

SITE NUMBER AND NAME: S042-I Spray Lakes Rockfall Barrier		HIGHWAY & KM: 25291:02, 30.434	PREVIOUS INSPECTION DATE: July 6, 2021	INSPECTION DATE: May 17, 2022
LEGAL DESCRIPTION: SW-25-024-11 M5	NAD 83 COORDINATES: UTM Northing Easting 11 5658604 611006		RISK ASSESSMENT: Small rockfall: PF: 13 CF: 4 TOTAL: 52 Large rockfall: PF: 7 CF: 7 TOTAL: 49	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 1220 (west) & 1540 (east) (Reference No. 70000698)			CONTRACTOR MAINTENANCE AREA (CMA): 28	

SUMMARY OF SITE INSTRUMENTATION: There is no instrumentation at the S042 site. LAST READING DATE: N/A	INSPECTED BY: Chris Morgan (KCB) Laura Assaad (KCB) Roger Skirrow (AT) Alex Frotten (AT)
PRIMARY SITE ISSUE: Rockfall from steep, high rock slope, large rockfall in 2013, dilated rock mass, active processes. Large rockfalls are defined as generally great than 15 m ³ in size.	
APPROXIMATE DIMENSIONS: Slope height at Site I is approximately 150 m.	
DATE OF ANY REMEDIAL ACTION: Fencing installed at S042-I between 2016 and 2017 inspections. Material behind the fence appears to be regularly cleared out by TransAlta Generation Partnership (TransAlta).	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress		X	N/A – gravel road		X
Slope Movement		X	Previously fallen rocks (small and large) are visible and have been pushed off the roadway.		X
Erosion		X	Differential weathering, freeze thaw, ice jacking, and seepage eroding rock mass.		X
Seepage		X	Evidence of seepage out of cracks and below the overhang.		X
Culvert Distress		X	N/A – none observed		X
Rockfall	X		Mainly single rockfalls and ongoing raveling. Possible signs of rock mass failures above the narrowest section of road, and at the north end of S042-I.		X

COMMENTS
Smaller rockfalls may be triggered by precipitation and ice jacking during thawing trend (late winter). Small rockfalls could also be caused by rock climbers or wildlife, although this is difficult to quantify.
Large rock mass falls are possible (including areas with visible disaggregated rock at the north end of S042-I). Rockfalls are potentially triggered by deep seated water build up in cracks and ice damming during freezing trend (early winter).
S042-I: <ul style="list-style-type: none"> The rock slope is the site of several climbing routes. Alberta Environment and Parks (AEP) are currently building an improved parking area for cars and buses at the north limit of the site in addition to various park improvements along the Smith Dorien Trail. The additional traffic and exposure to rockfall needs to be considered.

- On May 6, 2019, a rockfall event with a total volume estimated to be between 0.3 m³ and 0.5 m³ was reported to AT. Small rockfalls appear to be ongoing since fresh unweathered rockfall debris with sharp edges were observed in the ditch, indicating recent detachment from the slope.
- There were no significant changes to the rock slope between the 2021 and 2022 inspections (Photo 1 and 2).
- The tear in the fence mesh (first observed during the 2020 inspection) appears to have enlarged between the 2021 and 2022 inspections (Photo 3).
- Rockfall debris is accumulating behind the existing rockfall fence at the toe of the slope (Photo 4).

S042-II (not visited in 2022):

- Work on this site is not included in KCB's work scope for repair/mitigation design.

Maintenance/Repair/Monitoring Recommendations:

- A LiDAR/radar survey should be completed to monitor the location and frequency of rockfalls, as well as any potential continued dilation of larger volumes of rock. The rock fence should be cleared and the fence mesh repair. Regular maintenance should be completed. Additional road signage is recommended to warn road users of risk of fallen rocks on highway.
- KCB submitted a design report to AT in March 2021. Repair options include installation of a rockfall fence, rock slope scaling, installation of a mesh attenuation curtain, and ongoing monitoring. At the closest point, the powerline appears to be 3 m to 5 m away from the rock slope, which could restrict drape mesh placement locations.
- The proposed design for rockfall hazard mitigations should be submitted for regulatory/permitting review which will likely lead to public consultation.

