



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



SITE INSPECTION FORM

SITE NUMBER AND NAME: GP049 Rockfall 5.5 km South of McIntyre Mine		HIGHWAY & KM: 40:36, 8.395	PREVIOUS INSPECTION DATE: May 25, 2020	INSPECTION DATE: June 14, 2022
LEGAL DESCRIPTION: NW 29-57-08-W6M	NAD 83 COORDINATES: UTM Northing Easting 11 5981300 358436		RISK ASSESSMENT: PF: 12 CF: 4 TOTAL: 48	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 820 (north) & 1020 (south) (Reference No. 25592, 2021)			CONTRACT MAINTENANCE AREA (CMA): 504	

SUMMARY OF SITE INSTRUMENTATION: There is no instrumentation at the GP049 site. LAST READING DATE: N/A	INSPECTED BY: Chris Gräpel (KCB) Courtney Mulhall (KCB) Ed Szmata (AT) Kristen Tappenden (AT) Max Shannon (AT) Dwayne Lowen (AT MCI) Mike Schiffer (Ledcor HMC)
PRIMARY SITE ISSUE: Rockfall hazards from rock cut slope along west side of Hwy 40:36. Talus deposits and rockfall particles from rock cut slope constrict upslope/west highway ditch and falling rocks are a traffic hazard. The site is located along the west valley slope of the Smoky River. In 2022, debris flow component of this site made into a separate site (GP054) for debris flows only.	
APPROXIMATE DIMENSIONS: Rock cut slope near vertical, and approximately 250 m long and 15 m to 20 m high above pavement surface.	
DATE OF ANY REMEDIAL ACTION: Ongoing highway ditch cleaning and removal of rockfall particles from pavement surface.	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress		X	None observed at time of 2022 inspection.		X
Slope Movement	X		Previously fallen rockfall particles (up to 0.5 m x 1.0 m x 0.3 m) between toe of slope and edge of pavement.	X	
Erosion	X		Differential weathering, freeze thaw, ice jacking, and seepage eroding rock mass.	X	
Seepage	X		Seepage previously observed by others at crest of slope, but not at time of 2022 inspection.		X
Culvert Distress		X	No culverts observed by KCB.		X

COMMENTS
Rock mass consists of sedimentary rocks with beds that are approximately horizontal.
Several hanging rock blocks close to falling.
<p>Southern two-thirds of rock cut slope:</p> <ul style="list-style-type: none"> • Brow of rock slope is treed with a relatively thin layer of overburden. • Above the mid-slope bench the rock mass is highly fractured with an accumulation of fine-grained particles and rock piles creating a talus slope along the bench. • Below the mid-slope bench the rock mass is more massively bedded and competent. However, the coal (and other less competent materials) is weathering faster than the remaining rock mass resulting in the undermining of more competent materials, which result in overhanging blocks and particles with little support that eventually fall. • Mid-slope bench and talus cones/slopes could potentially bounce/launch/roll rockfall particles out onto highway. Some small trees on mid-slope bench. • Rockfall particle approximately 0.3 m x 0.3 m x 0.3 m observed approximately 1.0 m from west pavement edge.
<p>Northern third of site of rock cut slope:</p> <ul style="list-style-type: none"> • The rock quality is poor, and the overburden is thicker, resulting in the accumulation of talus cones/slopes along the bedding planes and at the toe of the slope. • Four large blocks were observed at the toe of the slope, but they look like they appear to have been pushed to their current location. • Talus cones/slopes could potentially bounce/launch/roll rockfall particles out onto highway.
<p><u>Maintenance/Repair/Monitoring Recommendations:</u></p> <ul style="list-style-type: none"> • Call out completed at the GP036, GP049, and GP053 sites on July 14, 2022 after increased rockfall activity was triggered by wet weather. As part of the call out a review will be completed to determine where scaling and an attenuating mesh is needed. <ul style="list-style-type: none"> ○ Short term – Rock slope should be scaled by a high-angle specialty contractor. Scaled materials and other rockfall materials should be cleaned out of the ditch. Estimated cost: \$55,000 to \$75,000 if entire rock face scaled. ○ Long term – Rock slope should be draped in an attenuating mesh that reduces the energy of falling rocks and limits their potential to reach the highway. Estimated cost: \$190,000 to \$260,000 if entire rock face draped with mesh. • Signage (e.g., “watch for fallen rock”, no parking etc.) should be installed on either side of site warning motorists of the rockfall risk. As well as the two cut slopes approximately 300 m and 700 m north of the site as shown in Photo 1. • Upslope/west ditch approximately 5 m to 6 m wide with an approximate 4H:1V sides slope. Rockfall particles not currently impeded ditch drainage. MC reported ditch has not been cleaned in approximately three years, and previously when the ditch was full water flowed out across the highway during heavy rainfall. Continue to clean to maintain to maintain rockfall storage volume (i.e., keep ditch as wide and deep as possible to retain material within the ditch) and reduce the potential for material reaching the highway. Buried gas line below ditch limits depth that ditch can be excavated or cleaned out.
<p>This report is an instrument of service of Klohn Crippen Berger (KCB). The report has been prepared for the exclusive use of Alberta Transportation (Client) for the specific application to the Peace Region (Grande Prairie District – South) Geohazard Risk Management Program (Contract No. CON0022166) and it may not be relied upon by any other party without KCB's written consent.</p>

