



Appendix D

Fluvial Geomorphology

APPENDIX D-1
Meander Belt Mapping
Updated May 2018



FIGURE D-1-1 Meander belt delineation for Hornby Tributary reaches

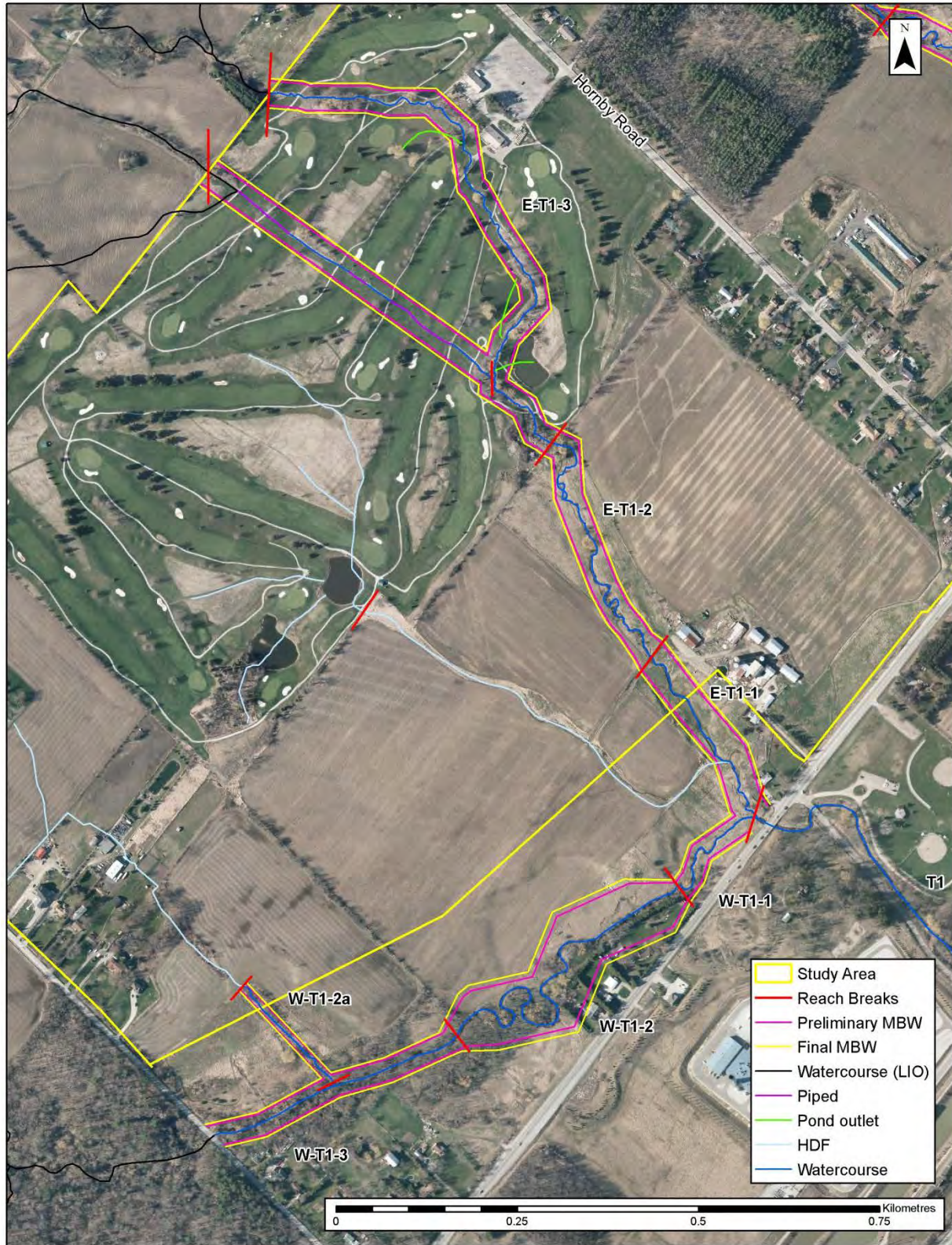


FIGURE D-1-2 Meander belt delineation for Middle Sixteen Mile Creek Tributary reaches

