

GEOHAZARD ASSESSMENT PROGRAM

PEACE RIVER / HIGH LEVEL AREA

2011 INSPECTION



| Site Number | Location | Name | Hwy | km |
|--------------------|----------------------|------------------|--------|-------------|
| PH47 | West of Deadwood, AB | Deadwood Slide | 690:02 | Approx. 2.2 |
| Legal Description | | UTM Co-ordinates | | |
| SW1/4 28-89-23-W5M | | 11V N 6289120 | | E 462789 |

| | Date | PF | CF | Total |
|-----------------------------|--|--------------|------|-------|
| Previous Inspection: | June 03, 2010 | 13 | 3 | 39 |
| Current Inspection: | June 06, 2011 | 13 | 3 | 39 |
| Road AADT: | 80 | Year: | 2010 | |
| Inspected By: | (Don Proudfoot and Harjeet Panesar, Thurber Engineering) (Neil Kjelland and Ed Szmata, Alberta Transportation) | | | |
| Report Attachments: | <input checked="" type="checkbox"/> Photographs <input checked="" type="checkbox"/> Plans <input type="checkbox"/> Maintenance Items | | | |

| Primary Site Issue: | Slope movement affecting highway | | |
|---|---|-------------------------------------|--------------------------|
| Dimensions: | See drawing | | |
| Date of any remediation: | None in the last year | | |
| Maintenance: | ACP patch (August 2008) | Worsened? | |
| Observations | Description | Yes | No |
| | | | |
| <input checked="" type="checkbox"/> Pavement Distress | Slight increase in crack width and drop, reflecting through 2008 ACP patch. Pavement cracking has extended beyond the patch limits to the west. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> Slope Movement | Slow creep movement causing cracks in pavement | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> Erosion | | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> Seepage | | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> Bridge/Culvert Distress | | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> Other | | <input type="checkbox"/> | <input type="checkbox"/> |

Instrumentation:
Two slope inclinometers (SI-A and SI-B), a pneumatic piezometer and some standpipe piezometers were observed on site and are understood to be installed by J.R. Paine.

Assessment (Refer to Figure PH47-1):

- The slope failure appears to be the result of toe erosion caused by the creek located immediately south of the highway leading to over-steeping of the slope. It is expected that, if left untreated, slow creep movements will continue.
- Additional signs of movement were noticed during the 2011 site visit. The pavement cracks have opened up ranging between 10 mm and 20 mm wide and vertical drops of about 5 mm to 15 mm.
- Groundwater levels in the two standpipe piezometers were recorded at levels of about 0.8 m to 2.5 m below ground surface at the time of our visit on June 6, 2011.
- High plastic grey clay drill cuttings were noticed around the SI installations.

Recommendations:

Three options have been identified as possible long term solutions.

The first option would involve the installation of a 1500 mm diameter CSP culvert along the toe of the slide, which would prevent further creek erosion of the toe of the slope. In addition to the culvert installation, a toe berm would be constructed and the slide mass re-graded to a flatter uniform slope in order to re-establish slope stability. A DFO authorization would be required to carry out this option.

The second solution would be based on the use of a pile wall to stabilize the highway side slope.

The third option would include either partial or full excavation of the slide mass, construction of a deep shear key, and reconstruction of the highway sideslope. This option would also involve the lining of the creek bed with rip rap in order to prevent further toe erosion.

As recommended during 2010 assessment, geotechnical investigation was undertaken by others which involved drilling three test holes. Two slope inclinometers and three standpipe piezometers were also installed as part of the investigation. The approximate locations are shown on Figure PH47-1.



Photo 1 - View of Highway 690 showing the 2008 ACP patch, looking east.



Photo 2 – Increased cracking on pavement looking southwest.



Photo 3 - View of Highway 690 showing the 2008 ACP patch, looking west.

