

ALBERTA TRANSPORTATION LANDSLIDE RISK ASSESSMENT

SECTION A: GEOTECHNICAL FILE REVIEW NORTH CENTRAL REGION SITE NC81: 16A Evansburg

LEGAL LOCATION:	SE 30-53-7-W5M
NEAREST LANDMARK:	0.5 km WEST OF EVANSBURG, AB
Highway Control Section:	HWY 16A:08, km 8.3
Date of Initial Observation:	2014
Date of Last Inspection:	2017
Last Inspected By:	Stantec Consulting Inc.
Instruments Installed:	None
Instruments Operational:	N/A
Risk Assessment:	PF(9) · CF(3) = RL (27)
Last Updated:	September 2017 – Stantec Consulting Ltd.



1. LOCATION

The site is located along Highway 16A:08 approximately 300 m west of Highway 75 and approximately 0.5 km west of the town of Evansburg, Alberta. Legal land description SE 30-53-7-W5M.

2. GENERAL DESCRIPTION OF SLOPE INSTABILITY

Highway 16A is a paved undivided highway, comprising of single eastbound and westbound lanes at this location. Historically, the Highway 16A embankment was built in order to reduce grades in the area. Highway 16A crosses a creek that flows northeast through a CSP culvert approximately 200 m west of Highway 75.

In June 2014, Golder conducted the first call-out inspection. Based on the observation then, a toe bulge about 0.4 m to 1.2 m high was observed at a level slightly above the creek and to the west. Cracks in the pavement were observed to be about 45 m long along the eastbound lane and some smaller cracks were observed on the westbound lane. Alberta Transportation had also noted a tension crack in the south ditch of the highway. Based on the call-out report, instability at this site is believed to be shallow in nature, with the failure possibly moving along a weak clay layer above the clay till. It may also be possible that movements may be due to a weak bentonitic layer depending on the depth of clay shale bedrock.

3. GEOLOGICAL/GEOTECHNICAL CONDITIONS

PHYSIOGRAPHIC REGION

Western Alberta Plains

BEDROCK GEOLOGY

Bedrock geology found on this site belongs to the Paskapoo Formation consisting of clay shale, siltstone, and sandstone. Based on the water well records, bedrock is anticipated to be shallower than 8 m.

SURFICIAL GEOLOGY

The site is located in an area of glaciolacustrine sediments overlain by highway embankment fill. The valley slopes generally comprise of colluvial deposits overlying bedrock belonging to the Paskapoo formation.

SITE STRATIGRAPHY

Based on Golder call-out inspection report, one borehole was advanced in 2002 near the culvert approximately 100 m east of the distress area. The borehole record shows the embankment fill overlies very soft clay over clay till over clay shale.



HYDROGEOLOGY

Based on the hydrogeological mapping around Wabamun Lake, the regional groundwater tends to drain southeast. The groundwater yield approximately 8 L/sec to 38 L/sec.

4. CHRONOLOGY

GENERAL

As documented in a Golder call-out report (June 2014), the area was included in the repair project approximately in 2008 to 2009. The exact dates, location, and detailed construction of the repair are unknown. The pavement on highway 16A eastbound lane have been patched multiple times in 2002, 2014, and 2017. In addition, the distress has been consistent throughout with pavement cracks, toe bulge, and ponded water around the same areas.

2002

A geotechnical investigation was conducted approximately 100 m east of the pavement distress area. One borehole was advanced to 10.4 m below ground surface for a culvert replacement.

2004 – 2012

Highway 16A was patched in the area of pavement distress.

2005

The culvert located approximately 100 m east of the pavement distress was replaced.

2009

Highway 16A was resurfaced.

2012

Initial movements observed by AT staff in the previously noted areas of pavement distress.

2014

Golder responded to a call-out request.. Golder observed several pavement cracks on the westbound and eastbound lanes of Highway 16A which were in similar locations as the previously observed cracks. Additionally, a toe bulge was observed south of the highway at a level slightly higher than the creek. The eastbound lane was patched in September 2014.

2017

The eastbound lane of Highway 16A had been patched in June 2017.



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5. GEOTECHNICAL INSTRUMENTATION

There are no instruments installed on this site.

6. REFERENCES

Alberta Transportation, Geotechnical Files.

Alberta Energy Regulator, October 17, 2005, "Hydrogeological map of the Wabamun Lake area, Alberta, NTS 83G."