APPENDIX D-2
Headwater Drainage Feature Summary Table
Updated April 2018

Drainage Feature Segment	Segment Code	Step 1		Step 2 Riparian	Step 3 Fish Habitat	Step 4 Terrestrial Habitat	Protocol Management Recommendation	Final Management Recommendation	Notes/ Rationale
		Hydrology	Modifiers						
HT-2b-3c	S1	Contributing	Ag	Limited (code 3)	Contributing	Limited	Mitigation	Mitigation	Channel definition noted during HDF site visit on Jan 19 2017
HT-2b-3b	S1	Contributing	Ag	Limited (code 3)	Contributing	Limited	Mitigation	No Management	Higher flow than normally anticipated due to timing of first visit. Modified through agricultural usage. Feature could not be located on second visit.
HT-2b-3a	S1	Limited or recharge	Ag	Limited (code 3)	Contributing	Limited	No Management	No Management	Higher flow than normally anticipated due to timing of first visit. Modified through agricultural usage. Feature could not be located on second visit.
HT-2b-3	S1	Contributing	Ag	Valued (code 4)	Contributing	Limited	Mitigation	Mitigation	Larger feature. Presence of healthy vegetation on second visit indicative of wetter conditions later into the dry season.
HT-2b-2	S1	Contributing		Important (code 7)	Contributing	Valued	Conservation	Conservation	Management recommendation is "Conservation" due to "important" riparian vegetation consisting of wetland and scrubland.
	S2	Contributing		Valued (code 4)	Contributing	Limited	Mitigation	Conservation	Mitigation recommendation based on hydrology. Recommendation is increased to "Conservation" as a result of higher classification in upstream segment.
	S3	Contributing		Valued (code 4)	Contributing	Limited	Mitigation	No HDF recommendation, segment has been upgraded to 'watercourse'	Receives a "Mitigation" classification based on hydrology. Standing water at downstream end of segment (Site Visit #2), defined bed/banks through length of segment, and gravel substrates on the bed suggest that this is a permanent feature of higher importance. Segment is classified as a 'watercourse' consistent with segment downstream of Trafalgar Road.
HT-2b-4	S1	Limited or recharge	Ag	Important (code 7)	Contributing	Contributing	Conservation	Conservation	Management recommendation is "Conservation" due to "important" riparian vegetation consisting of wetland.
	S2	Limited or recharge	Ag	Valued (code 4)	Contributing	Contributing	Conservation	Conservation	Scored as Conservation due to upstream and section considered as Conservation
	S3	Limited or recharge	Ag	Limited (code 3)	Contributing	Contributing	Conservation	Conservation	Scored as Conservation due to upstream section considered as Conservation. The segment also has defined bed and banks approaching the Trafalgar Road culvert and gravel substrate suggesting higher value.
HT-2b-4b	S1	Limited or recharge	Ag	Limited (code 3)	Contributing	Limited	No Management	No Management	Based on hydrology, standing water at the first visit. Feature was appears to be cut through furrowing to help drain the fields in the spring.
HT-2b-4a	S1	Limited or recharge	Ag	Limited (code 3)	Contributing	Limited	No Management	No Management	Based on hydrology, standing water at the first visit. Feature was appears to be cut through furrowing to help drain the fields in the spring.

