THURBER ENGINEERING LTD.

ALBERTA TRANSPORTATION GEOHAZARD ASSESSMENT PROGRAM
PART A: FILE REVIEW

PEACE REGION – PEACE-HIGH LEVEL

PH46 SOUTH RINGS CREEK

Legal Location:	SE¼23-081-04 W6M and SW¼24-081-04 W6M
Nearest Landmark:	1.9 km north on Hwy 64 from the junction with Hwy 2. Total distance is 11 km if travelling from Fairview west on Hwy 64A then south on Hwy 64.
Highway Control Section:	Hwy 64:06
Date of Initial Observation:	Bridge culvert constructed in 1990 Callout Inspection in 2005
Date of Last Inspection:	June 2008
Last Inspected By:	Thurber Engineering Ltd.
Instrumentation Installed:	None
Instrumentation Operational:	None
Risk Assessment:	PF = 11 CF = 2 Risk = 22

1. INTRODUCTION

The site is located on Hwy 64, 2 km north of the junction with Highway 2, and is 7.5 km south west of Fairview. The site includes the former construction site area for the 3 m diameter multi-plate culvert which carries South Rings Creek under Hwy 64. South Rings Creek runs from NE to SW and joins Rings Creek approximately 3 km SW of the site. The primary concern at the site is erosion that is occurring along the edges of the embankment fill as road ditch drainage runs down to the creek.

The location of the site is shown on Figure 1, while site details are shown on Figure 2, based on the last inspection.

No historical information was available from Alberta Transportation regarding this site.

2. BACKGROUND

2.1 Bedrock Geology

Based on the AGS 1:1,000,000 bedrock geology map of Alberta, the site is underlain by the Upper Cretaceous Kaskapoo Formation. Rocks in this unit consist of silty shale, thin ironstone bands, quartzose sandstone and thin oolitic mudstone beds. However, drift thickness maps indicate up to 90 m of soil overlying rock at this site, and given the lack of relief, bedrock geology is not expected to play any part in the behaviour of this site.

2.2 Surficial Geology

The AGS Bulletin 16 1 inch to 4 miles surficial geology map for this area indicates the site is underlain by lacustrine soils. The Alberta Soil Survey Report 23 map shows the site includes clay loam to clay soils with imperfect drainage, with a lacustrotill parent.

2.3 Hydrogeology

The ARC 1:500,000 Hydrogeology Map 151 shows no springs or flowing wells. Local perched water tables might be present in lenses of more permeable materials (e.g. sand) within the lacustrine deposits.

2.4 Geomorphology

South Rings Creek is a relatively small creek – perhaps 2 m wide and with up to 0.5 m of flow, with a catchment upstream of the culvert of approximately 1,500 ha. Flows in early June at the time of the annual geohazard inspections are typically low. Along the road, the width of the valley is between 250 m and 300 m from slope crest to slope crest. The valley is approximately 13 m deep at this point (depth of fill at the culvert).

Erosion and slope instability problems have occurred at this site in response to construction of the culvert crossing. There are also some ditch erosion problems away from the valley, indicating that soils in this area are erosion susceptible. Along the margins of the fill in the valley, water from the road-side ditches runs downslope at relatively steep gradients, causing erosion problems. This is more noticeable on the east side of the structure, possibly as a result of the generally south-westerly slope of the surrounding area, and consequent larger flows in the east road ditch.

