



**PEACE REGION
(GRANDE PRAIRIE DISTRICT – SOUTH) GRMP**



SITE INSPECTION FORM

SITE NUMBER AND NAME: GP008 Road Surface Slumping (2.5 km North of McIntyre Mine)		HIGHWAY & KM: 40:36, 16.365 and 17.139	PREVIOUS INSPECTION DATE: June 14, 2022	INSPECTION DATE: June 10, 2024
LEGAL DESCRIPTION:	NAD 83 COORDINATES:		RISK ASSESSMENT:	
	UTM	Northing	Easting	
SE 15-58-08-W6M	11	5986982	362802	West Slide: PF: 8 CF: 4 TOTAL: 32
SW 14-58-08-W6M	11	5987018	363134	Middle Slide: PF: 8 CF: 4 TOTAL: 32
SW 14-58-08-W6M	11	5987028	363196	East Slide: PF: 8 CF: 5 TOTAL: 40
NW 14-58-08-W6M	11	5987195	363778	ATCO Slide: PF: 8 CF: 4 TOTAL: 32
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 820 (East) & 820 (West) (Reference No. 70000788, 2023)			CONTRACT MAINTENANCE AREA (CMA): 504	

SUMMARY OF SITE INSTRUMENTATION:	INSPECTED BY:
Operable: Three slope inclinometer (SIs) and two pneumatic piezometers (PNs) installed in 2004 at west slide. No instruments installed at other slides.	Chris Gräpel (KCB)
Inoperable: One PN installed in 2004.	Courtney Mulhall (KCB)
LAST READING DATE: May 22, 2024	Robert Senior (TEC)
	Rishi Adhikari (TEC)
	Babatunde Awokunle (TEC)

PRIMARY SITE ISSUE:

At west side of site, three slides/slope failures in a possible mine-waste fill/dump below Hwy 40:36: west slide cuts diagonally across highway, middle slide confined to northbound lane and shoulder, and east slide encompasses both lanes of Hwy 40:36.

At east side of site, a shallow slide (ATCO slide, which was added to GP008 site in 2022) was triggered by temporary bench construction for powerline work and affects northbound lane of Hwy 40:36.

The site is located along the west valley slope of the Smoky River near the former McIntyre Mine (now CST Canada Coal Ltd.). In 2022, previous rockfall component of this site was separated into its own GRMP site (GP053).

APPROXIMATE DIMENSIONS:

West/middle/east slides: Slope appears to be approximately 30 m high and could be an old mine-waste fill/dump that predates highway construction. West, middle, and east slides at pavement surface approximately 60 m, 15 m, and 140 m wide, respectively.

ATCO slide: Slide is approximately 20 m wide and extends approximately 20 m from guardrail down to bench with an approximate slope angle of 2.5H:1V. The bench is approximately 20 m wide and 6 m deep (parallel and perpendicular to highway, respectively) with a near-vertical backslope.

DATE OF ANY REMEDIAL ACTION: Ongoing patching and paving, including recent patching in 2021 at the west and ATCO slide areas. At time of inspection, a contractor was mobilizing to site to repair the ATCO slide (see repair description below).

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Cracking and subtle dips in pavement surface at west, middle, and east slides (Photos 1 to 6, see below). Dip in pavement surface and cracking near shoulder of northbound lane at ATCO slide (Photos 7 and 8).		X

Slope Movement	X		Four slides as described above. Cracking in recent pavement patch indicates ongoing slide movements. SI movement rates slow (overall less than 2 mm/year). Subtle changes in slope grading near bushes at northern slide could indicate a toe bulge.		X
Erosion		X	None observed at time of 2024 inspection.		X
Seepage		X	None observed at time of 2024 inspection.		X
Culvert Distress	X		Culvert inlets crushed and/or partially blocked by rockfall particles in north highway ditch, see GP053 inspection report.		X

COMMENTS

TEC has previously said that pavement cracks from west, middle, and east slide zones usually reflect though pavement patches very quickly.

West Slide (Photos 1 and 2):

- Cracking in northbound lane that extends diagonally on either end across both lanes of highway.
- There appears to be a subtle dip or low spot in pavement surface just west of slide.

