

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



Site Number	Location	Name	Hwy	km
PH038-1	North of Town of Peace River	Whitemud River (km 45.5)	743:02	45.3
Legal Description		UTM Co-ordinates		
S11-88-21-5		11V N 6,274,373	E 485,755	

	Date	PF	CF	Total
<b>Previous Inspection:</b>	16-May-2023	7	2	14 (erosion scale)
<b>Current Inspection:</b>	13-May-2025	11	3	33 (erosion scale)
<b>Road AADT:</b>	180		<b>Year:</b>	2025
<b>Inspected By:</b>	Rocky Wang, TEC		Don Proudfoot, Thurber Ken Froese, Thurber	
<b>Report Attachments:</b>	<input checked="" type="checkbox"/> Photographs		<input checked="" type="checkbox"/> Plans	<input type="checkbox"/> Maintenance Items

<b>Primary Site Issue:</b>	<b>Site repaired in 2009.</b> Original issue was erosion and sliding affecting the highway sideslope and culvert outlet. Current issue is ongoing erosion of riprap swale and seepage along the highway ditch.	
<b>Dimensions:</b>	85 m of erosion along rip-rap drainage swale.	
<b>Date of any remediation:</b>	2009: The culvert was replaced with a larger, longer culvert, the embankment sideslopes were flattened, and slide areas around the culvert outlet were removed or unloaded. 2011: The swale on the east embankment was re-lined with larger Class 2-3 riprap.	
<b>Maintenance:</b>	Highway closed on July 13, 2020, due to landslide movements at other sites and was reopened late in the year after some detours were constructed around those landslides	
<b>Observations:</b>	<b>Description</b>	<b>Worsened?</b>
<input checked="" type="checkbox"/> Pavement Distress	Highway is gravel surfaced. Grading of the roadway is undertaken routinely, and the current operator has pushed the surface west exposing subgrade and seepage.	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	No noticeable signs of overall movement of the embankment. Slumping occurring along east swale and near both the culvert inlet and outlet.	<input type="checkbox"/>
<input checked="" type="checkbox"/> Erosion	Erosion has occurred along the east swale causing slumping along the entire length. Voids forming below concrete headwalls at inlet and outlet. Gravel from the roadway is washing down the east sideslope.	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Seepage	Minor seepage was noted in the riprap apron at the culvert outlet. Seepage also noted along the highway west ditch which has become quite pronounced since 2020 and seems to have increased since the grader operator has pushed the roadway wider.	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Bridge / Culvert	The 2.43 m dia. culvert (BF77273-2) was installed in 2009 and is in good condition. There is a 900 mm dia. culvert at the north side of the site: the inlet is sunken well below ditch level and an erosion bowl and gully have formed at the outlet.	<input checked="" type="checkbox"/>
<input type="checkbox"/> Other		<input type="checkbox"/>

**Instrumentation:**

None – destroyed during construction

**Assessment:**

Significant landslide movements on both sides of the valley closed the highway in July 2020 until detours were in place in Fall 2020. This site is located on a relatively flatter section of the roadway and was unaffected by these other movements.

The embankment fill slopes appeared to be in good condition with no signs of global instability and are well vegetated.

Significant erosion and settlement have developed especially in the upper, steeper, 30 m of the east swale where tension cracks and slumping have formed on both sides of the swale and have continued to deteriorate since 2016. Erosion, settlement, and cracking was also present at several other locations along the swale and have also continued to deteriorate though less aggressively since about 2020. Erosion and settlement along the drainage swale also extends closer to the toe of the bank (near the culvert outlet). The deterioration of this rock swale is likely a result of poor compaction, poor fill quality, and possible gaps in geotextile. Water flow is getting outside of the channel upslope so can erode behind the riprap for the remainder. The overall width of this erosion slumping increased in 2023 and, in 2025, the cracking has begun to extend into the tree line.

Some erosion and shallow slump cracks are present in the fill at the culvert outlet but have not worsened noticeably since about 2020. The void on the east side of the outlet concrete headwall was unchanged but the one on the west side continues to erode and grow in volume. Accumulated gravel was also noted in the channel just beyond the outlet. In 2020, voids were also documented below the concrete headwall at the inlet as well. No further deterioration was observed in 2021 though minor deterioration was noted in 2023 as ongoing erosion continues to affect the stability of the swale and river valley slopes. Changes in grading practice have meant that the sediment accumulation and ponding water observed in 2023 beyond the ditches haven't recurred though the water is now ponding in the ditch at the SW end of the site.

The scarps that were noted on the north side of the creek (left bank) west of the inlet and at the east side of the outlet appear to be stabilizing.

The seepage along the west ditch has continued to become more pronounced at each visit. In 2023, the grader operator had been cutting a shallow v-ditch to control this flow and limiting how much gets out on the roadway surface as it can cause icing in the winter. In 2025, the v-ditch had been graded further west exposing soft subgrade which could be a hazard for vehicles. Water is now also ponding on the roadway.