3. HISTORIC INFORMATION

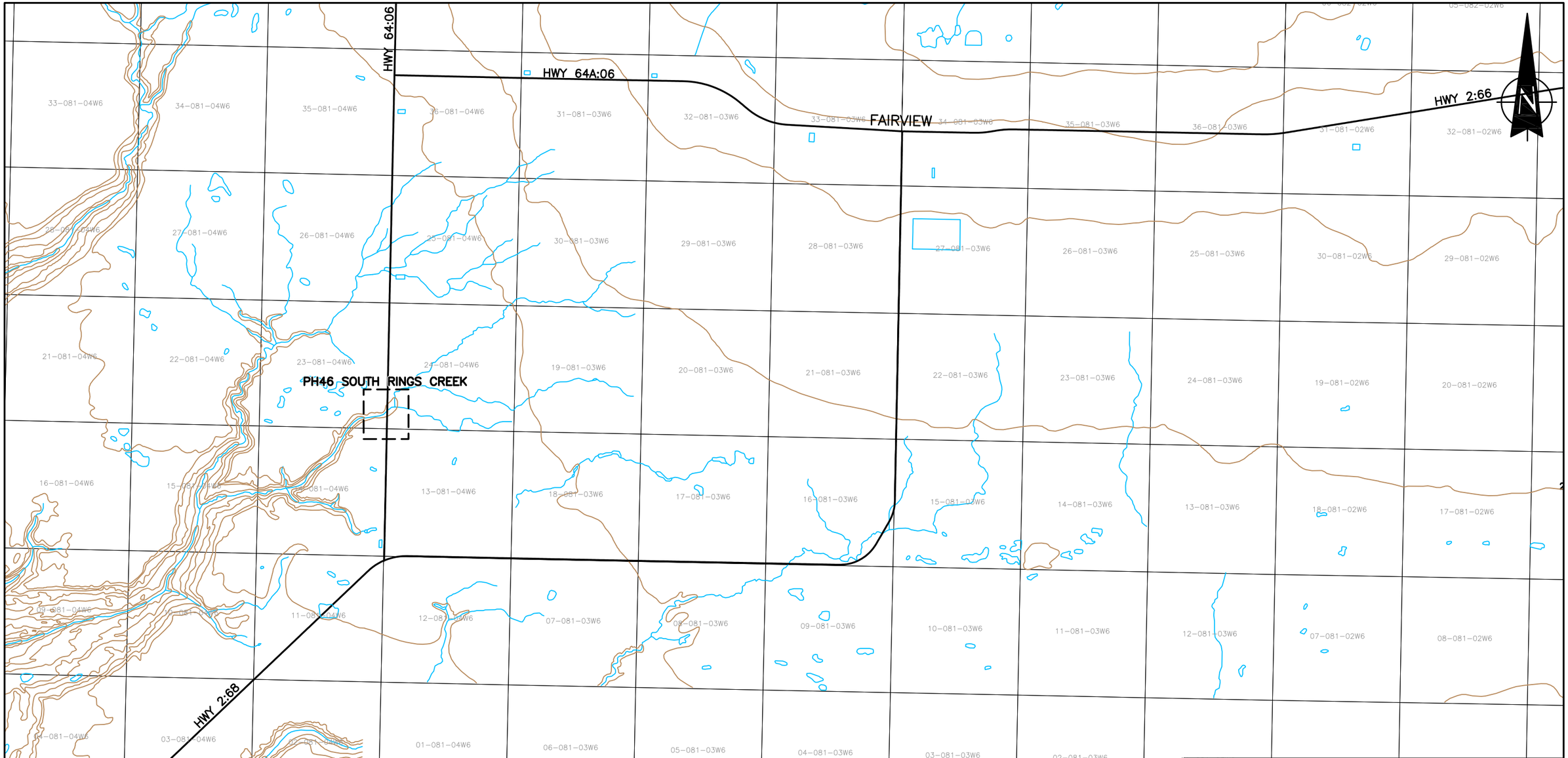
3.1 Summary

The structure was apparently re-built in 1990. Erosion problems resulted in a callout inspection during the 2005 annual geohazard assessments. Erosion is likely to have occurred prior to this point, and has continued to worsen since.

Other than the annual geohazard site visits, no other investigations have been conducted at this site. No mitigation or repair work has been conducted at this site.

3.2 Chronology

1990	Culvert structure re-built.
June 2005	Callout site visit as part of annual geohazard assessments. Severe erosion is occurring in the ditches running down the margins of the fill, particularly on the east side of the road.
June 2006	Erosion in the ditches along the margins of the embankment fill has worsened.
May 2007	Erosion in the ditches along the margins of the embankment fill has worsened.
June 2008	Erosion in the ditches along the margins of the embankment fill has worsened.



LEGEND:

APPROXIMATE SITE BOUNDARY — — — —

NOTES:

BASE PLAN COMPILED FROM CANVEC DATA AND ATRANS GPS ROAD SURVEY DATA.

