Appendix F–

Public Consultation

Appendix F1 –

Environmental Assessment Notice of Commencement



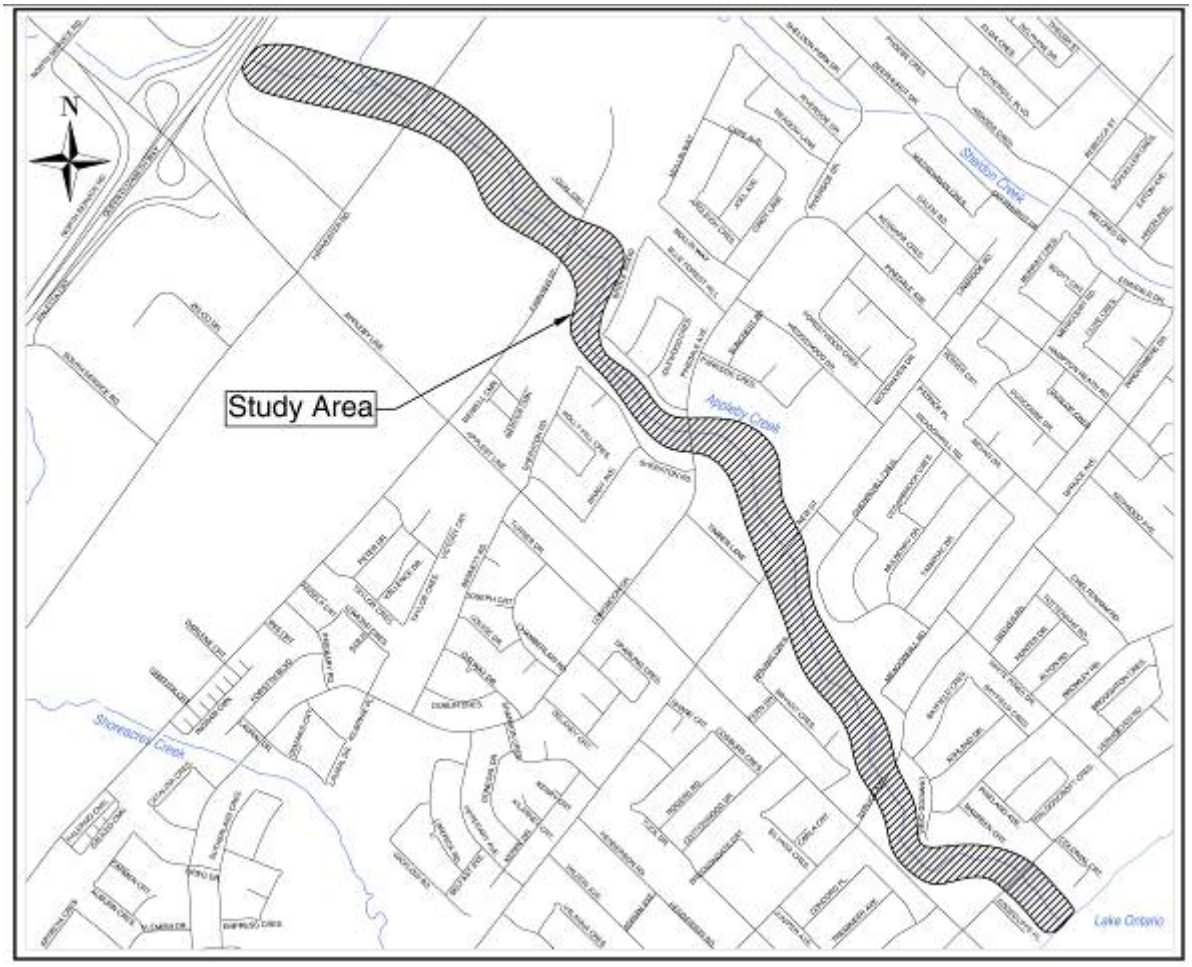
NOTICE OF STUDY COMMENCEMENT

Appleby Creek Erosion Control
Class Environmental Assessment

The Study
The City of Burlington is studying the risk of erosion related to Appleby Creek from Lakeshore Road to the Queen Elizabeth Way Highway. The objective of the study is to provide recommendations to reduce erosion and protect the natural heritage in the area.

Alternative erosion mitigation strategies will be investigated, which will include channel restoration and stabilization of Appleby Creek. Opportunities for natural channel design and native restoration practices will be looked at.

The study area is shown in this map:



The Process
The Appleby Creek Erosion Control Municipal Class Environmental Assessment is subject to the requirements of the *Ontario Environmental Assessment Act* as a project that will follow the Municipal Class Environmental Assessment Schedule B process. Once the existing conditions and problems are identified, solutions will be evaluated and shared with the public and agencies for comment.

Public Interaction
The City will give residents the chance to learn more about the project and comment at a Public Information Centre, which will be advertised in The Burlington Post. The PIC for this project will review the existing conditions and problems with potential solutions. It is planned for January, 2019. For more information contact:

For more project information, please contact:

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City of Burlington,
Senior Project Manager
426 Brant St., P.O. Box
5013, Burlington, ON
L7R 3Z6
905-335-7600, ext. 7486
Arif.Shahzad@burlington.ca

Robert Amos, MASc., P.Eng.
Aquafor Beech Ltd.
2600 Skymark Ave.
Building 6, Unit 2
Mississauga, ON
L4W 5B2
905-629-0099, ext. 284
Amos.R@Aquaforbeech.com

Appendix F2 –

List of Stakeholders

List of Stakeholders
Appleby Creek Erosion Control EA

Ontario Ministry Contacts	Organization	Suffix	First Name	Last Name	Position	Address	City	Province	Postal Code	Telephone	Fax	Email
	Ministry of Environment, Conservation and Parks	Ms.	Dorothy	Moszynski	Project Evaluator	135 St. Clair Avenue West, 1st Floor	Toronto	ON	M4V 1P5	T: (406) 326-3469	F: (416) 325-6345	dorothy.moszynski@ontario.ca
	Ministry of Environment, Conservation and Parks	Mr.	Daniel	Delaquis	Supervisor - Project Coordinator	8th Floor, 5575 Yonge Street	North York	ON	M2M 4J1	T: (416) 326-4839		dan.delaquis@ontario.ca
	Ministry of Environment, Conservation and Parks	Mr.	Trevor	Bell	Environmental Resource Planner / EA Coordinator- Air, pesticides & Environmental Planning	5775 Yonge Street, 9th Floor	Toronto	ON	M2M 4J1	416-326-3577		trevor.bell@ontario.ca
	Ministry of Natural Resources and Forestry	Mr.	Steven	Strong	Aurora District Planner	50 Bloomington Road West	Aurora	ON	L4G 3G8	T: (905) 713-7366	F: (905) 713-7360	steven.strong@ontario.ca
	Ministry of Transportation Ontario		Rina	Kulathinal	Head, Transportation Highway Engineering	1201 Wilson Avenue, 2nd Floor, Building D	Downsview	ON	M3M 1J8	T: (416) 235-4562		rina.kulathinal@ontario.ca
	Ministry of Transportation Ontario	Mr.	John	Van Voorst		1201 Wilson Avenue, 5th Floor, Atrium Tower	Downsview	ON	M3M 1J8	T: (416) 235-5568		john.vanvoorst@ontario.ca
	Ministry of Tourism and Culture	Ms.	Paula	Kupla	A/Heritage Planner, Central West, Culture Services Unit, Programs & Services Branch	400 University 4th Floor	Toronto	ON	M7A 2R9	416-341-7137	416-212-1802	paula.kulpa@ontario.ca
Federal Agencies	**Organization**	**Prefix/Suffix**	**First Name**	**Last Name**	**Position**	**Address**	**City**	**Province**	**Postal Code**	**Telephone**	**Fax**	**Email**
	Environment Canada	Mr.	Rob	Dobos	Manager, Environmental Assessment Section	Box 5050: 867 Lakeshore Road	Burlington	ON	L7R 4A6	T; (905) 336-4953	F; (905) 336-8901	rob.dobos@ec.gc.ca
	Transport Canada		Linda	Beaulieu		100 Front Street South	Sarina	ON	N7T 2M4	T: (416) 952-0470		linda.beaulieu@tc.gc.ca
	Fisheries and Oceans Canada				Fisheries Protection Program							FisheriesProtection@dfo-mpo.gc.ca
Region of Halton	**Organization**	**Prefix/Suffix**	**First Name**	**Last Name**	**Position**	**Address**	**City**	**Province**	**Postal Code**	**Telephone**	**Fax**	**Email**
	Halton Regional Municipality				Regional Clerk	1151 Bronte Rd.	Oakville	ON	L6M 3L1	905-825-6000		regionalclerk@halton.ca
	Halton Regional Municipality		Richard	Clark	Senior Planner	1151 Bronte Rd.	Oakville	ON	L6M 3L1	905-825-6000 x7214		richard.clark@halton.ca
	Halton Regional Municipality		Ron	Reinholt	Regional Forester	1151 Bronte Rd.	Oakville	ON	L6M 3L1	905-825-6000		ron.reinholt@halton.ca
	Region of Halton	Mr.	Brian	Hudson	Senior Planner, Planning Services, Halton Region					905-825-6000, ext. 7209	1-866-442-5866	Brian.Hudson@halton.ca
	Region of Halton	Mr.	James	Harnum	Commissioner, Public Works	~~1151 Bronte Road~~ RETURN TO SENDER	Oakville	ON	L6M 3L1			jim.harnum@halton.ca
	Halton Regional Municipality		Adam	Huycke	Senior Planner	1151 Bronte Rd.	Oakville	ON	L6M 3L1	905-825-6000 x7604		Adam.Huycke@halton.ca
First Nations	**Organization**	**Suffix**	**First Name**	**Last Name**	**Position**	**Address**	**City**	**Province**	**Postal Code**	**Telephone**	**Fax**	**Email**
	Ontario Secretariat for Aboriginal Affairs		Gill	Surinder Singh	Policy Advisor - Policy and Relationships Branch	720 Bay St. 4th Floor	Toronto	ON	M5G 2K1	416-314-6781		surinder.singh.gill@osaa.gov.on.ca
	Lands and ART Lands and Trust Services, Indian and Northern Affairs Canada	Ms.	Cheyenne	Loon	Senior Environmental Officer	25 St. Clair Avenue East, 8th Floor	Toronto	ON	M4T 1M2	Phone: 416-973-6625		cheyenne.loon@aandc-aadnc.gc.ca
	De dwa da dehs nye>s Aboriginal Health Centre	Ms.	Constance	McKnight	Executive Director	678 Main Street East	Hamilton	ON	L8M 1K2	905-548-9593 (905-544 4320 x228)		dedwada@cogeco.net
	Six Nations Lands and Resources	Ms.	Jo-Ann E.C.	Greene	Director	2498 Chiefswood Road, PO Box 5000	Oshweken	ON	N0A 1M0	519-753-0665	519-753-3449	
	The Chiefs of Ontario	Ms.	Margaret	Carpenter	Receptionist	111 Peter Street, Suite 804	Toronto	ON	M5V 2H1	416-597-1266	416-597-8365	margaret1@coo.org
	Haudenosaunee Development Institute	Mr.	Wayne	Hill		16 Sunrise Court, Suite 600 P.O. Box 714	Ohsweken	ON	NOA 1M0			tworowarchaeology@gmail.com
	Mississaugas of the Credit First Nation	Ms.	Megon	DeVries	Department of Consultation & Accommodation	2789 Mississauga Road R.R. #6	Hagersville	ON	N0A 1H0			megan.devries@newcreditfirstnation.com
	Six Nations First Nation	Ms.	Joanne	Thomas	Land Use Unit	1695 Chiefswood Road P.O. Box 5000	Ohsweken	ON	NOA 1M0			jthomas@sixnations.ca
	The Metis Nation of Ontario	Ms.	Jane	Brennan	Administrator	500 Old St. Patric St. Unit D	Ottawa	ON	K1N 9G4	613-798-1488	613-722-4225	janeb@metisnation.org
	The Métis Nation of Ontario	Ms.	Melanie	Paradis	Director	75 Sherbourne Street, Suite 311	Toronto	ON	M5A 2P9	T: 416-977-9881 X 114	F: 416-977-9911	melaniep@metisnation.org
	Ministry of Aboriginal Affairs	Ms.	Lorena	Weesit	Correspondence Coordinator, Communications Branch	160 Bloor Street East, 4th Floor	Toronto	ON	M7A 2E6			
	Ministry of Aboriginal Affairs	Mr.	David	Pickles	Team Lead for EAs	9th Floor, 160 Bloor Street East	Toronto	ON	7A 2E6	T: (416) 326-4757	F: (416) 326-1066	david.pickles@ontario.ca
	Assessment and Historical Research Indian and Northern Affairs Canada	Mr.	Sean	Darcy	Manager	10 Wellington St.	Gatineau	QC	K1A 0H4	819-997-8155	819-997-1366	
	Department of Indian and Northern Affairs											CAU-UCA@aadnc-aandc.gc.ca

