



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



**SITE INSPECTION FORM**

<b>SITE NUMBER AND NAME:</b> GP016 Slide 2 km West of Hwy 40 and Hwy 666 Junction		<b>HIGHWAY &amp; KM:</b> 666:02, 34.095 to 34.837	<b>PREVIOUS INSPECTION DATE:</b> July 20, 2021	<b>INSPECTION DATE:</b> <b>June 13, 2023</b>
<b>LEGAL DESCRIPTION:</b> NE 15-70-06-W6M SW/SE-15-70-06-W6M	<b>NAD 83 COORDINATES:</b> UTM    Northing    Easting 11      6103361    383748		<b>RISK ASSESSMENT:</b> Lower (2): PF: 13    CF: 7    TOTAL: 91 Middle (1): PF: 11    CF: 5    TOTAL: 55 Upper (3): PF: 11    CF: 4    TOTAL: 44	
<b>AVERAGE ANNUAL DAILY TRAFFIC (AADT):</b> 2,400 (west) & 1,960 (east) (Reference No. 28690 & 70000759, 2022)			<b>CONTRACT MAINTENANCE AREA (CMA):</b> 504	

<b>SUMMARY OF SITE INSTRUMENTATION:</b>  Operational: Three slope inclinometers (SIs), six pneumatic piezometers (PNs), one vibrating wire piezometer (VWP), and two standpipe piezometers (SPs) installed between 1989 and 2014.  Inoperable: Three SIs, three PNs, and two VWPs installed between 1989 and 2014.  LAST READING DATE: June 06, 2023	<b>INSPECTED BY:</b> Chris Gräpel (KCB) Courtney Mulhall (KCB) Roger Skirrow (TEC) Max Shannon (TEC)
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**PRIMARY SITE ISSUE:** Three landslide features along south valley slope of the Wapiti River. Hwy 666:02 fill placed in a cut and side-hill arrangement across slide area. Slide movement affecting both lanes of highway.

**APPROXIMATE DIMENSIONS:** Entire site is approximately 750 m long.  
  
Lower Slide (Site 2): 300-m-wide backscarp at guardrail and extends into south (eastbound) highway ditch and approximately 300 m to river valley floor. Depth to failure plane is assessed to be at about 10 m at highway level and about 20 m approximately 150 m downslope/north towards river.  
  
Middle Slide (Site 1): 300-m-wide backscarp (65 m wide at guardrail) and extends to highway centerline. Depth to failure plane is assessed to be about 20 m near highway level.  
  
Upper Slide (Site 3): 250-m-wide backscarp and extends approximately 1.5 m past edge of highway shoulder. Depth to failure plane is assessed to be about 7 m to 11 m at the highway level.

**DATE OF ANY REMEDIAL ACTION:** Ongoing milling and paving.

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 highway backslope and embankment, and SI data indicates ongoing slide movements.	X	
Erosion	X		Rill and small-gully erosion at WP316 due to surface water flow over edge of pavement.		X
Seepage	X		Crest of backslope at middle slide at WP314 appeared to be wet due to seepage and/or surface water flow at.	X	-
Culvert Distress		X	No culverts observed by KCB.		X

