

SITE NUMBER AND NAME: <b>C003 Battle River Crossing</b>		HIGHWAY & KM: 872:06, 4.0	PREVIOUS INSPECTION DATE: May 27, 2009	INSPECTION DATE: <b>July 12, 2019</b>
LEGAL DESCRIPTION: 5-40-10-W4M	NAD 83 COORDINATES: UTM Northing Easting 12 5806345 471780		RISK ASSESSMENT: PF: 9 CF: 5 TOTAL: 45	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 290 (south) & 460 (north) (Ref No. 126340 & 126330)			CONTRACT MAINTENANCE AREA (CMA): 21	

SUMMARY OF SITE INSTRUMENTATION:		INSPECTED BY: Chris Gräpel (KCB) Ryan Gazley (KCB) Rishi Adhikari (AT)
Operational: Two standpipes installed in 1992 and four standpipes installed in 2007.		
Inoperable: All slope inclinometers installed between 1992 and 2007 (14 total).		
LAST READING DATE: June 29, 2011		
PRIMARY SITE ISSUE: Deep-seated slide located along the Battle River Valley that crosses H872:06 at a skew angle from northwest to southeast. Slide movement is affecting the northbound and southbound lanes as indicated by transverse pavement cracks and guardrail deflection. Erosion in the west (southbound) ditch.		
APPROXIMATE DIMENSIONS: Slide features (i.e. head scarp, tension cracks, etc.) are not well defined. Slide is affecting a section of the highway approximately 200 m long.		
DATE OF ANY REMEDIAL ACTION: 1998 – pavement removed in slide-affected areas and replaced with dust abatement coating. 150 mm perforated drainage pipes installed below the road and along the west ditch to intercept groundwater flows. 2003 – Highway was repaved, and subgrade was improved. 2000 & 2007 – KCB installed replacement instrumentation.		