Drainage Feature Segment	Segment Code	Step 1		Step 2 Riparian	Step 3 Fish Habitat	Step 4 Terrestrial Habitat	Protocol Management Recommendation	Final Management Recommendation	Notes/ Rationale
		Hydrology	Modifiers						
E-T1-4	S1	Contributing		Limited (code 3)	Contributing	Limited	Mitigation	No HDF recommendation, segment has been upgraded to 'watercourse'	Management recommendation is "Mitigation" based on hydrology. Based on the amount of flow noted at Site Visit #1, historic aerial photos, and conditions upstream of the study area, the management recommendation has been increased to "Conservation". It is noted that upstream of the golf course the feature appears to be a defined watercourse based on a review of aerial photography. Modification by the golf course has made this feature difficult to assess fully. It is thought that with removal of the golf course this could potentially be a more significant feature than it currently appears to be, based on upstream conditions.
	S2	Valued		Important (code 5)	Valued	Contributing	Conservation	No HDF recommendation, segment has been upgraded to 'watercourse'	Management recommendation is "Conservation" due to surrounding riparian vegetation dominated by scrubland. Management recommendation is increased to "Protection" as a result of both defined bed and banks and standing water at Site Visit #2, suggesting more permanence and importance hydrologically.
HDF-1	S1	Important	Golf course ponds outlet at upstream end	Limited (Code 3)	Contributing	Valued	Protection	Conservation	Management recommendation is "Protection" based on "important" hydrology classification as a result of water during Site Visit #3. Terrestrial habitat is "valued" due to presence of tadpoles in isolated pool during Site Visit #3. Management recommendation is reduced to "Conservation" as the golf course ponds outlet to the feature and it is unclear how this impacts the natural hydrology of the feature.
	S2	Important		Limited (Code 3)	Contributing	Limited	Protection	Conservation	Management recommendation is "Protection" based on "important" hydrology classification as a result of water during Site Visit #3. Management recommendation is reduced to "Conservation" as the golf course ponds outlet to the feature and it is unclear how this impacts the natural hydrology of the feature.
HDF-2	S1	Important		Important (code 7)	Contributing	Valued	Protection	Protection	Management recommendation is "Protection" based on "important hydrology classification as a result of water noted during Jan 19 2017 site visit. Additionally ELC classification as SWM1-1 (White Cedar-Hardwood Mineral Mixed Swamp) can be considered wetland, resulting in important riparian and terrestrial.

Drainage Feature Segment	Segment Code	Step 1 Hydrology	Modifiers	Step 2 Riparian	Step 3 Fish Habitat	Step 4 Terrestrial Habitat	Protocol Management Recommendation	Final Management Recommendation	Notes/ Rationale
	S2	Contributing	Outlet from west to east pond	Limited (code 3)	Contributing	Contributing	Protection	Protection	Management recommendation is based on hydrology. This feature is a small swale that connects the west golf course pond to the east golf course pond; therefore, hydrology is a result of the pond water levels. Suggest reducing recommendation to "No Management". Increased to Protection due to protection in upstream segment
HDF-3	S1	Limited or recharge		Limited (code 3)	Contributing	Limited	No Management	No Management	Standing water at Site Visit #1, no management required.
HDF-4	S1	Contributing		Limited (code 3)	Contributing	Limited	Mitigation	No Management	Management recommendation of "Mitigation" is based on hydrology. Difficult to determine management due to potentially altered drainage on golf course, suggested that "No Management" recommendation.
HDF-4a	S1	Limited or recharge		Limited (code 3)	Contributing	Limited	No Management	No Management	Standing water at site visit 1, no management required.
W-T1-2b	S1	Contributing	Ag	Limited (code 3)	Contributing	Limited	Mitigation	Mitigation	Management recommendation of "Mitigation" based on hydrology.
	S2	Contributing*		Contributing* (code 2)	Contributing*	Limited*		Mitigation*	Management recommendation of "Mitigation" based on hydrology.
	S3	Contributing		Important (code 5)	Contributing	Contributing	Conservation	Conservation	Management recommendation of "Conservation" based on "important" riparian vegetation classification due to scrubland.

*Hydrology and fish habitat for W-T1-2b (S2) were based on the up- and down- stream classification, while riparian and terrestrial were based on a review of aerial photographs. Final management recommendation is preliminary based on a lack of field confirmation.

