

# Vinca Bridge Replacement On Hwy 38 over the North Saskatchewan River

Presentation to the Strathcona County On September 15, 2020



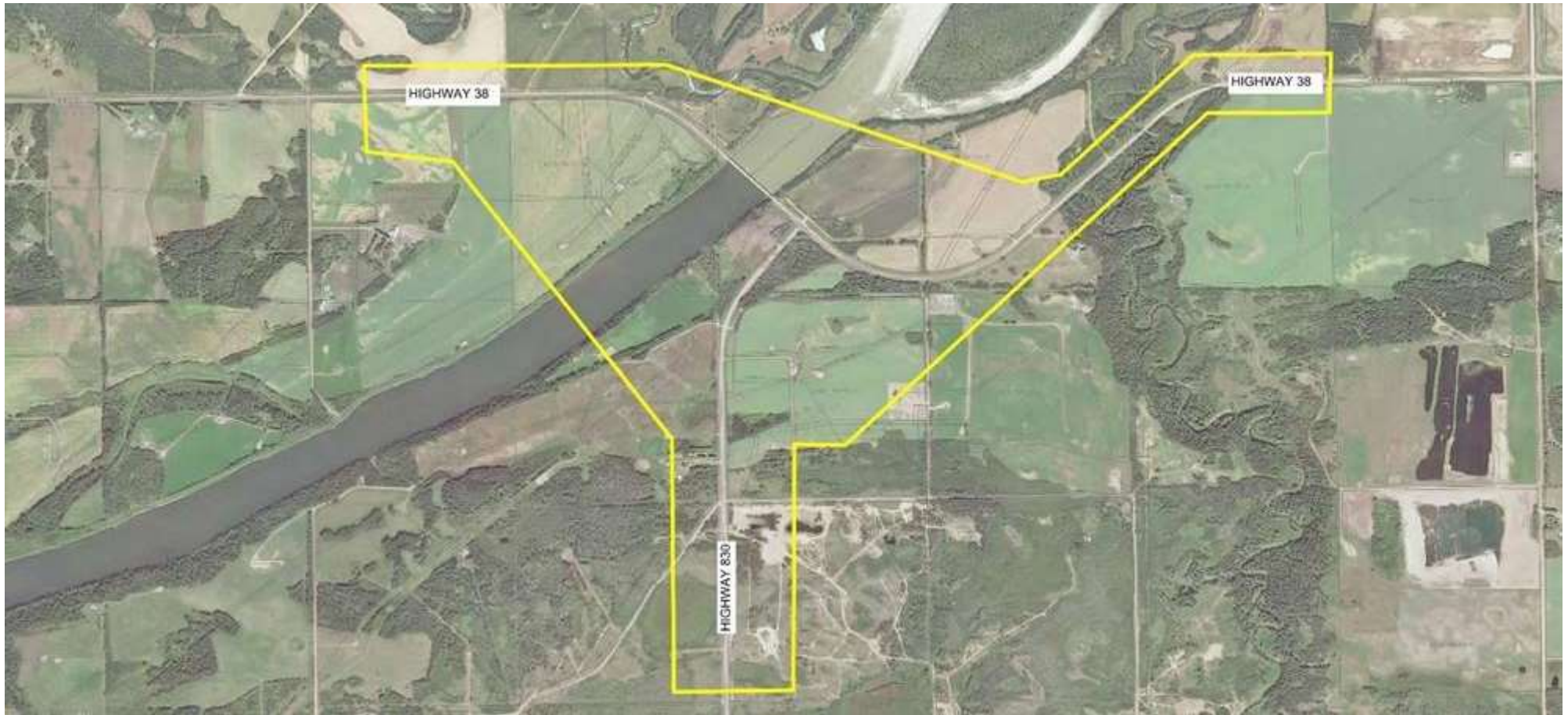
# Project Purpose

- Investigate possible alignment options for the crossing.
- Identify and design the Vinca Bridge replacement and related improvements.
- Minimize impacts on environmental, historical, geotechnical, utilities and land acquisition.





# Project Location and Foot Print



# Project Background

- Existing bridge was built in 1967 and needs to be replaced due to its age and the condition of the structure
- Identify optimal crossing of the North Saskatchewan River for Over-sized / Over-weight Loads heading to northern Alberta
- Currently serves 1500 vehicles per day, 24% of which are large trucks