<b>COMMENTS</b>
Slope upslope and downslope of highway is landslide terrain.
<p><u>Lower Slide (Site 2):</u></p> <ul style="list-style-type: none"> <li>• Pavement appears to be 2.0 m thick at edge of pavement.</li> <li>• Passing lane decommissioned and blocked with wooden barricades and orange delineators.</li> <li>• Pavement in two lanes adjacent to passing lane raised approximately 0.2 m to 0.25 m. Slide backscarp and flanks well-defined and extend through both lanes of Hwy 666:02.               <ul style="list-style-type: none"> <li>○ At WP309, pavement cracking approximately 50 mm to 75 mm wide and 0.5 m deep.</li> <li>○ At WP310, pavement has settlement approximately 0.5 m to 1.0 m. Top of guardrail is below top of pavement.</li> <li>○ In some locations, pavement breaking away from highway.</li> </ul> </li> <li>• Void previously observed by Maintenance Contract Inspector (MCI) through pavement has been paved over and was not visible during the 2023 inspection. The void opened where landslide deformations created a void or widened a crack at depth that the pavement started to deflect into (a “pothole” or “sinkhole”).</li> </ul>
<p><u>Middle Slide (Site 1):</u></p> <ul style="list-style-type: none"> <li>• Slide backscarp and flanks well-defined and extend to centerline of Hwy 666:02. Top of guardrail is at similar level as top of pavement at WP311 and WP312.</li> <li>• Slope instabilities along the backslope along/above the south side of Hwy 666:02 with a toe roll approximately 10 m below the crest of the backslope at WP313. From WP313 lots of crack observed at surface.</li> </ul>
<p><u>Upper Slide (Site 3):</u></p> <ul style="list-style-type: none"> <li>• Slide scarp extends to north (westbound) shoulder of Hwy 666:02 near WP315 where pavement is breaking away from the highway.</li> <li>• Wooden barricades in place to keep drivers away from highway shoulder.</li> <li>• Pavement has settlement approximately 1.0 m at edge of pavement.</li> </ul>
<p><u>Maintenance/Repair/Monitoring Recommendations:</u></p> <ul style="list-style-type: none"> <li>• CIMA+ did a planning study with Thurber based on Karl's 2016 recommendations. Highway decommissioning was recommended.</li> <li>• Guardrails should be raised and/or replaced if damaged.</li> </ul>



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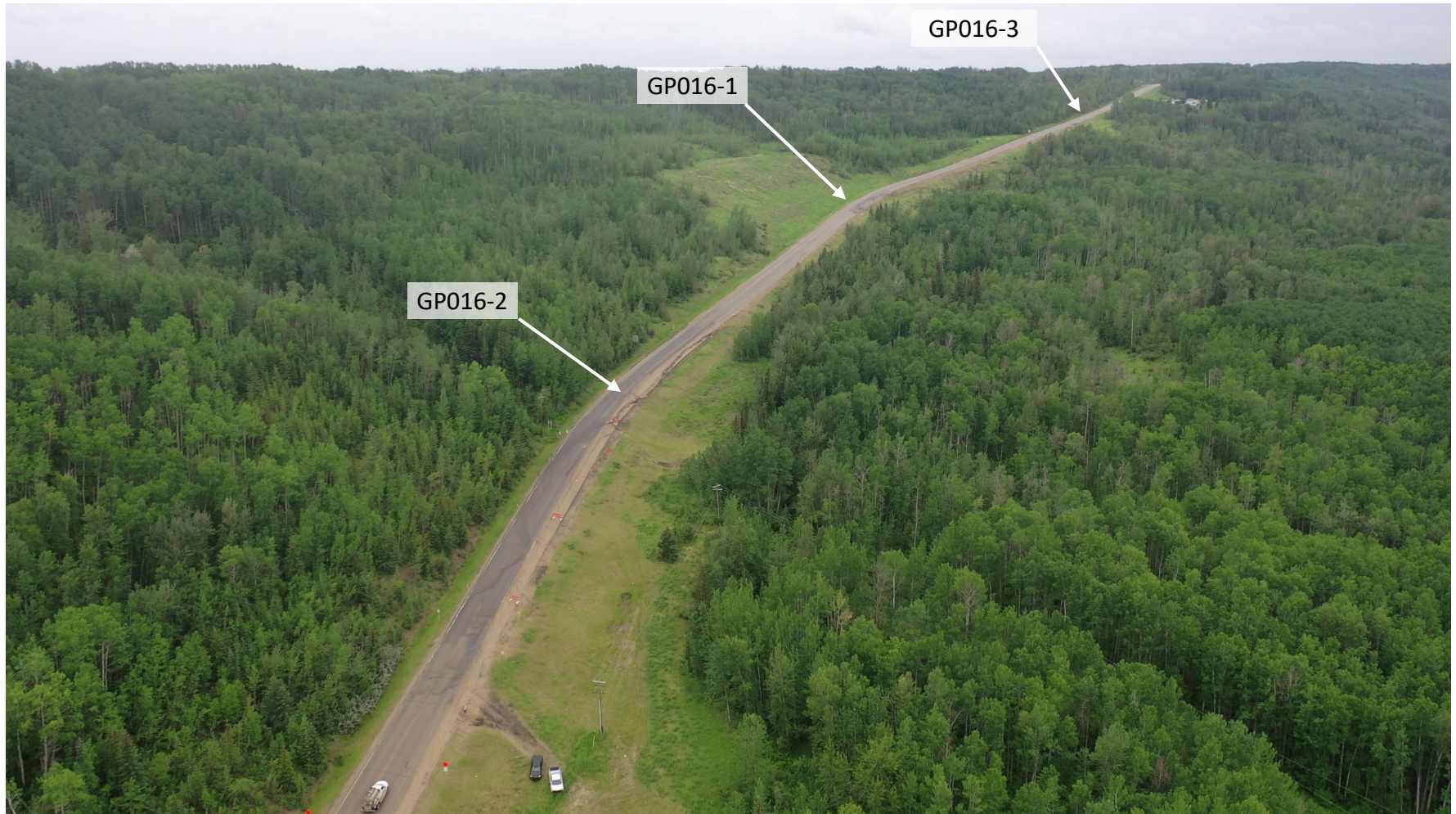
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Courtney Mulhall, M.Sc., P.Eng.  
Geotechnical Engineer