APPENDIX D-3
Headwater Drainage Feature Mapping
Updated May 2018

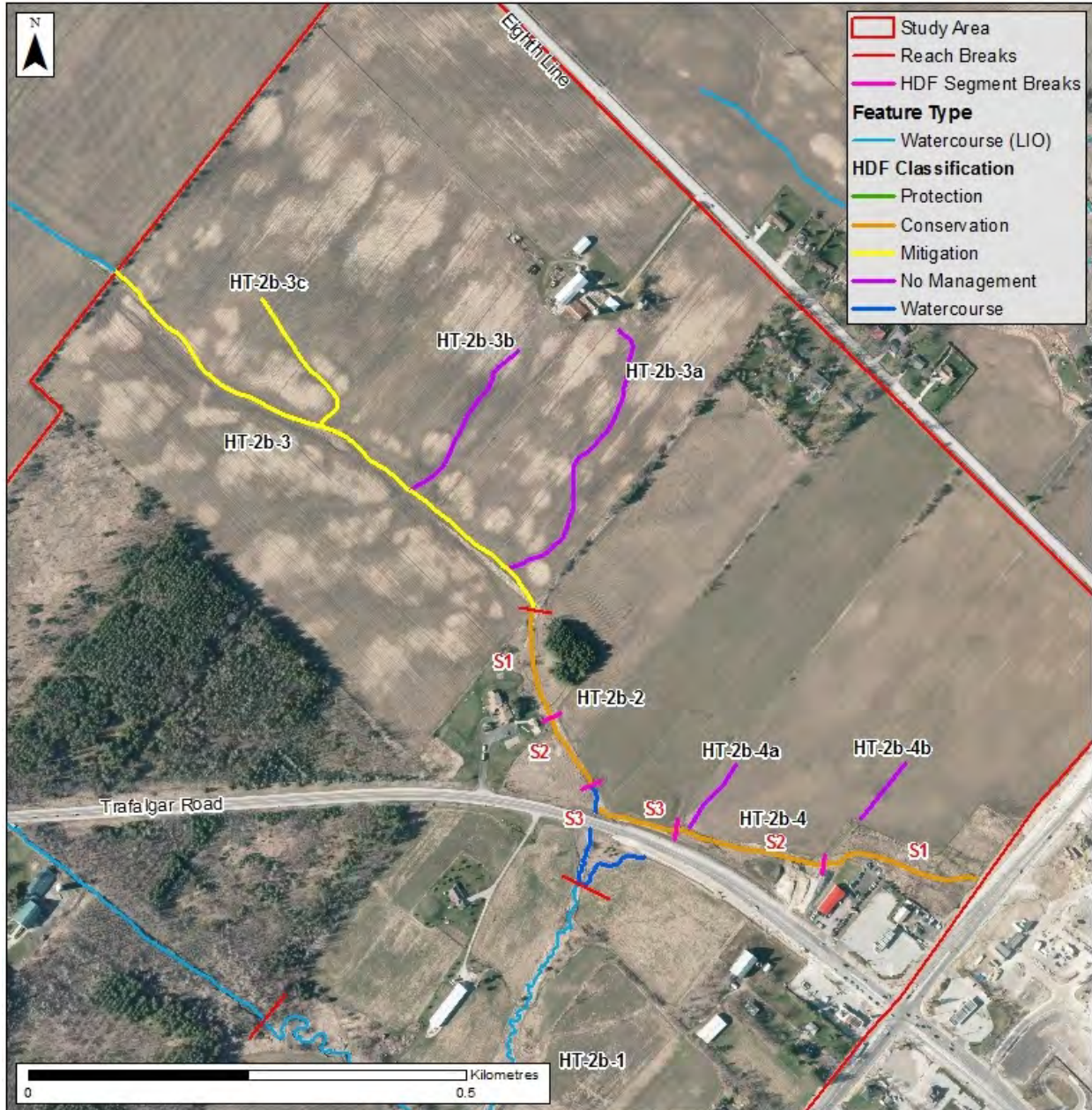


FIGURE D-3-1 Final management recommendations for HDFs in the eastern portion of the study area