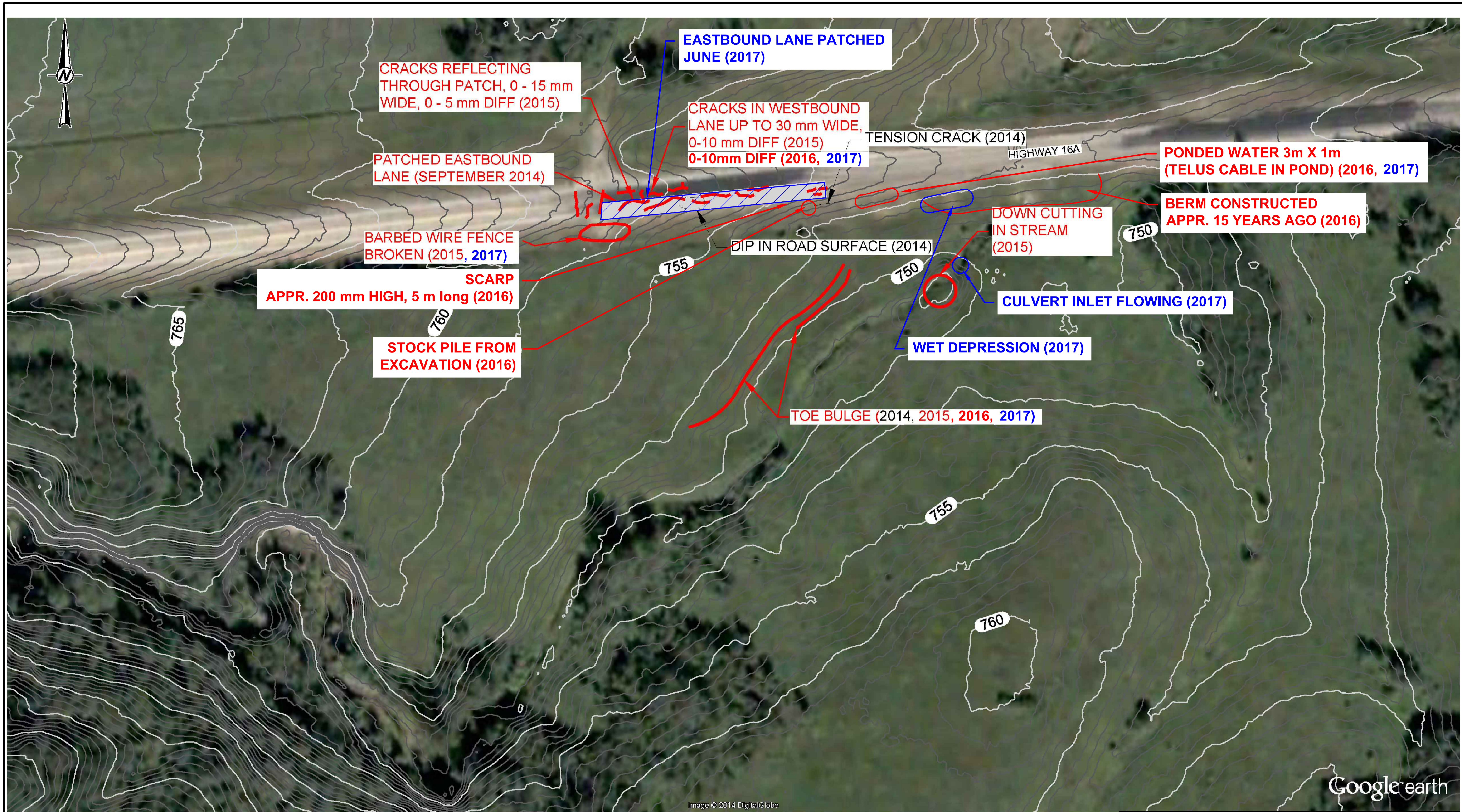
Alberta Energy Regulator, 2013, "Alberta Geological Survey Map 600 – Bedrock Geology of Alberta,"

Alberta Energy Regulator, 2013, "Alberta Geological Survey Map 601 – Surficial Geology of Alberta,"

Golder Associates, June 26, 2014, "North Central Region – Edson Area: Call-out Inspection Report," File: 13-1376-0027.

Golder Associates, June 18, 2015, "North Central Region – Edson Area: 2015 Inspection Report," File: 13-1376-0027.

Stantec Consulting Ltd., June 6, 2016, "North Central Region – Edson/Stony Plain Area: 2016 Inspection Report," File: 123312435



LEGEND

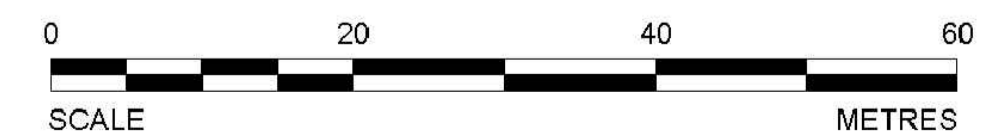
- MAJOR CONTOUR
- MINOR CONTOUR

REFERENCES

IMAGE OBTAINED FROM GOOGLE EARTH PRO, USED UNDER LICENSE.
 IMAGERY DATE: SEPTEMBER 11, 2004. GOOGLE EARTH IMAGE IS NOT TO SCALE.
 DATUM: NAD 83, PROJECTION: UTM ZONE 11

NOTES

1. FEATURE LOCATIONS ARE APPROXIMATE
2. PREVIOUS OBSERVATIONS SHOWN IN BLACK
3. 2015/16 OBSERVATIONS SHOWN IN RED
4. 2017 OBSERVATIONS SHOWN IN BLUE



STANTEC CONSULTING
 10160-112 STREET
 EDMONTON ALBERTA CANADA

ALBERTA TRANSPORTATION
 GEOHAZARD MONITORING PROGRAM
 NC81 16 A EVENSBERG
 SITE PLAN

DRAWN	WW / MK	CHECK	CDM	APPROVE	ID
DATE	12 SEP. 2017	SCALE	AS SHOWN	PROJECT #	123312435

FIGURE - 1