Middle Slide (Photos 3 and 4):

- Pavement cracking and subtle dip at middle slide is about 15 m wide with a roughly circular pattern that extends from highway centerline to northbound shoulder. The width of the slide as indicated by pavement cracking does not appear to indicate a large failure that extends far down the slope. The surface of the slope below the middle slide appears to be stable with the possibility of a toe bulge approximately 10 m downslope in the bushes that could also be a remnant from poor slope grading.
- Material exposed on slope below middle slide appears to be mine-waste material and could be from a former mine-waste fill/dump that predates highway construction. There is several meters distance between the guardrail and the crest of the slope which could also indicate a former mine waste structure as opposed to a highway embankment fill. Mine-waste dumps are typically built-in thick lifts with minimal compaction by end dumping with haul trucks. Settlements of the embankment could occur with time that might explain the movements at the western site limits, as would sliding of the waste dump slopes on thin sloping layers of segregated and/or fine-grained waste-dump materials that become preferential drainage paths.

East Slide (Photos 5 and 6):

- Cracking extends across both lanes of highway with a subtle dip in northbound lane. Pieces of pavement missing along one crack that extends roughly perpendicular across highway.
- Brake marks observed in southbound lane near blue-hazard-diamond sign.

Maintenance/Repair/Monitoring Recommendations:

- ATCO constructed a bench for powerline work on the downslope/east side of the highway embankment. The bench was constructed using a cut and sliver fill method, resulting in an over-steepened backslope and fill slope that led to the slide above the bench. Slides movements have resulted in pavement cracking near the shoulder of the northbound lane and a dip in the pavement surface. The stability of the slope below the bench is unknown, and it is immediately above the train tracks. KCB has prepared a repair design for the ATCO slide, which includes excavating and reconstructing the slide with geogrid-reinforced fill and drainage. At the time of the 2024 inspection, a contractor was mobilizing to site to begin repair work which is expected to take approximately two to three weeks to complete. KCB will be on site to monitor repair work. Estimated cost or repair: \$650,000 to \$700,000.

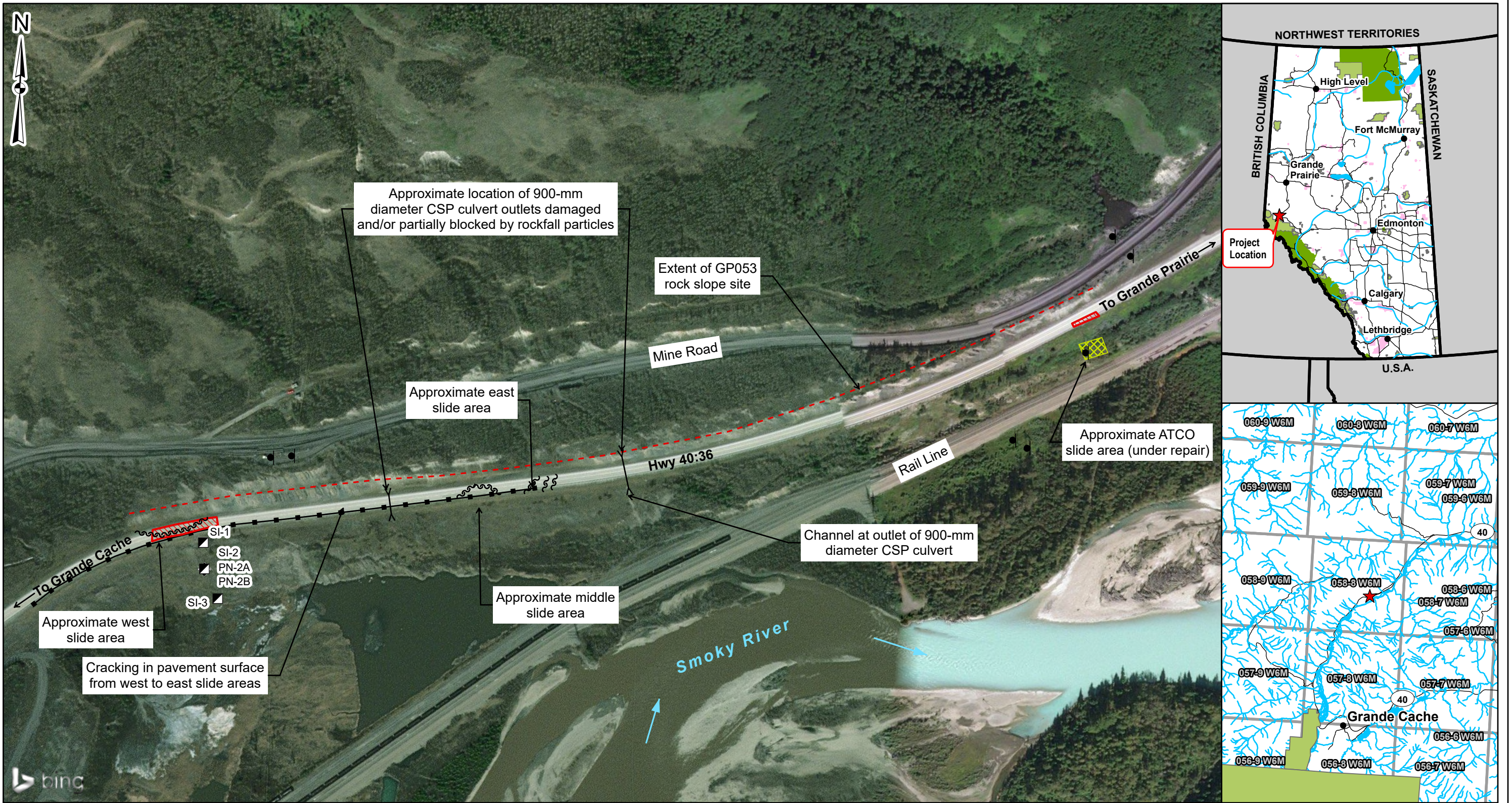
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Courtney Mulhall, M.Sc., P.Eng.
Geotechnical Engineer