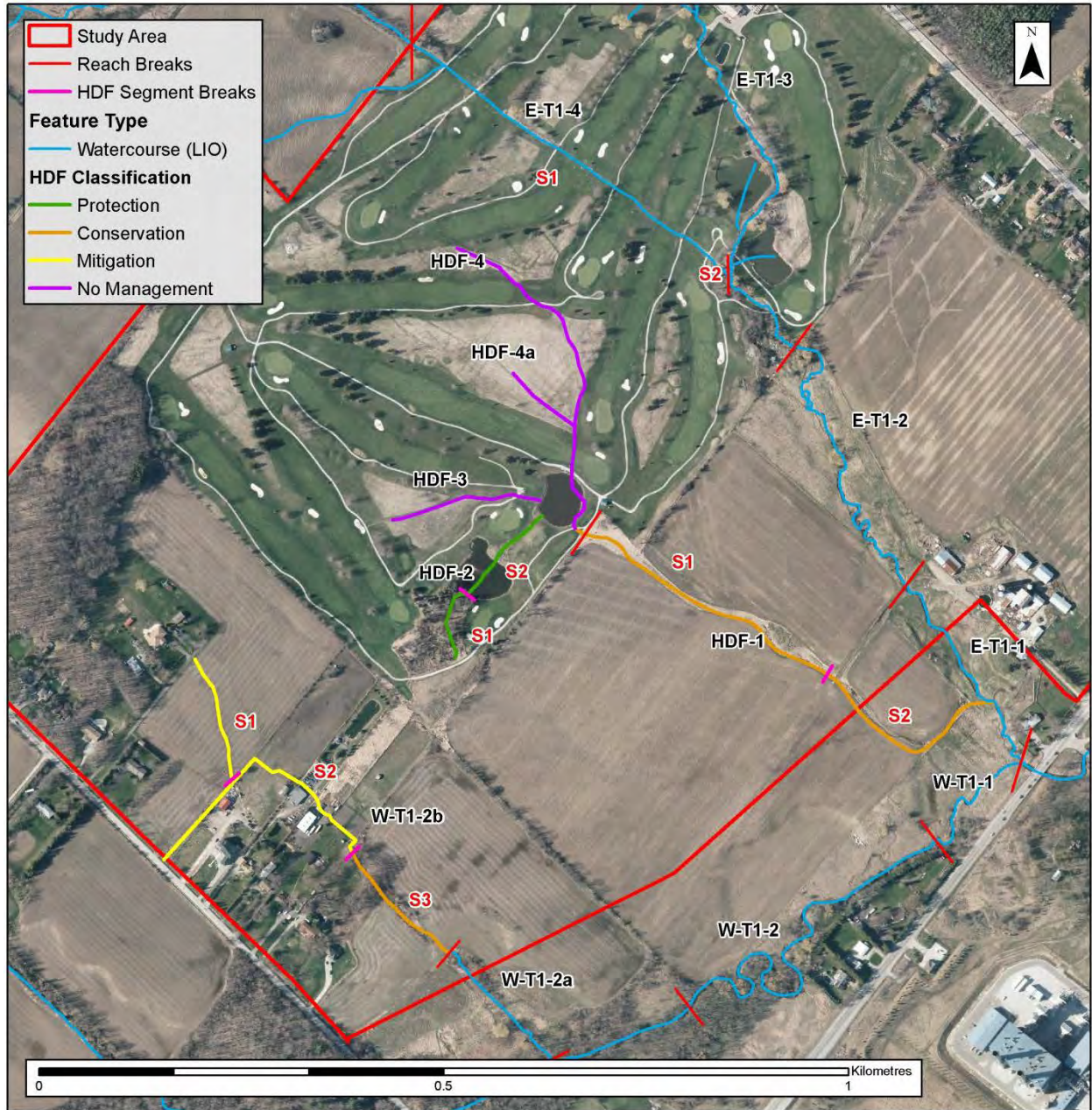


FIGURE D-3-2 Final management recommendations for HDFs in the western portion of the study area

