

SITE NUMBER AND NAME: NC037 – South of Whitcourt	HIGHWAY AND KM: 32:10, km 34.589	PREVIOUS INSPECTION: June 16, 2022	CURRENT INSPECTION: June 12, 2024
LEGAL DESCRIPTION: NW 27-59-12-W5M	NAD83 COORDINATES: UTM11U 5999427N, 583507E		RISK ASSESSMENT: PF: 5 CF: 4 Total: 20
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 2,160 (2023)		CONTRACTOR MAINTENANCE AREA (CMA): 508	

SUMMARY OF INSTRUMENTATION: Eight slope inclinometers, four pneumatic piezometers, four vibrating wire piezometers, and seven standpipe piezometers functional.	INSPECTED BY: Stantec: Leslie Cho, Sonja Pharand TEC: Kristen Tappenden
LAST READING DATE: May 14, 2024	
PRIMARY SITE ISSUE: Slope instability due to raised groundwater level caused by embankment construction together with weak foundation soils.	
APPROXIMATE DIMENSIONS: 500 m long by 80 m wide	
DATE OF ANY REMEDIAL ACTION: Dual toe berms constructed at Main Slide Site in 2011. Westbound lane patched in 2012, 2017, and 2018. Power Line Site was remediated in 2020 using single pass trenching to install a subdrain approximately 3 m below ground surface. Finger drains were also installed in the backslope and tied into the interceptor drain. The backslope was regraded as part of remediation. The highway was repaved across the entire site in 2024.	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICEABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Pavement repair very fresh during inspection.		X
Slope Movement	X		Back scarps at approximately STA 34+700 and STA 34+925 on south side of highway.	X	
Erosion	X		Erosion gullies in ditch at approx. STA 35+000, STA 34+880, and STA 34+800.		X
Seepage		X			X
Bridge/Culvert Distress	X		Sinkhole and erosion gully along culvert alignment at station 34+475, increasing in size. Possibly related to culvert.	X	

COMMENTS
<p><u>Power Line Site:</u></p> <ul style="list-style-type: none"> No pavement cracks, dips or otherwise were observed during the site inspection due to recent paving (Photos 2 to 4). Tire tracks were observed near the south edge of the highway near STA 34+950. The tracks were approximately 100 mm deep and the track furthest in the ditch was full of water (Photo 1). The ground crack observed adjacent to the tree line from about STA 34+960 to 34+980 during the 2022 inspection was barely visible and vegetated (Photo 5). It is surmised this crack was due to removal of an old silt fence since remnants of a silt fence was observed along portions of the open crack.

- The interceptor drain outlet daylighted approximately at the west end of the old gully. The ground at the outlet was dry at the time of inspection but sediment was observed in and around the drain outlet suggesting it is functional. Sediment inside the drain was found to be wet.
- The scarps and slumping on the backslope west of the powerline were observed to be more vegetated when compared to the 2022 inspection. No new erosion was visible on the exposed scarps (Photo 6).
- Ditch erosion was observed at about STA 34+880 (Photo 7). The channel approximately 100 mm wide and deep was observed to be similar to the 2022 inspection, with increased vegetation.
- Erosion control matting was bunching up along the backslope at various locations (Photo 8).
- The ditch and toe bulge was regraded as part of remediation in 2020. Vegetation has grown in the areas that were observed to be bare in 2022. (Photo 9).
- SP20-3 was observed to be leaning significantly south into the ditch (Photo 9). This is likely due to snow clearing activities.
- During this inspection, the localized ponding along the base of the scarps was not observed.
- The regraded backslope from about STA 34+750 to 34+950 appeared to be performing well with grass establishing on the slope. An old ground crack was observed again near STA 34+850 in an unrepaired area, and a newly observed ground crack was found near the lower tree line on the slope near STA 34+875 (Photo 10). The new ground crack was approximately 3 m long.
- The scarp on the south slope at approximately Station 34+700 appeared to be unchanged (Photo 11).
- Existing SIs within the Power Line site indicate creep movement of less than 1 mm/yr between 3 and 6 m deep. The SI installed in 2018 has only recorded 3 mm of movement in total, suggesting slope movements may be localized to the area upslope from SI10-8 and SI10-9.
- The water level in piezometer PN10-8 appears to be relatively consistent since the fall of 2017. A slight decrease in piezometric levels was observed in piezometers south of the highway since drain installation.
- The water levels on the south side of the site show some change. SP20-1 showed an increase in water level of 0.4 m, while SP20-2 showed a decrease by 0.1 m. This places the water levels in the standpipes at 1.3 m and 1.7 m below ground surface, respectively. SP20-3 remained dry.

