

**ALBERTA TRANSPORTATION AND
ECONOMIC CORRIDORS
GEOHAZARD ASSESSMENT PROGRAM
PEACE REGION – SWAN HILLS
2024 INSPECTION**



Site Number	Location	Name	Hwy	km
SH022-7	Little Smoky River	Little Smoky River Valley, North Hill – Site #7	744:02	19.58-19.71*
Legal Description		UTM Co-ordinates		
SW21-76-22-W5M		11U E 477,732	N	6,161,398

	Date	PF	CF	Total
Previous Inspection:	31-May-2022	10	4	40
Current Inspection:	4-Jun-2024	10	4	40
Road AADT:	270		Year:	2023
Inspected By:	Rishi Adhikari, TEC Robert Senior, TEC		Ken Froese, Thurber Roger Skirrow, Thurber	
Report Attachments:	<input checked="" type="checkbox"/> Photographs	<input type="checkbox"/> Plans	<input checked="" type="checkbox"/> Maintenance Items	

Primary Site Issue:	Highway traverses deep-seated, retrogressive landslides with ongoing creep movements due partly to erosion at toe by the Little Smoky River and Peavine Creek resulting in cracking and sagging of the pavement surface at numerous locations. Approx. 4 km of the highway crosses this unstable north valley slope. Site #7 is 70 m above and 480 m away from the Peavine Creek.	
Dimensions:	120 m length of highway affected by cracking and distortion. Unchanged from 2022. * - Division between SH22-7 and SH12-8 appears arbitrary.	
Date of Remediation:	Approximately 1 m thick GBC “sandwich” placed at this site in fall of 2015 or spring of 2016.	
Maintenance:	Routine ACP crack sealing, milling, and patching (2014 and 2015), when required. Spring 2017: Both sideslopes regraded Fall 2017: Patch over the entire site Spring 2019: Milling over most of the site 2021: From 0 m (at km 19.6) up to 1.06 m (at km 19.7) of vertical grade readjustment (downward) and 50 mm overlay.	
Observations:	Description	Worsened?
<input checked="" type="checkbox"/> Pavement Distress	Previously observed reflective longitudinal and traverse cracks are widespread and have extended and merged together.	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	Site is located on an active deep-seated landslide moving toward the Little Smoky River in one direction and Peavine Creek in another. This site crosses over and along a main scarp. The main slide scarp extends beyond the road prism into the backslope.	<input checked="" type="checkbox"/>
<input type="checkbox"/> Erosion		<input type="checkbox"/>
<input type="checkbox"/> Seepage		<input type="checkbox"/>
<input type="checkbox"/> Bridge/Culvert		<input type="checkbox"/>
<input type="checkbox"/> Other		<input checked="" type="checkbox"/>

Instrumentation: None.

Assessment:

The overall valley slope is moving as several separate slide blocks in response to the toe erosion and downcutting of two different rivers resulting in numerous scarps, sag ponds, and differential movement zones going in slightly different directions. The highway intersects the scarps of these blocks at several locations resulting in an uneven highway surface and cracking.

Site #7 intersects a major scarp which parallels the highway resulting in significant pavement distortions and requires frequent patching and milling to maintain a safe driving surface. The 2021 highway overlay removed most of the previously observed pavement distortions. As of the 2022 Geohazard inspection, some of the previously observed longitudinal and traverse cracks have started to reflect through. The highway embankment sideslopes were regraded to promote better drainage at the site. During the 2024 inspections, the cracks continued to spread. The main scarp that crosses the highway near km 19.62 shows cracks that have widened and exhibit vertical displacement. There was dip adjacent to the cracks that was milled. The previously observed slide scarp in the backslope has resurfaced.

Recommendations:

Short-Term:

- Road maintenance activities such as milling and patching should continue as necessary to maintain a safe roadway surface. Crack sealing of the ACP should be done to limit rain fall and snow melt entering the crack network.

Long-Term:

It is understood that, currently, the only long-term remediation option under consideration is realignment of the entire north hill section of Highway 744, and this study is currently being undertaken by CIMA+.. Consideration is also being given to a shorter realignment which would include this Site #7.

Ongoing Investigation:

- It is recommended that biennial geohazard inspection should continue as scheduled. As a potential highly active Site along Highway 744, consideration should be given to installing one or two deep slope inclinometers to measure movement rates at this site and contribute to a more fulsome understanding of the valley geohazard situation.

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.

Roger Skirrow, P.Eng.
Senior Geotechnical Engineer

Mark Gallego, P.Eng.
Geotechnical Engineer



STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment 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. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE 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.