APPENDIX D-4
Potential Stable Top of Slope Sites

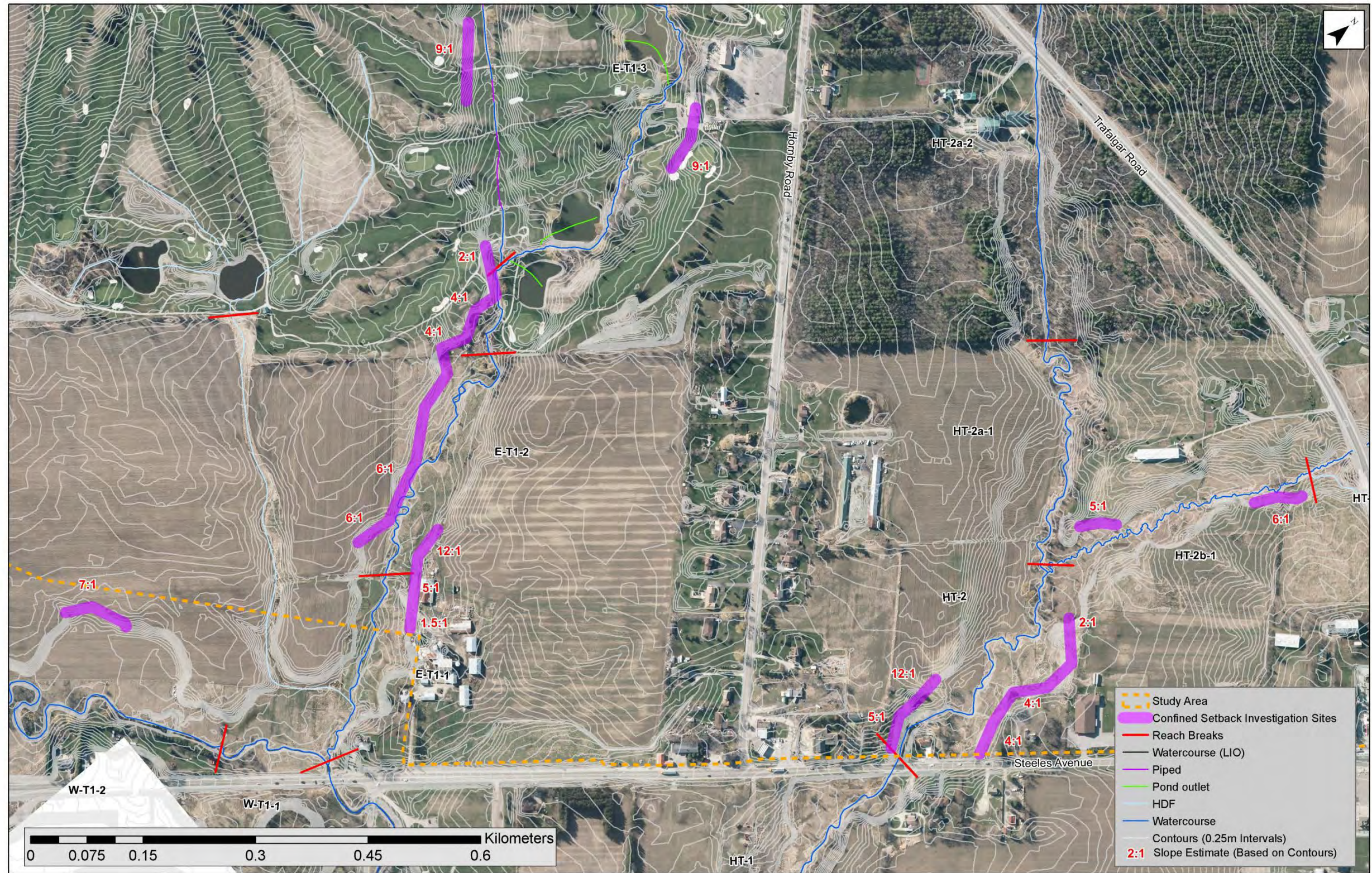


Figure D-4-1: Potential sites for stable top of slope analysis.