

**ALBERTA TRANSPORTATION AND
ECONOMIC CORRIDORS
GEOHAZARD ASSESSMENT PROGRAM
PEACE REGION (PEACE RIVER DISTRICT)
2025 INSPECTION**



Site Number	Location	Name	Hwy	km
PH080	North of St. Isidore	McKinney Creek	688:02	15.42
Legal Description		UTM Co-ordinates		
NW15/NE16/SE21/SW22-084-20-W5M		11U E 461,782	N	6,308,097

	Date	PF	CF	Total
Previous Inspection:	15-May-2023	8	2	16 (Erosion)
Current Inspection:	14-May-2025	8	2	16 (Erosion)
Road AADT:	1040		Year:	2025
Inspected By:	Rocky Wang, TEC		Ken Froese, Thurber	
Report Attachments:	<input checked="" type="checkbox"/> Photographs	<input type="checkbox"/> Plans	<input type="checkbox"/> Maintenance Items	

Primary Site Issue:	Landslide occurred on west slope of high embankment during installation of extensions for bridge file culvert in 2017. 2023: Erosion at the edges of the fill	
Dimensions:	Embankment fill is 300 m long measured along the road and 220 m wide perpendicular	
Date of Remediation:	2018: New culvert installed and embankment sideslopes flattened	
Maintenance:		
Observations:	Description	Worsened?
<input checked="" type="checkbox"/> Pavement Distress	Some differential settlement was observed at the ends of the embankment fill	<input type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	Significant slump occurred on the west side of the embankment during culvert extension excavation in 2017. The existing culvert and extension were abandoned and a new culvert installed instead. Slump had also occurred near shoulder on east side in 2013.	<input type="checkbox"/>
<input checked="" type="checkbox"/> Erosion	Erosion gullies are forming at the fill/native slope contacts in all four quadrants and exacerbated by rock clusters. Some erosion in approach ditches beyond the embankment fill. Deep erosion gullies just beyond riprap at culvert inlet and outlet.	<input checked="" type="checkbox"/>
<input type="checkbox"/> Seepage		<input type="checkbox"/>
<input checked="" type="checkbox"/> Bridge / Culvert	New culvert installed in 2018 – no apparent distress or evidence of slope movement	<input type="checkbox"/>
<input type="checkbox"/> Other		<input type="checkbox"/>
Instrumentation: Three vibrating wire piezometers (VW18-1 to 18-3) were installed by hand auger during construction from the base of the culvert excavation. These piezometers were trenched to the side of the excavation and used to monitor pore pressures during fill placement. Significant increases in the water level were observed during fill placement. VW18-1 (near west end of culvert): The water level spiked up about 6 m from the baseline readings during construction and appears to have stabilized about 2 m above the pre-construction level. VW18-2 (at west 1/3 of culvert): The water level spiked up almost 15 m from the baseline readings during construction and has dropped steadily since though at a decreasing rate with seasonal spike upward of about 0.5 m each fall. The current water level is about 3.5 m above the pre-construction level.		

VW18-3 (at east 1/3 of culvert): The water level spiked up about 5.5 m from the baseline readings during construction, dropped steadily thereafter, and is now stable at about 3 m above the pre-construction level.

Assessment:

SHORT VERSION: This embankment has a history of instability back to 1998. Thurber conducted a call-out inspection in 2013 for a slide on the east side of the embankment; however, the major failure occurred in fall of 2017 when an excavation for the culvert extension, necessary for grade widening, caused a landslide on the west side deforming the existing culvert. The decision was made to excavate and remove that culvert (which had already been lined due to corrosion issues) and replace it with a new one on a better alignment which also allowed for removal of the disturbed material from the slide. The highway was reconstructed at a final design grade about 2 m lower than design as the new culvert thickness was insufficient for the planned embankment height (a thicker culvert could not be obtained on short notice). Thurber's 2023 Geohazard Inspection report should be consulted for a longer version of the site history.

In 2023, there were no signs of slope movement on the embankment or highway surface. The observations made in 2025 also confirm that the embankment appears to be stable although the pavement appears to be deteriorating with alligator cracking and potholes being to form at the north transition. Some pavement raveling was also noted. The gullies in the upland ditches outside of the crossing had grown slightly but vegetation appears to be taking hold. Some new rutting was observed.

The significant erosion gullies forming at all of the fill interfaces in all quadrants of the embankment noted in 2023 have gotten worse as of 2025. In three of the quadrants, clusters of riprap had been placed in the ditch (these were redrawn in 2025). However, the domed shape of these clusters have served to push flow around both sides concentrating flow on the downstream side resulting in downcutting beside these clusters and the formation of gullies immediately downslope. The growth of the gullies has caused several of the rock clusters to collapse. In the SE quadrant, the erosion has caused the main flow to detour outside of the channel into the bush.