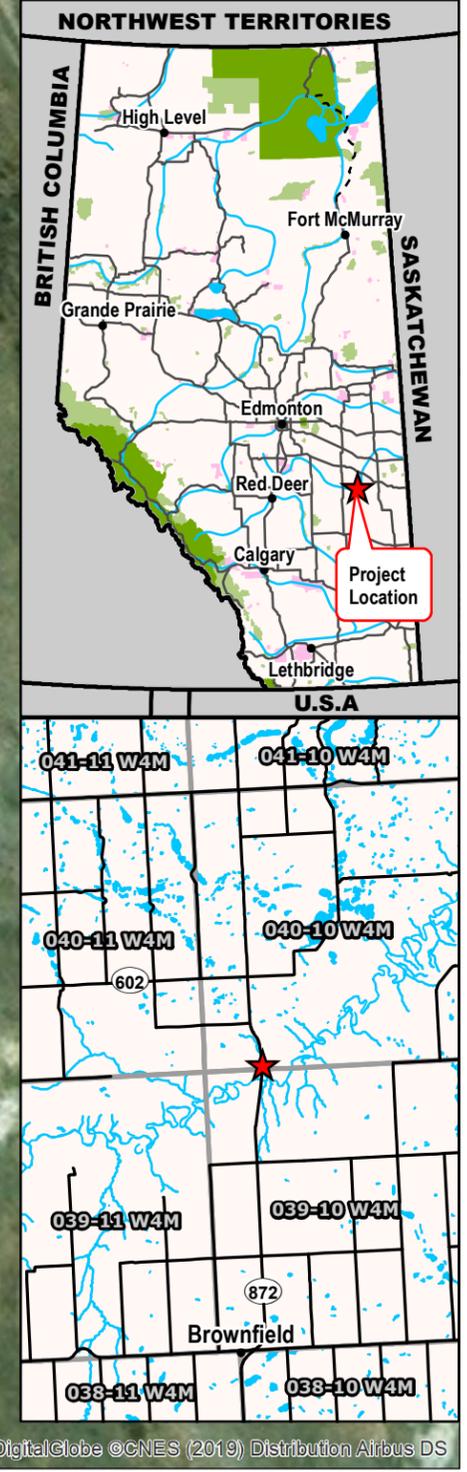
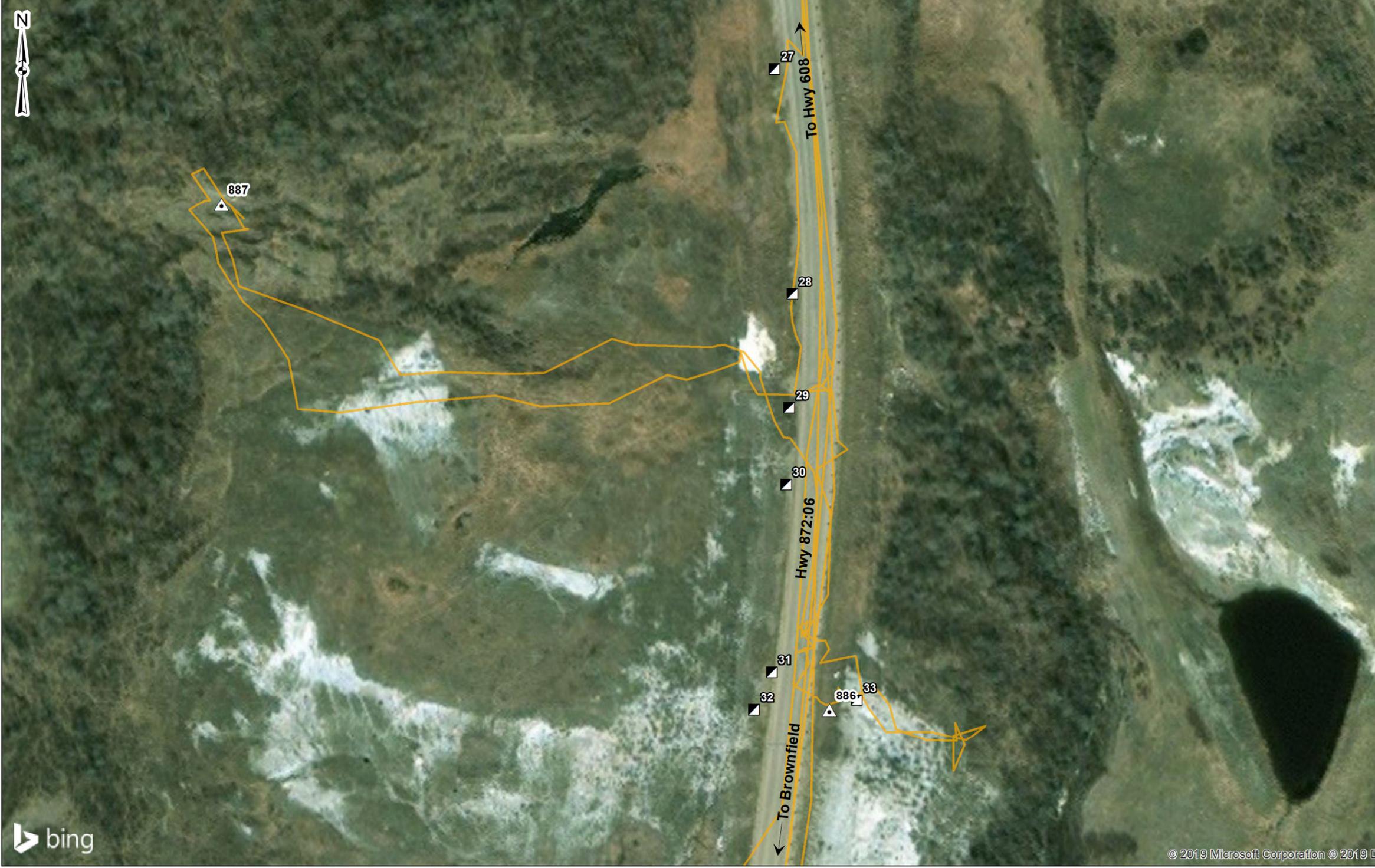
ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Pavement cracking, depressions and dips in southbound and northbound lanes.		
Slope Movement	X				
Erosion	X		Erosion channel/gully in the west (southbound ditch).		
Seepage		X	None observed.		
Culvert Distress		X	None observed.		

<b>COMMENTS</b>
The slide appears to be a deep-seated slide that is failing at a skew angle to the highway based on diagonal and semi-circular transverse cracks in the pavement.
The northbound and southbound lanes are affected by multiple dips and depressions and in some areas the pavement has settled approximately 1 to 2". Skid marks from vehicles braking were observed near most pavement cracks and depressions.
Bedrock is exposed upslope of the highway (waypoint 887) with a scarp extending laterally to the east. Slide blocks and other slide features including a horst and graben were observed downslope of the main scarp.
An erosion gully was observed in the west (southbound ditch) where the highway embankment meets the river valley slope indicating the presence of highly erodible or dispersive soils. Groundwater flow within the river valley slopes adjacent to and below the highway embankment may be contributing to the dips and depressions observed

in the pavement.

