

## GEOHAZARD RISK MANAGEMENT PROGRAM

### North Central Region – Edson / Stony Plain Area

#### 2020 Inspection Report

<b>Site Number</b>	<b>Site Name</b>		<b>Hwy</b>	<b>km</b>
NC39	South of Sturgeon River Crossing		825:02	9.1
<b>Legal Land Description</b>	NW 28-55-22-W4M			
<b>NAD 83 Coordinates</b>	12U	N 5962159	E 353532	
<b>Operational Site Instrumentation</b>	<b>Slope Inclinometers</b>		0	
	<b>Pneumatic Piezometers</b>		3	
	<b>Vibrating Wire Piezometers</b>		0	
	<b>Standpipe Piezometers</b>		0	
<b>Date of Last Instrumentation Readings</b>	May 28, 2020			

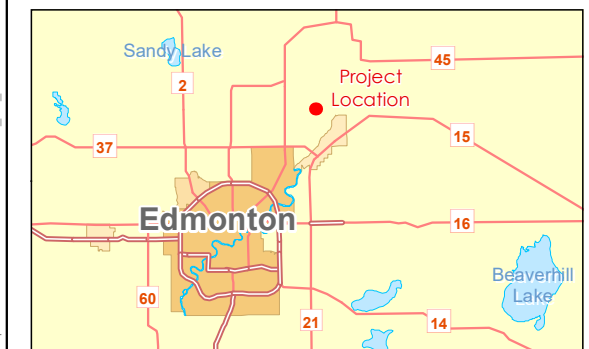
<b>Risk Assessment</b>	<b>Date</b>	<b>PF</b>	<b>CF</b>	<b>Risk Ranking</b>
<b>Current Inspection</b>	May 21, 2020	10	8	80
<b>Previous Inspection</b>	July 15, 2019 (Call-out at Bridge Site)	9	8	72
<b>Report Attachments</b>	<input checked="" type="checkbox"/> Photographs (6 photos)		<input checked="" type="checkbox"/> Site Plans (1 page)	

	<b>Stantec</b>	<b>Alberta Transportation</b>
<b>Inspected By</b>	Leslie Cho	Kristen Tappenden, Brennan Evans, and Corbet Kratko
<b>Date of Remediation</b>	2004/2005 – Riprap added in the west ditch south of bridge	

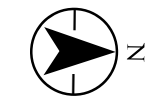
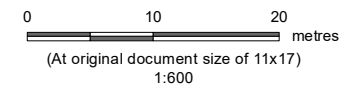
	2015 – Ditch regraded with riprap added in the west ditch south of bridge	
<b>Recent Maintenance</b>	2006 – Pavement dip patched 2016 – Milled and paved 2020 – Patched mid-May (north of bridge)	
<b>Primary Site Issue</b>	Backslope failure on the west side of Highway 825 (south of bridge) Erosion and slumping east of north bridge abutment.	
<b>Observations</b>	<b>Description and Location</b>	<b>Change from Previous Inspection</b>
<input type="checkbox"/> Pavement Distress		<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Culvert Distress		<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Bridge Distress		<input type="checkbox"/> Yes <input type="checkbox"/> No
<input checked="" type="checkbox"/> Slope Movement	Slump noticeably larger.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input checked="" type="checkbox"/> Erosion	On-going erosion in east ditch.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input type="checkbox"/> Seepage		<input type="checkbox"/> Yes <input type="checkbox"/> No
<input checked="" type="checkbox"/> Other	Ponding in eroded ditch.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