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The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT THURBER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS THURBER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belong to Thurber. Any use which a third party makes of the Report, is the sole responsibility of such third party. Thurber accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Thurber's express written permission.

5. INTERPRETATION OF THE REPORT

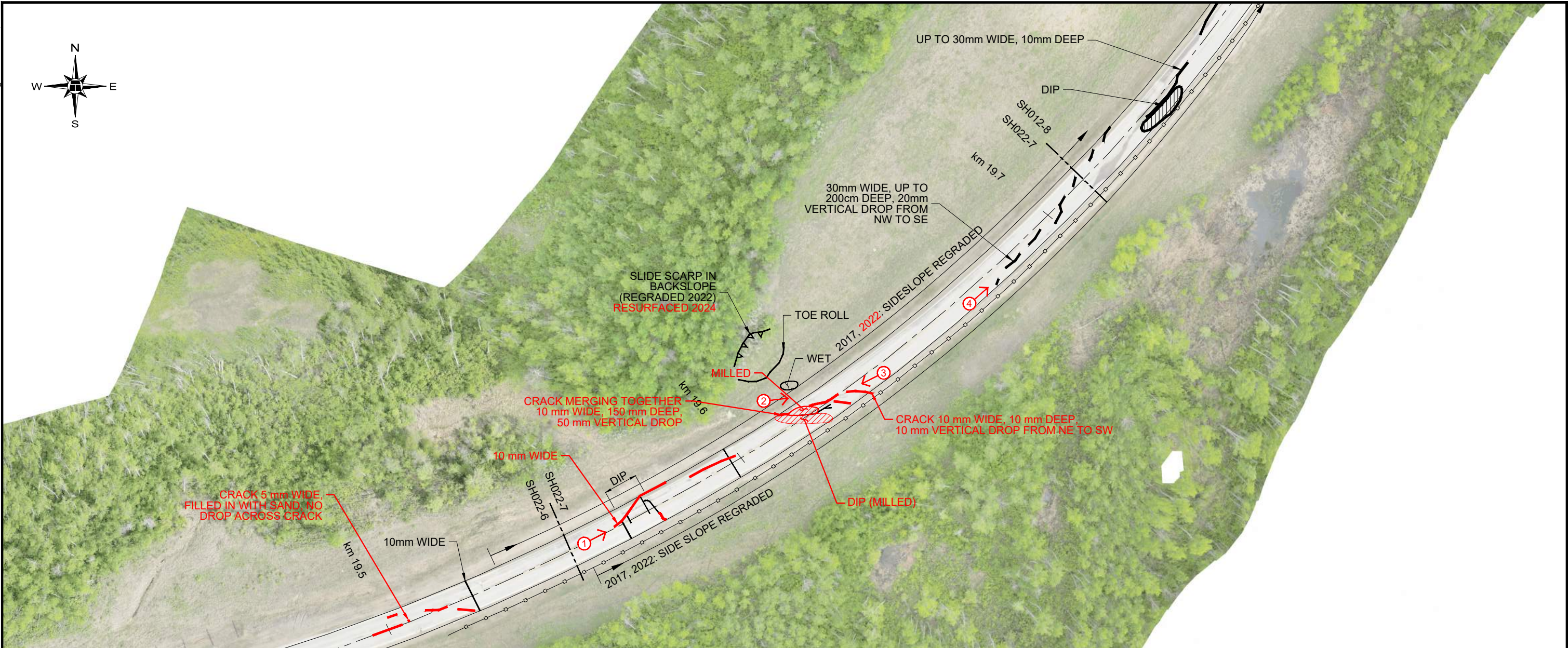
- a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature. 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 persons making use of such documents or records with our express written consent should 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 persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client should 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 on the basis of conditions in evidence at the time of site inspections and on the basis of 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 as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons 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 should 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 detailed in the contract documents should 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 in order to confirm and document that the site conditions do not materially differ from those interpreted 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. RELEASE OF POLLUTANTS OR HAZARDOUS SUBSTANCES

Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause the escape, release or dispersal of those substances. Thurber shall have no liability to the Client under any circumstances, for the escape, release or dispersal of pollutants or hazardous substances, unless such pollutants or hazardous substances have been specifically and accurately identified to Thurber by the Client prior to the commencement of Thurber's professional services.