On July 19, 2019 KCB returned to C003 with a “dummy” SI probe and water level meter to confirm if the instruments installed between 1992 and 2007 were readable, and if the piezometric level in the standpipes had increased since 2011. KCB confirmed that all SIs are no longer readable and the piezometric levels in the standpipes have decreased since 2011.

Time: 12:20:48 PM  
 Date: August 01, 2019  
 File: Z:\AEDM\A05115A02\ABT\_Central Region GRNIP\400 Drawings\2019\2\_Section B12\_2019\_Site Inspections\MXD\C003\_190910.mxd



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**Legend**

- GPS Waypoint (July 12, 2019)
- Slope Inclinometer
- GPS Track (July 12, 2019)



NOTES:  
 1. HORIZONTAL DATUM: NAD83  
 2. GRID ZONE: UTM Zone 12N  
 3. IMAGE SOURCE: Bing Maps, Microsoft Corporation 2019

CLIENT

*Alberta*

PROJECT  
 CENTRAL REGION GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE  
 Site Plan  
 C003 - North of Battle River  
 Hwy 872:06

SCALE: 1:1,000    PROJECT No. A05115A02    FIG No. 1

MICROFILM DATE

PWSS PLAN NO.

DRAWING NO.

CENTER CODE NO.

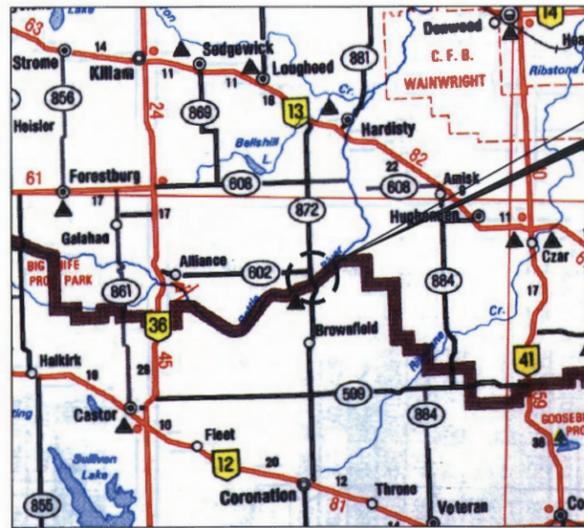
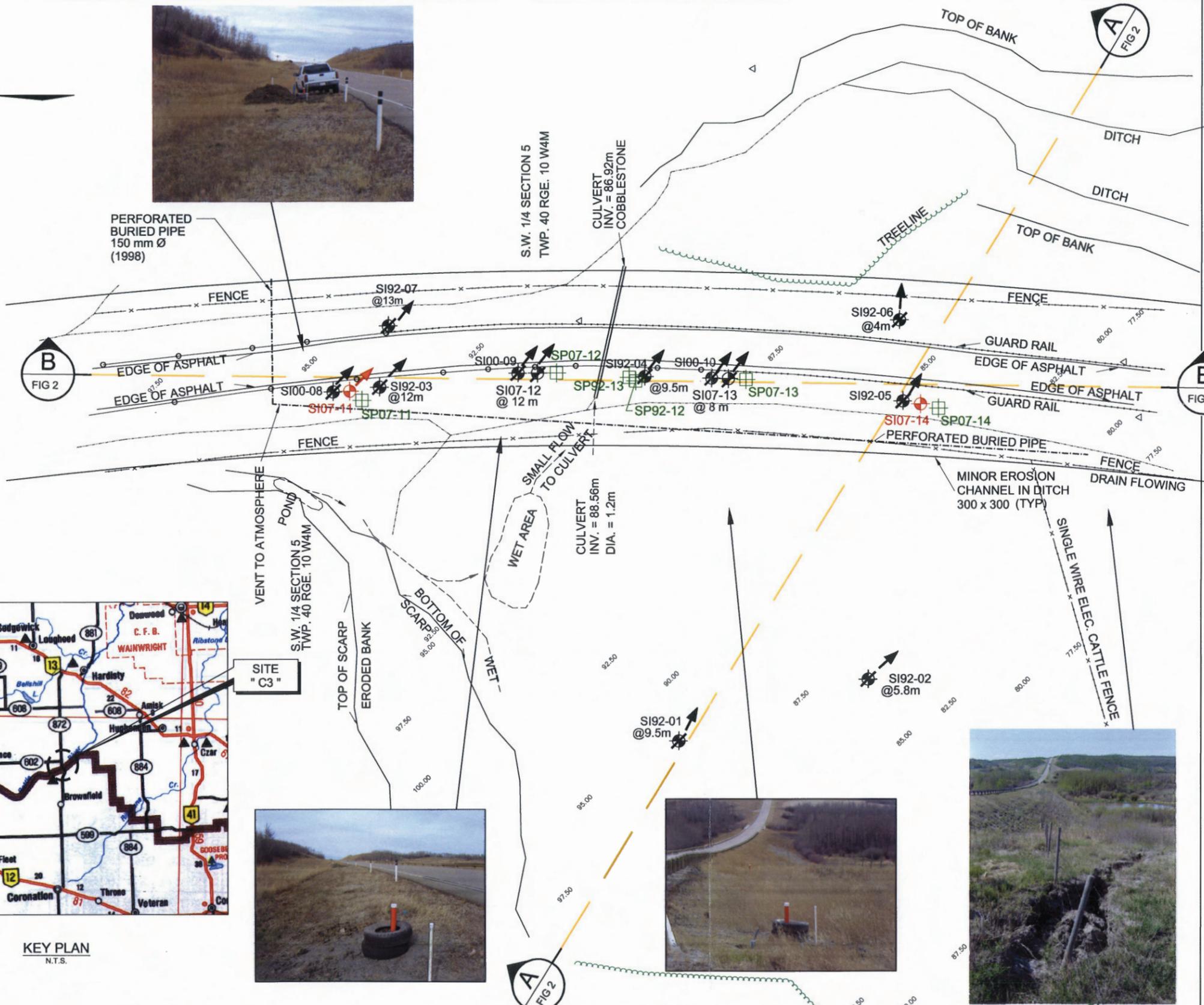
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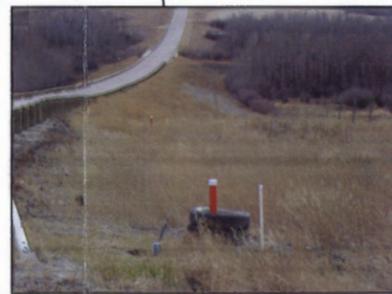
PERFORATED BURIED PIPE  
150 mm Ø  
(1998)