Utilities	Organization	Suffix	First Name	Last Name	Position	Address	City	Province	Postal Code	Telephone	Fax	Email
	Hydro One Networks Inc	Ms.	Rossella	Fazio	Manager, Transmission Lines Sustainment Investment Planning	483 Bay Street, North Tower 12th Floor	Toronto	ON	M5G 2P5	416-345-6411	416-345-5443	rossella.fazio@HydroOne.com
	Hydro One Networks Inc	Ms.	Jenny	Seo	Network Management Officer, Secondary Land Use	483 Bay St. | North Tower | 13th Floor	Toronto	ON	M5G 2P5	416.345.5676		Jenny.Seo@Hydroone.com
	Hydro One Networks Inc	Ms.	Enza	Cancilla	Hydro One Real Estate Management	185 Clegg Road	Markham	ON	L6G 1B7	(416) 345-5892		Enza.Cancilla@HydroOne.com
	Hydro One Networks Inc	Ms.	Susan	Sun	Secondary Land Use					416-345-6629		Susan.SUN@HydroOne.com
	Hydro One Networks Inc				Secondary Land Use							SecondaryLandUse@HydroOne.com
	Enbridge Pipelines Ltd.	Ms.	Ann	Newman	Crossings Coordinator, Enbridge Pipelines Inc.		Sarnia	ON	N7T 7H8			ann.newman@enbridge.com
Additional Stakeholders	**Organization**	**Suffix**	**First Name**	**Last Name**	**Position**	**Address**	**City**	**Province**	**Postal Code**	**Telephone**	**Fax**	**Email**
	Resident	Mr.	[redacted]	[redacted]		[redacted] Pinedale Ave	Burlington	ON		[redacted]		[redacted]
	Resident	Mr.				[redacted] Oval Court	Burlington	ON				
	Resident	Mr.				[redacted] Linwood	Burlington	ON				
	Resident	Mrs.				[redacted] Linwood	Burlington	ON				
	Resident	Mrs.				[redacted] Colonial Court	Burlington	ON		[redacted]		
	Resident	Mr.				[redacted] Colonial Court	Burlington	ON				
	Resident	Ms.				[redacted] Fallingbrook Crt	Burlington	ON				
	Resident	Ms.				[redacted] Cenaber Crt	Burlington	ON	L7L 5G7			
	Resident	Mr.				[redacted] Cenaber Crt	Burlington	ON	L7L 5G7			
	Resident	Mr.				[redacted] New St	Burlington	ON				
	Resident	Mr.				[redacted] Bridle Wood	Burlington	ON				
	Resident	Ms.				[redacted] Sheraton Rd	Burlington	ON	L7L 4B3			
	JL Planning	Ms.				[redacted] Fieldgate St	Burlington	ON				
	Urbantech Consulting	Mr.				[redacted]-14th Ave, Suite 301	Markham	ON	L3R 3T7	[redacted]		

Appendix F3 –

Public Information Centre Materials

Appleby Creek Erosion Control
Class Environmental Assessment
City of Burlington

February 19, 2019

Sign-in Sheet

Name	Address	Phone Number	E-mail
[redacted]	[redacted] PINEDALE AVE	[redacted]	[redacted]
[redacted]	[redacted] Oval Court, Burlington	[redacted]	[redacted]
[redacted]		[redacted]	[redacted]
[redacted]	[redacted] Linwood		
[redacted]	[redacted] Colonel [illegible]	[redacted]	[redacted]
[redacted]	[redacted] Colonial court	"	"
[redacted]	[redacted] Fallingbrook Crt		[redacted]
[redacted]	[redacted] Cranberry CRT BURLINGTON	[redacted]	[redacted]
[redacted]	[redacted] NEW ST	[redacted]	[redacted]

Name	Address	Phone Number	E-mail
[redacted]	[redacted] Bridle Wood	[redacted]	[redacted]
[redacted]	[redacted] Fieldgate St	[redacted]	[redacted]

Name	Address	Phone Number	E-mail
[redacted]	[redacted] SHERATON RD	[redacted]	[redacted]
[redacted]	[redacted] 14th Ave; Suite 301 Markham, ON L3R 3T7	[redacted]	[redacted]
[redacted]	[redacted] Conaker Ct Blvd. L7Z 5G7	[redacted]	[redacted]



WELCOME

Appleby Creek Erosion Control Environmental Assessment

PUBLIC INFORMATION CENTRE

February 19, 2019

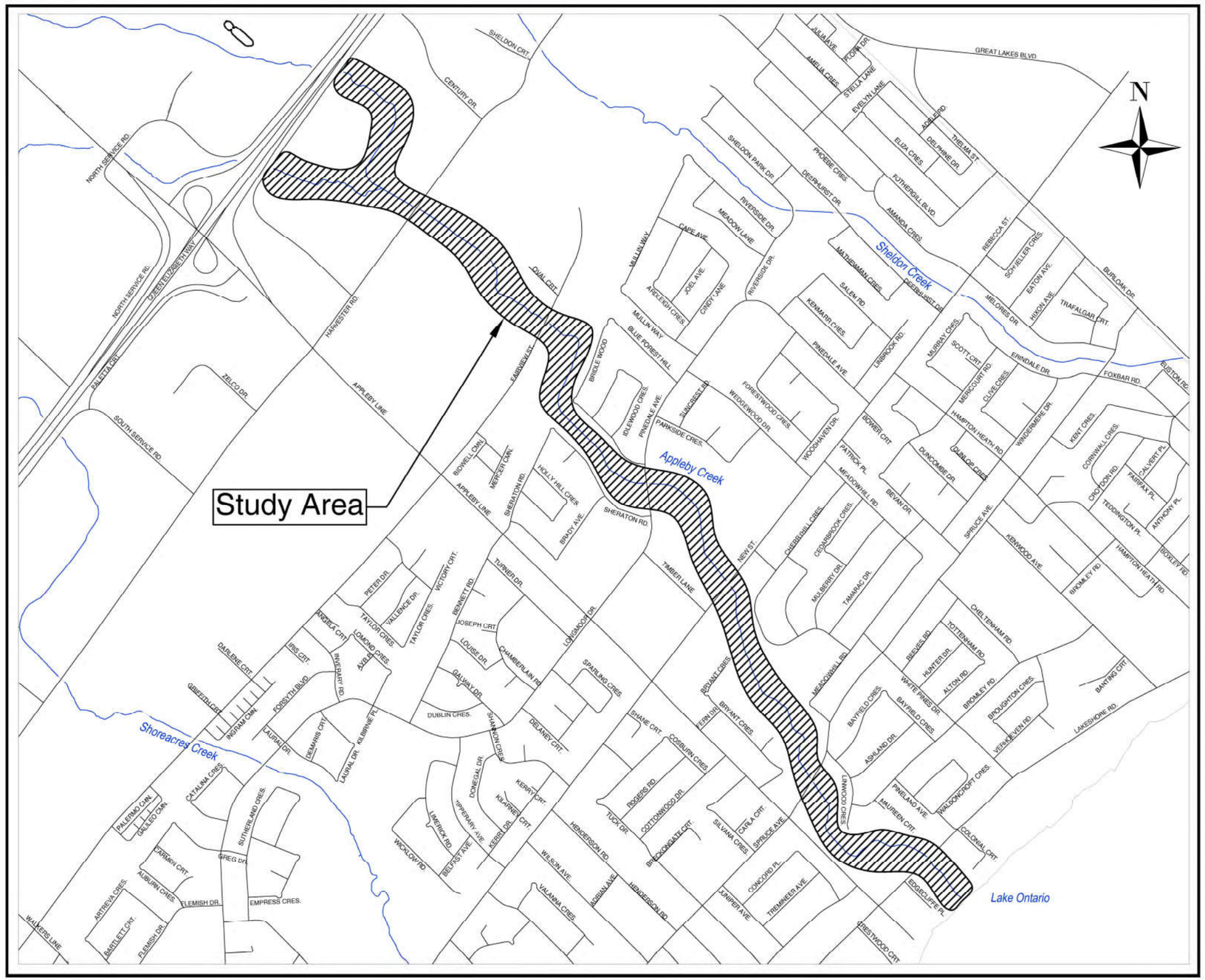
Your comments are encouraged and appreciated, as this will provide us an opportunity to address project issues and concerns.

