

**ALBERTA TRANSPORTATION  
GEOHAZARD ASSESSMENT PROGRAM  
PEACE REGION–GRANDE PRAIRIE  
2020 INSPECTION REPORT**

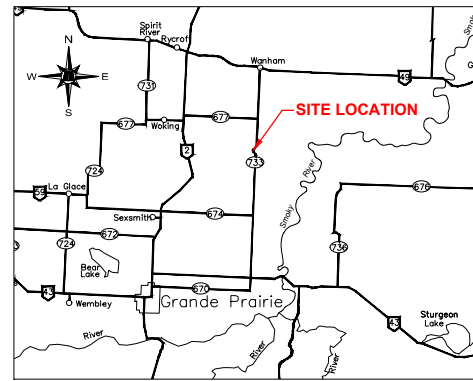


Site Number	Location	Name	Hwy	km
GP35	Hwy 733:04	Bad Heart River North	733:04	8.938
Legal Description		UTM Coordinates (NAD 83)		
LSD-1-33-75-3 W6M		E 412,161 N 6,155,446		

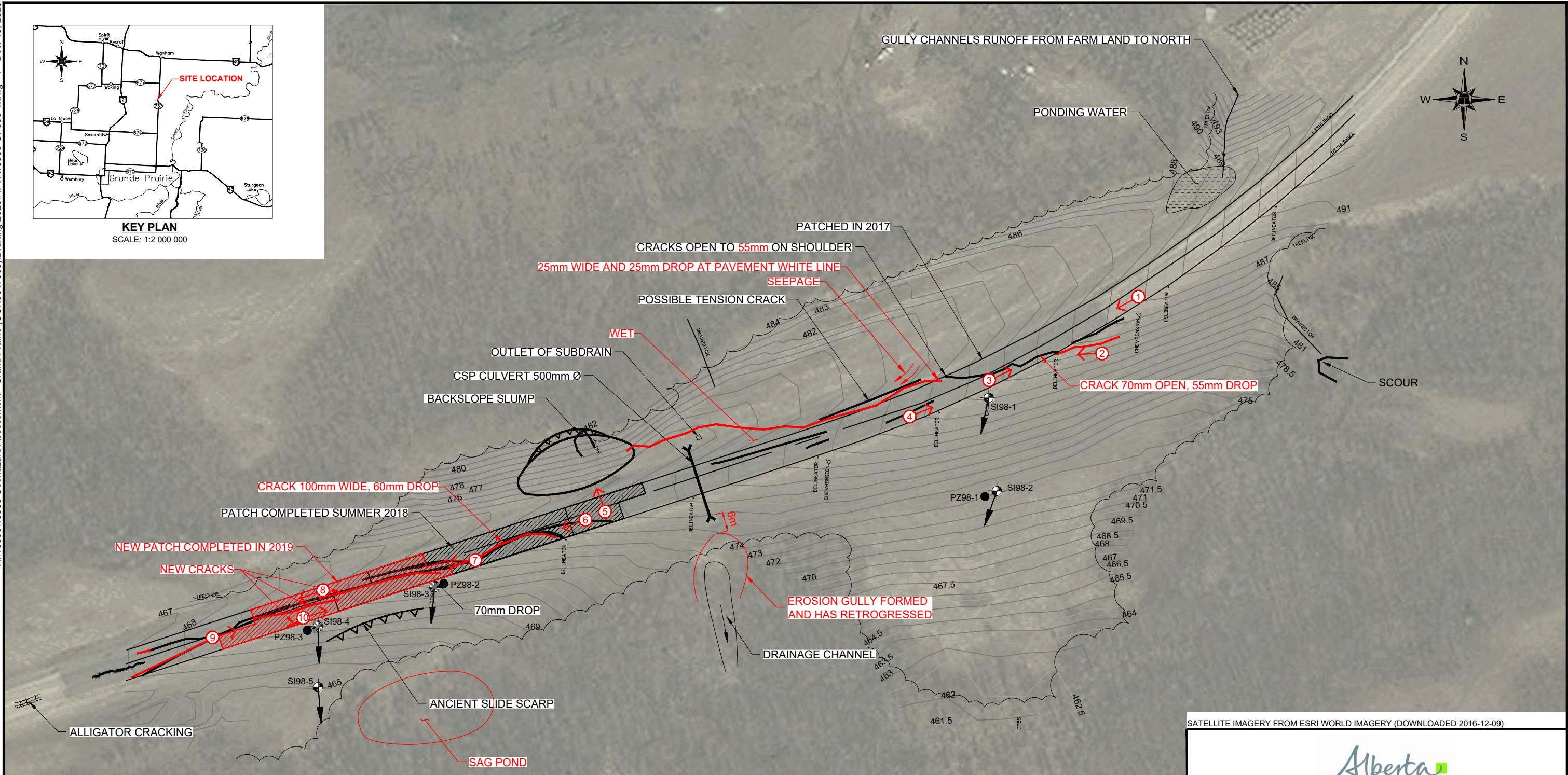
	Date	PF	CF	Total
<b>Previous Inspection:</b>	30-May-2019	11	4	44
<b>Current Inspection:</b>	28-May-2020	13	4	52
<b>Road AADT:</b>	610		<b>Year:</b>	2019
<b>Inspected by:</b>	Ed Szmata, AT Dwayne Lowen, AT Rishi Adhikari, AT		Don Proudfoot, Thurber Nicole Wilder, Thurber	
<b>Report Attachments:</b>	<input checked="" type="checkbox"/> Photographs <input checked="" type="checkbox"/> Plans <input type="checkbox"/> Maintenance Items			