S.W. 1/4 SECTION 5  
TWP. 40 RGE. 10 W4M

CULVERT  
INV. = 86.92m  
COBBLESTONE



KEY PLAN  
N.T.S.



**NOTES:**

1. SURVEY PERFORMED BY CHALLENGER GEOMATICS LTD. ON SEPT 6/7, 2001.
2. ACTUAL ELEVATION IS 565.7m ABOVE DATUM SHOWN.
3. PHOTOS TAKEN OCTOBER 2007.



LOOKING SOUTH TOWARDS BATTLE RIVER

- SI92-02 @13m SHEARED SLOPE INCLINOMETER WITH MOVEMENT DIRECTION AND SHEARED DEPTH
- SI07-13 ACTIVE SLOPE INCLINOMETER (2007)
- SP07-13 STANDPIPE PIEZOMETER

PERMIT	SEAL	DESIGNED BY DR	APPROVED BY DR	CONSULTANT
		DRAWN BY MD	CHECKED BY DR	
		SCALE 1:1 000 0 10 20 m		
MARK	DESCRIPTION OF REVISIONS	DATE	DWN.	ENG.

PROJECT	CENTRAL REGION		
	GEOHAZARD RISK ASSESSMENT		
TITLE	SITE C3: H872:06 NORTH OF BATTLE RIVER LOCATION PLAN		
DATE	JULY 2011	SHEET	1 of 2
		DRAWING No.	FIGURE 1
REV.			

