

December 4, 2006

File: 15-85-32

Alberta Infrastructure and Transportation
Unit 2, Jewell Building
3603 – 53 Street
Athabasca, Alberta
T9S 1A9

Attention: Mr. Arthur Kavulok

**NORTH CENTRAL REGION GEOHAZARD ASSESSMENT
HWY 2:48 CANYON CREEK (NC 9)
2006 ANNUAL INSPECTION REPORT**

Dear Sir:

This letter documents the 2006 annual site inspection of an area of slope instability located along Hwy 2:48 at km 26, about 3.2 km west of Canyon Creek (refer to Figure NC9-1, Section F). Thurber Engineering Ltd. (Thurber) undertook this inspection in partial fulfillment of our Geotechnical Services for Geohazard Assessment, Instrumentation Monitoring and Related Work contract (CE143/2006) with Alberta Infrastructure and Transportation (AIT).

Mr. Masud Karim, EIT and Mr. Don Proudfoot, P.Eng. of Thurber undertook the inspection on May 2, 2006 in the presence of Mr. Roger Skirrow, P. Eng., Mr. Arthur Kavulok, and Mr. Fred Bickell, of AIT.

1. BACKGROUND

Thurber last visited the site in June 2005 and the site condition at that time is described in our Part B assessment letter included in the site binder. Additional information for the site is provided in the Geotechnical File Review in Section A of the binder.

2. SITE OBSERVATIONS

The changes in condition since last year are shown on the site sketch plan, Figure NC9-1, attached for inclusion in Appendix F of the binder. The cross-section included previously in Section F (Figure NC9-2) is considered

current for this assessment. Selected photographs taken during the visit are also attached.

A new transverse crack up to about 5 mm wide was observed extending from the centerline of the highway to the south shoulder. The crack appears to be connected to a longitudinal crack extending east west within the patched area.

The confined low area adjacent to the south ditch was full of water during this year's visit. The ponded water extended about 10 m further east than the largest extent observed during previous visits.

The western portion of the scarp of the bench located north of the highway, as shown on the site plan, is somewhat active. The power pole, also located at the western limit of the slide area, was found to be somewhat tilted with its top downslope. A man made hole was located beside the location of PN#5 and a SI casing, believed to be the abandoned SI#5, was noted to be approximately 0.5 m below ground surface within the hole. SI#4 could not be found, as per previous visits since 2004.

No maintenance has been undertaken since last year.

3. ASSESSMENT

Similar to the last year's observation, no significant changes have been observed in slope conditions compared to the 2005 observations. However the area of ponded water was significantly larger than observed previously at this site.

Based on the historical slope inclinometer data at this site, slow creep movements have been measured on defined sliding planes in SI#2 and SI#6 at depths of 13 m and 6 m, respectively. In addition, pore water pressure readings remained steady except in PN02, which recorded an increase of 0.4 m in Fall 2005 compared to Spring 2005 reading and in PN01 which has showed an upward trend since 2004.

The slide movements in this area of slope instability appear to be related to variations in the groundwater level. Larger slope movement could occur during heavy or prolonged precipitation events. The confined low area adjacent to the south ditch is expected to be a source of water to the slide mass and could trigger future movements if water is allowed to pond in this location.

4. RISK LEVEL

The risk level for this site has been assessed as follows:

$$PF (5) * CF (4) = 20$$



A risk level of 20 is considered applicable to this site, based on a Probability Factor of 5 (active, very slow rate of movement) and a Consequence Factor of 4 due to the high fill slope involved. This rating is the same as provided in previous reports.

5. RECOMMENDATIONS

5.1 Short Term

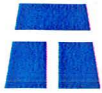
In the short term the site should be regularly inspected by the MCI to determine when further asphalt patching maintenance is required to maintain a smooth even road surface for traffic safety.

An unsuccessful attempt was made to locate SI#4 during this site visit. However, other operational instruments at this site are expected to provide sufficient information about the slide performance. Hence installation of additional instruments is not recommended at this time.

5.2 Long Term

Infill of the low area adjacent to the south ditch should be implemented to reduce the potential for water infiltration into the slide area, as recommended in previous assessment reports. A design and cost estimate has previously been submitted to AIT.

Alternatives for the source of fill were discussed with AIT during the site visit. To reduce the cost of fill placement, the hill area to the south could be considered for use as borrow. Stability of the backslope should be assessed prior to finalizing the cut depths in this area. Final grading should be such as to direct water away from the area and avoid ponded water in the vicinity of the slide area. Survey should be undertaken to confirm suitable ditch gradients can be achieved.



