

**ALBERTA TRANSPORTATION
GEOHAZARD ASSESSMENT PROGRAM
PEACE REGION – SWAN HILLS
2020 INSPECTION**



Site Number	Location	Name	Hwy	km
SH011-3 SH011-4	Little Smoky River	Little Smoky River Valley, North Hill – Sites #3 and #4	744:02	18.26-18.52 18.62-18.90
Legal Description		UTM Co-ordinates		
Site 3: SE20-76-22-W5M		11U E 476,536	N	6,161,182
Site 4: SE20-76-22-W5M		11U E 476,872	N	6,161,121

	Date	PF	CF	Total
Previous Inspection:	11-Jun-2019	7 9	3 3	Site 3: 21* Site 4: 27
Current Inspection:	2-June-2020	- 9	- 3	- Site 4: 27
Road AADT:	240		Year:	2019
Inspected By:	Rocky Wang, TRANS Ed Szmata, TRANS		Ken Froese, Thurber	
Report Attachments:	<input checked="" type="checkbox"/> Photographs <input checked="" type="checkbox"/> Plans <input 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 #3 is 45 m above and 350 m away from the Little Smoky River and Site #4 is 60 m above and 530 m away.
Dimensions:	Site 3: 240 m length of highway affected by cracking and distortion Site 4: 270 m length of highway affected by cracking and distortion
Date of Remediation:	None
Maintenance:	2005: 600t of asphalt overlay 2006: 640t of asphalt overlay Routine ACP crack sealing, milling, and patching, when required. 2019: Milled both lanes at Site 4 2020: Line painting; Spot patching at Site 4

Observations (Site 4):	Description	Worsened?
<input checked="" type="checkbox"/> Pavement Distress	Site was recently milled. Numerous longitudinal and traverse cracks are present with minor pavement undulations due to movement.	<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.	<input checked="" type="checkbox"/>
<input type="checkbox"/> Erosion		<input type="checkbox"/>
<input checked="" type="checkbox"/> Seepage	Slightly more ponded water observed in 2017 but similar or less in 2018 and 2019.	<input type="checkbox"/>
<input type="checkbox"/> Bridge/Culvert Distress	No culverts within site boundaries	<input type="checkbox"/>
<input type="checkbox"/> Other		<input 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 3:

*After subsequent years of only minor change, the risk level for Site 3 was lowered in 2019 and the site was not inspected in 2020.

Site 4:

In general, the site has deteriorated steadily over the last two or three years. There were noticeable changes in crack widths and lengths despite the milling undertaken across the entire site in 2019. Although the differential heights measured across the cracks was mostly eliminated, the cracks are still present and there is still overall unevenness of the driving surface. Recent patching had been undertaken at km 18.84 where vertical deformation has continued to occur.

Recommendations:

Short-Term:

- Road maintenance should continue as necessary to maintain a safe roadway surface and may consist of milling, patching, and crack sealing of the ACP.
- Culvert outlet at km 18.28 (Site 3) should be cleaned out.

Medium-Term:

- It is recommended to replace both culverts (Site 3) entirely due to the level of corrosion observed and to reset the grades and improve overall flow in and out. Appropriate riprap erosion protection should be placed at the ends of the culverts at that time.

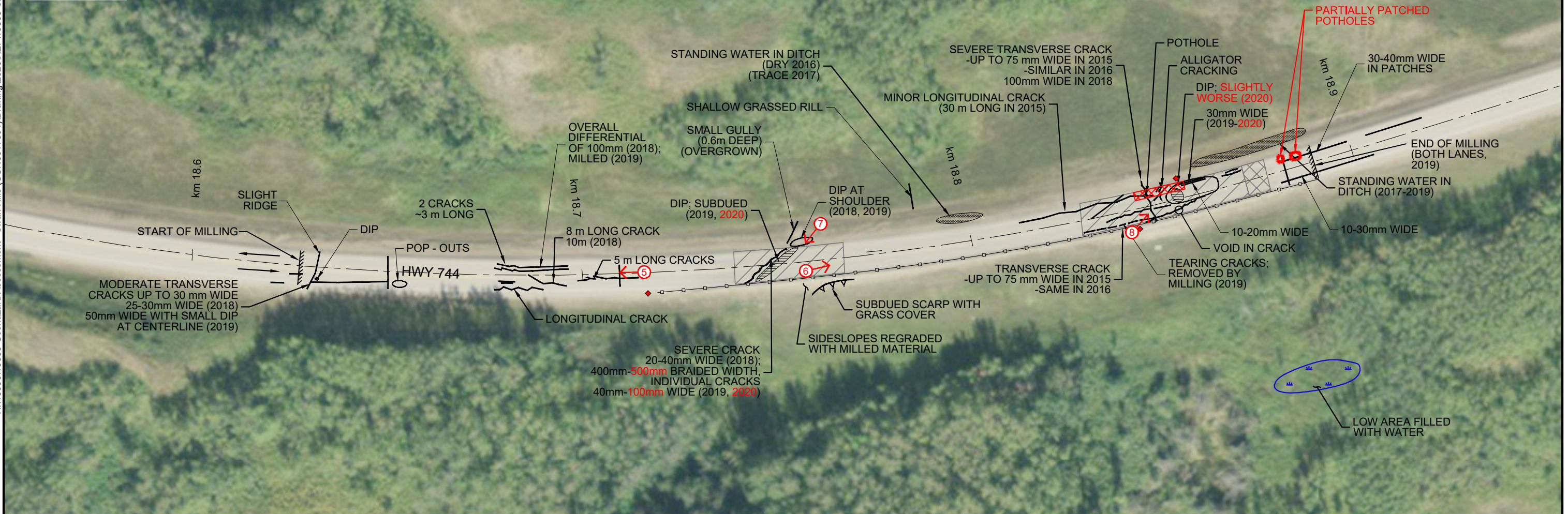
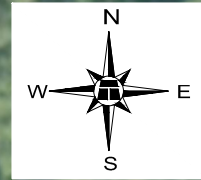
Long-Term:

It is understood that, at this time, the only remediation option under consideration is realignment of the north hill section of Highway 744. However, given the high cost of this option and as it is a low volume highway, it is unlikely that realignment will be undertaken in the near future. Consideration is also being given to a shorter realignment which will occur farther up the slope and will likely not include Sites #3 and #4.

Ongoing Investigation:

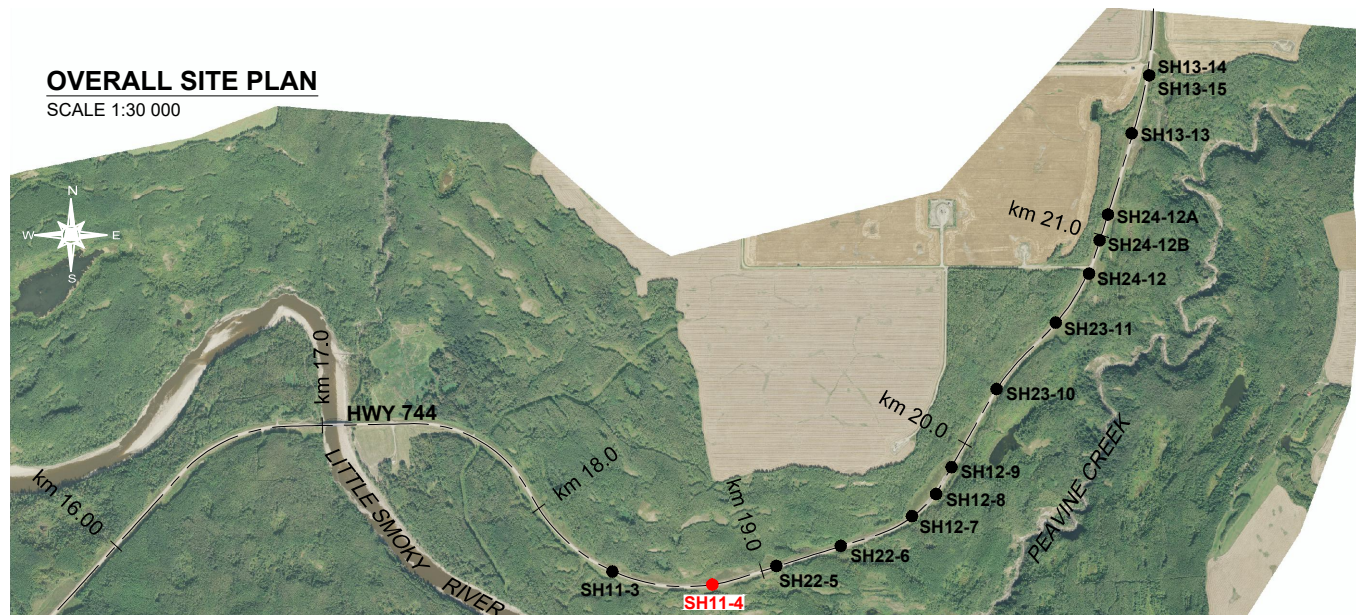
- It is recommended that the annual GeoHazard inspection should continue as scheduled for Site #4; consideration could be given to dropping Site #3 from the program.
- Test holes and instrumentation could be considered in the future in advance of any planned re-alignments or major slide repairs.

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DETAILED SITE PLAN
SCALE 1:1000

OVERALL SITE PLAN
SCALE 1:30 000

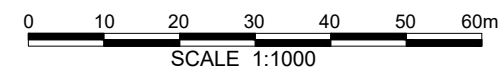


LEGEND

- GUARDRAIL
- ◆ RED TEMPORARY HAZARD SIGN
- ①➔ DIRECTION AND NUMBER OF PHOTO

NOTES

1. FEATURE LOCATIONS ARE APPROXIMATE.
2. PREVIOUS OBSERVATIONS SHOWN IN BLACK (2013-2015 FROM AMEC FIGURE 1, PROJECT EG10030, PROVIDED BY ALBERTA TRANSPORTATION).
3. JUNE 2020 OBSERVATIONS SHOWN IN RED.



SATELLITE IMAGE FROM VALTUS IMAGERY (DATED 2014)



PEACE REGION (SWAN HILLS)

**SH011-4: HWY 744:02 LITTLE SMOKY RIVER VALLEY
2020 SITE INSPECTION PLAN**

DWG No. 13355-SH011-4

DRAWN BY	KLW
DESIGNED BY	KEF
APPROVED BY	DWP
SCALE	AS SHOWN
DATE	OCTOBER 2020
FILE No.	13355



(Note: Photos 1 through 4 are at Site 3 which wasn't viewed in 2020.)



Photo 5, Site 4 – Looking west at patch at ~km 18.750.



Photo 6, Site 4 – Looking east at transverse crack and patch at ~km 18.820.



Photo 7, Site 4 – Looking southwest at dip in highway surface at ~km 18.840.



Photo 8 – Looking northeast of a portion of the patch at km 18.84.