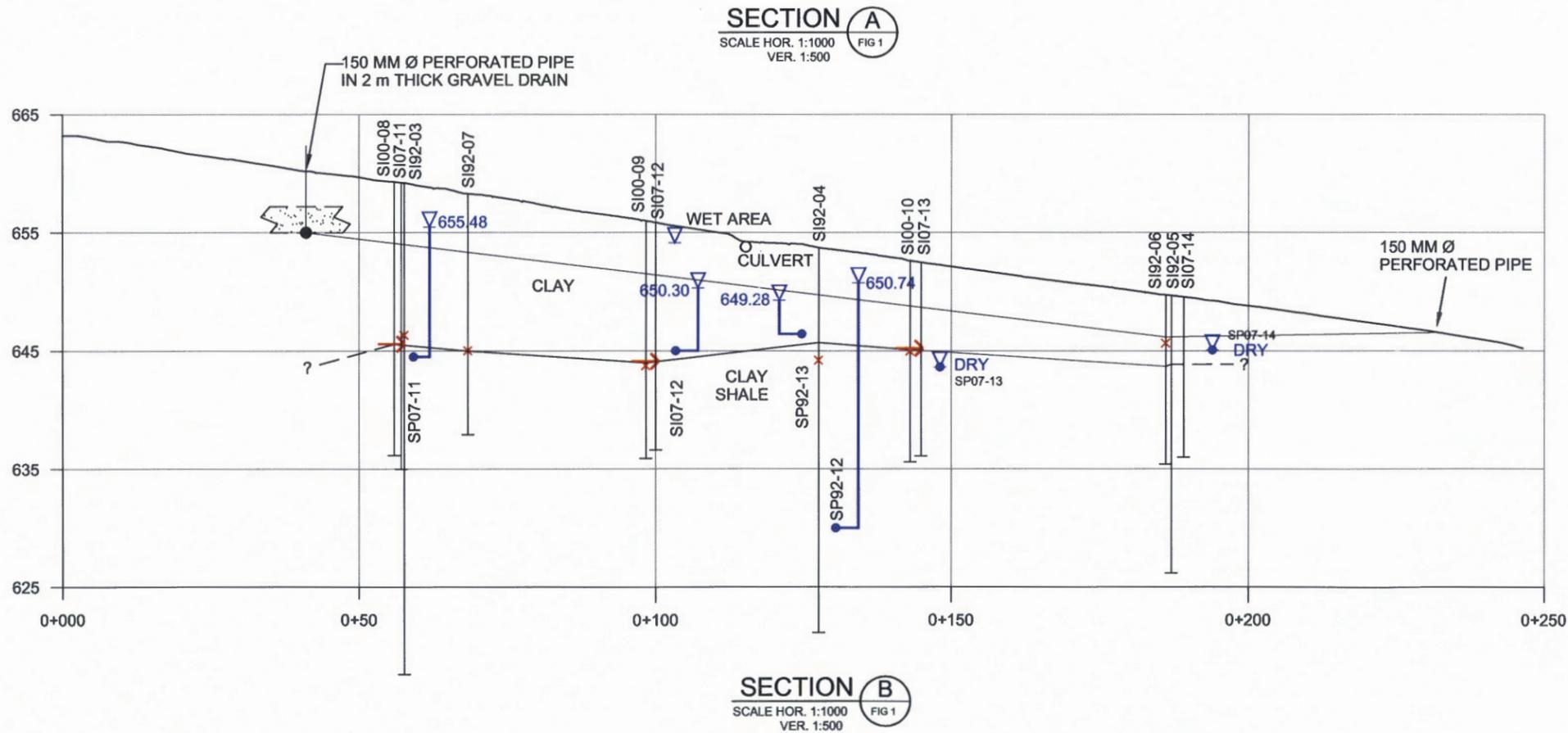
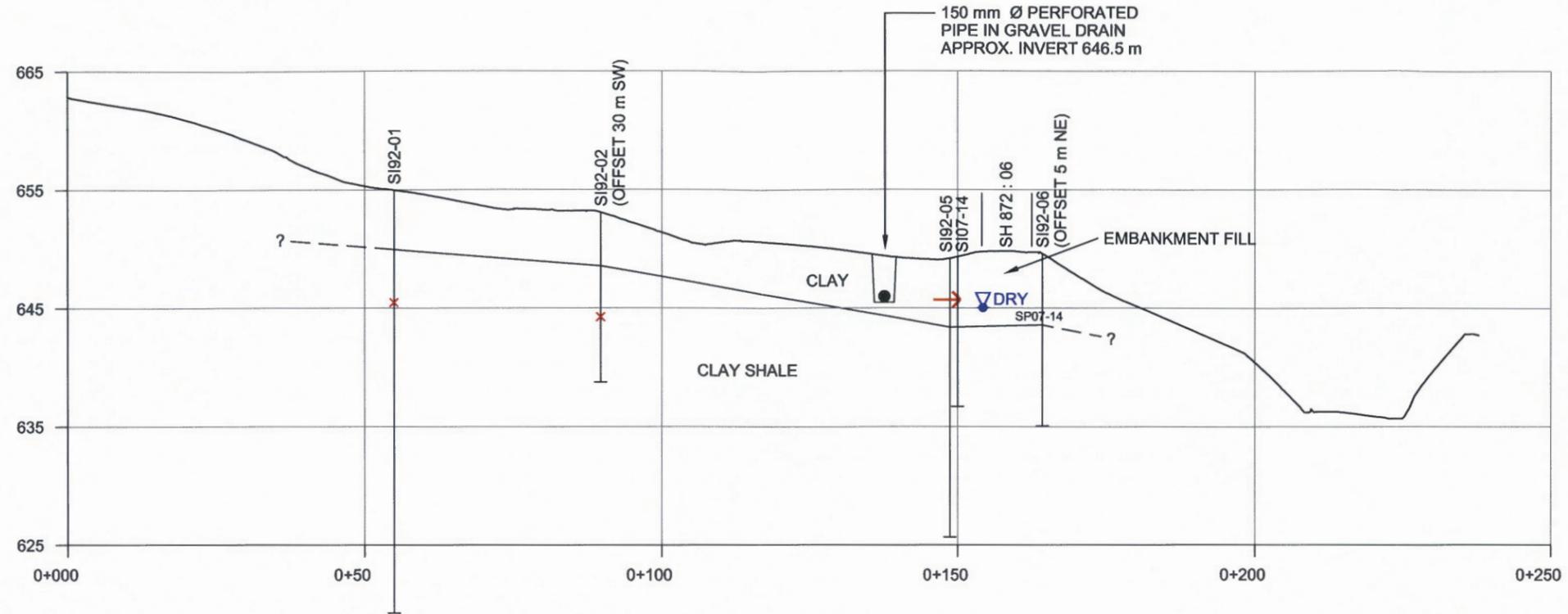
MICROFILM DATE