## Inspection Photographs

**Photo 1** Overview of GP016-1 (middle), 2 (lower), and 3 (upper) sites. Photo taken June 13, 2023, facing southwest.



**Photo 2** Overview of GP016-2 (lower) site. Note pavement patches, and cracking and settlement along both lanes of Hwy 666:02. Photo taken June 13, 2023, facing southeast.



**Photo 3** Overview of GP016-1 (upper) site. Note pavement patches, and cracking and settlement in westbound (north) lane of Hwy 666:02. As well as sliding along backslope and highway embankment (see next photo). Photo taken June 13, 2023, facing southwest.



**Photo 4** Cracking and settlement westbound (north) lane of Hwy 666:02 at GP016-1 (middle) site. Note cracking and toe rolls along backslope and highway embankment. Photo taken June 13, 2023, facing southeast.



**Photo 5** Overview of GP016-3 (upper) site. Note slide along shoulder of westbound (north) lane of Hwy 666:02. Photo taken June 13, 2023, facing southwest.





**Photo 6** Cracking and settlement in both lanes of Hwy 666:02 at GP016-2 (lower) site. Note edge along passing lane which has been decommissioned and blocked with wooden barricades and orange delineators. Photo taken June 13, 2023, facing southwest.



**Photo 7** Cracking and settlement in westbound (north) lane of Hwy 666:02 at GP016-2 (lower) site. Note drop in pavement along slide scarp. Photo taken June 13, 2023, facing southwest.



**Photo 8** Pavement breaking away highway along westbound (north) shoulder of Hwy 666:02 at GP016-2 (lower) site. Note guardrail deflected and below top of pavement. Photo taken June 13, 2023, facing northeast.



**Photo 9** Pavement breaking away highway along westbound (north) shoulder of Hwy 666:02 at GP016-2 (lower) site. Note guardrail deflected and below top of pavement. Photo taken June 13, 2023, facing northeast.



**Photo 10** Cracking and settlement in westbound (north) lane of Hwy 666:02 at GP016-1 (middle) site. Photo taken June 13, 2023, facing southwest.



**Photo 11** Cracking and settlement in westbound (north) lane of Hwy 666:02 at GP016-1 (middle) site. Note guardrail deflected at a similar level as top of pavement. Photo taken June 13, 2023, facing northeast.



**Photo 12** Crest of backslope at GP016-1 (middle) site near WP314. Area appeared wetter than during 2021 inspection. Photo taken June 13, 2023, facing southwest.



**Photo 13** Erosion at WP316 due to surface water flow over edge of pavement. Note guardrail also deflected and post is damaged. Photo taken June 13, 2023, facing southwest.