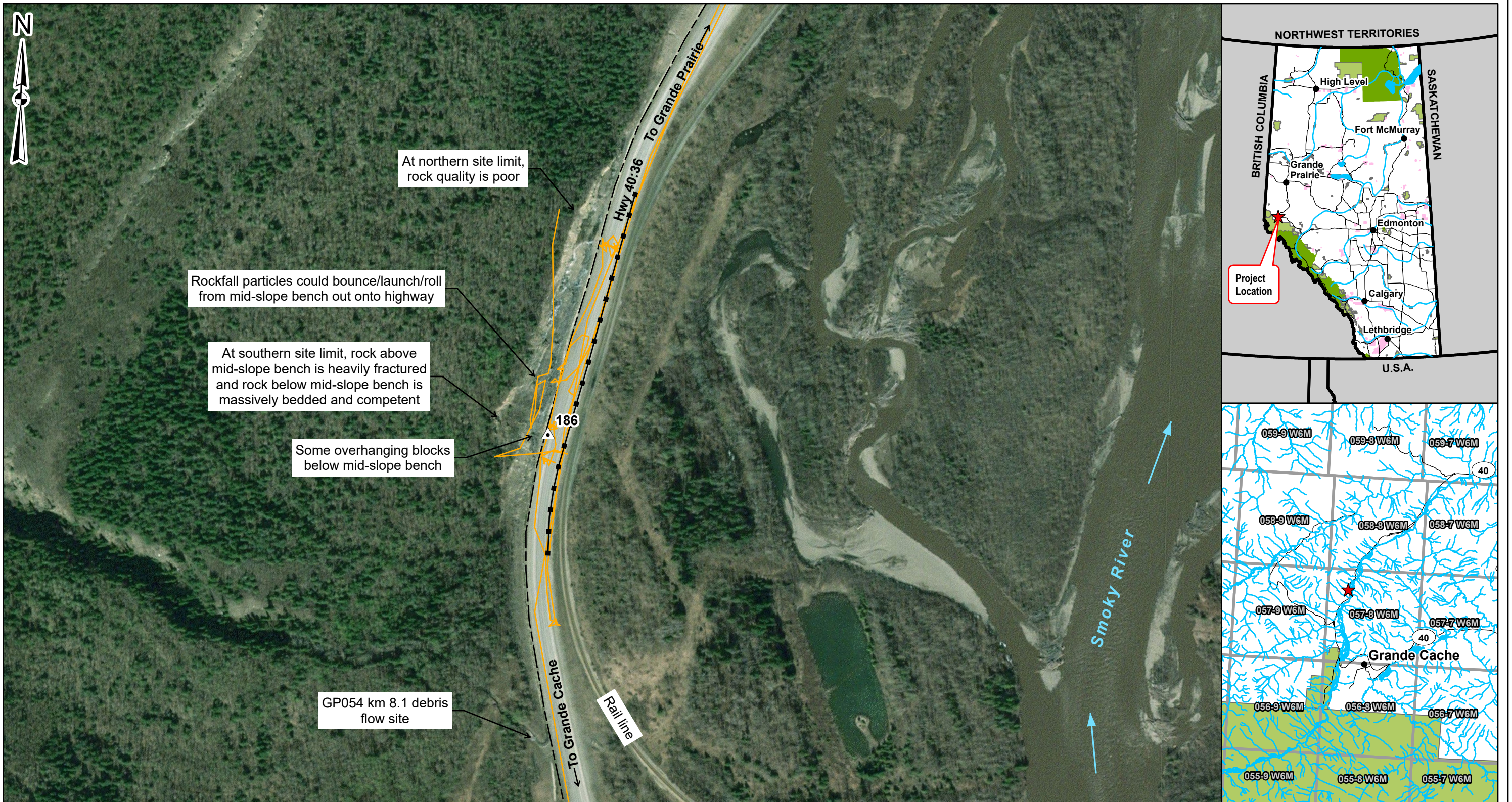
SITE INSPECTION FORM

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Chris Gräpel, M.Eng., P.Eng.
Senior Civil Engineer, Associate



Legend

- GPS Waypoint (June 14, 2022)
- GPS Track (June 14, 2022)
- Flow Direction
- Guardrail
- Pipeline

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
 GP049 - Rockfall 5.5 km South of McIntyre Mine
 Hwy 40:36, km 8.395

SCALE 1:3,000 PROJECT No. A05116A01 FIG No. 1

Inspection Photographs

Photo 1 Overview of GP049 site on Hwy 40:36. Photo taken June 14, 2022, facing northwest.