PWSS PLAN No.

DRAWING No.

CENTER CODE No.

PROJECT FILE No.



PERMIT	SEAL	DESIGNED BY DR	APPROVED BY DR	CONSULTANT	PROJECT CENTRAL REGION
		DRAWN BY MD	CHECKED BY DR		GEOHAZARD RISK ASSESSMENTS
		SCALE 1:500 1:1 000			
MARK	DESCRIPTION OF REVISIONS	DATE	DWN.	ENG.	DATE JULY 2011
					SHEET 2 of 2
					DRAWING No. FIGURE 2
					REV.

MICROFILM DATE

PWSS PLAN No.

DRAWING No.

CENTER CODE No.

PROJECT FILE No.



PERFORATED BURIED PIPE  
150 mm Ø  
(1998)

S.W. 1/4 SECTION 5  
TWP. 40 RGE. 10 W4M

CULVERT  
INV. = 86.92m  
COBBLESTONE

TOP OF BANK

DITCH

DITCH

TOP OF BANK

FENCE

GUARD RAIL

EDGE OF ASPHALT

EDGE OF ASPHALT

GUARD RAIL

FENCE

DRAIN FLOWING

MINOR EROSION  
CHANNEL IN DITCH  
300 x 300 (TYP)

SINGLE WIRE ELEC. CATTLE FENCE

GOVERNMENT ROAD ALLOWANCE

Fd. No Mk.



LOOKING SOUTH TOWARDS BATTLE RIVER

- SI92-02 @13m SHEARED SLOPE INCLINOMETER WITH MOVEMENT DIRECTION AND SHEARED DEPTH
- SI07-13 SLOPE INCLINOMETER (2007)
- SP07-13 STANDPIPE PIEZOMETER

**NOTE**

1. SURVEY PERFORMED BY CHALLENGER GEOMATICS LTD. ON SEPT 6/7, 2001.
2. ACTUAL ELEVATION IS 565.7m ABOVE DATUM SHOWN.
3. PHOTOS TAKEN OCTOBER 2007.

