

SITE NUMBER AND NAME: NC074 – South of Entwistle Slide	HIGHWAY AND KM: 22:30, km 44.2	PREVIOUS INSPECTION: May 25, 2020	CURRENT INSPECTION: June 14, 2023
LEGAL DESCRIPTION: SE 17 & SW 16-52-07-W5	NAD83 COORDINATES: UTM11U 5928504N, 633710E		RISK ASSESSMENT: PF: 3 CF: 5 Total: 15
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 3,340 (2023)		CONTRACTOR MAINTENANCE AREA (CMA): 509	

SUMMARY OF INSTRUMENTATION: Three slope inclinometers (SI) are functional.	INSPECTED BY: Stantec: Leslie Cho, Sonja Pharand TEC: Kristen Tappenden
LAST READING DATE: May 16, 2024	
PRIMARY SITE ISSUE: Slope instability from weak foundation soils and high groundwater table.	
APPROXIMATE DIMENSIONS: 100 m long by 40 m wide.	
DATE OF ANY REMEDIAL ACTION: Patched three times in 2011. Overlaid after 2012 inspection. Southbound lane (SBL) overlaid in 2013 and 2014. Patched in 2015. Patched end of June 2017. Gravel placed on SBL to repair drop at edge of pavement. West shoulder patched in 2018. SBL overlaid on June 21, 2019. SBL hand patched on June 29, 2019. The site was remediated in Fall 2019. Remediation consisted of installing a driven steel pile wall on the west side of the highway, replacing the centerline culvert, and reconstructing the highway.	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICEABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress		X			X
Slope Movement		X	Leaning fenceposts on the west embankment toe		X
Erosion	X		Significant erosion west of fence line along tree line.	X	
Seepage		X	Previously wet and spongy ground near BH17-02 and between SI19-02 and culvert was dry.		X
Bridge/Culvert Distress		X			X
Other	X		Depressions around each SI.		X

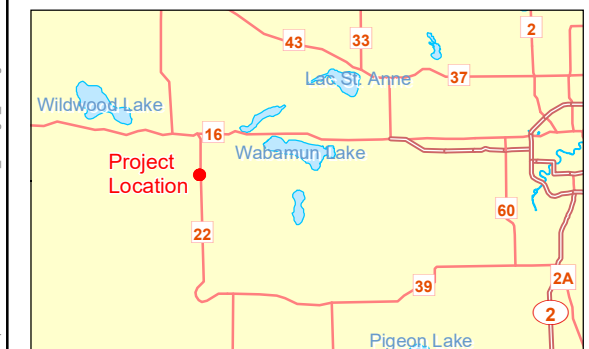
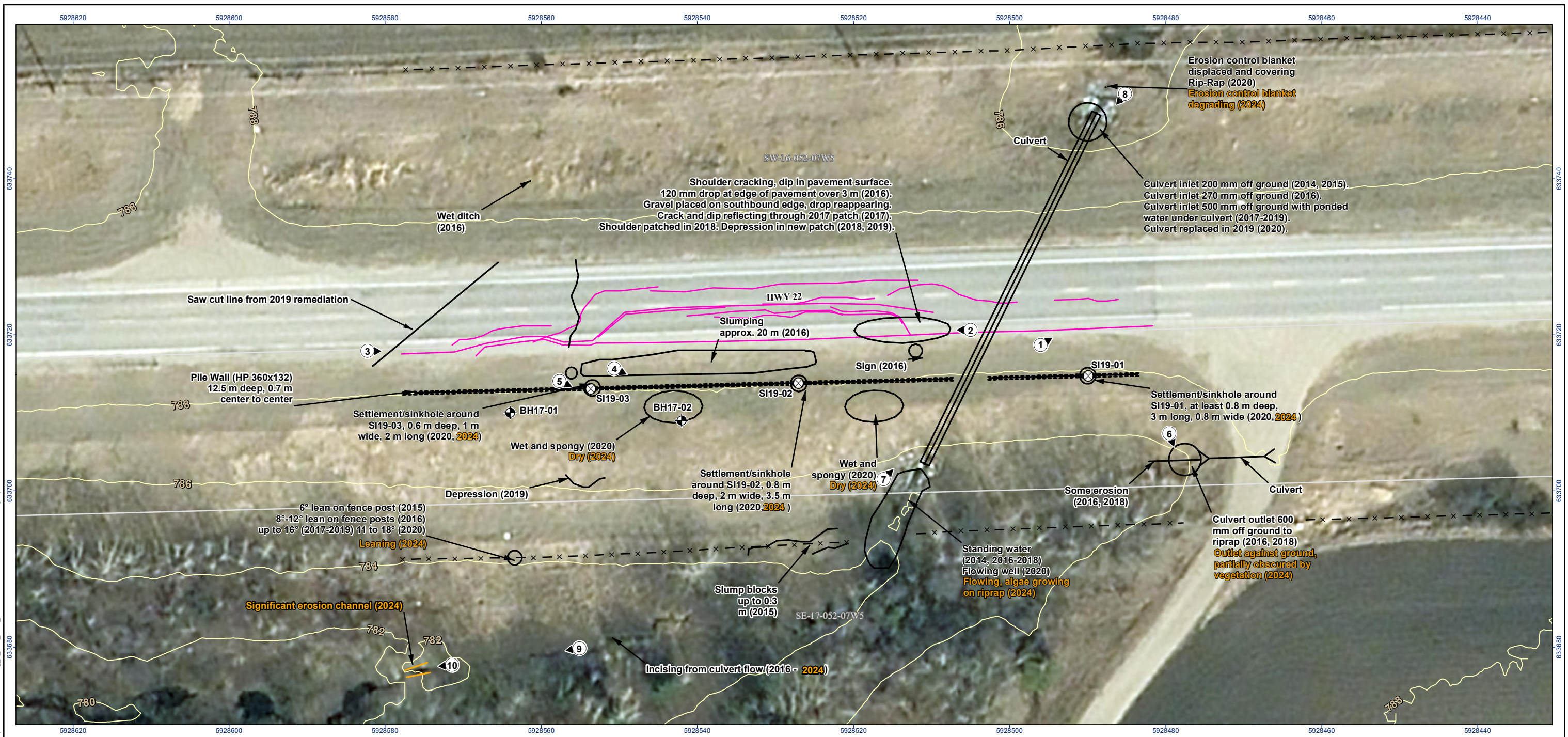
COMMENTS
<ul style="list-style-type: none"> Faint longitudinal cracks were observed within the remediated area of the highway. The cracks do not appear to be related to movement of the highway embankment (Photos 1 to 3). A bump is present in the SBL where the remediated pavement surface ends. A blue marker on the side of the highway warns of the bump (Photo 1). The highway embankments were observed to be well vegetated (Photo 4). Ground depressions of various dimensions around each of the slope inclinometers (SI) were observed to be generally unchanged since 2020, though the ground surface is now vegetated (Photo 5). These depressions are likely due to a combination of poor fill compaction during winter construction, and the Contractor being careful with compaction equipment around the SIs.

