

GEOHAZARD ASSESSMENT PROGRAM

PEACE RIVER / HIGH LEVEL AREA

2010 INSPECTION



Site Number	Location	Name	Hwy	km
PH58	Northeast of Town of Peace River, AB	Cadotte Lake	986:02	Approx. 41
Legal Description		UTM Co-ordinates		
NW1/4 35-86-17-W4M		11V N 6262615	E 526085	

	Date	PF	CF	Total
Previous Inspection:	May 19, 2009	11	3	33
Current Inspection:	June 3, 2010	11	3	33
Road AADT:	970	Year:		2009
Inspected By:	(Don Proudfoot and Gustavo Padros, Thurber Engineering) (Roger Skirrow, Neil Kjelland, Ted Prue 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:	Culvert inlet: Water ponded by beaver dam heaved culvert inlet Culvert outlet: Slope failure and destroyed pipe outlet		
Dimensions:	See drawing		
Date of any remediation:	None in the last year		
Maintenance:	None in the last year		Worsened?
Observations	Description	Yes	No
<input type="checkbox"/> Pavement Distress		<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	Retrogressive slope failure at culvert outlet location	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Erosion	Erosion rills near the culvert inlet and outlet have increased in size	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Seepage	Wet clay was noted throughout the slump and at the backscarp at the culvert outlet location	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Culvert Distress	- Culvert inlet heaved and broken by water uplift pressures created by beaver dam built in front of inlet - Culvert outlet destroyed by slope failure	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Other		<input type="checkbox"/>	<input type="checkbox"/>
Instrumentation:			
None			
Assessment (Refer to Figure PH57-1):			
Culvert Inlet: The beaver dam appears to have blocked the creek flow and created a pond upstream of the culvert. Seepage under the beaver dam appears to have exerted uplift pressures that heaved the culvert inlet. The water level rising behind the dam kept pushing the culvert inlet upwards, breaking it.			

Culvert Outlet: Retrogressive slope failure possibly triggered by erosion / scour at the outlet of the culvert. Seepage from the highway embankment may have been a contributing factor. Due to the continued retrogressive movement, a 6 m length CSP segment has sheared off and now the effective outlet starts deeper into the embankment. The slumped soil is partially blocking culvert flow and becoming saturated. The slump is expected to continue to retrogress towards the highway if repairs are not carried out. Based on the length of the broken CSP segments located downslope of the slump, it appears that the original culvert outlet was located roughly 21 m further north than the present sheared outlet.

Recommendations:

Repairs to the culvert inlet are required. The damaged pipe section needs to be removed and a small excavation of the embankment toe near the culvert inlet is required to provide access for repairs. A new pipe section needs to be installed.

