PEACE REGION
(GRANDE PRAIRIE DISTRICT – SOUTH) GRMP
SITE INSPECTION FORM

SITE NUMBER AND NAME: **GP041 Ditch Erosion North of Grande Cache**	HIGHWAY & KM: 40:34, 32.405	PREVIOUS INSPECTION DATE: June 12, 2023	INSPECTION DATE: **June 2, 2025**
LEGAL DESCRIPTION: SE 04-57-08-W6M	NAD 83 COORDINATES: UTM 11 Northing 5973931 Easting 360755	RISK ASSESSMENT: PF: 10 CF: 3 TOTAL: 30	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 1,570 (north) & 1,700 (south) (Reference No. 70000104, 2024)		CONTRACT MAINTENANCE AREA (CMA): 504	

SUMMARY OF SITE INSTRUMENTATION: There is no instrumentation at the GP041 site. LAST READING DATE: N/A	INSPECTED BY: Chris Gräpel (KCB) Courtney Mulhall (KCB) Babatunde Awokunle (TEC) Rocky Wang (TEC)
PRIMARY SITE ISSUE: Erosion feature in east (northbound) ditch of Hwy 40:34 just north of Grande Cache, alongside a previous erosion repair completed in 2006 as described below.	
APPROXIMATE DIMENSIONS: Erosion feature in east highway ditch approximately 300 m long, up to 1 m wide, and up to 0.5 m deep with a near-vertical side slope on the south (highway) side of ditch. Ditch grade is steep (approximately 5% to 10%).	
DATE OF ANY REMEDIAL ACTION: Repaired in 2006 and 2024 as described below.	

ITEM	**CONDITION EXISTS**		**DESCRIPTION AND LOCATION**	**NOTICABLE CHANGE FROM LAST INSPECTION**	
	YES	NO		YES	NO
Pavement Distress	X		None observed at time of 2025 inspection, but erosion in some locations has progressed to within 1 m of edge of pavement since 2024 repair.	X	
Slope Movement		X	None observed at time of 2025 inspection.		X
Erosion	X		Erosion ongoing in east highway ditch. Since 2024 repair, an erosion feature has formed between east highway shoulder and ditch due to surface water flow bypassing 2024 repairs.	X	
Seepage		X	None observed at time of 2025 inspection.		X
Culvert Distress		X	No culverts observed by KCB.		X

COMMENTS

Previous Remedial Actions:

- An erosion feature in the north highway ditch was repaired in 2006 by placing riprap on a woven geotextile separating medium. The riprap was conglomerate from a nearby quarry and has since experienced various degrees of breakdown due to the matrix material for the conglomerate being sandstone with variable resistance to freeze-thaw particle breakdown. Sometime afterwards (at least once since 2013) limestone or greywacke riprap from a nearby quarry was placed on the 2006 repair to augment the riprap armoring where conglomerate riprap had deteriorated due to freeze-thaw action.
- TEC's Highway Maintenance Contractor (HMC), graded the north highway ditch, installed a turf reinforcement mat (TRM), and installed approximately 20 above-grade riprap check dams in spring 2024. The check dams include some particles of conglomerate (Photo 5) that will likely experience breakdown similar to the riprap placed during 2006 repairs.

Visual Observations:

- Since the 2024 repair, an erosion feature has formed on the north side of the highway between the shoulder and the ditch bottom (Photos 1 through 8) due to surface water flow bypassing the TRM and above-grade riprap check dams, and potentially due to inadequate riprap/channel freeboard and snow clearing activities as described below. The erosion feature extends approximately 270 m from WP050 to WP033 and is approximately 0.5 m to 1.0 m wide and up to 0.5 m deep. After WP033, ditch flow shifts towards the tree line and away from the highway. Erosion was not observed within the tree line at the toe of the highway embankment.
- Material is beginning to build up behind the check dams (almost to the top of some of the check dams and may overtop soon) placed in the ditch in 2024 (Photos 1, 2, and 5), possibly exacerbating the flow that is causing the erosion discussed in the previous bullet.
- TRM placed in the ditch in 2024 is beginning to deteriorate and be undermined.
- TEC has previously mentioned that:
    - erosion worsened since the area upslope/east of highway was developed within Grande Cache (clearing, grading, gas station, parking lot);
    - snowplows can put large thicknesses of snow into the highway ditch which can block flow during spring freshet, causing water to bypass the riprap and flow onto unarmoured portions of the highway embankment fill/ditch side slopes; and
    - off-road vehicles (e.g., ATVs) are using the highway ditch as a trail which can create tire ruts that can cause erosion to form.
- Two recreational trails cross the north highway ditch (Photo 4).