FIG 2

FIG 2

FIG 2

VENT TO ATMOSPHERE

POND

S.W. 1/4 SECTION 5  
TWP. 40 RGE. 10 W4M

TOP OF SCARP  
ERODED BANK

BOTTOM OF SCARP

WET AREA

CULVERT  
INV. = 88.56m  
DIA. = 1.2m



KEY PLAN  
N.T.S.



PERMIT	SEAL	DESIGNED BY DR	APPROVED BY DR	CONSULTANT
		DRAWN BY MD	CHECKED BY DR	
		SCALE 1:1 000 0 10 20 m		
MARK	DESCRIPTION OF REVISIONS	DATE	DWN.	ENG.

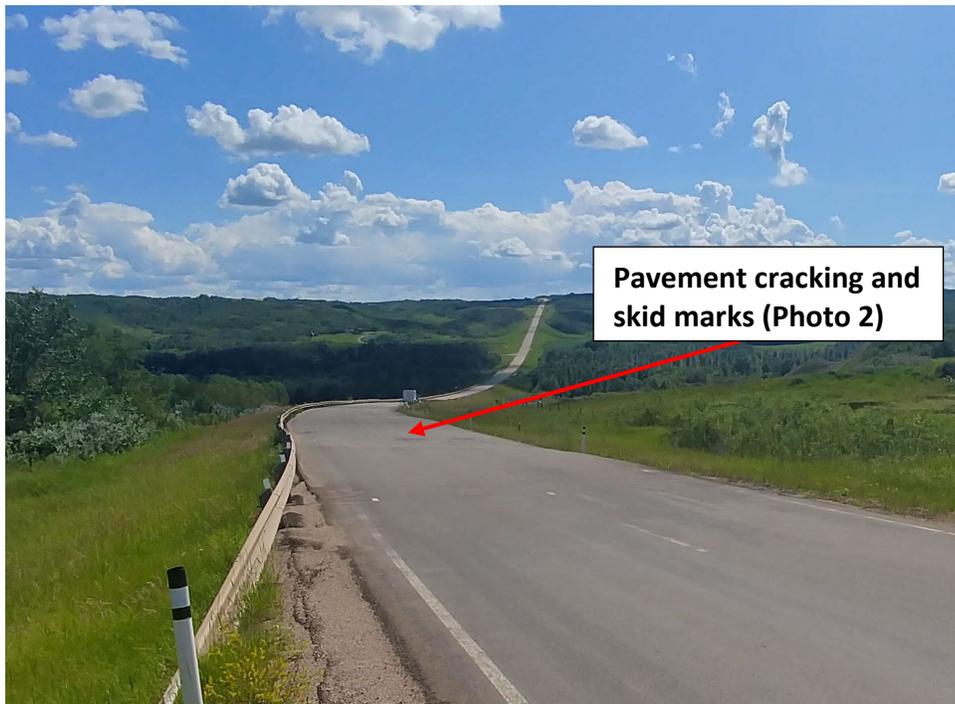
DESIGNED BY DR	APPROVED BY DR
DRAWN BY MD	CHECKED BY DR
SCALE 1:1 000 0 10 20 m	

CONSULTANT

PROJECT	CENTRAL REGION		
	GEOHAZARD RISK ASSESSMENT		
TITLE	SITE C3: H872:06 NORTH OF BATTLE RIVER LOCATION PLAN		
DATE	MAY 2010	SHEET	1 of 2
		DRAWING No.	FIGURE 1
REV.			