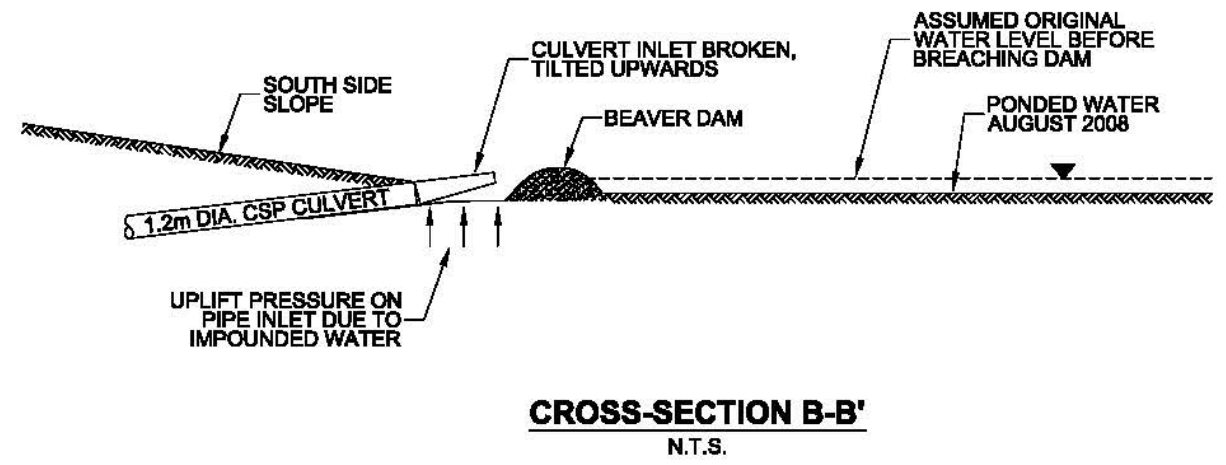
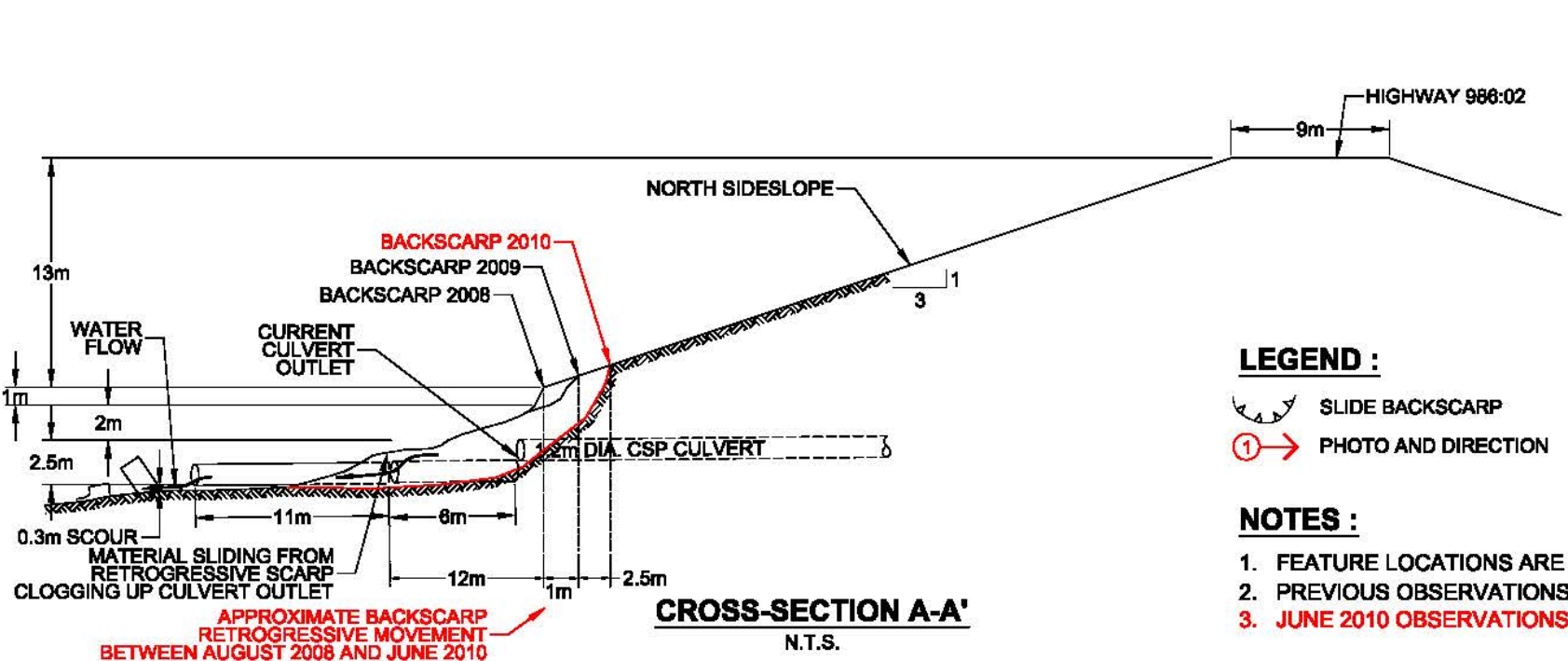
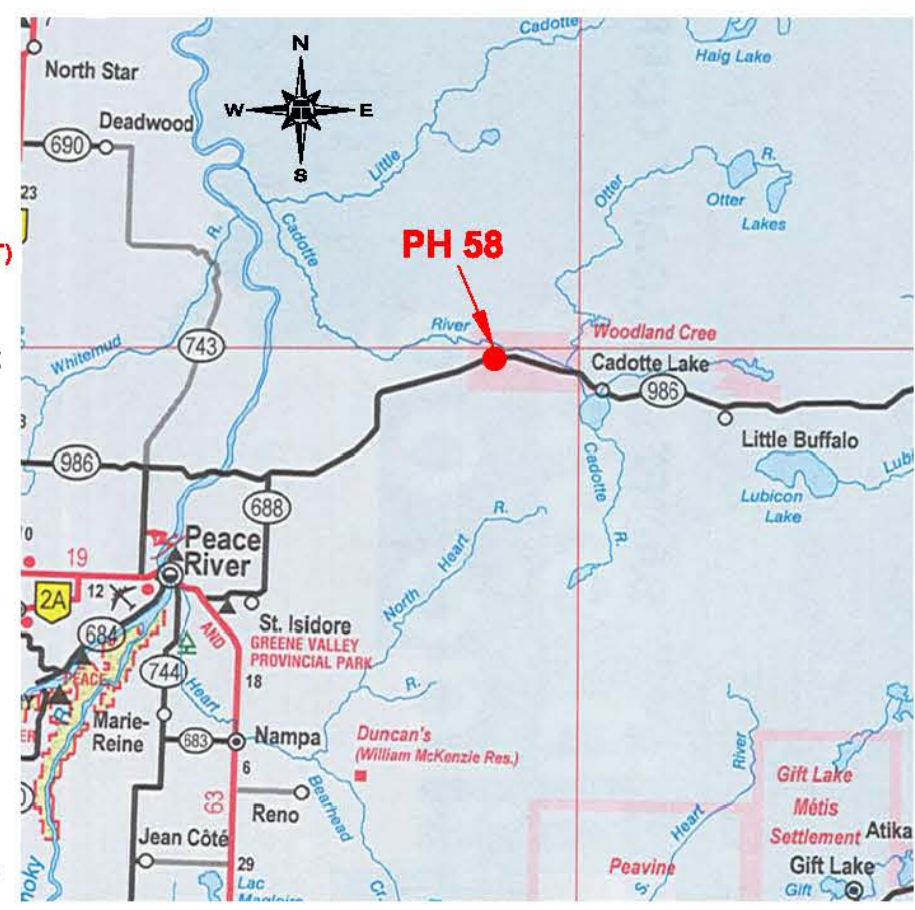