File: Z:\A\EDM\A05116A01\ABT Grande Prairie South GRMP\400 Drawings\GIS\MXD\2024\Section B\AT_GP_South_SectionB_241016.aprx Date: Time: Creator: A.Harrison

Legend

- Powerpole
- Approximate Pneumatic Piezometer Location
- Approximate Slope Inclinometer Location
- Flow Direction
- Crack
- Rockfall Corridor
- Guardrail
- Culvert
- ATCO Excavation
- Pavement Patch



NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM ZONE 11N
 3. IMAGE SOURCE: 2022 MICROSOFT CORPORATION, 2022 MAXAR CNES, DISTRIBUTION AIRBUS DS

CLIENT



PROJECT
 PEACE REGION (GRANDE PRAIRIE DISTRICT-SOUTH)
 GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE
 Site Plan
 GP008 - Road Surface Slumping
 (2.5 km North of McIntyre Mine)
 Hwy 40:36, km 16.365 and 17.139

SCALE 1:4,000 PROJECT No. A05116A01 FIG No. 1

Inspection Photographs

Photo 1 Cracking in pavement surface of Hwy 40:36 at east slide area. Photos taken June 10, 2024, facing southeast and southwest, respectively.



Photo 2 Slope on south side of Hwy 40:36 at west slide area. Photos taken June 10, 2024, facing southeast and southwest, respectively.



Photo 3 Cracking and dip in pavement surface of Hwy 40:36 at middle slide area. Photo taken June 10, 2024, facing southeast.



Photo 4 Slope on south side of Hwy 40:36 at middle slide area. Photos taken June 10, 2024, facing southeast and southwest, respectively.



Photo 5 Cracking and dip in pavement surface of Hwy 40:36 at east slide area. Photo taken June 10, 2024, facing northeast and west, respectively.



Photo 6 Slope on south side of Hwy 40:36 at east slide area. Photos taken June 10, 2024, facing southeast and southwest, respectively.



Photo 7 Pavement surface of Hwy 40:36 above ATCO slide. Note contractor in process of mobilizing to site to begin repair work. Photo taken June 10, 2024, facing southwest.



Photo 8 ATCO slide on south side of Hwy 40:36. Note contractor in process of brush removal to begin repair work. Photo taken June 10, 2024, facing southwest.