Aquafor Beech Limited

CITY OF Burlington

STUDY AREA

The study area along Appleby Creek between South Service Road and Lake Ontario



STUDY PURPOSE / PROBLEM DEFINITION

The study is being carried out to study the risk of erosion related to Appleby Creek within the study area, and provide recommendations to reduce erosion and protect the natural heritage in the area.

PUBLIC INFORMATION CENTRE PURPOSE

This Public Information Centre (PIC) is Designed to:

- Present information on existing conditions
- Present alternative approaches to erosion protection
- Present study process and timelines

To gain community input on:

- Existing conditions information
- Identification of opportunities and mitigation preferences
- Alternative evaluation criteria and scoring

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PROCESS

CLASS EA PROCESS - SCHEDULE B

Many projects related to municipal systems are similar in nature, are carried out routinely, and have predictable and mitigatable environmental effects which are investigated according to the Municipal Engineers Association "Municipal Class Environmental Assessment" (October 2000, as amended in 2007 & 2011).

This study is being undertaken as a Schedule B project under the Municipal Class Environmental Assessment process. The flow chart illustrates the key steps to be undertaken as part of the EA process.

Phase 1 – Identify Problems

- Identify Problem or Opportunity
- Public Consultation

We Are Here →

Phase 2 – Alternate Solutions

- Identify Alternative Solutions
- Inventory Natural, Social, Economic Environment
- Environmental Impacts and Mitigation
- Alternatives Evaluation
- **Review Agency and Public Consultation**
- Select Preferred Solution
- Review and Confirm Choice of Schedule
- Notice of Completion to Review Agency & Public
- Implementation

NATURAL HERITAGE ASSESSMENT

To assess the existing natural environment within the study, the following studies were undertaken:

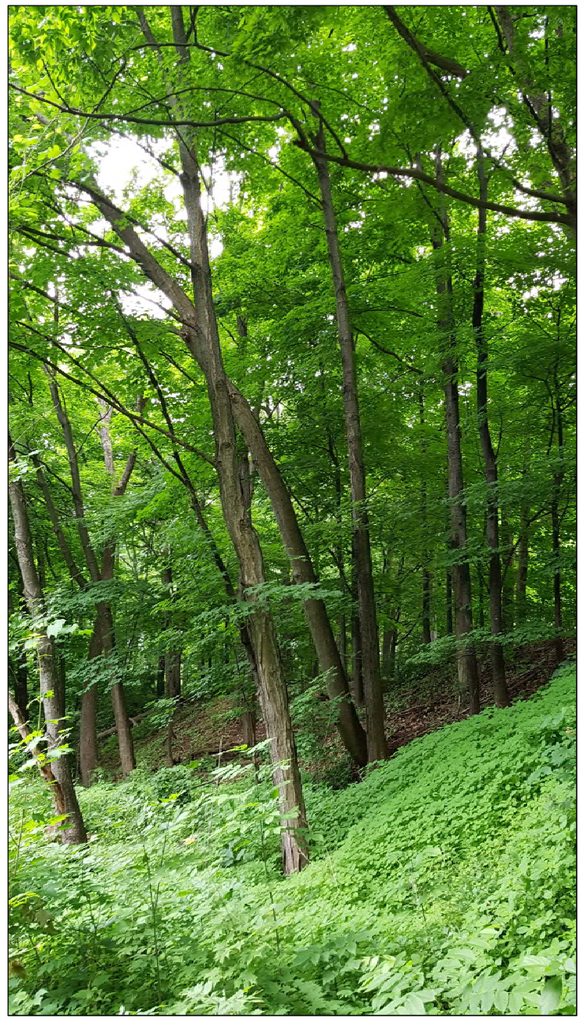
1. Tree inventory and assessment;
2. Vegetation community classification (Ecological Land Classification (ELC) protocol);
3. Vascular plant survey (includes vascular plant Species at Risk (SAR) survey);
4. Breeding Bird Surveys (BBS);
5. Candidate bat maternity roost surveys;
6. Snake surveys (no snakes recorded during surveys);
7. Frog and toad call surveys (no frogs or toads recorded during surveys);
8. Fish community and aquatic habitat assessment;
9. SAR screening and habitat assessment; and,
10. Significant Wildlife Habitat (SWH) screening and assessment.



Shagbark Hickory (*Carya ovata*) near Bromley Park, Burlington

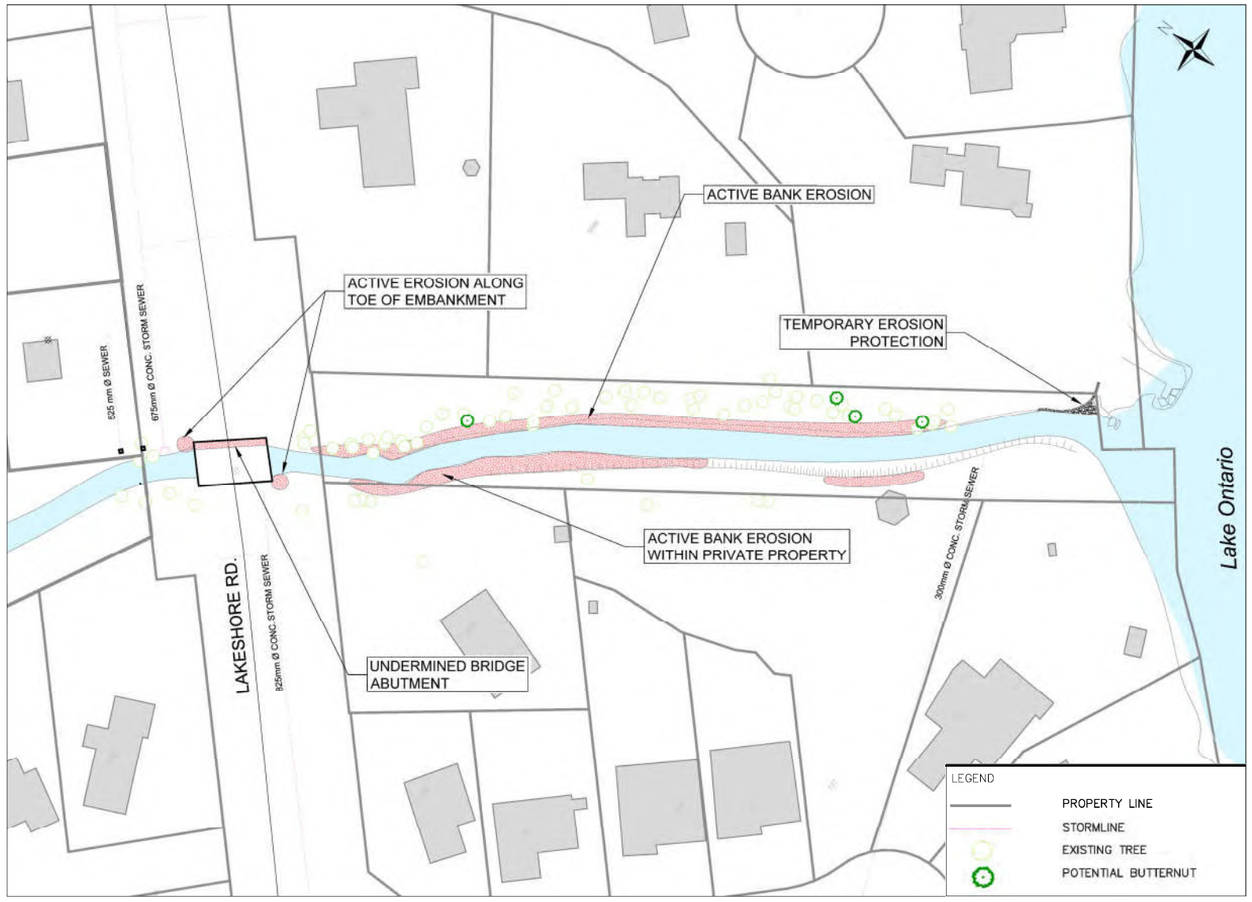


Black-crowned Night-heron (*Nycticorax nycticorax*) foraging in Appleby Creek



Oak, Maple and Hickory Forest on the slope of Appleby Creek

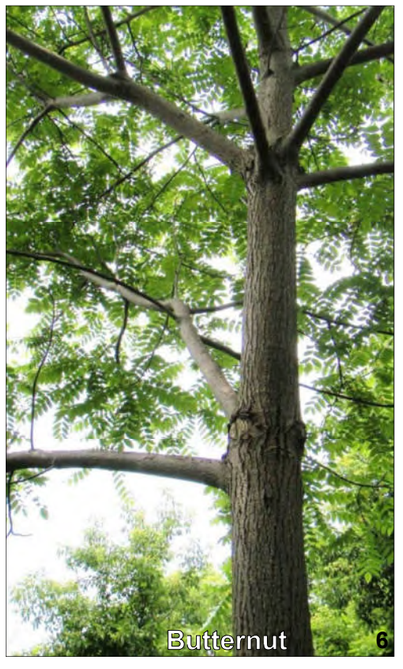
TREE INVENTORY



- Trees greater than 10cm diameter were inventoried in proximity to erosion sites within the study area, and a total of 39 species were identified.
- Within Reach 1, four **Butternuts**, which is an endangered species protected under Ontario's Endangered Species Act, were identified.
- Removal of trees may be required to accommodate channel and culvert works. However, the removed trees will be compensated with as per City of Burlington and Conversation Halton standards during restoration stage.