Significant gullies have formed at the inlet (east end) on both sides of the bank just upstream of the riprap treatment which have eroded noticeably since 2023. A new gully developed at the west end since 2023 at the edge of the outlet riprap apron.

Recommendations:

Short-Term:

- Routine inspection should be undertaken to ensure that the ongoing ditch erosion is not encroaching on the highway or nearby approaches.

Medium-Term:

- The ditches in all four quadrants should be reconstructed: remove the existing riprap clusters, regrade the ditches in a trapezoidal shape, line flat sections of the ditches with TRM, and steep sections of the ditch with riprap or gabion mattress. If the gradient requires it, riprap or gabion basket check dams should also be installed.
- Extend the bridge culvert inlet riprap apron further upstream. Reshape the ditches such that flow discharges in a controlled manner on to these aprons at the inlet and outlet.
- Use compacted fill or grout, along with ditch reshaping and erosion protection, to repair the hanging outlet at the southwest approach.

Ongoing Inspection:

- It is recommended that the every second year Geohazard inspection frequency be maintained.

Closure

It is a condition of this letter report that Thurber's performance of its professional services will be subject to the attached Statement of Limitations and Conditions.

Don Proudfoot, M.Eng., P.Eng.
Partner | Senior Geotechnical Engineer

Ken Froese, M.Eng., P.Eng.
Senior Associate | Senior Geotechnical Engineer

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1. STANDARD OF CARE

This Report has been prepared in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances at the same time and in the same or similar locality and in compliance with all applicable laws.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment, including this Statement For Use and Interpretation of Report, are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

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The Report has been prepared for the specific site, development, design objectives, and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

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5. INTERPRETATION OF THE REPORT

- a) **Nature and Exactness of Soil and Contaminant Description:** Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors is inherently judgement-based. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other parties making use of such documents or records with or without our express written consent need to be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other parties. Some conditions are subject to change over time and those making use of the Report need to be aware of this possibility and understand that the Report only presents the interpreted conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client must disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.
- b) **Reliance on Provided Information:** The evaluation and conclusions contained in the Report have been prepared based on conditions in evidence at the time of site inspections and based on information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report resulting from misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other parties providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.
- c) **Design Services:** The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber is recommended to be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design need to be reported to Thurber immediately so that Thurber can address potential conflicts.
- d) **Construction Services:** During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions to confirm and document that the site conditions do not materially differ from those conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. INDEPENDENT JUDGEMENTS OF CLIENT

The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or other parties who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes, but is not limited to, decisions made to develop, purchase, or sell land, unless such decisions expressly form part of the stated purpose of the Report as described in Paragraph 3.

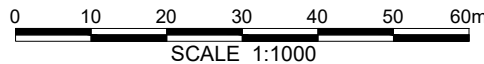


LEGEND

- APPROXIMATE VIBRATING WIRE PIEZOMETER (VW) LOCATION
- PHOTOGRAPH NUMBER AND DIRECTION
- RIPRAP PILE (EROSION CONTROL MEASURE) (REDRAWN IN 2025)

NOTE:

- MAY 2025 OBSERVATIONS SHOWN IN RED
- IMAGE FROM ESRI WORLD IMAGERY DATED SEPTEMBER 2022



PEACE REGION (PEACE RIVER DISTRICT)

PH080: MCKINNEY CREEK CULVERT SLIDE
HWY 688:02 km 15.42 BF72477
2025 SITE INSPECTION PLAN

DWG No. 32121-PH080-1

DRAWN BY	DLA
DESIGNED BY	KEF
APPROVED BY	DWP
SCALE	1:1000
DATE	SEPTEMBER 2025
FILE No.	32121





Photo 1 – Looking east at erosion at collapsed riprap clusters in NW quadrant ditch.



Photo 2 – Looking west at a riprap cluster and erosion gully in lower half of NW quadrant ditch.



Photo 3 – Looking SE at new erosion gully cutting through the edge of the outlet riprap apron.



Photo 4 – Looking west at erosion gully forming in SW quadrant ditch.



Photo 5 – Looking south at eroding west ditch. Vegetation growth has improved slightly since 2023.



Photo 6 – Looking north at erosion gully forming below the outlet of an approach culvert in the west ditch south of the bridge culvert. Vegetation is becoming established. Also note dip in the highway over the bridge culvert.



Photo 7 – Looking north at erosion gully on the north side of the culvert inlet which is starting to undermine the riprap apron.



Photo 8 – Looking south at the north erosion gully (far side of Photo 6) and south erosion gully (far side of this photo) at the culvert inlet.



Photo 9 – Looking east at slumping forming upstream of the culvert inlet.



Photo 10 – Looking east at erosion gully forming below private landowner culvert on the east side of the ditch north of bridge culvert.



Photo 11 – Looking northeast at a gully starting to form below an approach culvert near Photo 9.



Photo 12 – Pothole and alligator cracking at north end near farm approach.