

**SITE INSPECTION FORM**

<b>SITE NUMBER AND NAME:</b> GP055 Hwy 674 Embankment Slide North of Sexsmith		<b>HIGHWAY &amp; KM:</b> 674:02, 15.150	<b>PREVIOUS INSPECTION DATE:</b> August 31, 2022	<b>INSPECTION DATE:</b> <b>June 13, 2023</b>
<b>LEGAL DESCRIPTION:</b> SW 03-74-04-W6M	<b>NAD 83 COORDINATES:</b> UTM Northing Easting 11 6137493 403024		<b>RISK ASSESSMENT:</b> PF: 10 CF: 4 TOTAL: 40	
<b>AVERAGE ANNUAL DAILY TRAFFIC (AADT):</b> 1,080 (east) & 540 (west) (Reference No. 29750 and 30730, 2022)			<b>CONTRACT MAINTENANCE AREA (CMA):</b> 504	

<b>SUMMARY OF SITE INSTRUMENTATION:</b>  Operable: One slope inclinometer (SI), and four vibrating wire piezometers (VWPs) installed in 2022.  LAST READING DATE: N/A	<b>INSPECTED BY:</b> Chris Gräpel (KCB) Courtney Mulhall (KCB) Roger Skirrow (TEC) Max Shannon (TEC)
<b>PRIMARY SITE ISSUE:</b> Slide in highway embankment fill on south side of Hwy 674:02 due to a high groundwater table. At the site, the highway crosses a low narrow valley (approximately 4 m deep and 10 m wide at base).	
<b>APPROXIMATE DIMENSIONS:</b> North side of highway embankment approximately 5 m high sloped at approximately 3H:1V, and south side approximately 2 m high sloped at approximately 4H:1V. Slide is approximately 7 m wide at centerline and 15 m wide at south (eastbound) shoulder of Hwy 674:02.	
<b>DATE OF ANY REMEDIAL ACTION:</b> 2018 – highway embankment partially reconstructed with a shallow sub-excavation (approximately 1.0 m to 1.8 m deep) and replaced with gravel. A similar repair may have also been completed in the mid-1980s. Ongoing pavement patching.	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Cracking and settlement in pavement surface, including recent pavement patches, as described below.	X	
Slope Movement	X		Cracking and settlement in recent pavement patches and along slide flanks, and SI data indicates ongoing slide movements which are getting worse with time.	X	
Erosion		X	None observed at time of 2023 inspection.		X
Seepage	X		None observed at time of 2023 inspection.		X
Culvert Distress		X	No culverts observed by KCB.		X

<b>COMMENTS</b>
<p>Pavement is approximately 1 m thick with near-vertical shoulders and was recently milled in the south (eastbound) lane.</p>
<p>Slide backscarp and flanks well-defined and extend from centerline to the south (eastbound) shoulder of Hwy 674:02 down the south slope of the highway embankment to the downstream toe where there is a well-defined toe roll. Pavement cracks up to approximately 30 mm wide and differential settlement up to approximately 100 mm observed along the slide backscarp. The slide backscarp has previously been observed in the north (westbound) lane of Hwy 674:02 by the maintenance contract inspector (MCI) between pavement patches. The well-defined backscarp, flanks, and toe roll indicate the slide has formed a near-complete or complete three-dimensional failure surface which supports observations that the slide has retrogressed past the highway centerline and movements are getting worse with time.</p>
<p>A 900-mm-diameter smooth-walled steel pipe appears to have been drilled into place on the east abutment of the highway embankment.</p>
<p>Riprap is present at the south toe of the highway embankment, potentially indicating the location of a former culvert. However, KCB has not observed a culvert inlet or outlet on either side of the highway embankment.</p>
<p>As discussed in our 2020 preliminary engineering report (PER) for the site, a high groundwater table appears to be present at the site as indicated by standing water in a dugout immediately southwest of the site, a reported spring nearby on hydrogeological maps, anecdotal information on livestock sinking into the valley bottom, and pore pressures above ground surface being recorded in the piezometers possibly indicating artesian pressures in the underlying clay till. High groundwater levels and upward gradients likely created adverse foundation conditions which, without drainage, appear to have destabilized the highway embankment.</p>
<p><u>Maintenance/Repair/Monitoring Recommendations:</u></p> <ul style="list-style-type: none"> <li>• TEC should acquire land so slide repairs can be completed. KCB has already begun preparation of a repair design and figures and a Request for Quotation (RFQ). At TEC's request KCB will instead prepare a tender for the selected design option: construction of a toe berm with geogrid-reinforced fill to flatten the slope, three drain pipes installed within the fill that span the length of the toe berm foundation, from the toe of the existing slope to the toe of the new slope, and a shear key constructed below the toe berm at the toe of the existing slope. This work will also include extension of the existing culvert through the east abutment of the highway embankment. Estimated cost: approximately \$375,000.</li> </ul>



**PEACE REGION  
(GRANDE PRAIRIE DISTRICT – SOUTH) GRMP**



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Courtney Mulhall, M.Sc., P.Eng.  
Geotechnical Engineer

## Inspection Photographs

**Photo 1** Cracking and settlement (up to approximately 10 cm) along slide headscarp in south (eastbound) lane of Hwy 674:02. Note pavement was recently milled. Photo taken June 13, 2023, facing southwest.