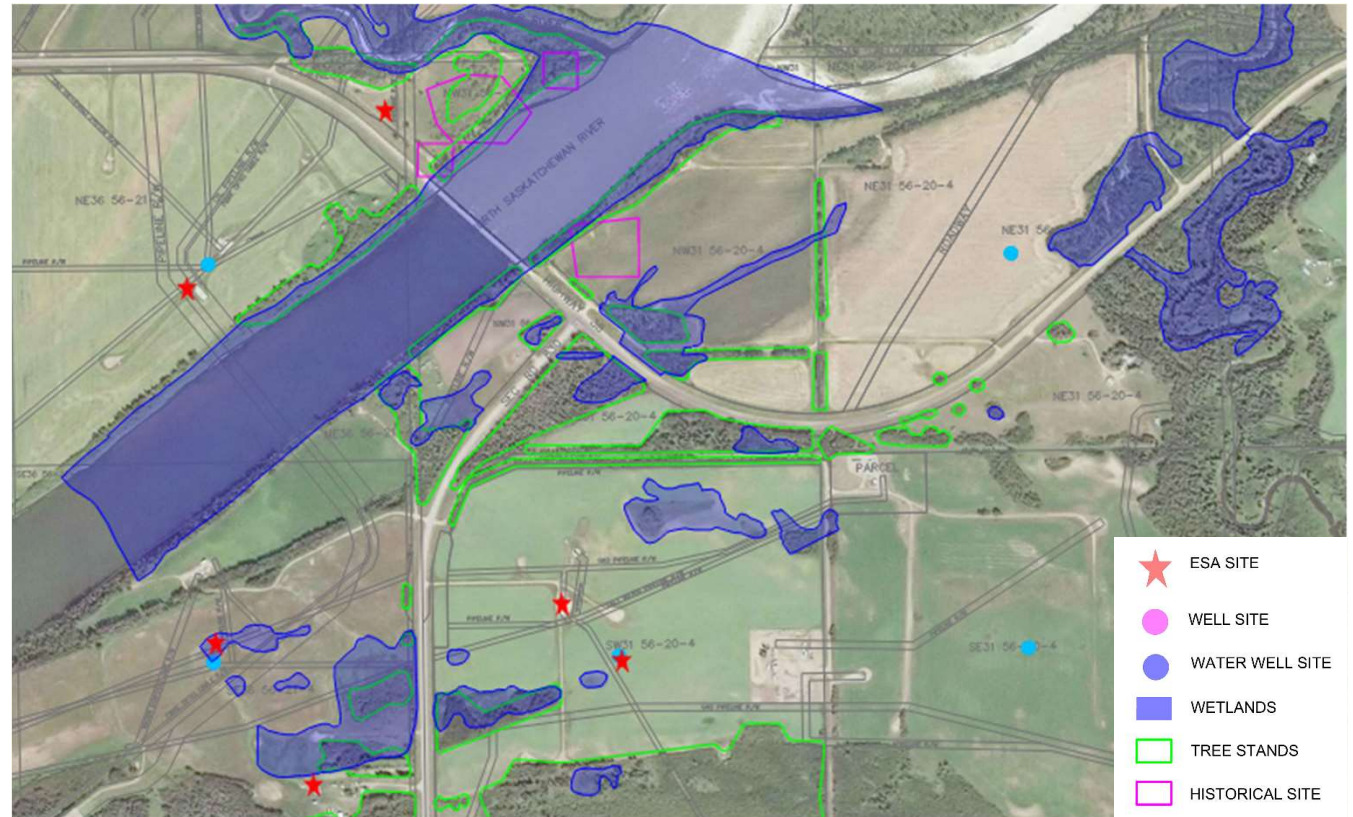
## Project Considerations

- The North Saskatchewan River channel is stable due to upstream dams, but the bridge crossing should still be perpendicular to water flow.
- Steep river embankments and removing vegetation for construction could reduce slope stability. This needs to be considered during construction staging.
- The bridge over Beaverhill Creek is in good condition and is not to be impacted by this project.



# Project Constraints: Environmental

- 3 Watercourses
  - North Saskatchewan River
  - Redwater River
  - Beaverhill Creek
- 16 Wetlands
- Numerous Tree Stands
- 6 Non-Reclaimed Environmentally Sensitive Area Sites





