

SITE NUMBER AND NAME: C075 Hwy 609 Ditch Erosion		HIGHWAY & KM: 609:02, 16.42	PREVIOUS INSPECTION DATE: June 24, 2020	INSPECTION DATE: June 29, 2021
LEGAL DESCRIPTION: NW 08-44-19-W4M & SW 17-44-19-W4M	NAD 83 COORDINATES: UTM Northing Easting 12 5849463 383508		RISK ASSESSMENT: PF: 7 CF: 3 TOTAL: 21	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 460 (east) & 400 (west) (Reference No. 107370 & 110370)			CONTRACT MAINTENANCE AREA (CMA): 517	

SUMMARY OF SITE INSTRUMENTATION: There is no instrumentation at the C075 site. LAST READING DATE: N/A	INSPECTED BY: Chris Gräpel (KCB) Roger Skirrow (AT) Tony Penney (AT) Dwight Rewega (AT)
PRIMARY SITE ISSUE: Erosion features (ditch erosion and gullies) located along Hwy 609 and a corroding culvert underlying Hwy 609. On Hwy 56 there is a large erosion gully that is approaching the highway at the outlet of a centreline culvert.	
APPROXIMATE DIMENSIONS: The erosion is impacting approximately 600 m of the north (westbound) ditch and short sections of the south (eastbound) ditch.	
DATE OF ANY REMEDIAL ACTION: Unknown	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress		X	None observed		X
Slope Movement		X	None observed		X
Erosion	X		Ongoing ditch erosion is the north (westbound) ditch	X	
Seepage		X	None observed		X
Culvert Distress	X		The bottom of the 1200 mm diameter CSP culvert is corroding		X

COMMENTS

The site was first inspected by KCB and AT on June 24, 2020, when KCB conducted a call-out report (final report issued to AT on January 27, 2021).

North (westbound) ditch erosion:

- The 1200 mm diameter CSP culvert is corroding at the base and requires repair (e.g., sleeved with a smaller-diameter smooth walled culvert) (Photo 1). Corrosion was observed at the inlet and outlet located on the north and south side of Hwy 609, respectively.
- The erosion gullies downstream (northeast) of the CSP culvert outlet have increased in size since the 2020 call-out site visit and is moving upslope. The erosion is within 9 m of the edge of the highway, approximately 2.5 m deep, and within the clear zone.
- A steep slope failure was observed above the erosion gully at the CSP culvert outlet. The slope outside of the gully is approximately 15%. The ditch upslope (west) of the CSP culvert outlet is approximately 10%.
- Erosion on the north side of the highway at the toe of the bedrock backslope (appears to be similar bedrock as seen in the badlands) extends upslope (west) approximately 200 m and ends in a wet spot of the ditch. The wet spot is believed to be at the top of the bedrock outcrop, based on the exposed bedrock outcrop on the cut slope.

- The erosion has retrogressed towards the highway since the 2020 inspection and requires repair. The repair should be sufficient to pass flows from the 1:20 year rainfall event. AT to provide KCB with LiDAR data for the site.

. South (eastbound) ditch erosion:

- Ditch erosion was observed in two locations but is not as severe as the west ditch erosion.
- An exposed fibre-optic line was observed near the west extent of the site (southeast of Waypoint 0062).
- A fence is being impacted by the ditch erosion.

During the site inspection, KCB and AT also visited the C054 site (southeast of C075, on Hwy 56). There is erosion in the east (northbound) ditch that has likely been ongoing for a long time but is now just reaching the highway. The repair should focus on stopping the erosion from reaching the highway and could consist of Class I or II riprap.

Discussed Remediation Action:

North (westbound) ditch erosion:

- Repair options for the ditch erosion could include backfilling the ditch erosion with gravel next to the highway. Local fine-grained material could be used to backfill the erosion gullies downstream of the CSP culvert outlet, located on private land.
- The reconstructed channel on private land should be moved away from the steep natural slope to reduce the potential for erosion to cause natural slope failure. Riprap armouring may be required in the channel.
- Check dams in the highway ditch (gabion baskets or riprap) could be incorporated into the repair, as long as the side slopes of the check dams are not steeper than 4H:1V so that the check dams wouldn't be considered a barrier in the ditch and a potential hazard to highway traffic.
- KCB to provide a memo outlining the private-land-gully repair, ditch repair, and culvert sleeving for the MCI to provide costs to the HMC.