**Photo 2** Cracking and settlement along slide headscarp in south (eastbound) lane of Hwy 674:02. Photo taken June 13, 2023, facing west.



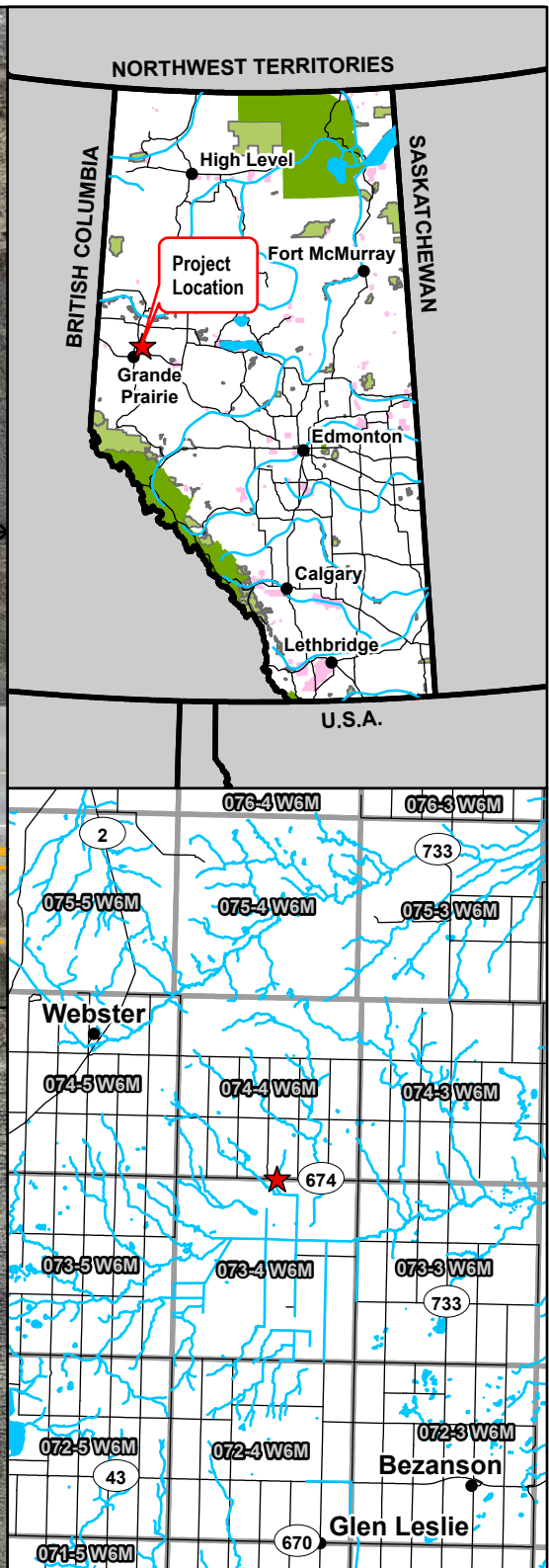
**Photo 3** Cracking and settlement along slide scarp in south (eastbound) lane of Hwy 674:02. Note thickness (up to approximately 0.5 m) and near-vertical edge of exposed pavement. Photo taken June 13, 2023, facing northwest.



**Photo 4** Slope and toe area of slide on south side of Hwy 674:02 embankment. Note pond water in dug out southwest of highway embankment and slide. Photo taken June 13, 2023, facing southwest.



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**Legend**

- Borehole and Instrument
- GPS Track (June 13, 2023)
- Scarp
- Crack
- Telus Utility Trench
- Fence
- Culvert
- Settlement in Highway Surface
- Test Pit Location
- Ground Depressions



NOTES:  
 1. HORIZONTAL DATUM: NAD83  
 2. GRID ZONE: UTM ZONE 11N  
 3. IMAGE SOURCE: PROVIDED BY CHALLENGER GEOMATICS, CAPTURED OCTOBER 2022

CLIENT

PROJECT	PEACE REGION (GRANDE PRAIRIE DISTRICT-SOUTH) GEOHAZARD RISK MANAGEMENT PROGRAM	
TITLE	Site Plan GP055 - Slide North of Sexsmith Hwy 674:02, km 15.150	
SCALE	PROJECT No. A05116F01	FIG No. 1