0 0.5 1.0 1.5 2.0 2.5 km

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SCALE 1:50 000	DATE OCTOBER 29, 2008	FILE No. 15-16-213A-C2A	

Alberta Transportation

PEACE REGION (PEACE RIVER/HIGH LEVEL)
(PH46) SOUTH RINGS CREEK

SITE LOCATION

FIGURE 1

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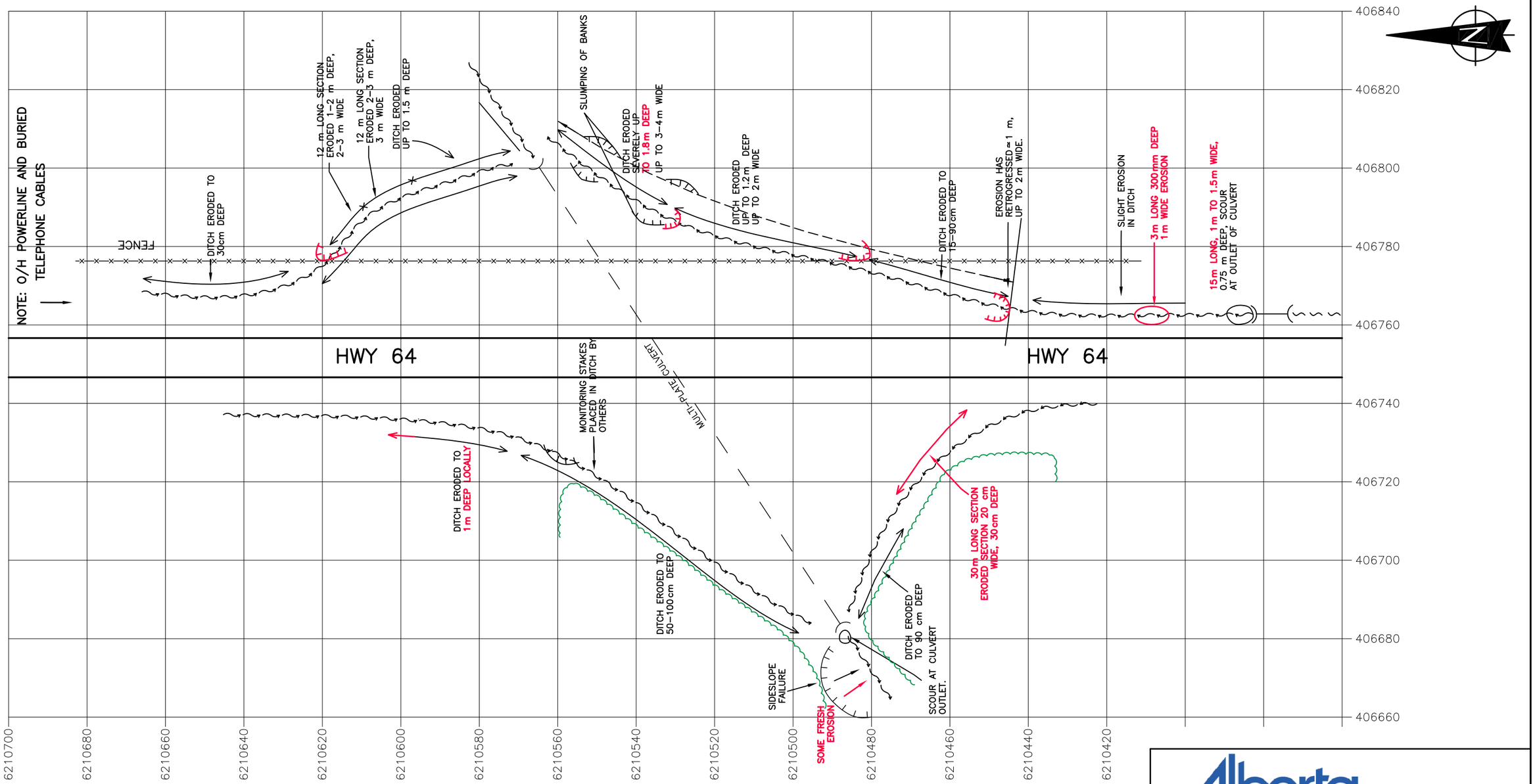
GEOTECHNICAL ▪ ENVIRONMENTAL ▪ MATERIALS



NOTES:

1 LOCATION DATA RECORDED USING HAND HELD GPS RECEIVER. ALL LOCATIONS ARE APPROXIMATE AND ARE FOR ILLUSTRATIVE PURPOSES ONLY.

2 2008 OBSERVATIONS SHOWN IN RED

0 10 20 30 40 50 m

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PEACE REGION (PEACE RIVER/HIGH LEVEL)
PH46 HIGHWAY 64:06, KM 25.9

SITE PLAN

FIGURE 2

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GEOTECHNICAL ▪ ENVIRONMENTAL ▪ MATERIALS