Common Name	Botannical Name	Reach 1	Reach 2	Reach 3	Reach 4	Reach 5	Reach 6	Reach 7
Amur Maple	*Acer ginnala*					2		
Austrian Pine	*Pinus nigra*			3	2		5	
Basswood	*Tilia americana*		3	4				1
Bitternut Hickory	*Carya cordiformis*		1					
Black Locust	*Robinia pseudoacacia*			3				
Black Walnut	*Juglans nigra*	1	8	3	4	7	2	23
Bur Oak	*Quercus macrocarpa*			3			1	
Butternut	***Juglans cinerea***	4						
Colorado Blue Spruce	*Picea pungens*					1		
Common Apple	*Malus spp.*	1					1	1
Common Buckthorn	*Rhamnus cathartica*						1	
Crack Willow	*Salix x rubens*					4	1	
Douglas Fir	*Pseudotsuga menziesii*				4			
English Hawthorn	*Crataegus laevigata*					1	1	
European Mountain-Ash	*Sorbus aucuparia*			1				
Hackberry	*Celtis occidentalis*					4		
Honeylocust	*Gleditsia triacanthos var. inermis*					5	2	
Hop Hornbeam	*Ostrya virginiana*			2				
Horsechestnut	*Aesculus hippocastenum*	2						
Hybrid Crack Willow	*Salix x rubens*	7	2			1	11	4

Common Name	Botannical Name	Reach 1	Reach 2	Reach 3	Reach 4	Reach 5	Reach 6	Reach 7
Little-leaf Linden	*Tilia cordata*					2	1	
Manitoba Maple	*Acer negundo*	1	2		1	14	10	1
Norway Maple	*Acer platanoides*	33	14	11	7	16	2	1
Red Oak	*Quercus rubra*		1	5		1		1
Russian Olive	*Elaeagnus angustifolia*						1	1
Shagbark Hickory	*Carya ovata*			1				
Siberian Elm	*Ulmus pumila*			6	1	1		1
Silver Maple	*Acer saccharinum*	1			4	4		
Slippery Elm	*Ulmus rubra*							1
Small-leaved Linden	*Tilia cordata*					1		
Smooth Serviceberry	*Amelanchier laevis*					1		
Sugar Maple	*Acer saccharum*		3	16				
Sweet Cherry	*Prunus avium*			1			1	
Weeping Willow	*Salix x sepulcralis* 'Chrysocoma'		2			1		
White Ash	*Fraxinus americana*	12	15	8		6	36	9
White Elm	*Ulmus americana*	2	5			1		
White Mulberry	*Morus alba*		3		1	1	2	
White Pine	*Pinus strobus*			1				
White Spruce	*Picea glauca*					5		



VEGETATION COMMUNITY CLASSIFICATION

Vegetation communities within the study area were identified during field surveys completed in accordance with the *Ecological Land Classification (ELC) System for Southern Ontario: First Approximation and its Application* (Lee et al., 1998) protocol in 2018. Additional surveys are scheduled for spring 2019.

Determining the vegetation communities within the study area aids in identifying the presence of significant vegetation communities, Significant Wildlife Habitat (SWH), and the habitats of potential Species at Risk.

In total, nine vegetation communities are within the study area (see Board 10). Some of these communities are either complex communities (i.e. a pattern of two or more vegetation ecosites or types forming a mosaic (Lee et al., 1998)) or have inclusions (i.e. vegetation types less than 0.5 ha within a larger vegetation type). None are provincially or globally significant.



Mineral Cultural Savannah

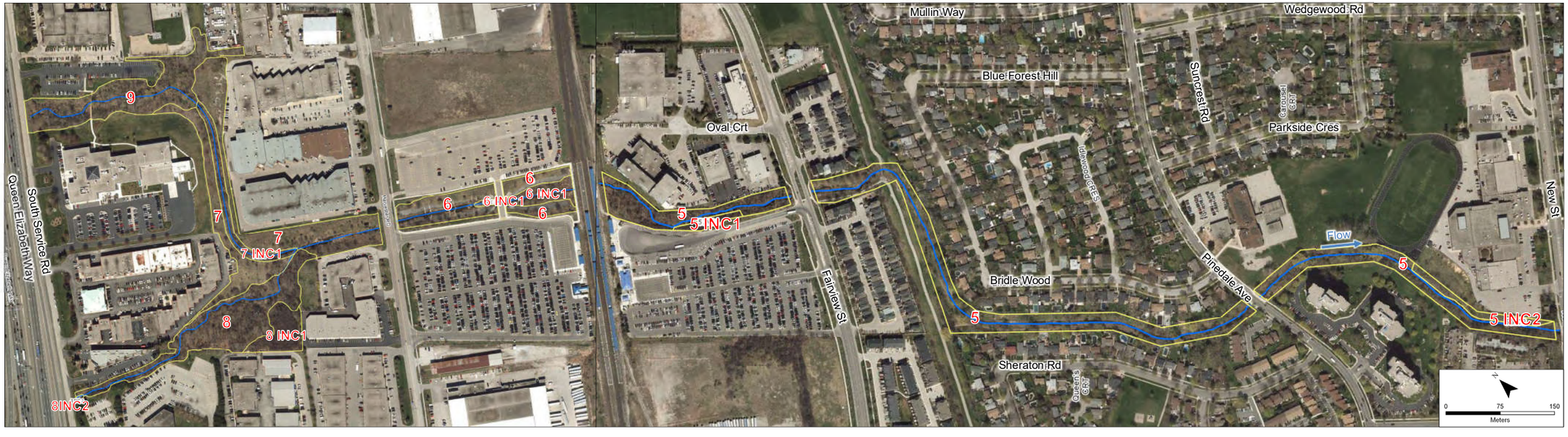


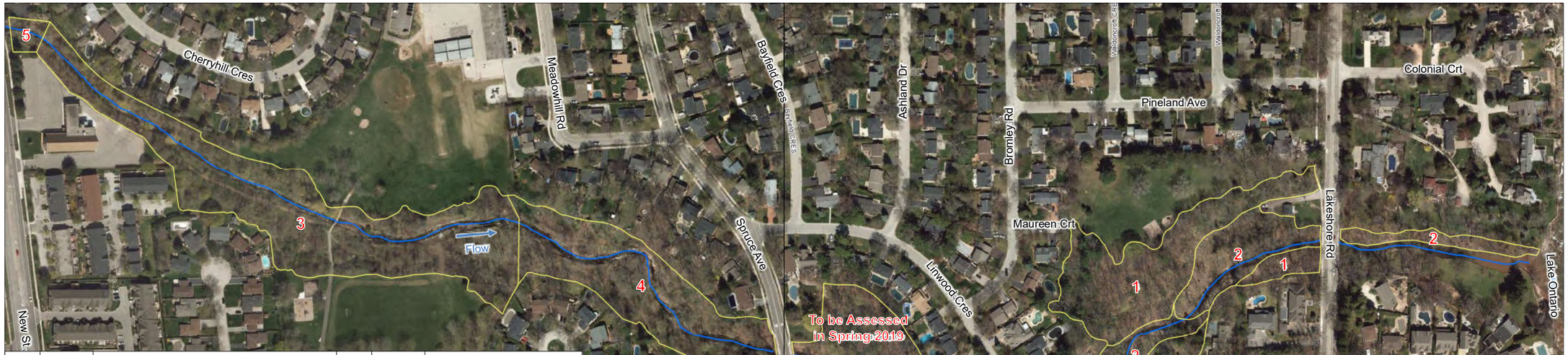
Mineral Deciduous Forest adjacent to Appleby Creek