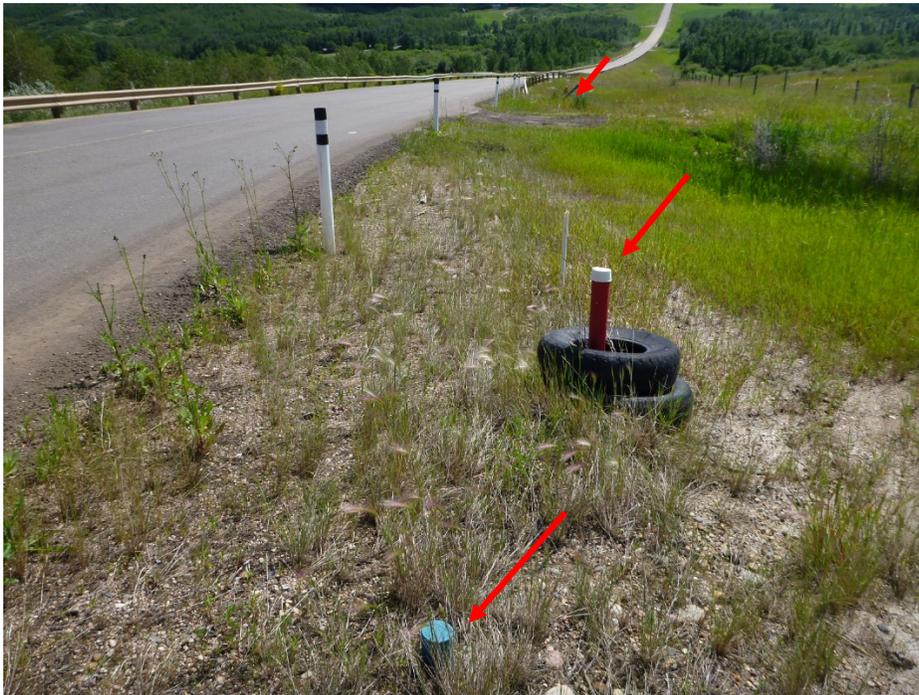
**Photo 1** Overview of C003 site. Photo taken July 12, 2019 looking south.



**Photo 2** Transverse pavement cracking and skid marks from vehicles braking on north flank of slide. Photo taken July 12, 2019 looking south.



**Photo 3** Existing instruments (SIs and standpipes) along west (southbound) ditch. Photo taken July 12, 2019 looking south.



**Photo 4** Pavement cracking across highway on south flank of slide. Photo taken July 12, 2019 looking southeast.



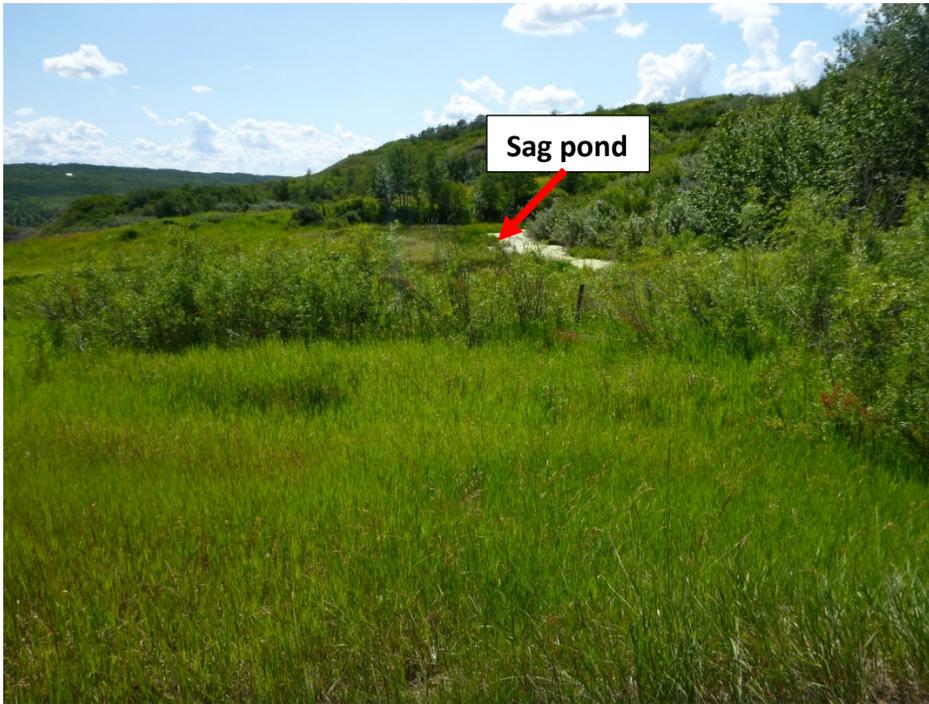
**Photo 5** Exposed bedrock and scarp upslope of highway near waypoint 887. Photo taken July 12, 2019 looking north.



**Photo 6** Photo taken from backscarp looking southeast towards the highway. Slide appears to be failing at skew angle to the highway. Photo taken July 12, 2019.



**Photo 7** Sag pond located below the backscarp (Photo 6) and upslope of the highway. Photo taken July 12, 2019 looking west.



**Photo 8** Erosion in west (southbound ditch) adjacent to highway. Photo taken July 12, 2019 looking south.