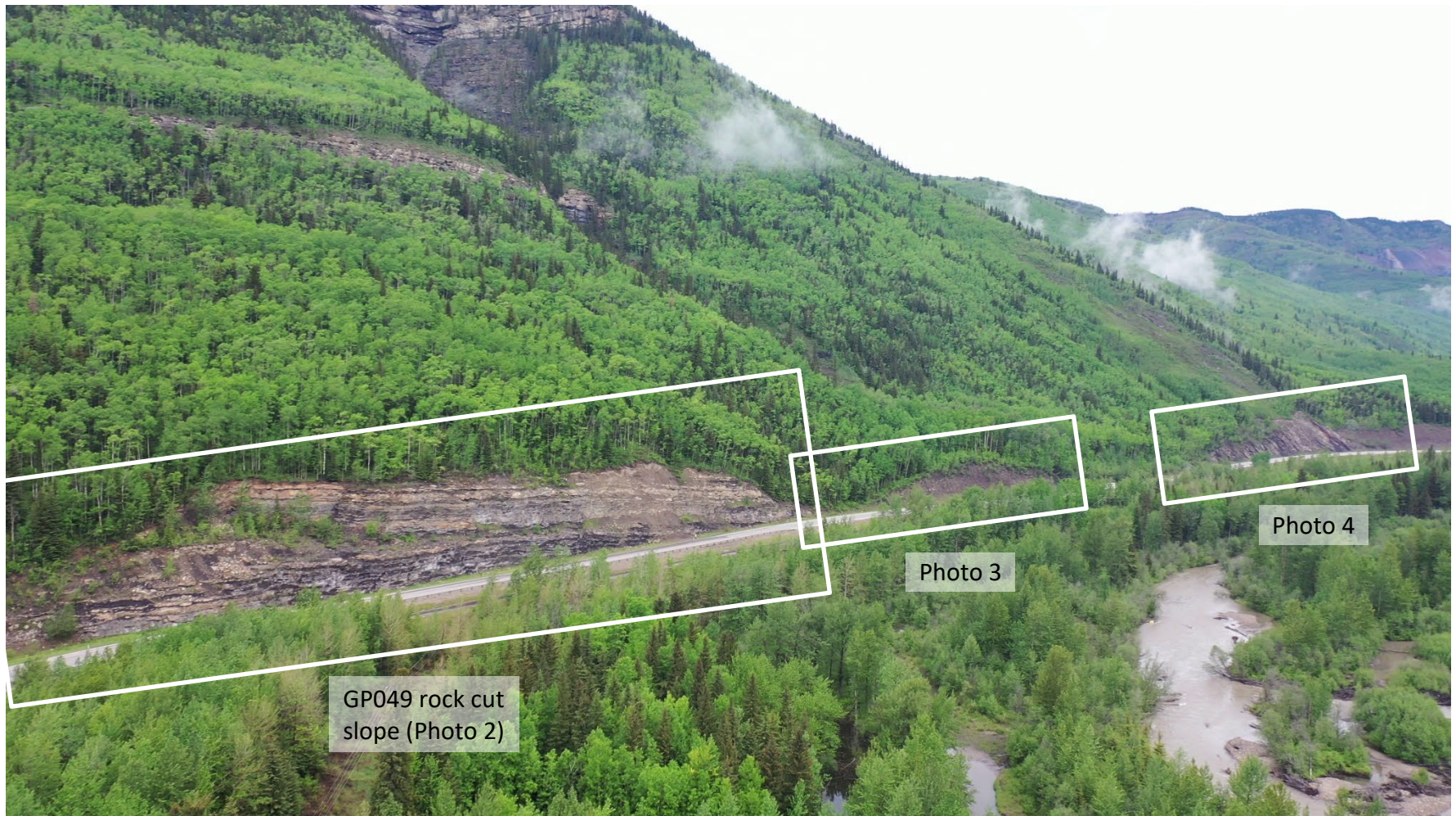


Photo 2 Rock cut slope along west side of Hwy 40:36. Note mid-slope bench and talus cones/slopes could potentially bounce/launch/roll rockfall particles out onto highway. Photo taken June 14, 2022, facing west.



Photo 3 Cut slope along west side of Hwy 40:36 north of GP049 site. Photo taken June 14, 2022, facing west.



Photo 4 **Rock cut slope along west side of Hwy 40:36 north of GP049 site. Photo taken June 14, 2022, facing west.**



Photo 5 Rock cut slope along west side of Hwy 40:36. Photo taken June 14, 2022, facing northwest at southern site limit.



Photo 6 Near horizontal bedding of rock cut slope. Rock below mid-slope bench is massively bedded and competent. While rock above mid-slope bench is heavily fractured. Photo taken June 14, 2022, facing northwest.



Photo 7 Overhanging blocks which have been undermined by differential weathering of coal (and other less competent materials). Photo taken June 14, 2022, facing northwest.



Photo 8 Talus materials and rockfall particles along mid-slope bench. Photo taken June 14, 2022, facing west.



Photo 9 At northern site limit, rock quality is poor resulting in small talus cones/slopes along bedding planes and at toe of slope. Photo taken June 14, 2022, facing west.



Photo 10 Rockfall particle near edge of southbound lane. Photo taken June 14, 2022 facing southwest.



Photo 11 Pavement surface and east side of Hwy 40:36. Photo taken June 14, 2022, facing northeast.



Photo 12 Pavement surface and east side of Hwy 40:36. Photo taken June 14, 2022, facing southwest.