<b>Discussion</b>	<p>Inspection of NC39 has shifted from the site south of the bridge to the new erosion site on the bridge's north abutment as per the January 2020 Annual Review meeting. The legal land description, coordinates, and highway kilometer have been updated accordingly.</p> <p>The eroded area was first observed by AT on June 27, 2019 after a series of rainfall events. Stantec responded to a call-out request in July 2019 and the current inspection marks the first site inspection since the call-out.</p> <p>At the time of inspection, Highway 825 was patched approximately 1 week prior and no signs of pavement cracking were observed as shown in Photos 1 and 2. In discussion with the MCI, patching was part of the maintenance schedule and was not due to the erosion and slumping.</p> <p>Erosion and ponding continued to be observed in the east ditch as shown in Photo 3. Due to high water levels within the ditch, it was uncertain whether erosion had increased.</p> <p>Straw bales were along the ditch and around the scarp in 2019 prior to the call-out. During the 2020 inspection, many bales were missing and presumed to be washed into the river. In addition, the bales placed along the scarp had fallen into the slump as shown in Photo 4.</p> <p>The erosion underlying the irrigation pipe appeared to be wider than during the 2019 call-out as shown in Photo 5. The pipe is believed to be inoperable since it was found disconnected at several locations west of the slump.</p> <p>The bridge appeared unaffected by the current slumping. The east side of the bridge is shown on Photo 6.</p>
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<b>Assessment</b>	<p>As-built drawings suggest 3 m of black organic fill exists at the site which may have become soft and saturated after prolonged rainfall in 2019. The soil appeared to have high sand and silt content and is prone to erosion from surface run-off upstream of the ditch. The increased rainfall experienced in 2019 may have resulted in high velocity concentrated flow in the ditch increasing the rate of erosion. The water flow may have down-cut the soil and caused the soil to collapse at a small local scale which propagated until a mass wash out occurred from surface water flow.</p> <p>Given the observed widening of the slump and undermining of the irrigation pipe, erosion and slumping is on-going at a relatively significant rate.</p> <p>Instruments monitored as part of the GRMP show variations in piezometric level of +/- 0.5 m since Fall 2019. The two piezometers in the lower part of the slope showed increase in piezometric levels. However, all three instruments are located south of the bridge and along the backslope.</p> <p>A standpipe was observed adjacent to the scarp, but it is unknown if it is operational.</p>
<b>Recommendations</b>	<p>The site should be monitored regularly by the MCI for retrogression of the scarp towards the roadway and bridge structure.</p> <p>Rock check dams can be placed along the east ditch to reduce the water flow velocity until full remediation can take place.</p> <p>Long term-remediation may include removing the loose soil and organics and replacing with imported clay fill to reinstate the ditch grades. The rock check dams can likely remain in place as part of erosion control.</p> <p>Ditch grading should be completed to promote surface water drainage; however, this should be completed as part of long-term remediation to reduce the rate of current erosion.</p> <p>If available, borehole data from the standpipe near the scarp should be reviewed and the standpipe added to the instrumentation monitoring program.</p> <p>Site inspections should continue to be completed annually.</p>



- Previous Observation
- 2020 Observation
- Site Detail
- Straw Bale



*Project Location*  
 NW-28-055-22 W4M,  
 Alberta

Prepared by MK on 2020-06-11  
 Quality Review by LC on 2020-06-19  
 Independent Review by XL on 2020-06-19

*Client/Project*  
 Alberta Transportation  
 Geohazard Monitoring Program  
 NC39 - Hwy 825 at Sturgeon River

123312435

*Figure No.*  
**1**

*Title*  
**Site Plan**

**Notes**  
 1. Coordinate System: NAD 1983 3TM 114  
 2. Data Sources: Geogratis, ©Department of Natural Resources Canada, All rights reserved.  
 3. Background: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Reference: 2020 Annual Inspection Photographs at NC39 – South of Sturgeon River Crossing  
File Number: 123312435



Photo 1: Highway 825. Looking southwest.



Photo 2: Highway 825. Looking northwest.

Reference: 2020 Annual Inspection Photographs at NC39 – South of Sturgeon River Crossing  
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**Photo 3:** Erosion gully along east ditch. Looking south from culvert outlet.



**Photo 4:** Slump adjacent to bridge abutment approximately 8 m to 10 m wide. Straw bales fell into slump from scarp retrogression. Looking north.

Reference: 2020 Annual Inspection Photographs at NC39 – South of Sturgeon River Crossing  
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**Photo 5:** Irrigation pipe undermined by erosion and slump, approximately 6 m wide. Looking east.



**Photo 6:** Bridge appeared unaffected. Looking south.