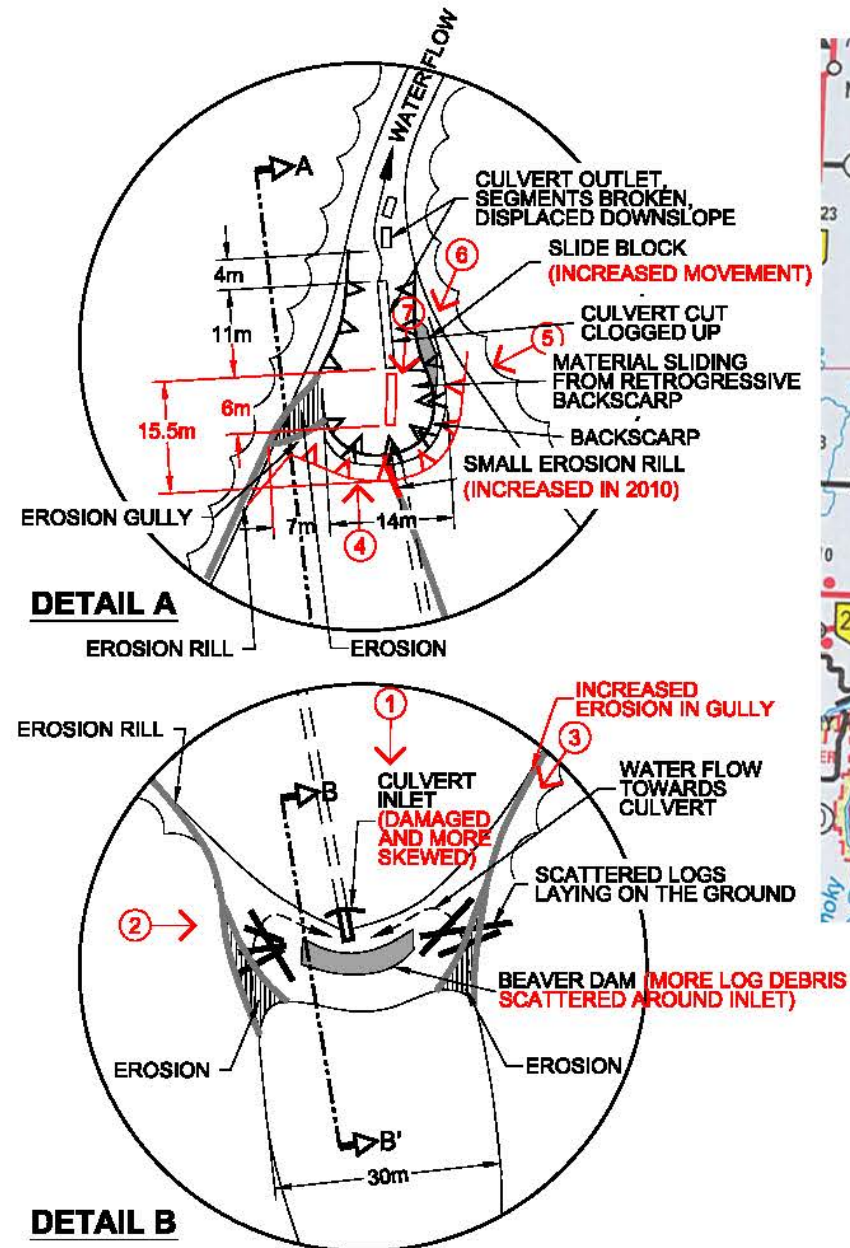
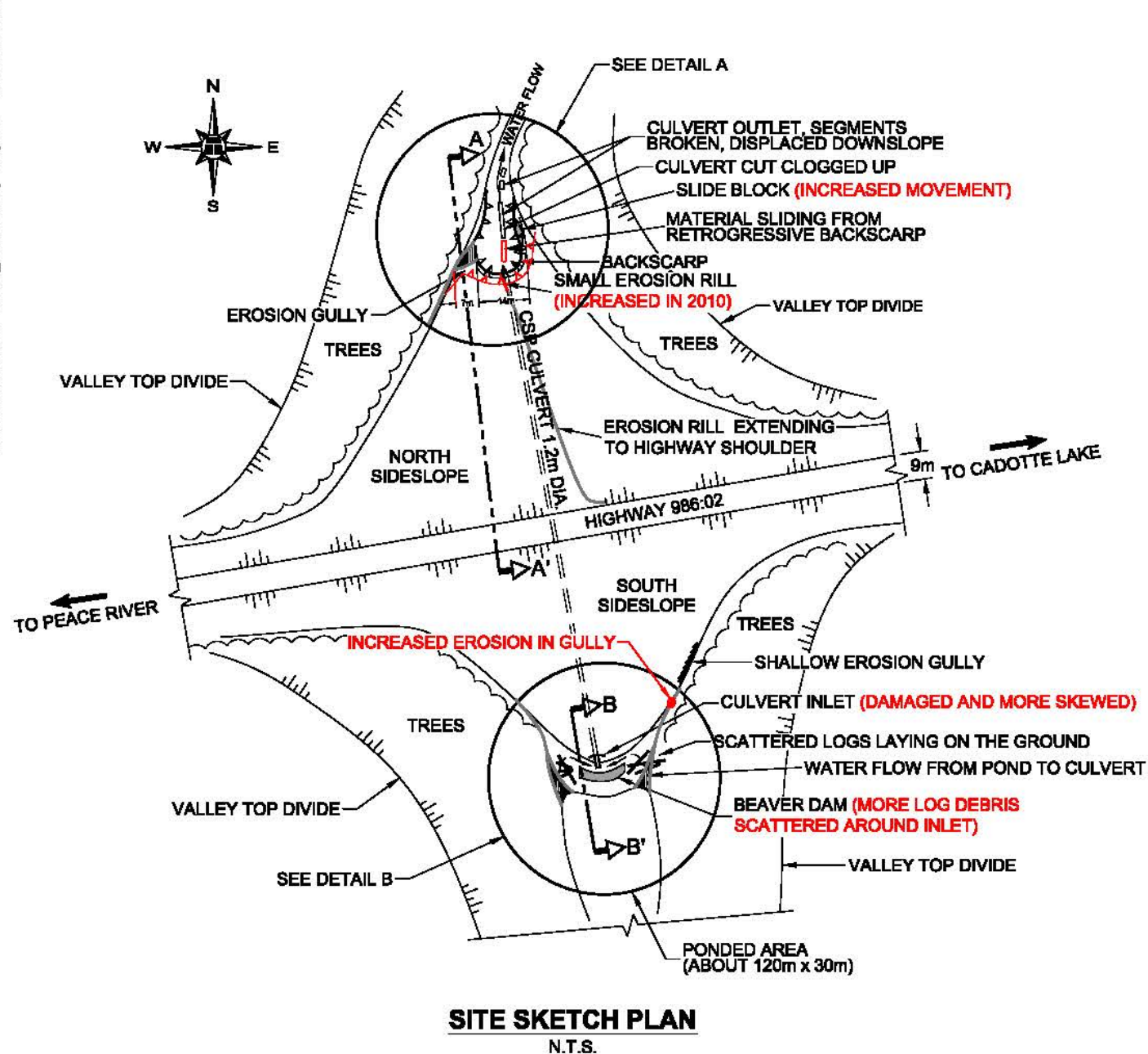
To repair the inlet, it should be backfilled with well compacted medium plastic clay to re-establish a plug. Rip rap erosion protection should be placed around the inlet in accordance with AT standards.