<b>Primary Site Issue:</b>	<p>Sliding movements of Hwy 733:04 along the north valley slope of Bad Heart River Valley. The roadway is located within an active landslide area and previously the site was identified by having an upper slide area and a lower slide area which were active since the early 1980's.</p> <p>Based on the recent observations of ground subsidence and head scarp cracking over the period between 2010 and 2020, it appears that the upper and lower slides have gradually coalesced into one major slide.</p> <p>Slide can be classified as slow movement based on the rate of movement.</p>		
<b>Dimensions:</b>	<p>The upper slide was initially estimated to be about 80 m long and the lower slide was estimated to be about 150 m long along the roadway alignment. The extents along the valley slope for both could not be defined and require further investigation.</p> <p>The upper and lower slides appear to have merged and developed into a large slide about 380 m in length along roadway alignment.</p>		
<b>Maintenance:</b>	ACP patching of dips and cracks in 2019; patching was also carried out in 2018 and 2017.		
<b>Observations:</b>	<b>Description</b>	<b>Worsened?</b>	
<input checked="" type="checkbox"/> Pavement Distress	Cracks and dips on pavement within landslide impact area with differential drop up to 70 mm were observed during the 2020 inspection. The pavement was patched in summer 2019 and these same scarp cracks have reflected through new patch. The northeast portion of the site was not patched but cracks appeared slightly worse especially in the SBL/WBL shoulder they were open to 70 mm.	<input checked="" type="checkbox"/>	
<input type="checkbox"/> Slope Movement	The lower (south) and upper (north) slides have merged into a larger slide. Tension cracks up to 55 mm wide were observed extending along the west ditch near the northeast portion of the slide. The scarp was also more defined in the northwest ditch.	<input checked="" type="checkbox"/>	