# Project Constraints: Environmental

## Rare Vegetation

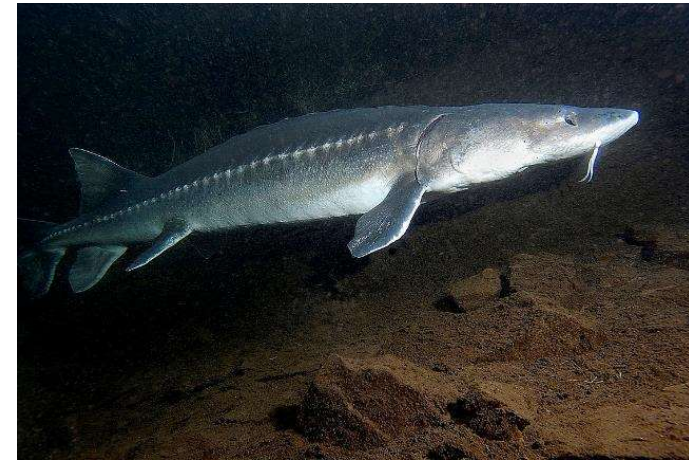
- Creeping ancyliid
- Moss

## Wildlife Habitats

- 43 birds
- 6 mammals
- 2 amphibians
- 1 reptile

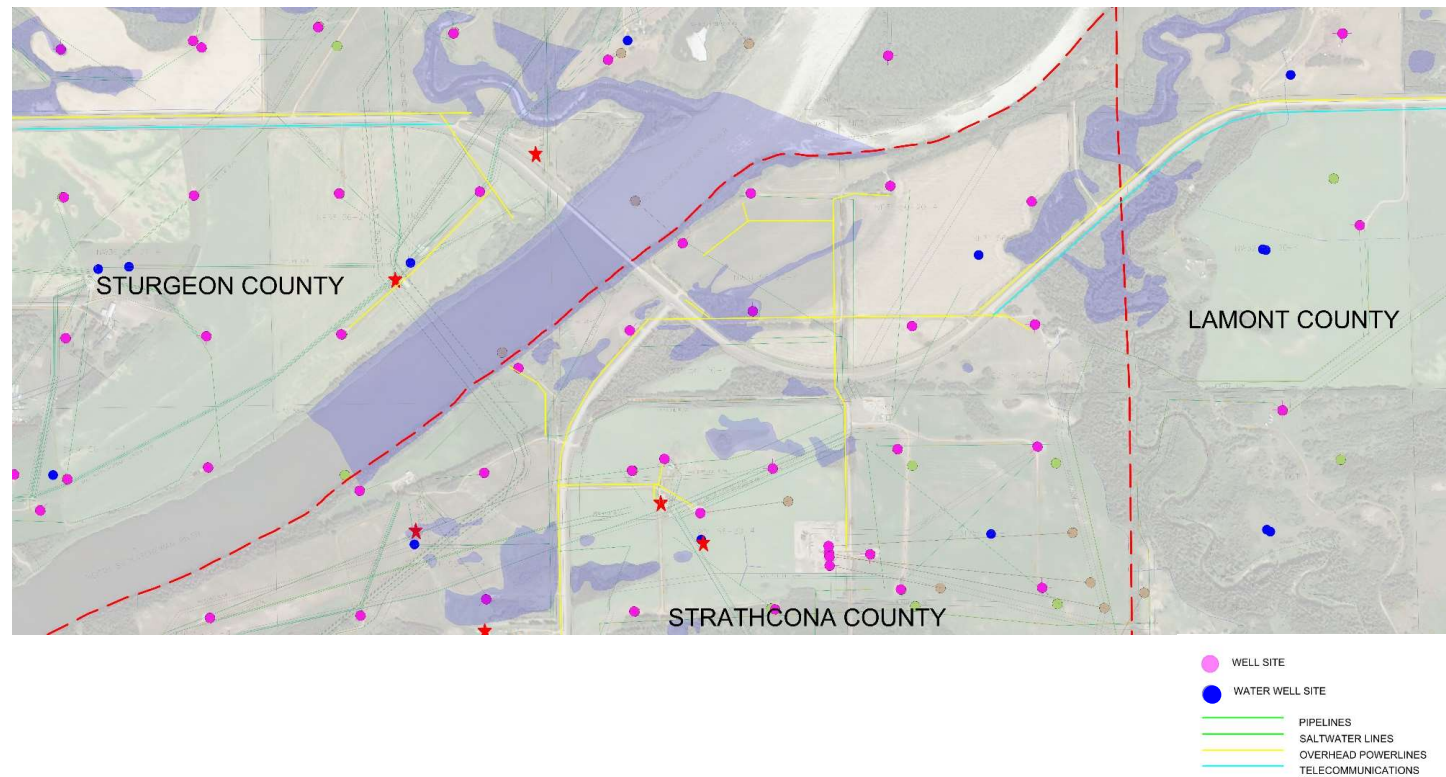
## Fisheries Previously Documented

- 5 sportfish
  - Lake Sturgeon At Risk
- 4 non-sportfish



# Project Constraints: Utilities

- 24 Pipelines
- 20 Well sites
- 10 Saltwater Lines
- 3 Overhead Power
- Telecommunications
- 12 Water Wells



