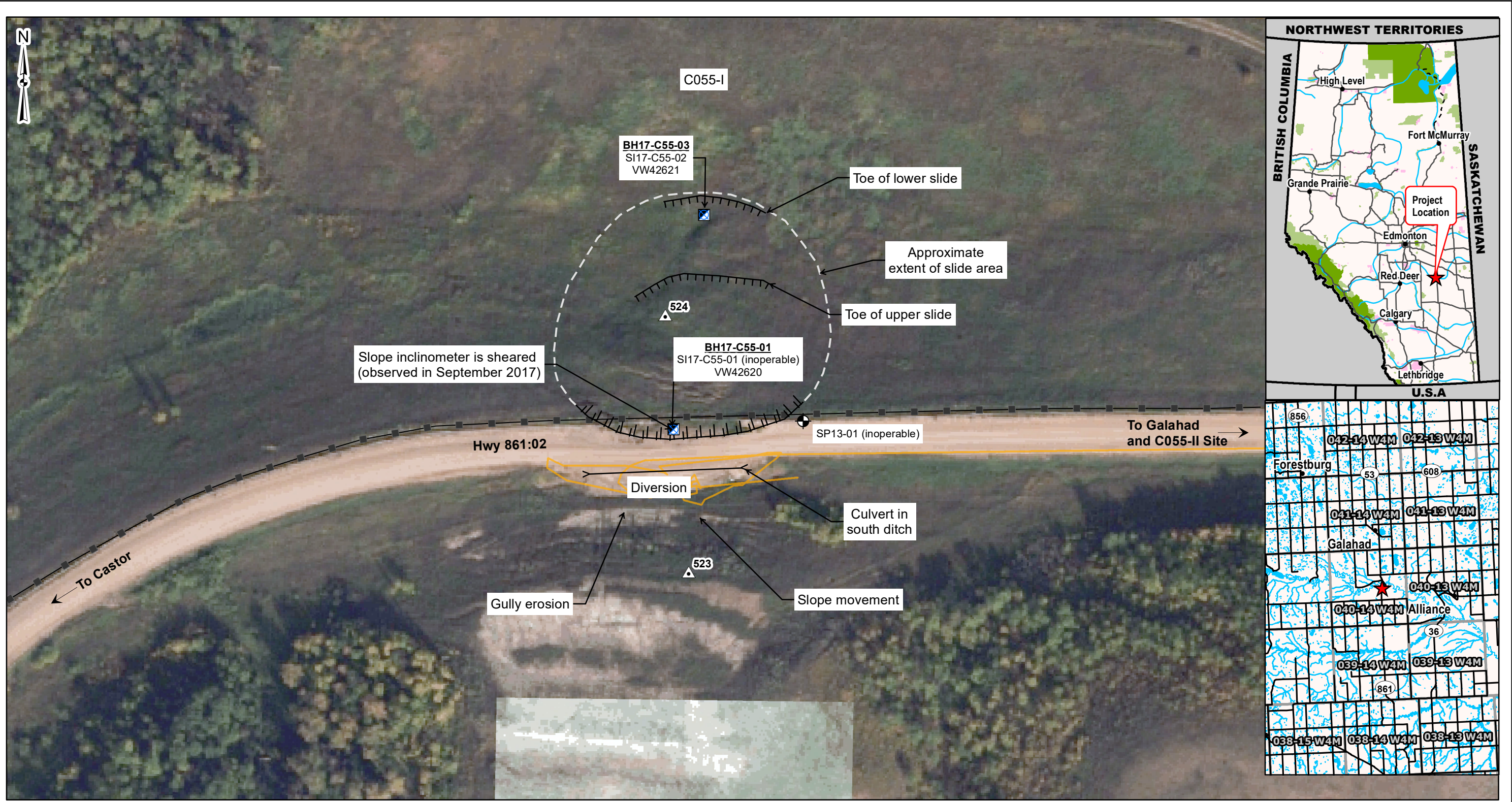
At C055 – II, riverbank erosion appears to be progressing at a slow but consistent rate. Stakes installed 2 m behind the crest of the steep erosion slope during the 2017 inspection have since been removed, likely by mowing equipment.

Discussed remedial actions:

C055 – I: Raise guardrail to prevent vehicles from sliding overtop and down the slope. Construct berm on lower half of slope to buttress the slope, with finger drains to convey seepage water from the slope face to the toe of the berm; and reconstruct upper slope with geosynthetic reinforced fill. The toe berm will require land acquisition after preliminary engineering has been completed to assess the area of land required.

C055 – II: Install a guard rail (or HTCB) and eventually realign this portion of the highway further away from outside bend and erosion zone of the Battle River.

Time: 11:00:43 AM  
 Date: September 11, 2019  
 File: Z:\A\EDM\A05115A02\ABT Central Region GRNIP\400 Drawings\2019\2 Section B12\_2019 Site Inspections\MXD\C055\_190911.mxd



**Legend**

- ▲ GPS Waypoint
- Guardrail
- ▣ Slope Inclinometer (SI)
- ><— Culvert
- ⊗ Vibrating Wire Piezometer (VW)
- ⊕ Standpipe Piezometer (SP)
- GPS Track (July 12, 2019)
- ⏏ Scarp



**NOTES:**  
 1. HORIZONTAL DATUM: NAD83  
 2. GRID ZONE: UTM Zone 12N  
 3. IMAGE SOURCE: Abacus Datagraphics Ltd.  
 Image dated July 14, 2014 to October 10, 2014  
 4. Location of instruments is approximate (not surveyed)

CLIENT

*Alberta*

**Klohn Crippen Berger**

PROJECT CENTRAL REGION GEOHAZARD RISK MANAGEMENT PROGRAM		
TITLE Site Plan C055 - Galahad Slide Hwy 861:02, km 26.000		
SCALE 1:1,000	PROJECT No. A05115A02	FIG No. 1

**Photo 1** View of C055-I slide site from Hwy 861 (red circle). Note trees cleared on slope above C055-I site. Red arrow indicates location of settled guardrail. Photo taken July 12, 2019 looking south.



**Photo 2** View of C055-I slide area, settled guardrail, and sheared SI. Photo taken July 12, 2019 looking east.



**Photo 3** Photo showing the location of the C055-II riverbank erosion site. Photo taken July 12, 2019 looking south.