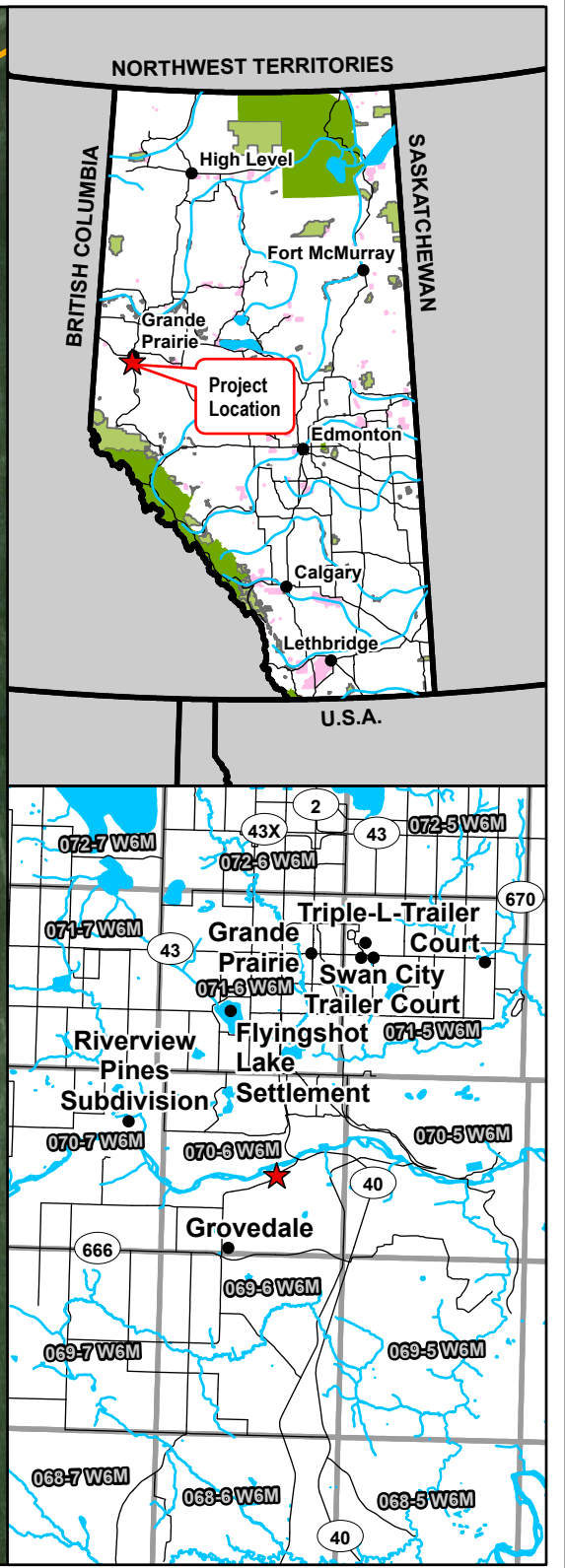
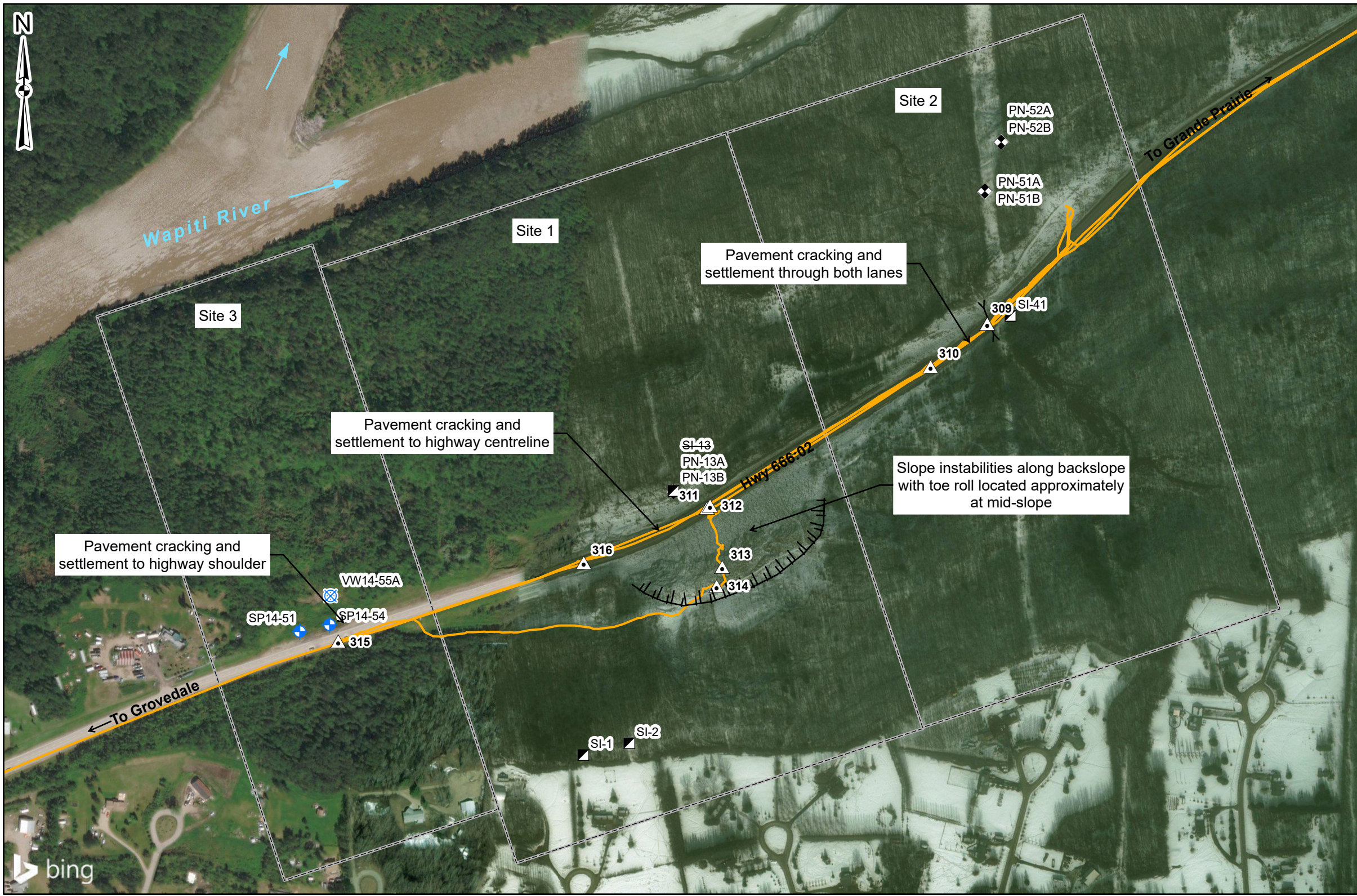