Maintenance/Repair/Monitoring Recommendations:

- In the Spring the 2025, KCB completed an environmental evaluation (EE) and preliminary engineering of ditch repairs at the site, including the section previously repaired in 2024. At TEC's request, KCB will complete detailed design and prepare a tender for the selected design option: removing the existing above-ground check dams, regrading the ditch, installing below-grade check dams, and armouring the ditch with riprap. Estimated cost: approximately $800,000 to $1,000,000 based on a repair length of 640 m, and the price of hard, durable limestone that is not likely to be locally available. The final repair length will be determined during detailed design. The cost for riprap could be considerably lower if TEC considers the use of locally available greywacke for this repair. The use of greywacke and concerns about variability in particle durability could potentially be addressed through special provisions within the tender which could include inspection and testing quality control / quality assurance (QA/QC) during production and placement, and an extended warranty period. The repair may be tendered together with GP026 highway ditch erosion repairs.

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2025 Oct. 15
ID#153449

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

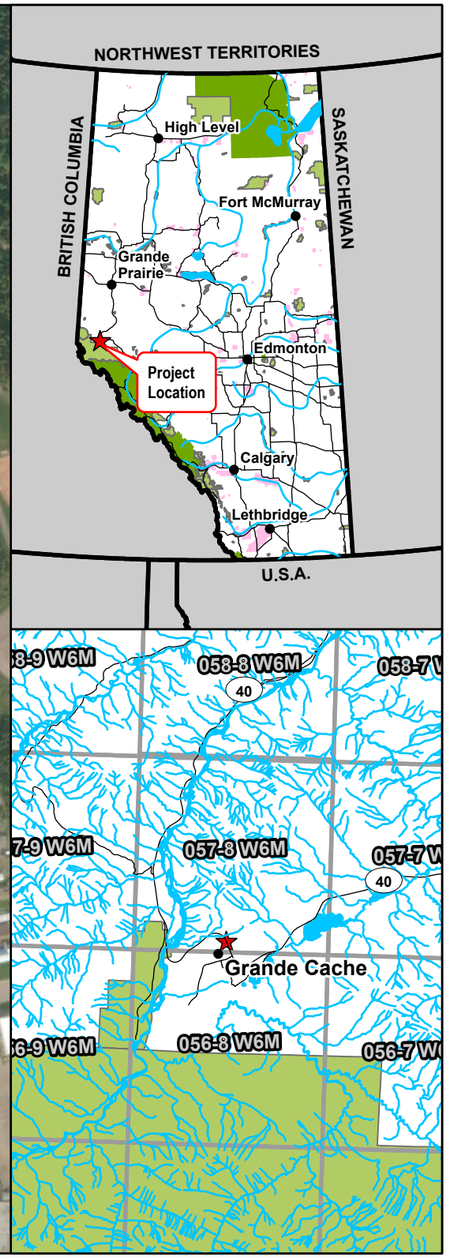
PERMIT TO PRACTICE
KLOHN CRIPPEN BERGER LTD.

RM SIGNATURE: _____

RM APEGA ID #: 187607

DATE: 15 Oct. 2025

PERMIT NUMBER: P009196
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)



Legend

- Ditch Erosion
- GPS Waypoint

0 150 Metres

NOTES:
1. HORIZONTAL DATUM: NAD83
2. GRID ZONE: UTM ZONE 11N
3. IMAGE SOURCE: 2025 MICROSOFT CORPORATION 2025 MAXAR CNES, DISTRIBUTION AIRBUS DS

CLIENT: Alberta

Klohn Crippen Berger

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

TITLE: Site Plan
GP041 - Ditch Erosion South of Grande Cache
Hwy 40:34, km 32.405

SCALE	PROJECT No.	FIG No.
1:4,000	A05116A01	1

File: Z:\AEDM\A05116A01 ABT Grande Prairie South GRMP\400 Drawings\GIS\MXD\2025\Section B\GIS\1ABT_GPSouth_SectionB_250703.aprx Date: Time: Creator: : HMananbyan

Inspection Photographs

Photo 1 **Ditch on east side of Hwy 40:34. Note erosion between highway shoulder and ditch from flow bypassing check dams. Photo taken June 2, 2025, facing southeast.**

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Photo 2 **Ditch on east side of Hwy 40:34. Note erosion between highway shoulder and ditch from flow bypassing check dams. Photo taken June 2, 2025, facing northwest.**

Photo 3 **Ditch on east side of Hwy 40:34. Note erosion between highway shoulder and ditch from flow bypassing check dams. Photo taken June 2, 2025, facing northwest.**

Photo 4 **Ditch on east side of Hwy 40:34. Note recreational trail/road that crosses highway ditch. Photo taken June 2, 2025, facing southeast.**

Photo 5 **Ditch on east side of Hwy 40:34. Note erosion between highway shoulder and ditch from flow bypassing check dams, material building up behind checks dam, and deterioration and undermining of turf reinforcement mat. Photo taken June 2, 2025, facing west.**

Photo 6 **Ditch on east side of Hwy 40:34. Note erosion between highway shoulder and ditch from flow bypassing check dams, deterioration and undermining of turf reinforcement mat, and quality of riprap particles in ditch, some of which are composed of conglomerate. Photo taken June 2, 2025, facing southeast.**

Photo 7 **Ditch on east side of Hwy 40:34, at north end of site. Photo taken June 2, 2025, facing northwest.**

Photo 8 **Ditch on east side of Hwy 40:34, at north end of site. Photo taken June 2, 2025, facing southeast near WP033.**