6. CLOSURE

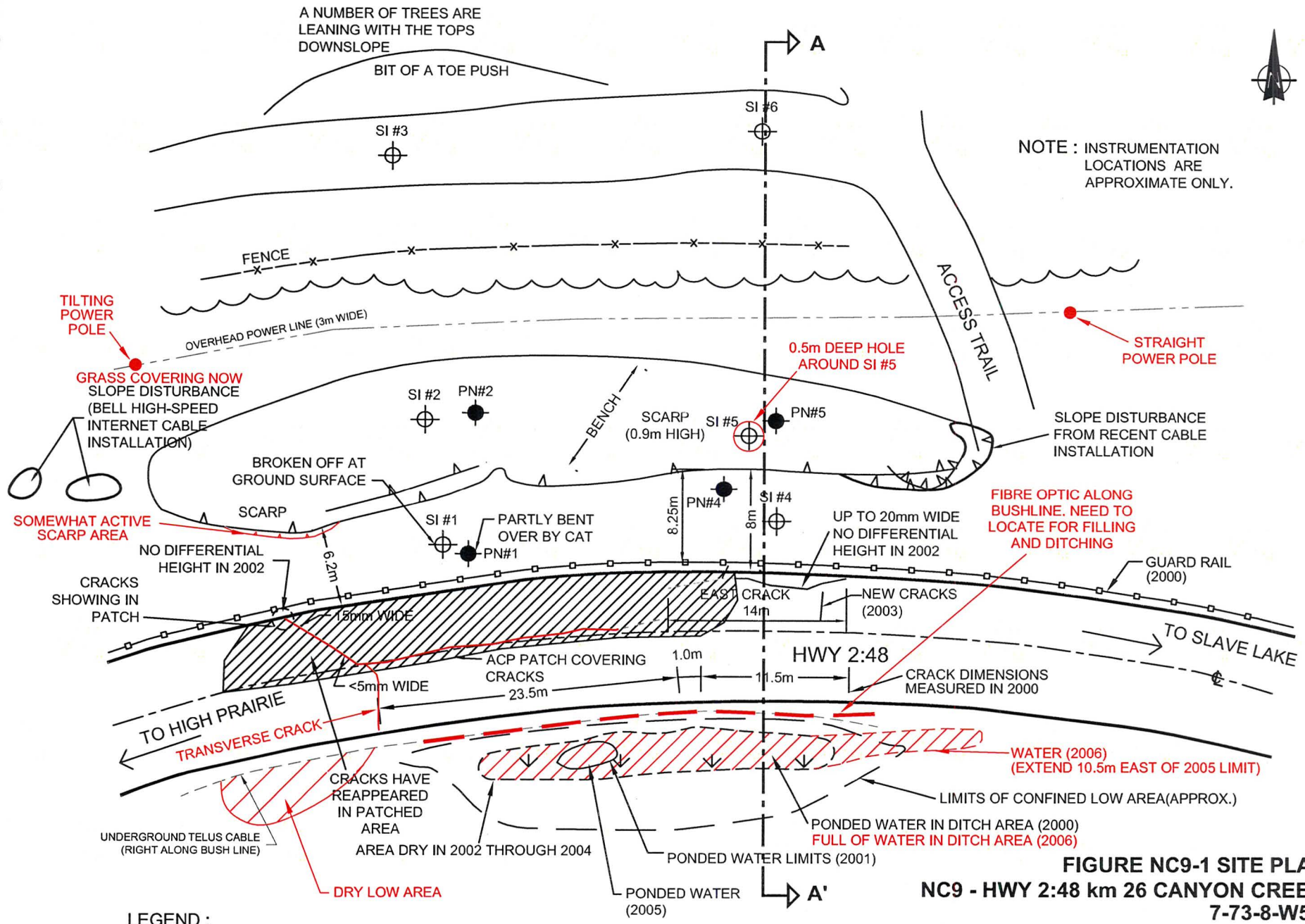
We trust this assessment and recommendations meet with your needs at this time. Please contact the undersigned should questions arise or if the slide condition worsens.

Yours very truly,
Thurber Engineering Ltd.
Don Law, P.Eng.
Review Principal

Masud Karim, M.Sc.
Project Coordinator
/dw

Attachments

cc Mr. Roger Skirrow, P.Eng.
Director, Geotechnical Services (AIT)



NOTE : INSTRUMENTATION LOCATIONS ARE APPROXIMATE ONLY.

FIGURE NC9-1 SITE PLAN
NC9 - HWY 2:48 km 26 CANYON CREEK
7-73-8-W5M

LEGEND :

⊕ SI EXISTING SLOPE INCLINOMETER ⊙ PN EXISTING PNEUMATIC PIEZOMETER

CHANGES OBSERVED ON MAY 2, 2006 SHOWN IN RED

MAY 2, 2006
 SCALE 1:400 (APPROX.)
 THURBER PROJECT #15-85-32



Photo 1 Confined low area adjacent to the south ditch. Ponded water is visible throughout, May 2, 2006.



Photo 2 Transverse crack through the patched area, May 2, 2006.



Photo 3 Looking West along Highway at cracks, May 2, 2006.



Photo 4 Hole around SI#5 location, May 2, 2006.