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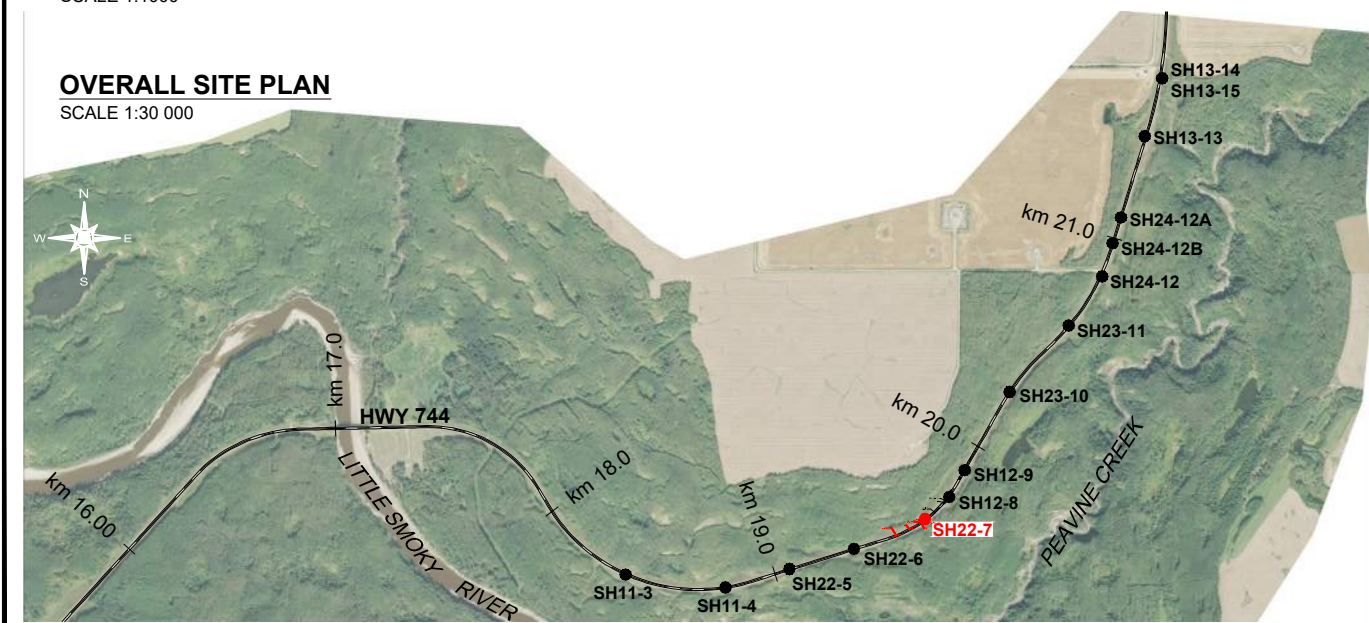


DETAILED SITE PLAN

SCALE 1:1000

OVERALL SITE PLAN

SCALE 1:30 000

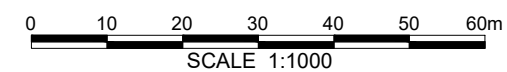


LEGEND

- DRAINAGE CHANNEL
- GUARDRAIL
- ASPHALT PATCH
- DIRECTION AND NUMBER OF PHOTO

NOTES

1. FEATURE LOCATIONS ARE APPROXIMATE.
2. JUNE 2024 OBSERVATIONS SHOWN IN RED.
3. CRACK AND PATCH PATTERNS RESET AS HWY 744 WAS OVERLAID IN SUMMER 2021.
4. GUARDRAIL AND CULVERT LOCATIONS TAKEN FROM MCINTOSH PERRY AS-BUILT DRONE SURVEY (JULY 2021).



ORTHOIMAGE DERIVED FROM UAV IMAGERY FLOWN BY THURBER IN JUNE 2024
 OVERALL SITE PLAN IMAGE: SATELLITE IMAGE FROM VALTUS IMAGERY (DATED 2014)



PEACE REGION (SWAN HILLS)

**SH022-7: HWY 744:02 LITTLE SMOKY RIVER VALLEY
 2024 SITE INSPECTION PLAN**

DWG No. 32121-SH022-7

DRAWN BY	ML
DESIGNED BY	MG
APPROVED BY	DWP
SCALE	AS SHOWN
DATE	SEPTEMBER 2024
FILE No.	32121





Photo 1 – Looking east from west end of site.



Photo 2 – Looking at cracks merging together and widening where main scarp crosses highway.



Photo 3 – Looking west at parallel cracks merging together at the centerline.



Photo 4– Looking east towards Site #8 where cracks were observed near the guardrail.