Main Slide (Berm) Site:

- The upper and lower toe berms appear unchanged since the previous inspection.
- The west culvert outlet at approximately Station 34+475 was observed to be flowing (Photo 13). Water flow was steadily trickling, and occasionally flowed in waves, similar to the 2020 inspection.
- Immediately upslope and southwest of the culvert outlet, the vegetated gully appears to have increased in width to a maximum of 1.2 m wide. The gully remains up to 1 m deep (Photo 14).
- Approximately midway upslope from the culvert outlet, the sinkhole feature was observed along the culvert alignment (Photos 14 and 15). The sinkhole appears to have increased in length towards the south compared to the 2022 inspection, and is now 3.0 m wide, 5.3 m long and 2.5 m deep. This sinkhole feature is possibly due to a break in the west culvert at Station 34+475 that runs beneath it.
- No pavement cracks or dips were observed during the site inspection due to recent paving (Photos 17 & 18).
- SI movement historically suggests the slope is creeping at a rate of less than 1 mm/year; however, slope inclinometer SI10-5 has a current rate of movement of 8 mm/year.
- The water levels in the piezometers at this site have been relatively stable since 2019 ranging from 0.4 m to 11 m below ground surface.

RECOMMENDATIONS

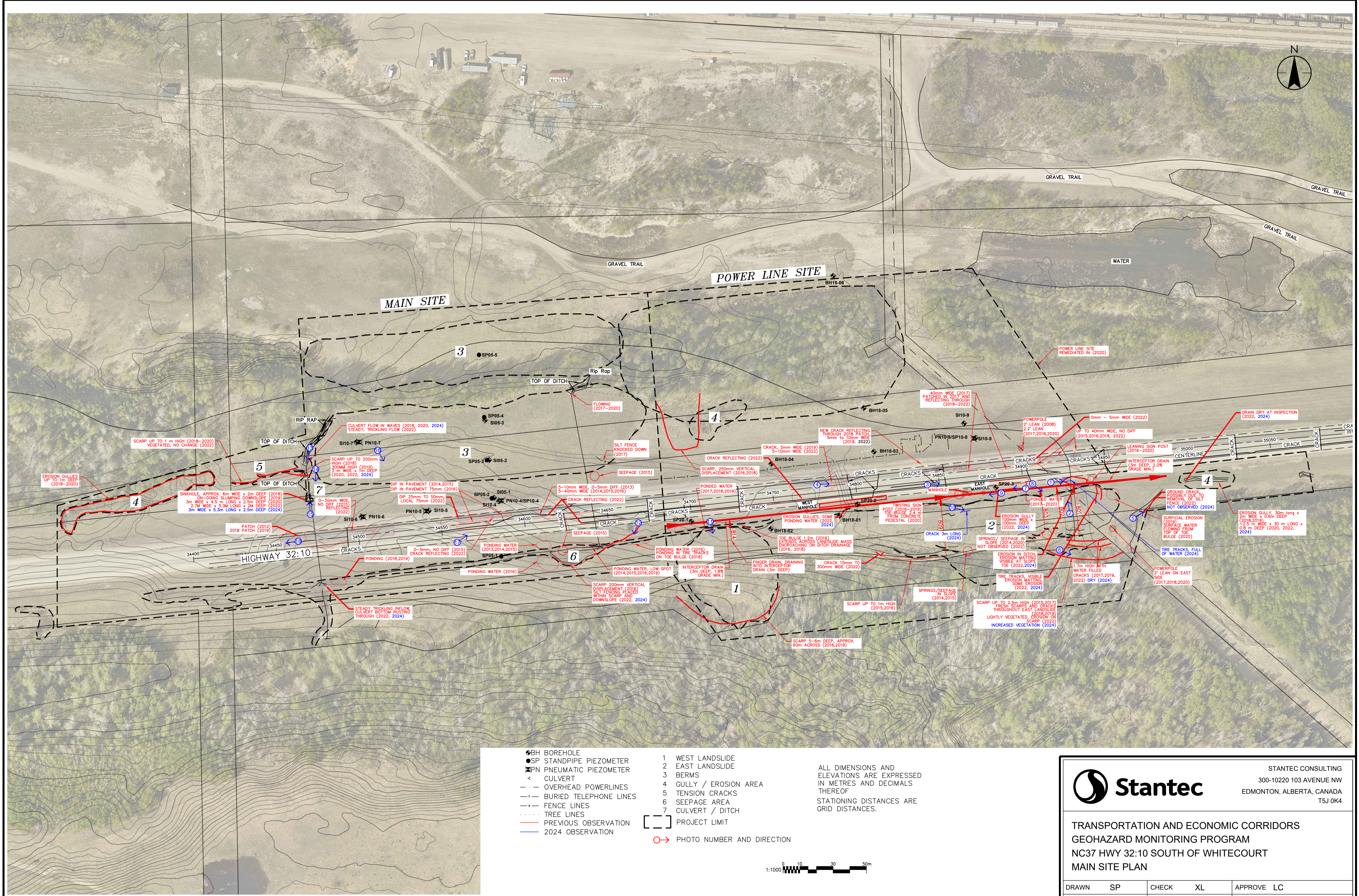
- It is recommended that a CCTV inspection be completed for the west culvert at Station 34+475 to inform design of potential remedial measures for the culvert. Additional boreholes may be required to support culvert remediation.
- The toe berms at the Main Slide Site may be extended, if warranted.
- Site inspections should continue every two years.
- Instruments should continue to be read annually in the spring.