VEGETATION COMMUNITY CLASSIFICATION

Aquafor Beech Limited | City of Burlington

Appleby Creek Erosion Control Environmental Assessment





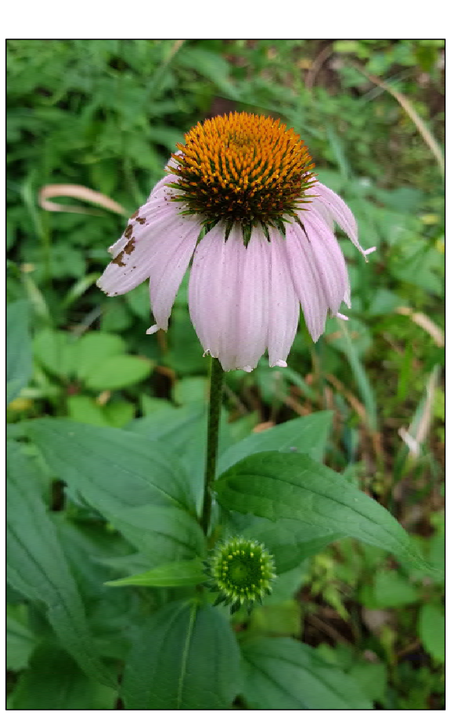
ID	Code	Community Type Description	ID	Code	Community Type Description
1	FOC2	Dry – Fresh Oak – Maple – Hickory Deciduous Forest	6	CUS1	Mineral Cultural Savannah
2	FOD7 (CUW1)	Fresh – Moist Lowland Deciduous Forest – Mineral Cultural Woodland Complex	6 INC1	MAM2-10	Forb Mineral Meadow Marsh
2 INC1	CUP3	Coniferous Plantation (White Spruce)	7	CUM1 (CUT1-1)	Mineral Cultural Meadow - Sumac Cultural Thicket Complex
3	CUW1 (FOD7)	Mineral Cultural Woodland – Fresh - Moist Lowland Deciduous Forest Complex	7 INC1	MAM2-10	Forb Mineral Meadow Marsh
4	FOD9-1 (FOD7 -4)	Fresh – Moist Oak – Sugar Maple Deciduous Forest - Fresh – Moist Black Walnut Lowland Deciduous Forest Complex	8	CUW1	Mineral Cultural Woodland
5	CUW1	Mineral Cultural Woodland	8 INC1	CUT1	Hawthorn / Buckthorn Mineral Cultural Thicket
5 INC1	CUT1	Hawthorn Mineral Cultural Thicket	8 INC2	MAS2-1	Cattail Mineral Shallow Marsh
5 INC2	CUS1	Dry – Moist Old Field Meadow	9	CUW1	Mineral Cultural Woodland

VASCULAR PLANTS

Vascular plants were identified in concert with vegetation community surveys in 2018. Additional surveys are planned for spring 2019. To date, 151 species have been identified, plus an additional 11 to genus.

Attributes of the vascular plant species recorded within the study area are as follows:

- Introduced Species: 76
- Native Species: 75
- Provincially Rare Species (S1-S3): 1 (Butternut, Juglans cinerea)
- Species at Risk: 1 (Butternut)



Purple Coneflower
(*Echinacea purpurea*)



Shagbark Hickory
(*Carya ovata*)



Water Plantain
(*Alisma subcordatum*)



Butternut (*Juglans cinerea*)

BREEDING BIRDS

Two Breeding Bird Surveys (BBS) were conducted in 2018 by a qualified avian biologist. A total of 35 species were recorded during surveys. BBS results are as follows:

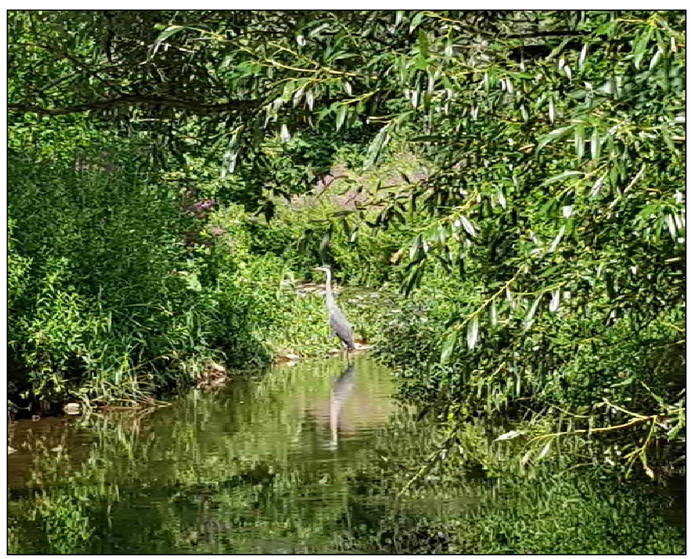
- Confirmed breeding: 1
- Probable breeding: 13
- Possible breeding: 16
- No breeding evidence: 5

Provincially rare species: 1 (Black-crowned Night-heron (*Nycticorax nycticorax*))

Due to a lack of breeding evidence (i.e. no nests were observed in trees), it is believed the Black-crowned Night-heron is using the Appleby Creek corridor north and south of the Appleby GO station to forage for fish.



Black-crowned Night-heron
(Nycticorax nycticorax)



Great Blue Heron (*Ardea herodias*)



Juvenile Red-tailed Hawk
(*Buteo jamaicensis*)

SPECIES AT RISK

For the purpose of this Study, Species At Risk (SAR) are defined as species listed as Endangered (END), Threatened (THR), or Special Concern (SC) under the provincial Endangered Species Act (ESA) and/or the federal Species at Risk Act (SARA). Other Species of Conservation Concern (SOCC) are those with Global ranks of G1-G3 and/or Subnational/Provincial ranks of S1-S3.

Species included in the screening assessment include those provided by secondary sources and those documented via direct observations by Aquafor Beech Limited. **A total of 18 SAR and SOCC are included in the screening assessment**. Of these, 10 are either confirmed present or have the potential to occur within the study area. These are as follows:

Species Name		Ranking					Assessment of Species Occurrence at or Near the Study Area
Scientific Name	Common Name	SARA*	ESA*	G-Rank	S-Rank	Halton Region	
Myotis leibii	Eastern Small-footed Myotis	END	END	G4	S2S3	-	Potentially Present
Myotis lucifugus	Little Brown Myotis	END	END	G3	S4	Common	Potentially Present
Myotis septentrionalis	Northern Myotis	END	END	G1G2	S3	Common	Potentially Present
Perimyotis subflavus	Tri-coloured Bat	END	END	G2G3	S3?	-	Potentially Present
Nycticorax nycticorax	Black-crowned Night-heron	-	-	G5	S3B, SZN	Uncommon	Confirmed Present
Cardellina canadensis	Canada Warbler	THR	SC	G5	S4B	Rare	Present (Likely Migrant)
Contopus virens	Eastern Wood-Pewee	SC	SC	G5	S4B	Common	Confirmed Present
Juglans cinerea	Butternut	END	END	G4	S2?	Common	Confirmed Present
Chelydra serpentina	Snapping Turtle	SC	SC	G5	S3	Common	Potentially Present
Danaus plexippus	Monarch	SC	SC	G4	S2N,S4B	Common	Confirmed Present

*Species ranking for SARA and ESA are as follows: EXT – Extinct, EXP – Extirpated, END – Endangered, THR – Threatened, SC – Special Concern, NAR – Not-at-Risk, and DD – Data Deficient

SIGNIFICANT WILDLIFE HABITAT

The province has provided guidance for the identification and assessment of Significant Wildlife Habitat (SWH). In Burlington, the primary document to use to identify SWH is the Technical Guide for Ecoregion 7E (Government of Ontario, 2015).

Candidate or Confirmed SWH types within the study area are as follows:

- **Bat Maternity Colonies – Candidate**
- **Migratory Butterfly Stopover Areas – Candidate**
- **Landbird Migratory Stopover Areas – Candidate**
- **Special Concern and Rare Wildlife Species – Candidate/Confirmed**
  - ❖ Snapping Turtle (SC, S3), Candidate
  - ❖ Black-crowned Night-heron (S3), Confirmed



Monarch (*Danaus plexippus*)

SWH is a *Key Feature* of Halton Region's Natural Heritage System (RNHS) and is protected under the Region's Official Plan.

FISHERIES & AQUATIC HABITAT

To assess the existing fisheries and aquatic habitat within the study the following studies were undertaken:

- Aquatic habitat assessments at Fairview Street, New Street & Pinedale Avenue;
- Aquatic community assessments of historic data;
- SAR screening and potential habitat identification; and,
- Significant Wildlife Habitat screening.

Summary of Fish Community Sampling:

Common Name	Scientific Name	Count
Blacknose Dace	*Rhinichthys atratulus*	1
Brassy Minnow	*Hybognathus hankinsoni*	2
Brook Stickleback	*Culaea inconstans*	24
Carps and Minnows	*Cyprinidae*	3
Creek Chub	*Semotilus atromaculatus*	286
Fathead Minnow	*Pimephales promelas*	10
Goldfish	*Carassius auratus*	1
Green Sunfish	*Lepomis cyanellus*	47
Largemouth Bass	*Micropterus salmoides*	1
Lepomis sp.	*Lepomis sp.*	8
Longnose Dace	*Rhinichthys cataractae*	22
Pumpkinseed	*Lepomis gibbosus*	4
Threespine Stickleback	*Gasterosteus aculeatus*	2
White Sucker	*Catostomus commersoni*	34

Data from Conservation Halton

Key Findings:

- No aquatic SAR were identified within the study area;
- The thermal classification of Appleby Creek within the study area is that of a Cool-Warm thermal regime and is dominated by warmwater and coolwater species;
- The Index of Biotic Integrity (IBI) for Appleby Creek ranges from Poor-Fair (indicating that there is limited high quality aquatic habitat);
- A number of **fish barrier(s)** were observed upstream of the crossing at Fairview Street (deteriorating gabion weir and debris jam) and upstream of the Go Line crossing; and,
- There are opportunities to improve fish habitat.