**Photo 14** Pavement breaking away highway along westbound (north) shoulder of Hwy 666:02 at GP016-3 (upper) site. Note longitudinal cracking in pavement. Photo taken June 13, 2023, facing southwest.



**Photo 15** Pavement breaking away highway along westbound (north) shoulder of Hwy 666:02 at GP016-3 (upper) site. Photo taken June 13, 2023, facing southwest.





**Legend**

- ▲ GPS Waypoint (June 13, 2023)
- ◆ Pneumatic Piezometer (PN)
- Slope Inclinometer (SI)
- ⊕ Standpipe Piezometer (SP)
- ⊗ Vibrating Wire Piezometer (VW)
- GPS Track (June 13, 2023)
- Flow Direction
- ⊥ Scarp
- Culvert
- Site Extent

NOTES:  
 1. HORIZONTAL DATUM: NAD83  
 2. GRID ZONE: UTM ZONE 11N  
 3. IMAGE SOURCE: 2022 MICROSOFT CORPORATION, 2022 MAXAR CNES, DISTRIBUTION AIRBUS DS  
 4. INSTRUMENT LABELS THAT ARE INDICATED WITH STRIKE THROUGH TEXT ARE INOPERABLE. INSTRUMENTS INOPERABLE PRIOR TO 2021 NOT SHOWN.

CLIENT

*Alberta*

**Klohn Crippen Berger**

PROJECT  
 PEACE REGION (GRANDE PRAIRIE DISTRICT-SOUTH)  
 GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE  
 Site Plan  
 GP016 - Slide 2km West of Hwy 40 and Hwy 666 Junction  
 Hwy 666:02, km 34.837

SCALE 1:5,000 PROJECT No. A05116A01 FIG No. 1

File: \\int.klohn.com\ProjData\A\EDM\A05116A01\ABT Grande Prairie South GRMP\401 Drawings\GIS\WXD\2023\Section B\ABT\_GPSouth\_SectionB\_230619.aprx Date: Time: Creator: aharrison