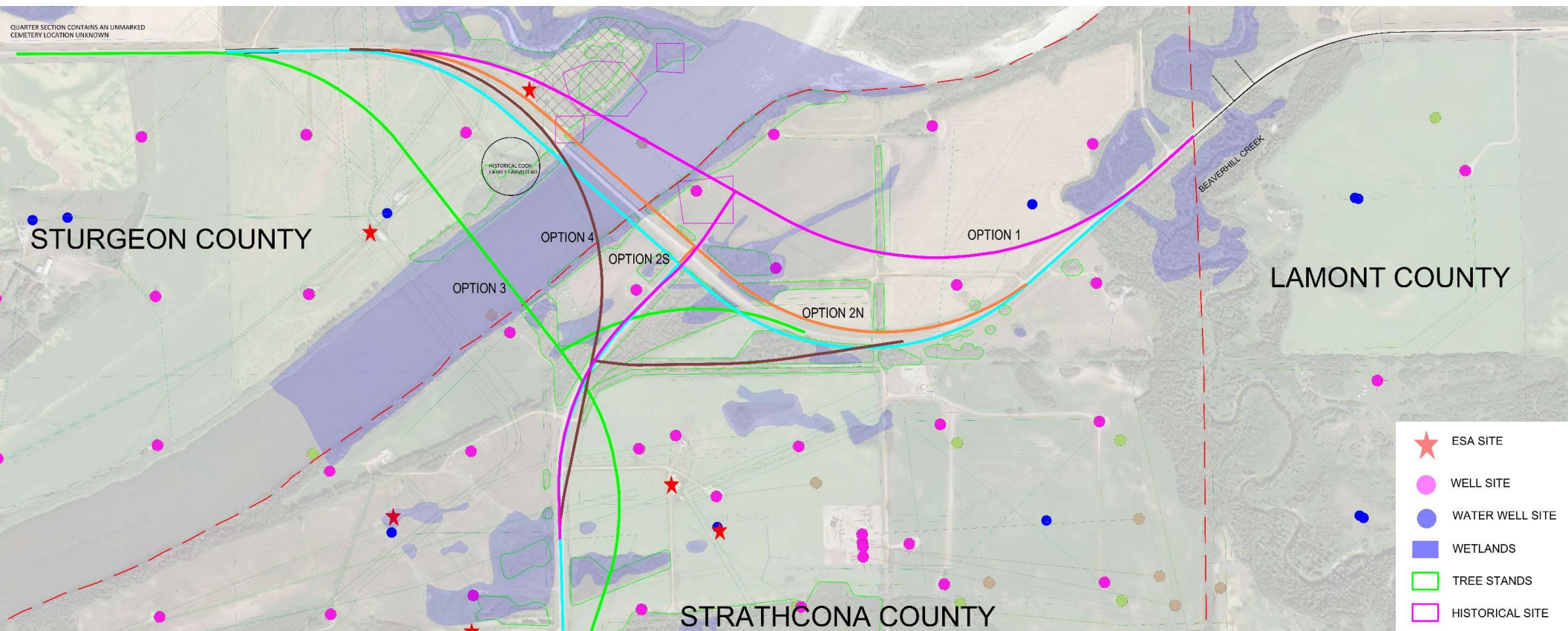


# Project Constraints: Historical

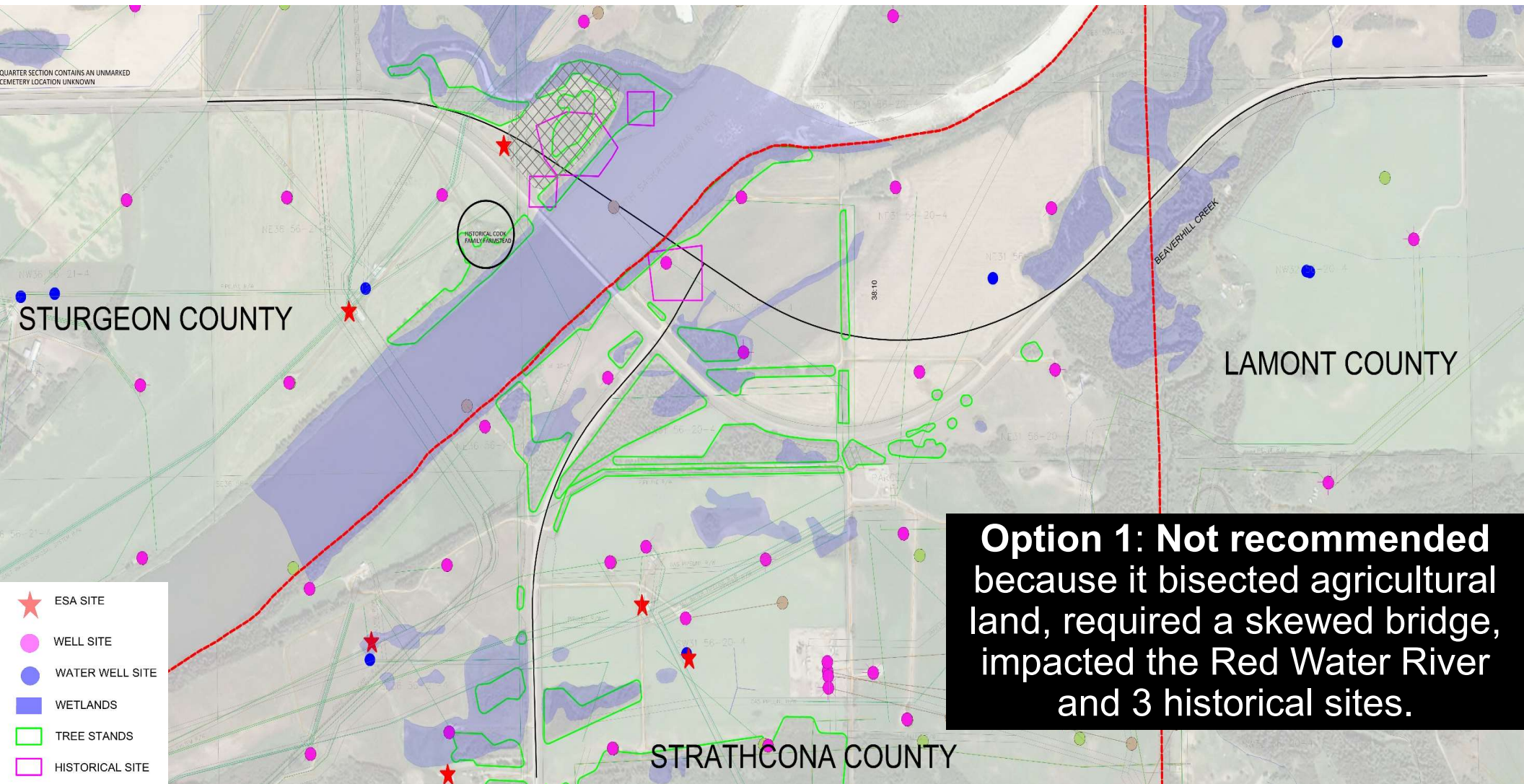
- No Aboriginal Traditional Use sites within the project limits
- 4 Historical Sites
  - Sites 6 and 17 have HRV = 4
  - Sites 9 and 11 have HRV=0
- 3 Historical structures
  - Vinca Bridge
  - Cook Family Farmstead
  - Cook Family Cemetery