South (eastbound) ditch erosion:

- The fibre-optic line needs to be relocated and repaired.
- Where the fence has fallen, the ditch needs to be graded and the fence needs to be repaired.
- The ditch erosion should be repaired similar to the west ditch (e.g., backfilled with gravel with riprap armouring).

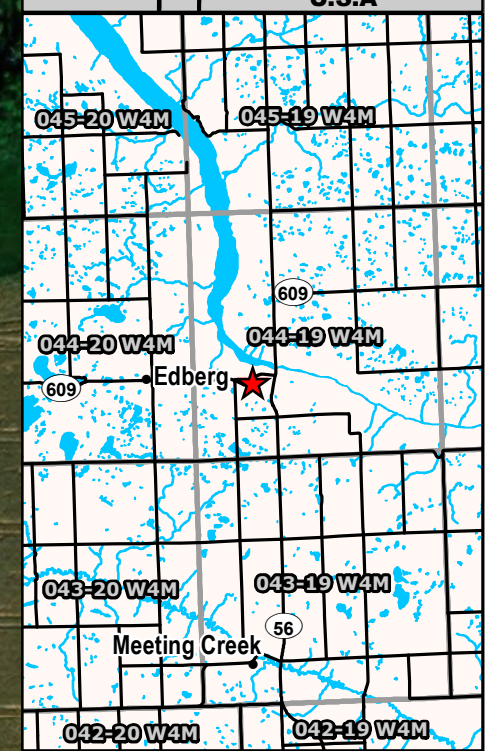
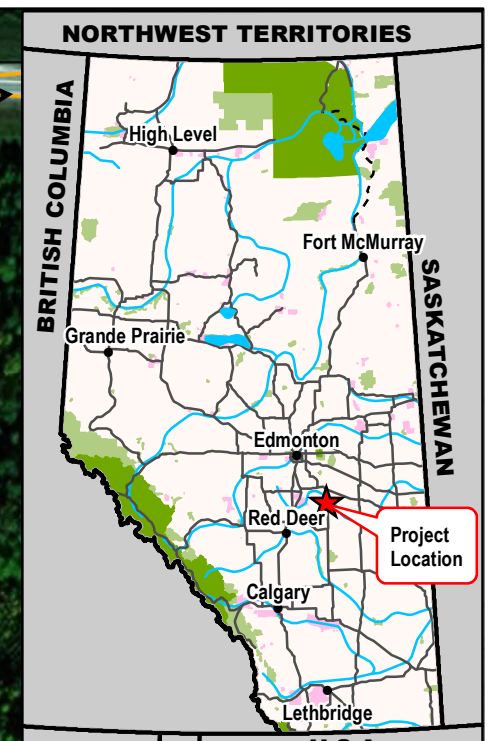
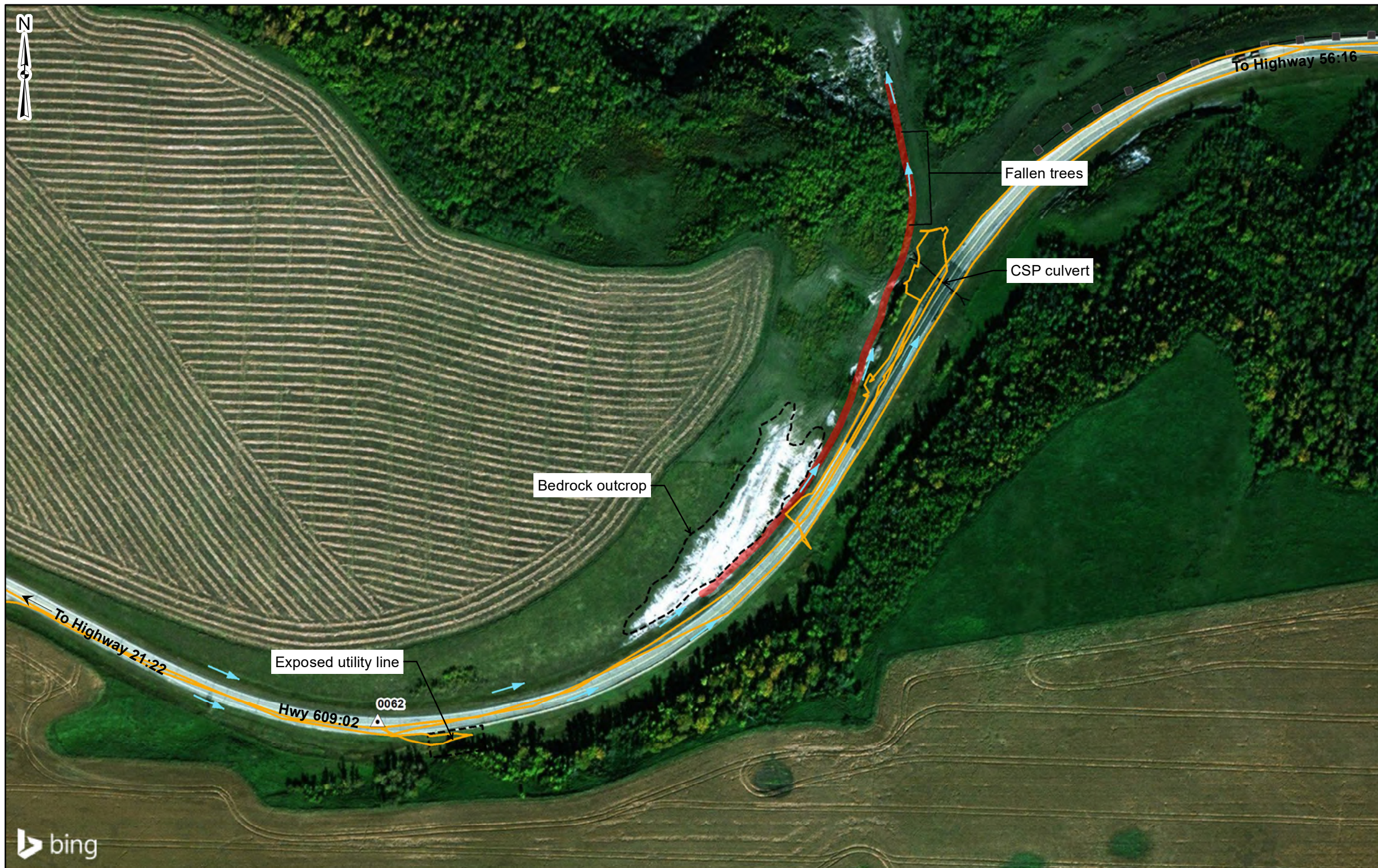
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(iii) KCB should be consulted regarding the interpretation or application of the findings and recommendations in the report.	
Chris Gräpel, M.Eng., P.Eng. Civil Engineer, Associate	