**Recommendations:****Short-Term:**

- Periodic visits by the AT Maintenance Contractor are recommended to ensure that the erosion at the west end of the swale is not adversely affecting the highway.
- Grading practices should be adjusted to limit the attempts to widen the roadway top width at this location as pushing into the soft subgrade is somewhat counter-productive.
- The silt fences installed on both sides of the embankment are no longer required and should be removed to minimize the potential for channelized flow.

**Medium-Term**

- A subdrain should be installed at the spring along the west ditch discharging into the riprap apron at the culvert inlet. A proposed alignment and typical French Drain cross-section have been shown on the drawing. A riprap surface on the top of the subdrain should be used to allow infiltration though it will be prone to plugging due to grading and will require routine cleaning or replacement.

**Long-Term:**

- The east swale should be completely reconstructed: remove and salvage the existing riprap, excavate the wet or soft subgrade at the base of the channel to a depth of 1 m over a 10 m width, place and compact borrow material, flatten the sideslopes, install new non-woven geotextile, and replace the rock riprap. The subgrade should be compacted with a sheepsfoot compactor. Borrow material could be taken from the knoll located northeast of the channel.

- The voids forming below the concrete headwalls should be grouted if the other repairs are undertaken at the site.
- Similarly, if other repairs are being done, consideration should be given to adding additional riprap along the creek banks at the outlet to replace that lost to water erosion as well as at both headwalls.

Ongoing Investigation:

- It is recommended that the Geohazard inspection should continue as scheduled (every other year).

**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 Use and Interpretation of Report.

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

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



## STATEMENT FOR USE AND INTERPRETATION OF REPORT

### 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.

**IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT, AS DESCRIBED ABOVE. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE OF THE REPORT.**

### 3. BASIS OF REPORT

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

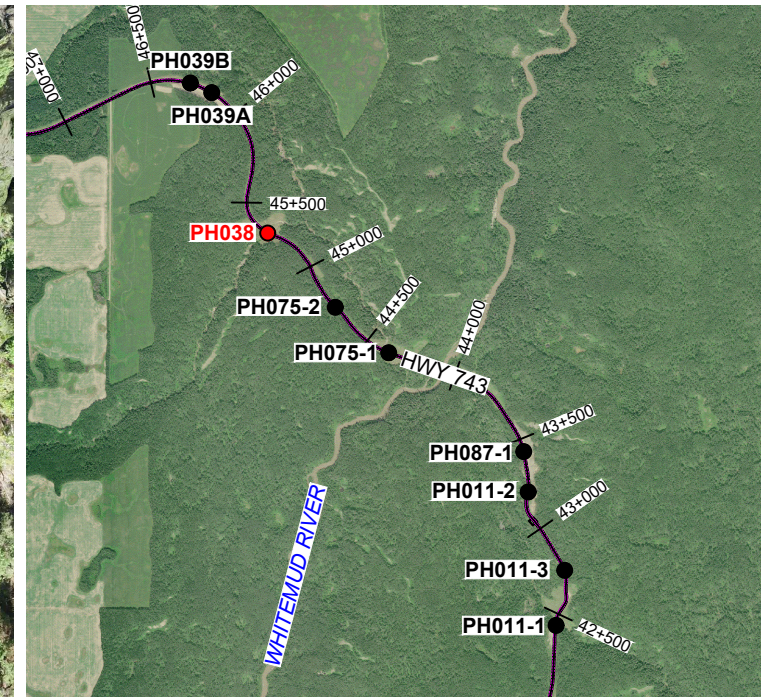
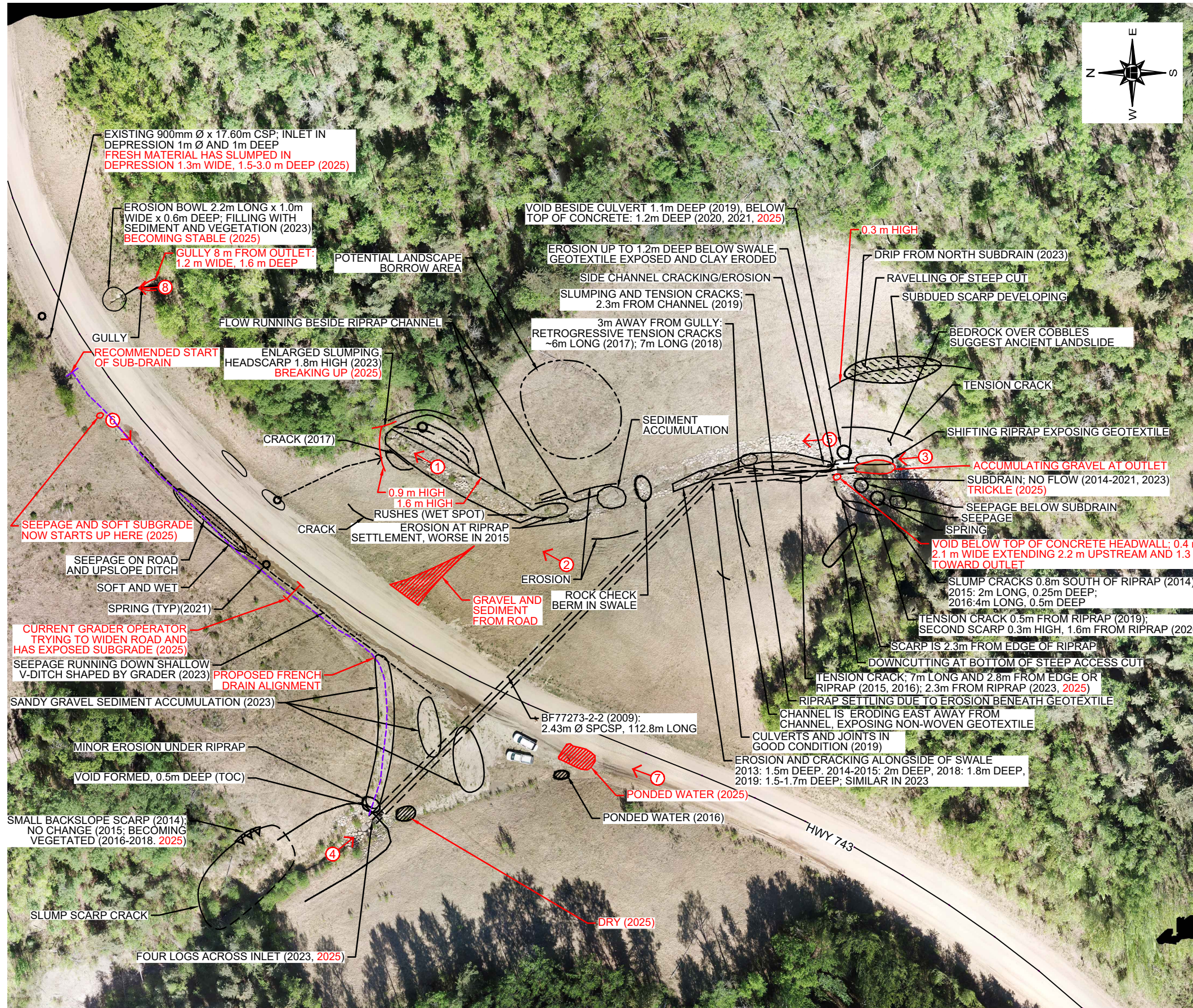
The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client for the development, design objectives, and/or purposes described to Thurber by the Client. **NO OTHER PARTY MAY USE OR RELY ON THE REPORT OR ANY PORTION THEREOF FOR OTHER THAN THE CLIENT'S BENEFIT IN CONNECTION WITH THE PURPOSES DESCRIBED IN THE REPORT.** Any use which a third party makes of the Report is the sole responsibility of such third party and is always subject to this Statement for Use and Interpretation of Report. Thurber accepts no liability or responsibility for damages suffered by any third party resulting from use of the Report for purposes outside the reasonable contemplation of Thurber at the time it was prepared or in any manner unintended by Thurber.