NORTH CENTRAL REGION GRMP
EDSON / STONY PLAIN
SITE INSPECTION FORM




PREPARED BY: Sonja Pharand, P.Eng.	REVIEWED BY: Xiteng Liu, M.Sc., P.Eng., PMP	PERMIT TO PRACTICE:



- BH BOREHOLE
 - SP STANDPIPE PIEZOMETER
 - PN PNEUMATIC PIEZOMETER
 - > CULVERT
 - - - OVERHEAD POWERLINES
 - - - BURIED TELEPHONE LINES
 - - - FENCE LINES
 - TREE LINES
 - PREVIOUS OBSERVATION
 - 2024 OBSERVATION
- 1 WEST LANDSLIDE
 - 2 EAST LANDSLIDE
 - 3 BERMS
 - 4 GULLY / EROSION AREA
 - 5 TENSION CRACKS
 - 6 SEEPAGE AREA
 - 7 CULVERT / DITCH
- [] PROJECT LIMIT
 - PHOTO NUMBER AND DIRECTION

ALL DIMENSIONS AND ELEVATIONS ARE EXPRESSED IN METRES AND DECIMALS THEREOF
STATIONING DISTANCES ARE GRID DISTANCES.





STANTEC CONSULTING
300-10220 103 AVENUE NW
EDMONTON, ALBERTA, CANADA
T5J 0K4

**TRANSPORTATION AND ECONOMIC CORRIDORS
GEOHAZARD MONITORING PROGRAM
NC37 HWY 32:10 SOUTH OF WHITECOURT
MAIN SITE PLAN**

DRAWN	SP	CHECK	XL	APPROVE	LC
DATE	16 SEP 2022	SCALE	AS SHOWN	PROJECT #	123315222

FIGURE -1

2024 Site Inspection Photos at NC037



Photo 1: Tire tracks with ponded water in ditch near STA 34+950. Looking east.



Photo 2: Fresh pavement below powerlines. Looking north from south slope.

2024 Site Inspection Photos at NC037



Photo 3: Pavement condition at approximately STA 34+850. Looking east.



Photo 4: Pavement condition at approximately STA 34+775. Looking east.

2024 Site Inspection Photos at NC037



Photo 5: Old ground crack due to silt fence removal at approx. STA 34+960 not visible. Looking northeast.



Photo 6: Increased vegetation on scarps. Old slumping on backslope. Looking southeast.

2024 Site Inspection Photos at NC037



Photo 7: Erosion gully in the south ditch at approximately STA 34+880. SP20-3 casing leaning significantly. Looking west.



Photo 8: Repaired and vegetated south slope with bunched erosion control matting at approx. STA 34+950. Looking southeast.

2024 Site Inspection Photos at NC037



Photo 9: Repaired south slope and toe at approx. STA 34+875. Looking west.



Photo 10: Cracking on slope near lower tree line, near STA 34+875. Looking southeast.

2024 Site Inspection Photos at NC037



Photo 11: Scarp on south side of highway at approx. STA 34+700. Looking south.



Photo 12: Silt fencing left on south slope at approx. STA 34+675. Looking south.

2024 Site Inspection Photos at NC037



Photo 13: Culvert outlet adjacent to west extent of upper toe berm. Looking southwest.



Photo 14: Gully and sinkhole directly upslope from west culvert. Looking south.

2024 Site Inspection Photos at NC037



Photo 15: Sinkhole and gully directly upslope from the west culvert. Looking north.



Photo 16: Slope at main site, looking upslope towards the southeast.

2024 Site Inspection Photos at NC037



Photo 17: Pavement condition in WBL at approximately 34+575. Looking northeast.



Photo 18: Pavement condition from approx. STA 34+450. Looking west.