# Options Considered



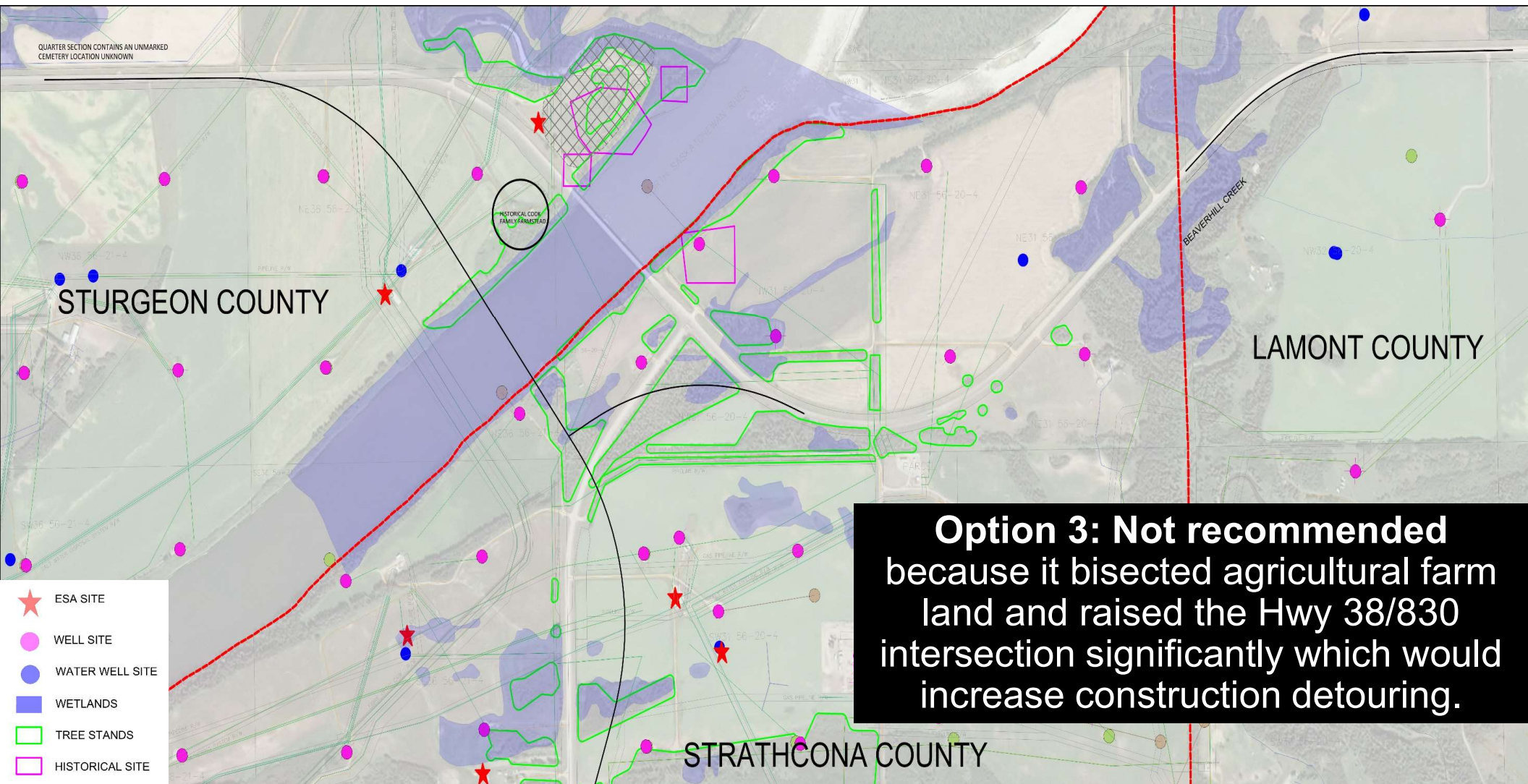




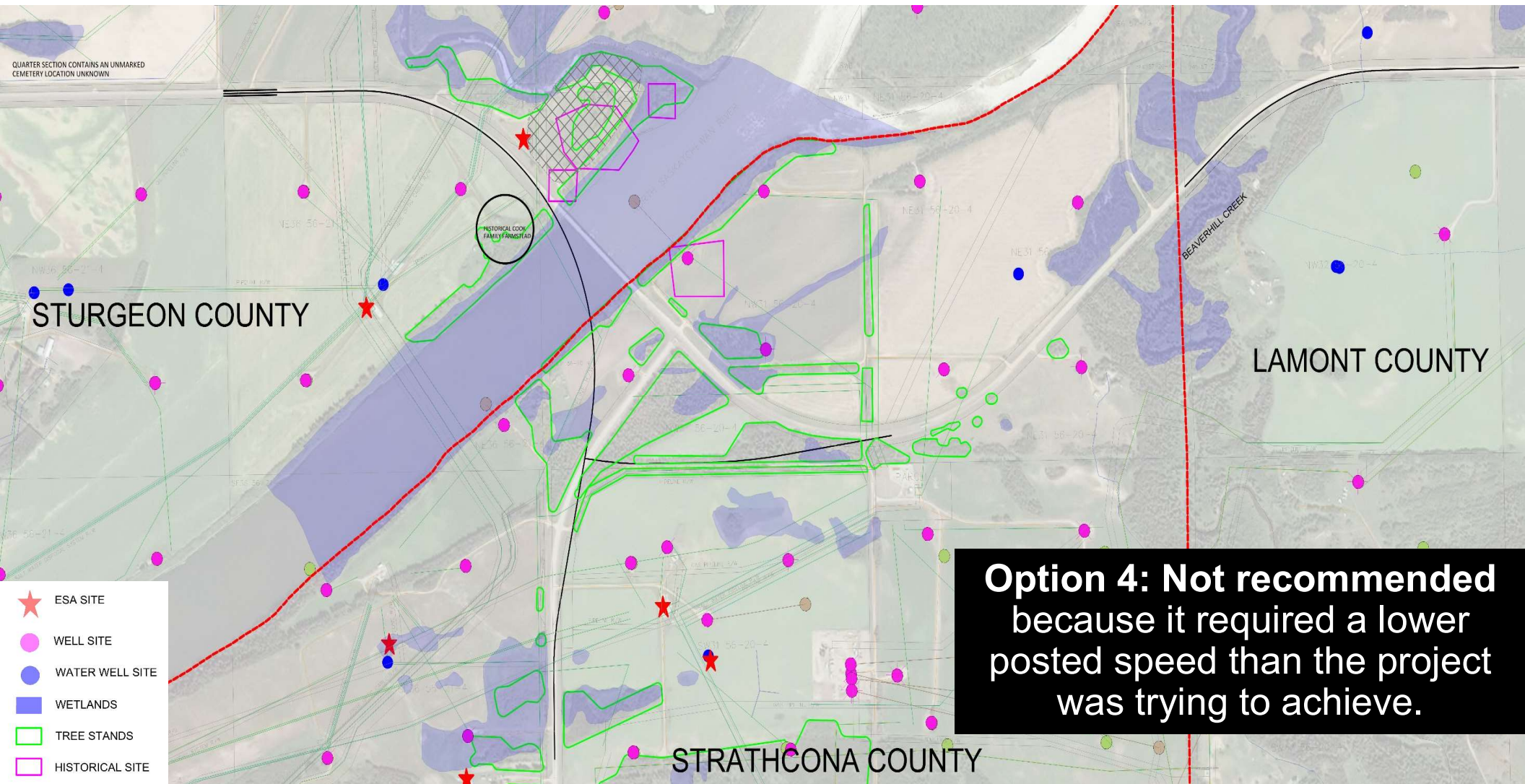










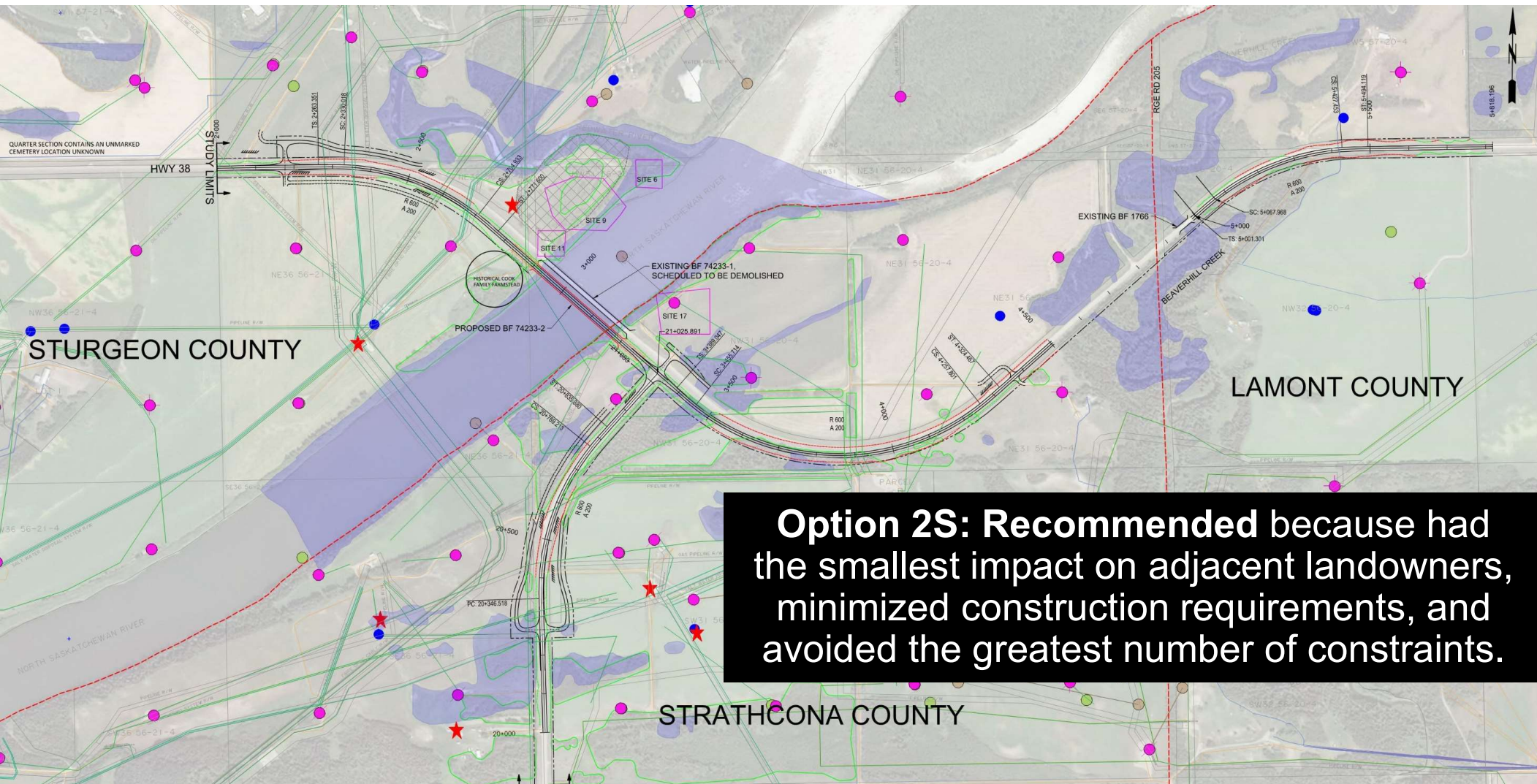




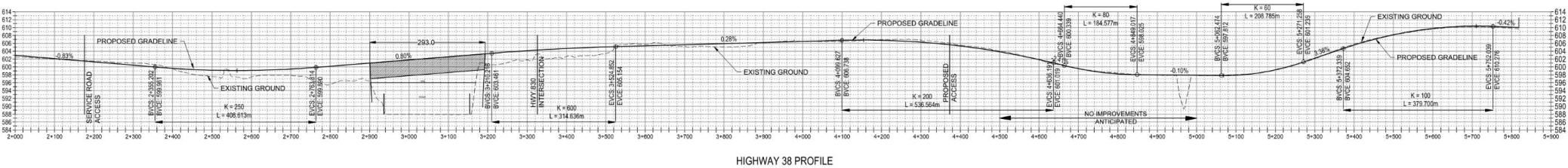
Key Issues	Criteria	Option 1	Option 2N	Option 2S	Option 3	Option 4
		Tangent bridge 130 m downstream of the existing crossing	Tangent bridge 30m downstream of existing crossing.	Tangent bridge 30m upstream of existing crossing.	Tangent bridge 340m upstream of existing crossing.	Curve bridge upstream of existing crossing.
Option Information						
Geometry	Highway	3.6km of highway reconstruction required.	2.9km of highway reconstruction required.	2.8km of highway reconstruction required.	3.5km of highway reconstruction required.	2.5km of highway reconstruction required.
	Bridge	25° LHF skew	Minor LHF skew to river, bridge to be built on square (similar to existing bridge)	Minor LHF skew to river, bridge to be built on square (similar to existing bridge)	No skew	On square