- All SIs are installed within the H-piles. The SIs showed deflection of the top pile ranging from 25 mm to 130 mm. Some regrading work was completed as warranty following construction of the pile wall which could have contributed to some of the observed deflection.
- The outlet of the culvert below the driveway on the west side of the highway is partially obscured by vegetation (Photo 6).
- The replaced culvert appeared to be performing well with no signs of distress. Water was flowing from the outlet, and algae is growing on the riprap below the outlet (Photo 7). The displaced erosion control blanket at the inlet has partially degraded and is unlikely to hinder water collection by the culvert (Photo 8).
- Water flow from the culvert outlet appears to be incising the toe of the slope west of the fence line. A significant erosion channel was observed further downstream as shown in Photos 9 and 10.
- No signs of distress along the embankment were observed.

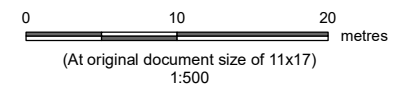
RECOMMENDATIONS

- The highway surface should be monitored for pavement cracks, and cracks should be sealed to prevent water infiltrating the embankment.
- The depressions around the SIs on the west sideslope should be backfilled and seeded to prevent water from collecting and softening the surrounding soils.
- Site inspections should continue to be completed once per contract cycle.
- Instrumentation should continue to be read annually.

PREPARED BY: Sonja Pharand, P.Eng.	REVIEWED BY: Xiteng Liu, M.Sc., P.Eng., PMP	PERMIT TO PRACTICE



- Borehole Location
- Slope Inclinometer
- Previous Observations
- 2024 Observations
- Pavement Cracks prior to 2019 remediation
- Fence
- Ground Elevation Contours (m AMSL, LiDAR Nov. 2007)
- Quarter Section
- Photos and Direction



Project Location
 Hwy 22
 Parkland County, Alberta

Client/Project
 Transportation and Economic Corridors
 Geohazard Monitoring Program
 NC74 Hwy 22:30 South of Entwistle Slide

Figure No.
1

Title
Site Plan

Notes
 1. Coordinate System: NAD 1983 UTM Zone 11N
 2. Data Sources: Geogratis, ©Department of Natural Resources Canada, All rights reserved.
 3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

2024 Site Inspection Photos at NC074



Photo 1: Bump at south extent of highway repair in SBL. Looking southeast.



Photo 2: Highway condition within repair zone, looking north.

2024 Site Inspection Photos at NC074



Photo 3: Pavement at north end of remediation limits. Looking south.



Photo 4: Slope inclinometers along pile wall on west embankment slope. Looking southwest.

2024 Site Inspection Photos at NC074



Photo 5: Depression in west embankment slope along pile wall alignment, near SI19-03. Looking east.



Photo 6: Culvert below driveway on west side of highway, looking southwest.

2024 Site Inspection Photos at NC074



Photo 7: Culvert outlet on west side of highway. Looking southeast.



Photo 8: Culvert inlet on the east side of the highway. Looking northwest.

2024 Site Inspection Photos at NC074



Photo 9: Flow from culvert leading from culvert outlet to erosion area. Looking north.



Photo 10: Significant erosion along creek channel. Looking north.