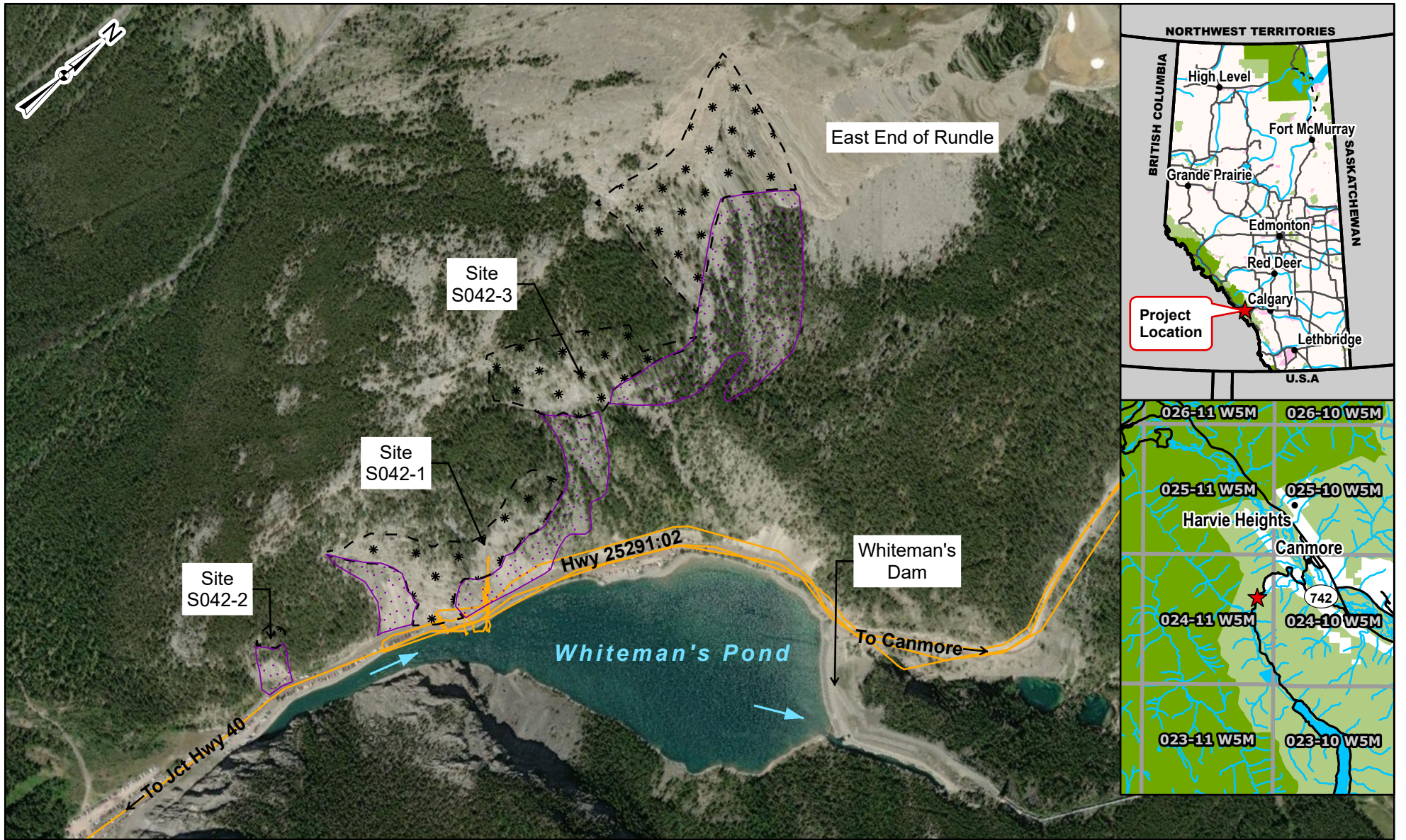
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<p>Chris Gräpel, M.Eng., P.Eng. Senior Civil Engineer, Associate</p>	
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Legend

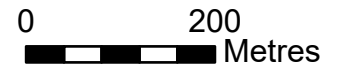
-  GPS Track (May 17, 2022)
-  Flow Direction
-  Active Talus
-  Potential Rockfall Sources

NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM ZONE 11N
 3. IMAGE SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS AND THE GIS USER COMMUNITY.

CLIENT




PROJECT SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM		
TITLE Site Plan S042 - Spray Lakes Rockfall Barrier Hwy 25291:02, km 30.434		
SCALE 1:8,000	PROJECT No. A05116A03	FIG No. 1



Inspection Photographs

Photo 1 Source area for rockfall, north of highway. Photo taken May 17, 2022, facing north.



Photo 2 Location north of the highway where the installation of a wire mesh should be completed to mitigate the rockfall hazard (indicated by red arrow). Photo taken May 17, 2022, facing northeast.



Photo 3 The bottom portion of the rock slope north of the highway and rock fence located at the toe of the slope. The tear in the rock fence (indicated by red arrow) appears larger since the 2021 inspection. Photo was taken May 17, 2022, facing northwest.



Photo 4 Rock slope north of the highway. Debris has accumulated behind the rock fence since and requires removal. No significant change since the 2021 inspection. Photo taken May 17, 2022, facing southwest.