	Heavy Loads on The Bridge	Skewed bridge <u>not</u> preferred for OS/OW vehicles	Square bridge preferred for OS/OW vehicles	Square bridge preferred for OS/OW vehicles	Square bridge preferred for OS/OW vehicles	Skewed bridge <u>not</u> preferred for OS/OW vehicles
Route Continuity	Oversized / Overweight Corridor	OS/OW turn at the intersection.	OS/OW turn at the intersection.	OS/OW turn at the intersection.	OS/OW corridor is continuous.	OS/OW corridor is continuous.
Design Exceptions Required		No	No	No	No	Yes - bridge barrier acts as an obstruction to stopping sight distance: shoulder widened to 3.5m and posted speed would need to be reduced to 70km/h.
Project Constraints						
Environmental	North Saskatchewan River	Impacts common to all options.				
	Red Water River	Impacted	Impacted	Not impacted.	Not impacted.	Not impacted.
	Beaverhill Creek	Not impacted, BF 1766 is not affected by improvements.				
	# of Wetland Impacted	6	6	8	3	5
	# of Tree Stands Impacted	10	14	14	5	10
	# of ESAs Impacted	1	1	0	0	0
	# of Water Wells Impacted	0	0	0	0	0
Geotechnical	West Embankments	10.4m of fill	7.6m of fill	5.7m of fill	6.3m of fill	1.9m of fill
		North abutment approach fill would be overtop of the reclaimed borrow pit and fluvial deposits, this may affect fill settlement.	North abutment approach fill would be overtop of the reclaimed borrow pit and fluvial deposits, this may affect fill settlement.	No significant geotechnical challenges anticipated.	No significant geotechnical challenges anticipated.	No significant geotechnical challenges anticipated.
	East Embankments	6.9m of fill	4.4m of fill	2.4m of fill	5.9m of fill	2.6m of fill
		Construction of abutment adjacent to steep slopes and requires vegetation removal to access the site and prepare the abutment area.				
	Highway Alignment	3.9m of fill at intersection	2.0m of fill at intersection	1.1m of fill at intersection	5.4m of fill at intersection	0.4m of fill at intersection
Historical Resources	# of Sites Impacted	Site 9 and Site 11 (HRV 0) Site 17 (HRV 4)	Site 11 (HRV 0) Site 17 (HRV 4)	Site 11 (HRV 0)	0	Site 11 (HRV 0)
	Historic Structures Impacted	no	Cook family homestead	no	no	Cook family homestead

