ALBERTA TRANSPORTATION
GEOHAZARD ASSESSMENT
PEACE REGION (SWAN HILLS)
SITE SH 29: DRIFT PILE BANK EROSION, HWY 2:50

SECTION A – GEOTECHNICAL FILE REVIEW

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1.0 PROJECT SETTING

1.1 LOCATION

Site SH29 (Drift Pile Bank Erosion) is located on a local road ~500 m south of Highway 2:50. The intersection of the local road and Highway 2:50 is located ~120 m west of the Hwy 2:50 bridge crossing of Drift Pile River. The legal land description of site SH29 is LSD 16 – Sec 20 – Twp 73 – Rge 12 – W5M.

In the area of the site, Drift Pile River generally flows from south to north. At the site, the west river bank adjacent to the local road is located on the outside of a bend in the river channel. Historically, toe erosion and bank slumping on the west creek bank has been on-going and the top of bank has been gradually retrogressing toward the local road to the west.

1.2 SITE GEOLOGY, HYDROGEOLOGIC AND GEOMORPHOLOGIC SETTING

Physiographic Region: The site is situated in the Peace River Lowland Region of Alberta.

Bedrock Geology: The site is underlain by the Cretaceous Wapiti and/or Smoky Group. The Wapiti Group consists of feldspathic clayey sandstone, bentonitic mudstone, bentonite, and minor coal beds. The Smoky Group consists primarily of clayshale with lesser amounts of sandstone.

Surficial Geology: The site is situated in a glaciolacustrine plain cut by the Drift Pile River valley with associated fluvial deposits from the Drift Pile River meander plain.

Hydrogeology: The sandstone and coal beds of the Wapiti Formation and fluvial deposits associated with the Drift Pile River have the potential for flows up to 2 L/s.

Stratigraphy: No subsurface investigation has been completed to investigate the stratigraphy at the site.

2.0 HISTORICAL INFORMATION

The history of this site is based on a review of Karl Engineering Consultants Ltd. (2008 to 2010), AMEC Environment & Infrastructure (2012), and Alberta Transportation files. Historical plans and photos of the site are found in Section F.

2008

The erosion/slumping on the west bank of the river was first documented in a call out inspection report completed by Karl Engineering Consultants in summer 2008. At this time, it was reported that erosion on the west river bank had caused a steepening and slumping of the river bank that was encroaching on a 5 to 10 m stretch of the local road. The river bank was estimated to be 10 m in height. The distance between the edge of the road and the top of the erosion scarp

was reported to be 7 m (estimated). The top of the bank was well reported as vegetated with shrub and tree growth. West of the road (across the road from the erosion site), a dugout was located at a distance of 14 m from the west edge of the road.

It was assessed by Karl Engineering Consultants that the process of lateral river bank degradation at the site (although gradual) would continue and the top of bank would retrogress closer to the edge of the road. Karl Engineering Consultants recommended preserving the existing setback space with riparian vegetative growth and completing annual inspections to assess the extent of bank erosion and determine if the road would be adversely affected. A possible remedial option presented by Karl Engineering Consultants was to shift the roadway west towards the dugout.

2009

Although no new significant deterioration was reported by Karl Engineering Consultants to have developed over the year of 2008/2009, it was reported that the steep bank section along the local road extended over a length of 30 m.

2010

No new deterioration was reported by Karl Engineering Consultants to have developed over the year of 2009/2010.

2012

AMEC Environment and Infrastructures initial site assessment indicated that the erosion scarp extended over an approximate 40 m stretch of the west bank of the river. Along the erosion zone, the erosion scarp was estimated to be 10 m high. At the closest point, the top of the erosion scarp was measured to be 6 m from the edge of the local road and it appeared that approximately 0.3 to 0.5 m of recent scarp retrogression had occurred. It was assessed that over time, or accelerated due to high flow or flooding of the Drift Pile River, retrogression of the scarp could encroach on the local road. For the short term, annual inspections were recommended to assess toe erosion and slumping along the river bank. Longer term remedial recommendations included stabilization of the river bank and/or realignment of the road.

REFERENCES

1. Energy Resources Conservation Board, ERCB/AGS Map 554, scale 1:100,000, 2010. "Surficial Geology of the Faust area (NTS 83O/SW)"

2. Alberta Research Council, Report 77-1, 1978. "Hydrogeology of the Lesser Slave Lake Area, Alberta."

3. Karl Engineering Consultants Ltd., August 31, 2008. "Call-Out Inspection Report Hwy 2:50 – Local Road at Drift Pile (SH-29) Bank Erosion along Drift-Pile River along a local road in the lands of IR-150."

4. Karl Engineering Consultants Ltd., December 31, 2008. "Peace Region (Swan Hills) GeoHazard Assessment, (SH29) Hwy 2:50 Drift Pile River Bank Erosion at local road at Indian Reserve."

5. Karl Engineering Consultants Ltd., December, 2009. "Peace Region - Swan Hills GeoHazard Risk Assessment, Site Inspection Form, SH 29, Drift Pile Bank Erosion, Hwy 2:50."

6. Karl Engineering Consultants Ltd., November, 2010. "Peace Region - Swan Hills GeoHazard Risk Assessment, Site Inspection Form, SH 29, Drift Pile Bank Erosion, Hwy 2:50."

7. Amec Environment & Infrastructure, July 4, 2012. "Peace Region - Swan Hills GeoHazard Risk Assessment, Site Inspection Form, SH 29, Drift Pile Bank Erosion, Hwy 2:50."