The remains of the beaver dam should be excavated down to the original ground level to drain as much water as possible and the logs scattered near the culvert inlet need to be removed to avoid drift from blocking the culvert. Measures have to be taken to prevent beavers from building a new dam.

The erosion rill east of the culvert inlet should be backfilled with clay, topsoiled, seeded and covered with high flow soil covering (RECP). A flat-bottom swale should be formed at this repair to avoid concentration of runoff.

The recommended repair at the outlet is to excavate the slumped material to undisturbed soil below and behind the slide surface and to dispose of the wet clay and broken culvert pieces. A blanket of free draining granular material should then be draped over the lower 1/3 of the excavation, separated from the native soil by a non-woven geotextile. The culvert should be extended to a longer length than the original to allow a berm to be constructed to flatten the overall inclination of the sideslope. A rip rap lined flow dissipation bowl should be constructed beyond the outlet of the extended pipe.

A topographic survey, stability analysis and fisheries assessment should be carried out to complete the design.



- LEGEND :**
- SLIDE BACKSCARP
 - PHOTO AND DIRECTION
- NOTES :**
1. FEATURE LOCATIONS ARE APPROXIMATE
 2. PREVIOUS OBSERVATIONS SHOWN IN BLACK
 3. JUNE 2010 OBSERVATIONS SHOWN IN RED

FIGURE PH58-1
PH58 : CULVERT CROSSING ON HWY 986:02 WEST OF CADOTTE LAKE
PEACE REGION (PEACE RIVER / HIGH LEVEL) GEOHAZARD ASSESSMENT

DATE : JUNE 2010
 THURBER PROJECT # 15-18-250



Photo 1: View of south sideslope, beaver dam remains and ponded water, south of culvert inlet.



Photo 2: View of beaver dam and culvert inlet, broken and tilted upwards, looking east.



Photo 3: Increased erosion in rill located east of culvert inlet.



Photo 4: Broken culvert and increased slope movement at the outlet, looking north.



Photo 5: View of slope failure and broken culvert outlet, looking upslope.



Photo 6: Increased backscarp retrogression at culvert outlet, looking west.



Photo 7: Pipe destroyed at culvert outlet location, looking upslope.