Fathead Minnow, *Pimephales promelas*
Photo Credit: Konrad P. Schmidt & Donals Biemborn

Next Steps:

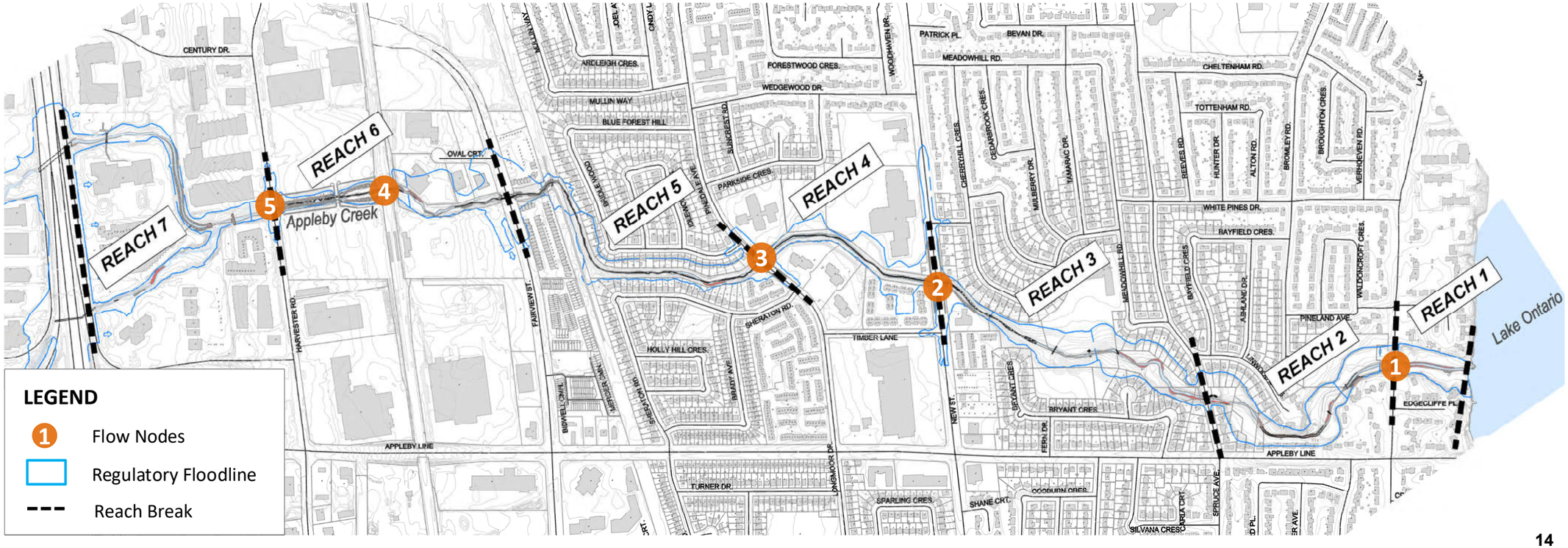
- More detailed aquatic habitat assessments following the Ontario Stream Assessment Protocol (OSAP) will be conducted in the spring of 2019, with efforts focused on areas of with significant erosion. Results will be compared to reference sites within the study area to better represent a healthy aquatic habitat in the design phase.

HYDROLOGY & EXISTING FLOODING PROFILE

Flows at different locations under various rainfall events are presented in the table, and the flooding profile under regional storm is shown in the figure.

Aquafor has recently completed the *Appleby Creek Flood Mitigation EA study between Fairview Street to New Street*, and identified flood mitigation measures within the study area. Hence, this study will incorporate the flood mitigation opportunities where possible to provide integrated solutions to mitigate both erosion and flooding.

Event	Flow (m^3/s)				
	Node 1	Node 2	Node 3	Node 4	Node 5
Regional	109	106	101	93	85
100 Year	61	59	57	54	50
50 Year	55	53	51	48	45
25 Year	48	47	45	42	39
10 Year	38	38	35	34	32
5 Year	31	31	30	28	26
2 Year	21	21	20	19	18



EROSION INVENTORY

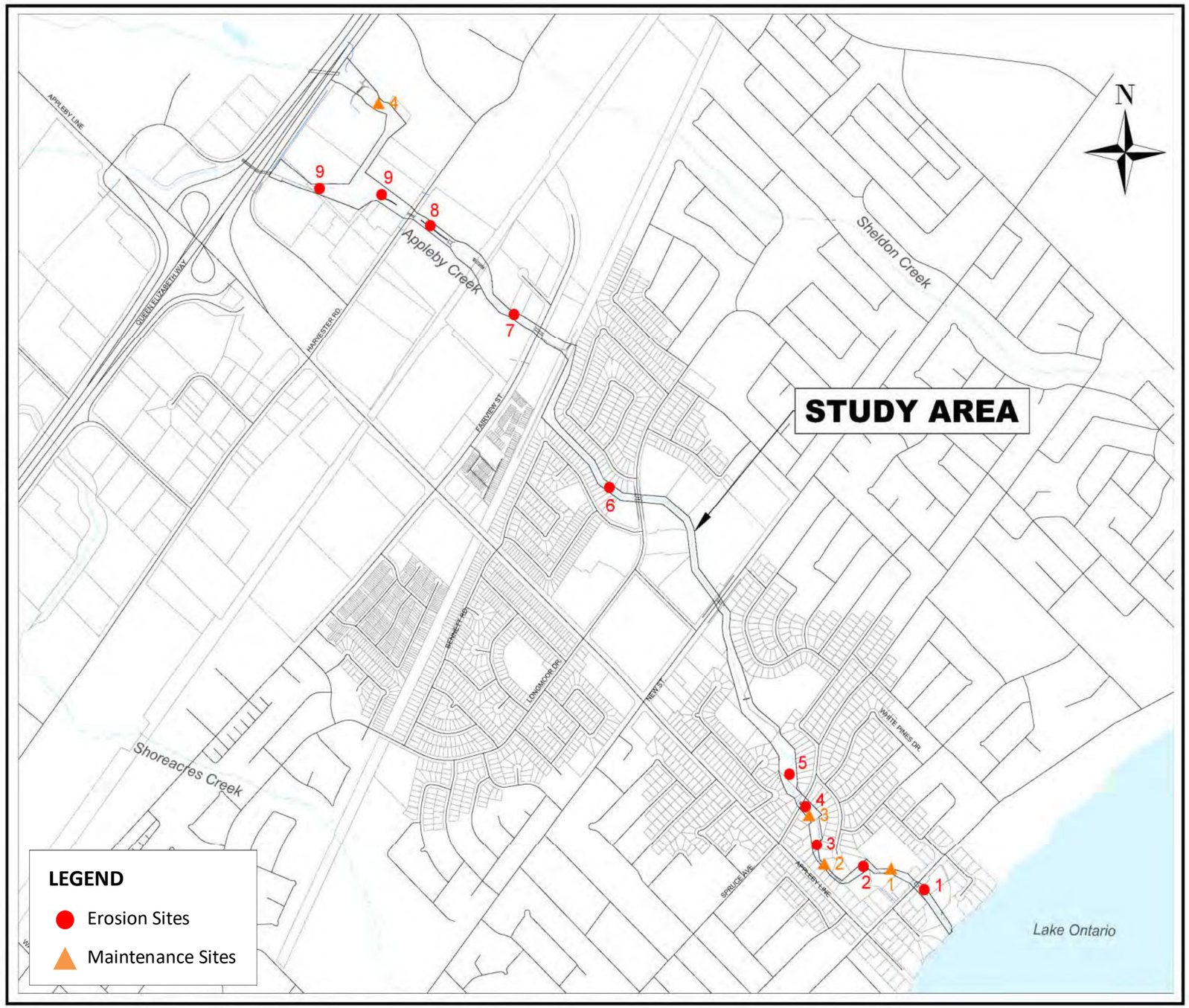
Nine erosion sites and four maintenance sites were identified within the study area.

Risks observed at the erosion sites include:

- Risks to private properties;
- Risks to municipal infrastructure;
- Negative impacts on water quality;
- Fish barrier.

Issues observed at maintenance sites consists of:

- Woody debris and fallen trees within the creek – negative impact on flow conveyance;
- Deteriorating engineered structures require maintenance.



EVALUATION CRITERIA

The following criteria are used to evaluate each alternative. It will help determine which alternative should be selected as the preliminary preferred alternative.

Comment sheets are provided to collect public feedback on the evaluation criteria and preliminary evaluation.

Physical / Natural Environment	
Potential to Reduce Stream Bank and Stream Bed Erosion	Greater reduction of erosion risks to public
Potential to Reduce Flooding Risks	Greater reduction of flooding risks to public and/or private lands for longer time scores higher
Potential to Improve Aquatic Habitat	Greater improvements to fish and aquatic habitat scores higher, including substrate, overhanging vegetation, turbidity, and passage/connectivity
Potential to Improve Terrestrial Habitat	Greater improvements to terrestrial habitat scores higher, including loss and replacement of vegetation and natural corridor connectivity

Social / Cultural Environment	
Aesthetics / Recreation	Greater improvements to the aesthetics of the creek corridor and how the alternative impacts recreational use of the corridor score higher
Compatibility with Adjacent Land Use	Greater compatibility with the land use of adjacent properties scores higher
Community Disruption	Less disruption the surrounding community and residents scores higher
Public Health and Safety	Greater protection of public health and safety for a longer time scores higher

Technical and Engineering Considerations	
Ease of Implementation	Ease of Implementation Greater ease of implementing scores higher
Agency Acceptance	Agency Acceptance Greater likelihood that regulatory authorities will support the alternative scores higher
City Acceptance	Town Acceptance Greater compliance with existing City plans, policies, and bylaw requirements scores higher
Technical Feasibility	Greater technical feasibility relative to other alternatives scores higher

Economic Environment	
Construction Costs	Lower construction cost relative to other alternatives scores higher
Operation and Maintenance Costs	Lower operations and maintenance costs relative to other alternatives scores higher
Life Cycle Costs	Lower life cycle costs relative to the other alternatives scores higher
Infrastructure Protection	Greater protection of existing infrastructure for a longer time scores higher

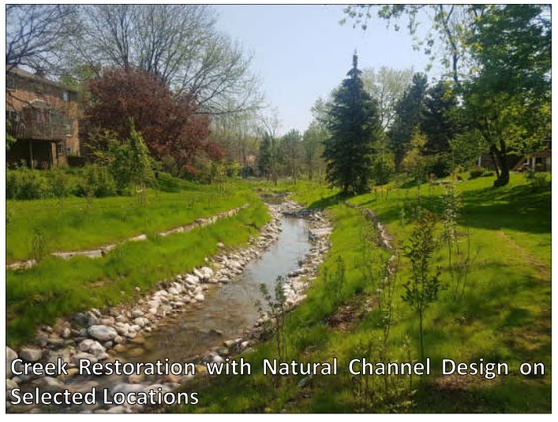
PRELIMINARY ALTERNATIVE SOLUTIONS

1. **Do nothing**
   - Leave the site as it is and allow erosional processes to continue within the watercourse corridor;
   - Maintenance or possibly emergency works may be required in the future.