### 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

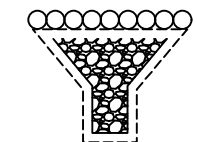
The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or 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.



**KEY PLAN**  
SCALE 1:40 000

**LEGEND**  
① PHOTOGRAPH NUMBER AND DIRECTION

- NOTES**
1. FEATURE LOCATIONS ARE APPROXIMATE.
  2. MAY 2025 OBSERVATIONS SHOWN IN RED.
  3. MANY HISTORICAL NOTATIONS REMOVED IN 2023 - CONSULT 2021 DRAWING



PROPOSED FRENCH DRAIN DETAIL:  
WASHED ROCK IN NON-WOVEN GEOTEXTILE  
0 10 20 30 40 50 60m  
SCALE 1:1000

ORTHOMOSAIC DERIVED FROM THURBER UAV FLIGHT IN 2023



PEACE REGION (PEACE RIVER DISTRICT)

PH038-1: HWY 743:02 WHITEMUD RIVER, km 45.3  
2025 SITE INSPECTION PLAN

DWG No. 32121-PH038-1

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





**Photo 1 – Looking at the north end of drainage swale.**



**Photo 2 – Looking northeast at drainage swale.**



**Photo 3 – Looking northwest at culvert outlet.**



**Photo 4 – Looking southeast at culvert inlet.**



**Photo 5 – Looking north at swale near the culvert outlet.**



**Photo 6 – Looking southwest at road and seepage along west ditch. Note exposed subgrade at edge of roadway and ponded water in the distance (red arrow).**



**Photo 7 – Looking at seepage along west side of road near the south end of the site.**



**Photo 8 – 900 mm-dia. culvert outlet and gully at the north end of the site.**



**UAV 2023 Orthomosaic: Seepage can be seen along the left side of the highway; the eroding and slumping channel is to the right of the highway.**



**UAV 2023 UAV Image – Slumping at the north end of the of the riprap-lined channel on the east embankment.**