Key Issues	Criteria	Option 1	Option 2N	Option 2S	Option 3	Option 4
Utilities	# of Active Well Sites Impacted	1 - well hole could be impacted by the pier	0	0	0	0
	Battery Site Impacted	no	no	no	no	no
	# of Pipeline Crossings	7 operating	7 operating	7 operating	8 operating	6 operating
		2 abandoned	2 abandoned	2 abandoned	5 abandoned	3 abandoned
		3 discontinued	5 discontinued	4 discontinued	1 discontinued	4 discontinued
	# of Saltwater Lines Impacted	6	6	6	6	6
	# of Telecommunication Lines Impacted	0	0	0	0	1
	Telecommunication Conduit on the Bridge Impacted	yes	yes	yes	yes	yes
	# Overhead Power Lines Impacted	10	11	11	4	9
Community Sustainability						
Land Acquisitions & Right-of-Way Requirements	Sturgeon County	3 parcels, totaling 15 acres	3 parcels, totaling 14 acres	3 parcels, totaling 11 acres	2 parcels, totaling 23 acres	2 parcels, totaling 13 acres
	Strathcona County	4 parcels, totaling 28 acres	4 parcels, totaling 20 acres	6 parcels, totaling 24 acres	7 parcels, totaling 24 acres	4 parcels, totaling 16 acres
	Lamont County			2 parcels, totaling 0.7 acres		
Customer Service						
Constructability		Tie in's to existing alignment at locations where existing tangent section ties to new super elevated, need to maintain traffic	New alignment in close proximity to existing alignment. May need to stage sideslope construction and or use temporary retaining wall. Need to maintain traffic at intersection while raising the grade.	New alignment in close proximity to existing alignment. May need to stage sideslope construction and or use temporary retaining wall. Need to maintain traffic at intersection while raising the grade.	Need to maintain traffic on while constructing new alignment. Complex cross-overs.	Need to maintain traffic at crossings, profile does not match. Limited construction space at west abutment.
Financial						
Costs		\$81.1M	\$77.6M	\$75.4M	\$77.4M	\$81.2M (wider bridge)
Other Considerations						
Risks	Schedule	Alignment crosses known ESA site, schedule risk if remediation is needed.	Alignment crosses known ESA site, schedule risk if remediation is needed. Alignment encroaches on Historic Site #17, HRIA could require further investigation/remediation, delaying clearance letter.			Design exception required and there is no guarantee that it would be accepted. If rejected, the evaluation process would need to be redone - delaying the entire project.
	Costs	Alignment crosses known ESA site, potential risk that AT would need to pay for remediation costs.	Alignment crosses known ESA site, potential risk that AT would need to pay for remediation costs.			Curved bridges are more complex to construct, bids could have a significantly higher cost than expected.
	Permitting	Alignment encroaches on Redwater River. Additional DFO, NavWater, Water Act, Public Lands Act permitting may be required.	Alignment encroaches on Redwater River. Additional DFO, NavWater, Water Act, Public Lands Act permitting may be required.			Alignment encroaches on Redwater River. Additional DFO, NavWater, Water Act, Public Lands Act permitting may be required.

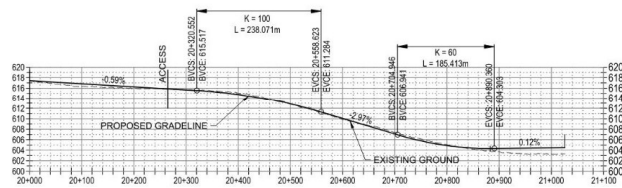




**Option 2S: Recommended** because had the smallest impact on adjacent landowners, minimized construction requirements, and avoided the greatest number of constraints.



HIGHWAY 38 PROFILE



HIGHWAY 830 PROFILE

Recommended Profile



# Next Steps

- Finalize Functional Planning Report
- Public Information Session – fall 2020
- Consult with affected landowners
  - Note: No Aboriginal Traditional Use sites are within the Project Limits
- Field Investigations
- Property Acquisition





Questions?