- Legend**
- GPS Waypoint (June 29, 2021)
 - GPS Track (June 29, 2021)
 - Guardrail
 - Culvert
 - Erosion
 - Flow Direction

NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM Zone 12N
 3. IMAGE SOURCE: World Imagery, ESRI ArcGIS Online
 4. The locations of features were estimated from site observations and were not surveyed.

CLIENT

PROJECT CENTRAL REGION GEOHAZARD RISK MANAGEMENT PROGRAM		
TITLE Site Plan C075 - Hwy 609 Ditch Erosion Hwy 609:02, km 16.42		
SCALE 1:2,500	PROJECT No. A05116A02	FIG No. 1

Time: 15:29:20 PM
 Date: November 08, 2021
 File: Z:\AEDM\A05116A02\ABT_Central Region_GRI\IP\400 Drawings\GIS\MXD\2021\Section\B\C075_B_211108.mxd

Inspection Photographs

- Photo 1** The CSP culvert underlying Hwy 609 (oriented north-south) is corroded at the culvert inlet and outlet (outlet shown) and required repair. Photo taken June 29, 2021 facing southeast.



- Photo 2** The erosion gully downstream (northeast) of the culvert outlet is approximately 3 m wide and 2 m deep and has worsened since the 2020 call-out site visit. Photo taken June 29, 2021 facing northeast.



Photo 3 The erosion gully downstream (northeast) of the CSP culvert outlet is impacting the fence on the north (eastbound) side of Hwy 609. Photo taken June 29, 2021 facing west.



Photo 4 The erosion gully downstream of the north (westbound) ditch, downstream of the CSP culvert outlet has worsened since the 2020 call-out site visit. Photo taken June 29, 2021 facing north.



Photo 5 The erosion gully upstream (west) of the CSP culvert outlet has worsened since the 2020 call-out site visit and is approximately 2 m to 2.5 m deep. Photo taken June 29, 2021 facing west.



Photo 6 Erosion gully in the north (westbound) ditch is retrogressing towards Hwy 609. Photo taken June 29, 2021 facing east.