Exposed Fence Pole Foundation and Tree Roots Due to Erosion, Risk to Private Property

2. **Selective Works**
   - Localized channel bank and/or bed work to address erosion issues at the site;
   - May require ongoing maintenance, occasional repairs, or eventual replacement;
   - Often preferred to limit the economic cost and the environmental damage of large-scale channel engineering and stream restoration works.



Creek Restoration with Natural Channel Design on Selected Locations

3. **Reach-based works**
   - A reach-based approach to address erosion issues at the site;
   - Typically applied in highly constrained urban watercourses;
   - Primarily utilizes “hard” channel engineering approaches, but may incorporate some natural channel designs;
   - Higher capital cost, but require minimal maintenance.



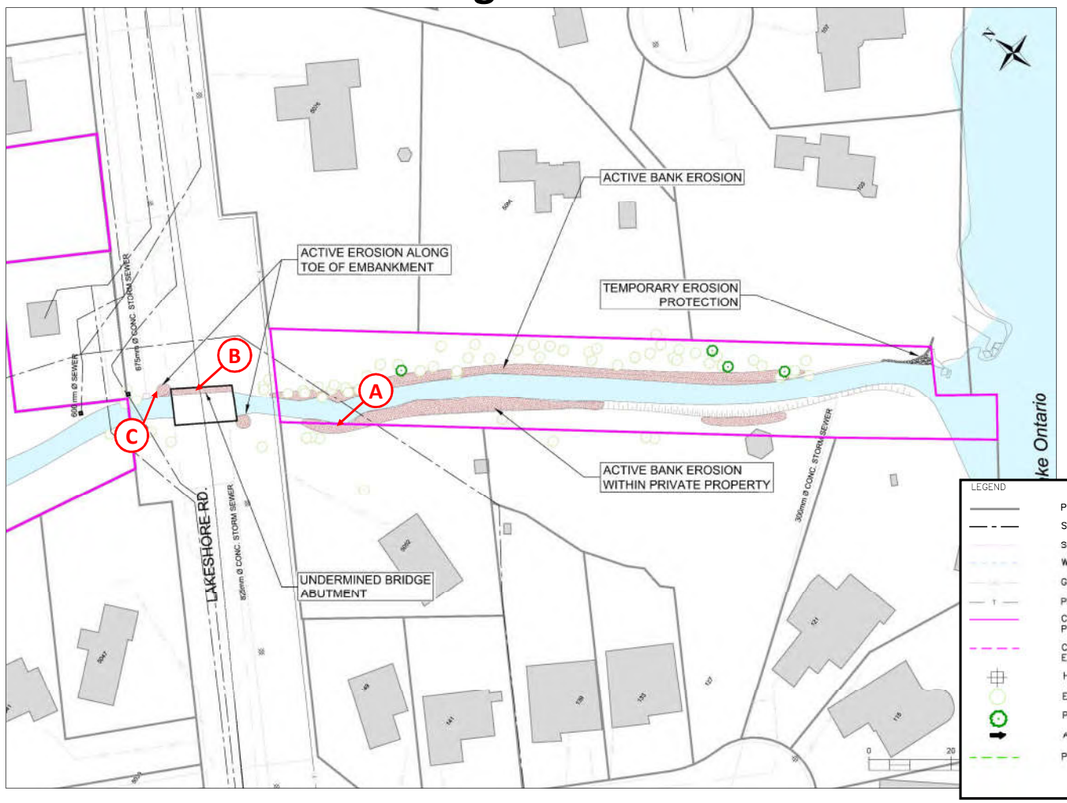
Armourstone Bank Treatment within Confined Channel

EROSION SITE 1

Aquafor Beech Limited | City of Burlington

Appleby Creek Erosion Control Environmental Assessment

Existing Conditions



Conceptual Design

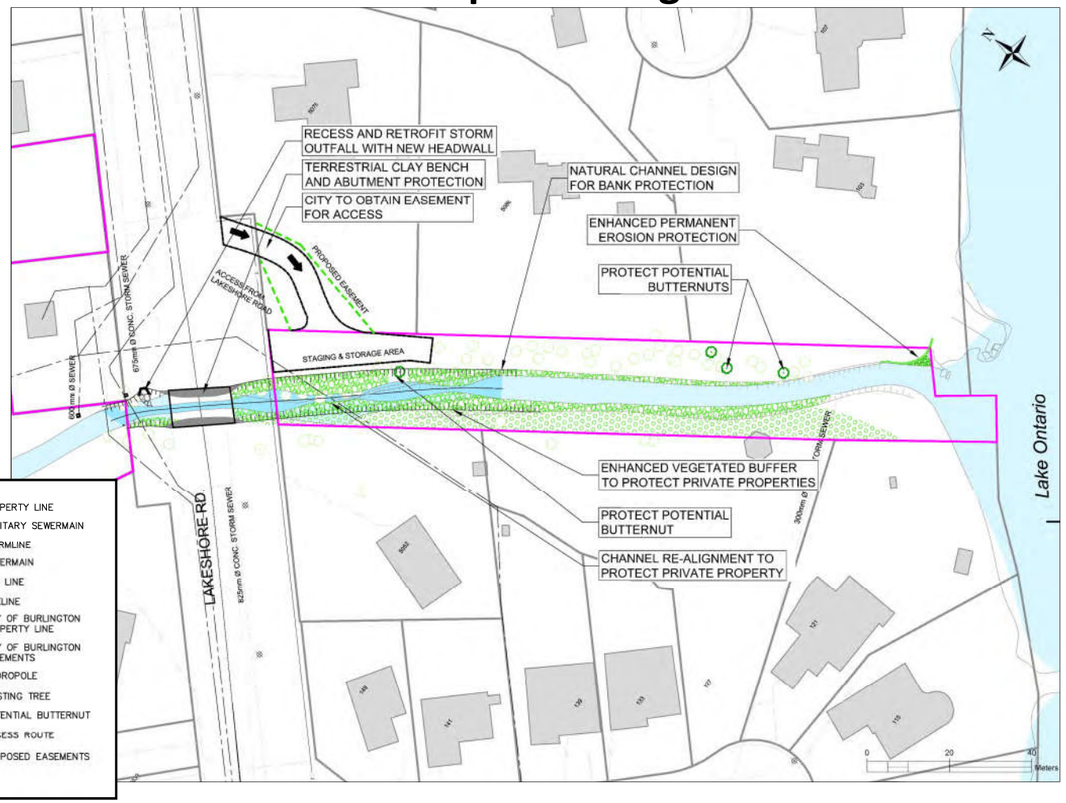
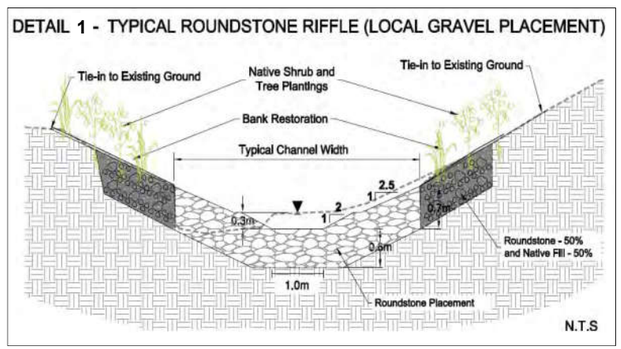
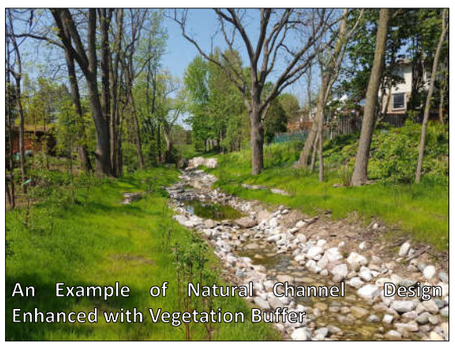



Photo A – Active Bank Erosion onto Private Property


Photo B – Failed Bridge Abutment Protection


Photo C – Undermined Outfall Headwall Due to Bedrock Loweing




An Example of Natural Channel Design Enhanced with Vegetation Buffer

Risks to private property, municipal infrastructure and aquatic habitat due to:

- Active bank erosion
- Shale bedrock lowering
- Failed bridge abutment protection and deteriorating storm outfall headwall

Level of Risk: High

Conceptual design notes:

- Selective works
- Minor channel realignment to protect private property
- Natural channel design to enhance creek riparian while providing protection
- Terrestrial clay bench design for bridge to enhance terrestrial ecology while protecting bridge abutment