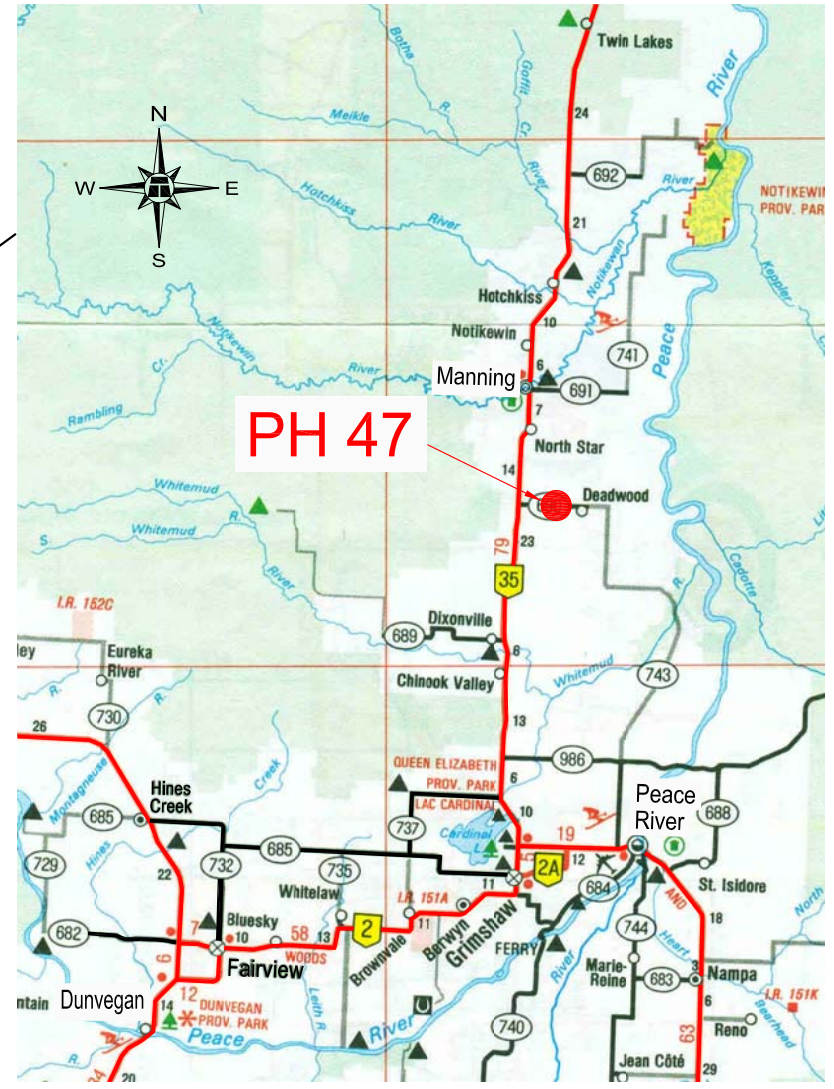
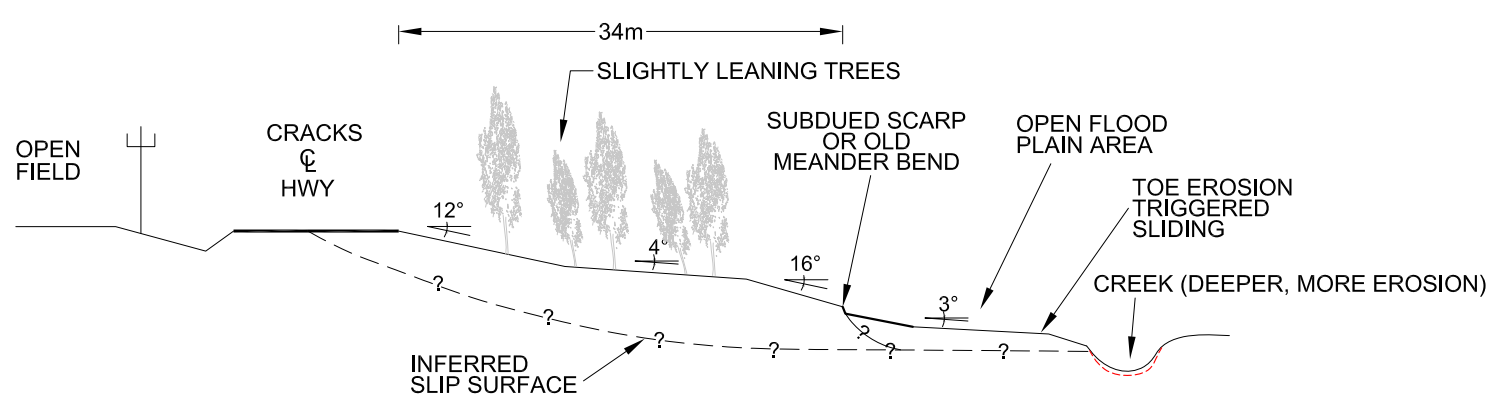
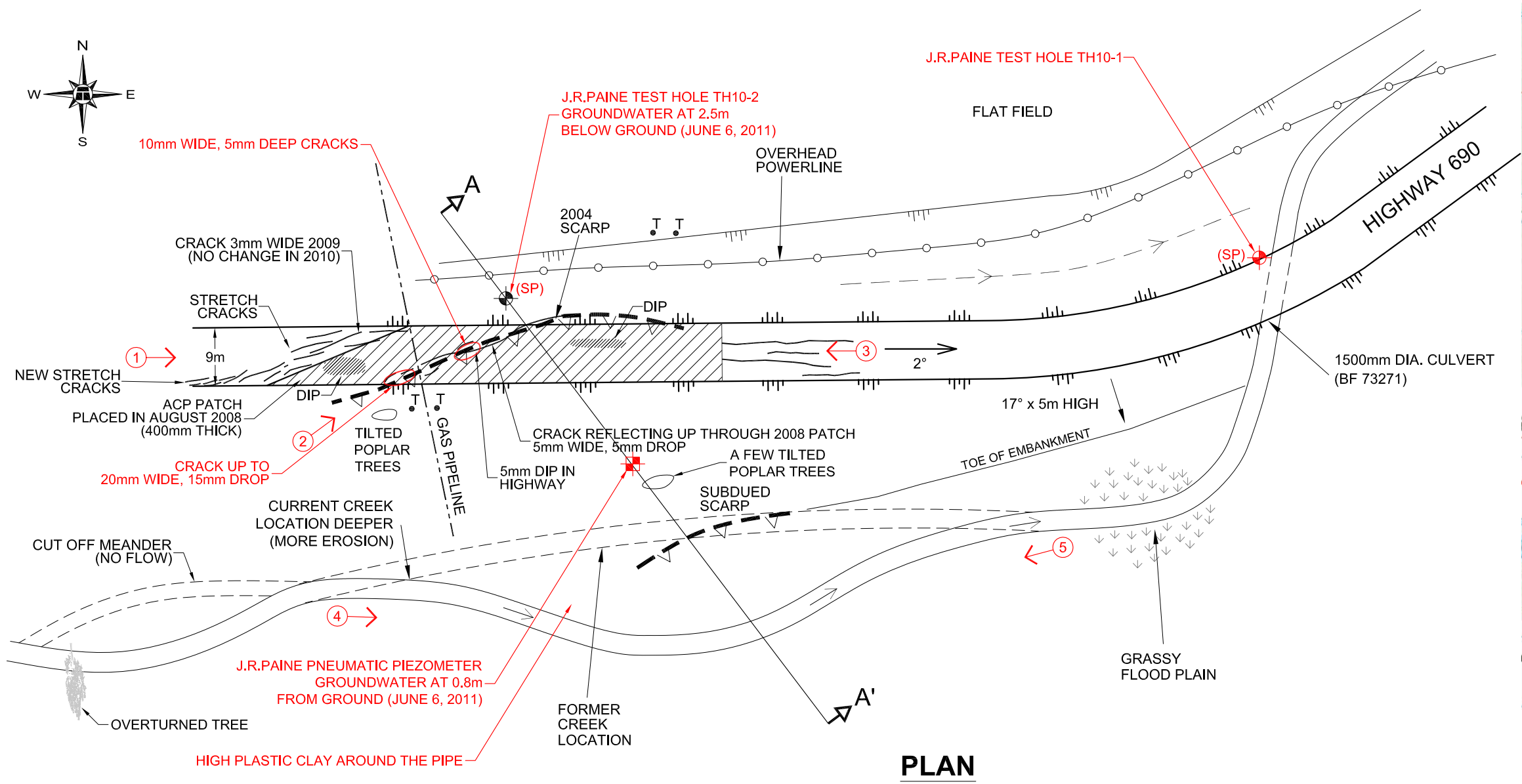


Photo 4 - View of creek looking east.



Photo 5 - View of creek looking west.

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NOTES :

1. FEATURE LOCATIONS ARE APPROXIMATE
2. PREVIOUS OBSERVATIONS SHOWN IN BLACK
3. JUNE 2011 OBSERVATIONS SHOWN IN RED

LEGEND :

- ⊙ TELUS PEDESTAL
- ⊙ PROPOSED PZ LOCATION
- ① → PHOTO AND DIRECTION

**FIGURE PH47-1
DEADWOOD SLIDE- PH47 - HWY 690:02
PEACE REGION (PEACE RIVER/HIGH LEVEL)
GEOHAZARD ASSESSMENTS**

DATE : JUNE 2011
THURBER PROJECT # 15-16-264