<input checked="" type="checkbox"/> Erosion	A drainage gully was observed just south of the 500 mm diameter CSP culvert during previous inspections and has worsened into an erosion gully in 2020. Which is now 6 m from the culvert outlet.	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Seepage	A gully which channels runoff flow from the farmland to the north to the slide area exists approximately 50 northeast of site. Some ponded water was observed at the base of the gully and seepage was previously observed along the west ditch and in a tension crack in the shoulder; seepage was present in 2020.	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Bridge/Culvert Distress	The existing centerline culvert (about 500 mm in diameter) appeared to be functioning well at the time of inspection; however, the culvert was partially obstructed by overgrown vegetation at inlet and outlet locations.	<input checked="" type="checkbox"/>
<input type="checkbox"/> Other		<input type="checkbox"/>
<b>Instrumentation:</b>		
Previous reports indicated that 5 slope inclinometers (SI) and 3 standpipe piezometer (PZ) were installed at this site. Results of the slope movement monitoring from SI readings indicated that the depth of slip surface varied from 7 m to 12 m below the existing ground surface. The instruments at this site are no longer operational and are not being read anymore.		
<b>Assessment:</b>		
No major slope movement was observed at this site; however, ongoing slope creep is occurring since cracks have shown through new patch. Further details of the background information about this site can be obtained from the previous reports in the site Geohazard Binder and are not repeated herein.		
The ongoing creep movements appear to be occurring at this site since 1998. To keep the roadway surface in a relatively good driving condition AT has been milling and patching the pavement every 1 to 2 years. The addition of several asphalt overlays in the past has steepened the shoulder of the northbound lane, which may create traffic hazards to vehicles.		
A mid to long term remediation measure could consist of realigning highway towards the backslope to minimize/avoid the impacts from the active landslide.		
<b>Recommendations:</b>		<b>Ballpark Cost</b>
As AT has been doing over the years, as a short-term mitigation measure, it is recommended that sealing of pavement cracks and patching of roadway be undertaken in the slide impacted area. The differential drops along the backscarps should be milled to improve driving conditions. The site should continue to be monitored to provide a history and trend of potential slide activity.		Maintenance (currently about \$100,000 every year)
Consideration should be given to install guard-rails (+/-150 m) along the northbound lane to eliminate the potential hazard of the sharp shoulder as a result of successive overlay patches. In addition, the inlet and outlet areas of the existing 500 mm centreline culvert should be cleared of vegetation and debris to improve its performance. The erosion gully should be monitored for retrogression. The possible tension crack and scour should be backfilled with clay material to minimize the surface water infiltration.		\$70,000



**KEY PLAN**  
SCALE: 1:2 000 000



SATELLITE IMAGERY FROM ESRI WORLD IMAGERY (DOWNLOADED 2016-12-09)



**PEACE REGION (GRANDE PRAIRIE)**

**GP035-1: HWY 733:04 BAD HEART RIVER NORTH  
2020 SITE INSPECTION**

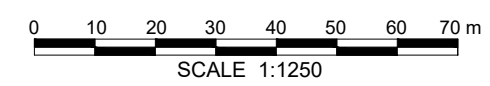
**DWG No. 13353-GP035-1**

**LEGEND**

- CRACKS (APPROXIMATE)
- PREVIOUS SLOPE INCLINOMETER (NON-OPERATIONAL)
- PREVIOUS STANDPIPE PIEZOMETER (NON-OPERATIONAL)
- DIRECTION AND NUMBER OF PHOTO
- SLOPE INCLINOMETER DAMAGED

**NOTES:**

1. PREVIOUS OBSERVATIONS SHOWN IN BLACK.
2. MAY 28, 2020 OBSERVATIONS SHOWN IN RED



DRAWN BY	ML
DESIGNED BY	NPW
APPROVED BY	RVC
SCALE	1:1250
DATE	DECEMBER 2020
FILE No.	13353





**Photo 1.**  
Looking southwest  
along Hwy (former  
north slide)



**Photo 2.**  
Looking southwest  
along Hwy 733 733  
at sharp shoulder  
from successive  
overlays (former  
north slide).



**Photo 3.**  
Looking northeast  
along Hwy 733 at  
scarp crack which  
extends into should  
and embankment  
(former north slide)



**Photo 4.**  
Looking northeast  
along Hwy 733  
(former north slide)  
Possible tension  
crack.



**Photo 5.**  
Looking northwest  
at backslope slump



**Photo 6.**  
Looking southwest  
(former south  
slide).



**Photo 7.**  
Looking southwest  
(end of the former  
south slide).



**Photo 8.**  
Looking southwest  
(end of the former  
south slide).



**Photo 9.**  
Looking northeast  
near the south end  
of the former south  
slide.



**Photo 10.**  
Looking northeast  
near the middle of  
the former south  
slide.





**Photo 11.**  
Looking east at  
ponded water in the  
south ditch.



**Photo 12.**  
Looking south at  
erosion gully.