EROSION SITE 2 & MAINTENANCE SITE 1

Existing Conditions

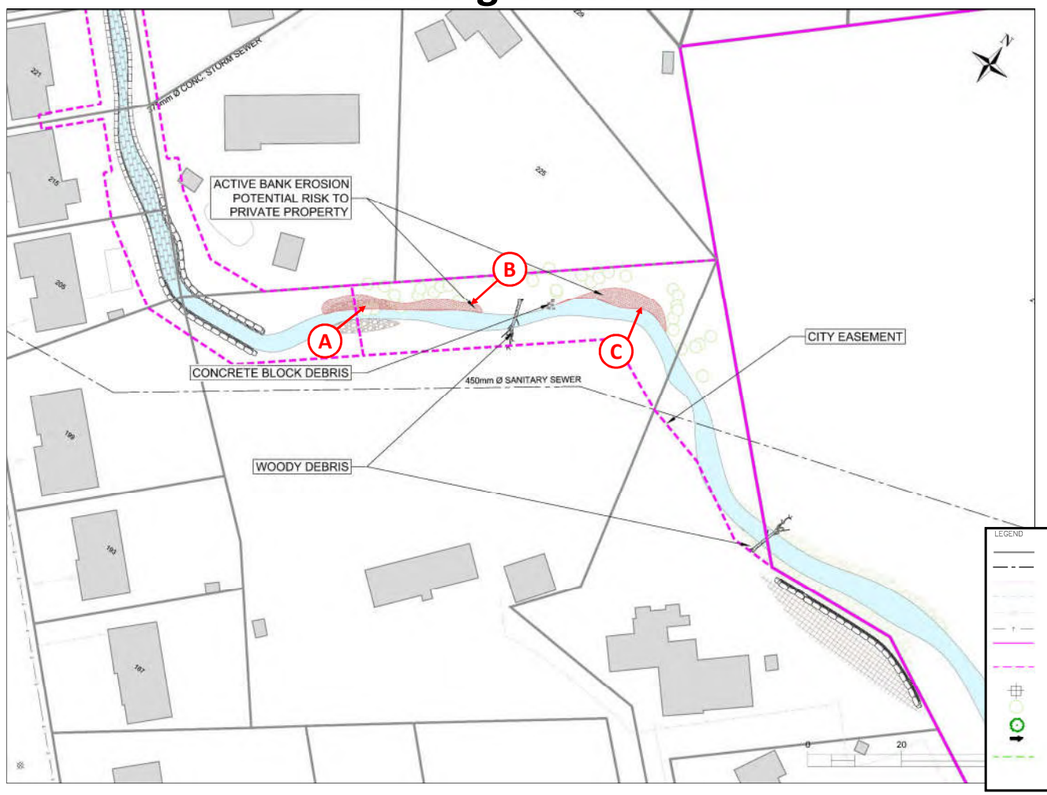



Photo A – Failed Rip-Rap at Toe of Bank


Photo B – Undermined Trees Leaning into the Creek

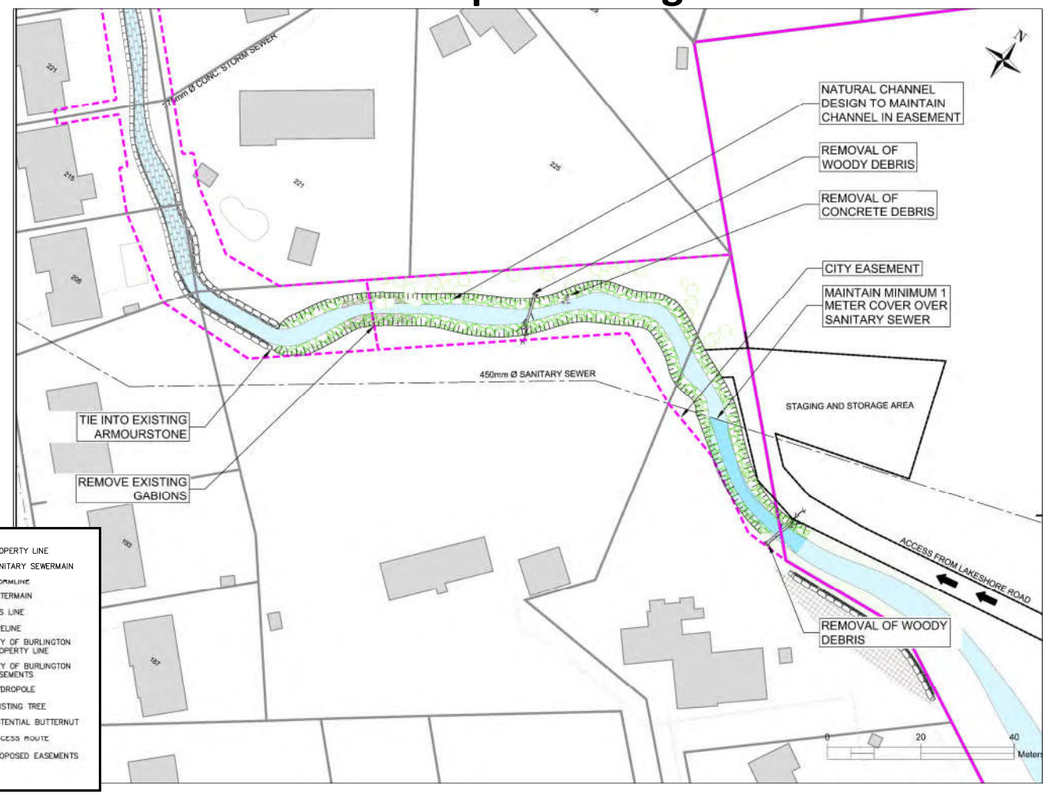

Photo C – Eroded Outer Bank with Near Vertical Slope, Exposed Shale Bedrock

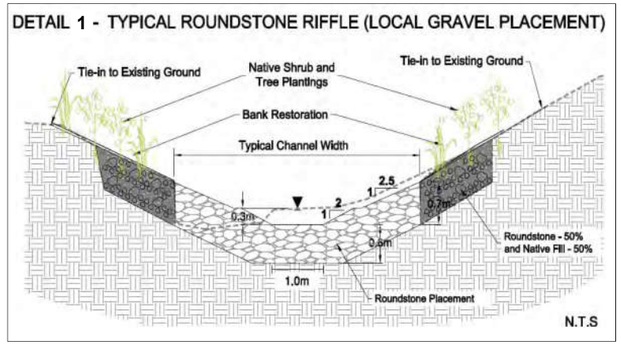
Risks to private property and aquatic habitat due to:

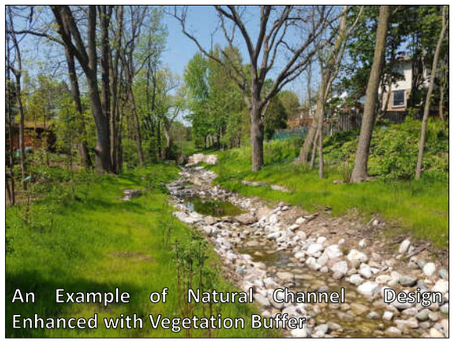
- Active bank erosion, undermined trees
- Exposed Shale bedrock
- Failed bank protection measures

Level of Risk: low

Conceptual Design






An Example of Natural Channel Design Enhanced with Vegetation Buffer

Conceptual design notes:

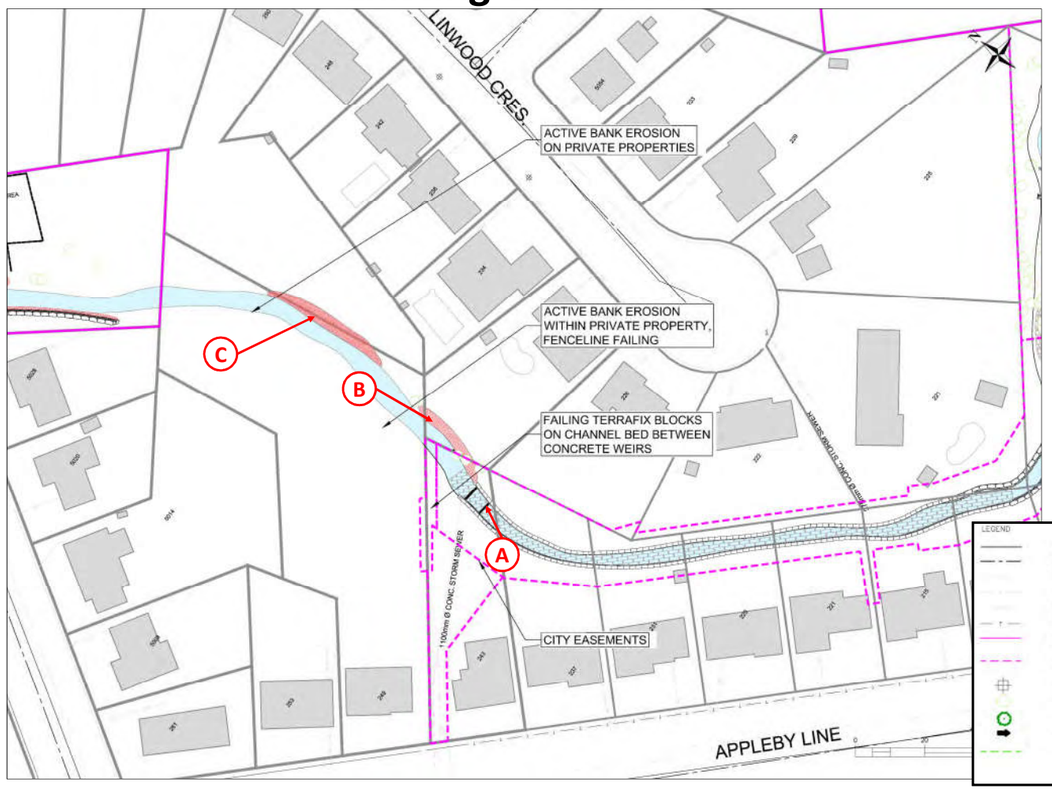
- Selective works
- Natural channel design to enhance creek riparian, provide protection against bank erosion, and limit potential risks within City easements

Recommended maintenance work:

- Removal of fallen trees and woody debris

EROSION SITE 3 & MAINTENANCE SITE 2

Existing Conditions



Conceptual Design

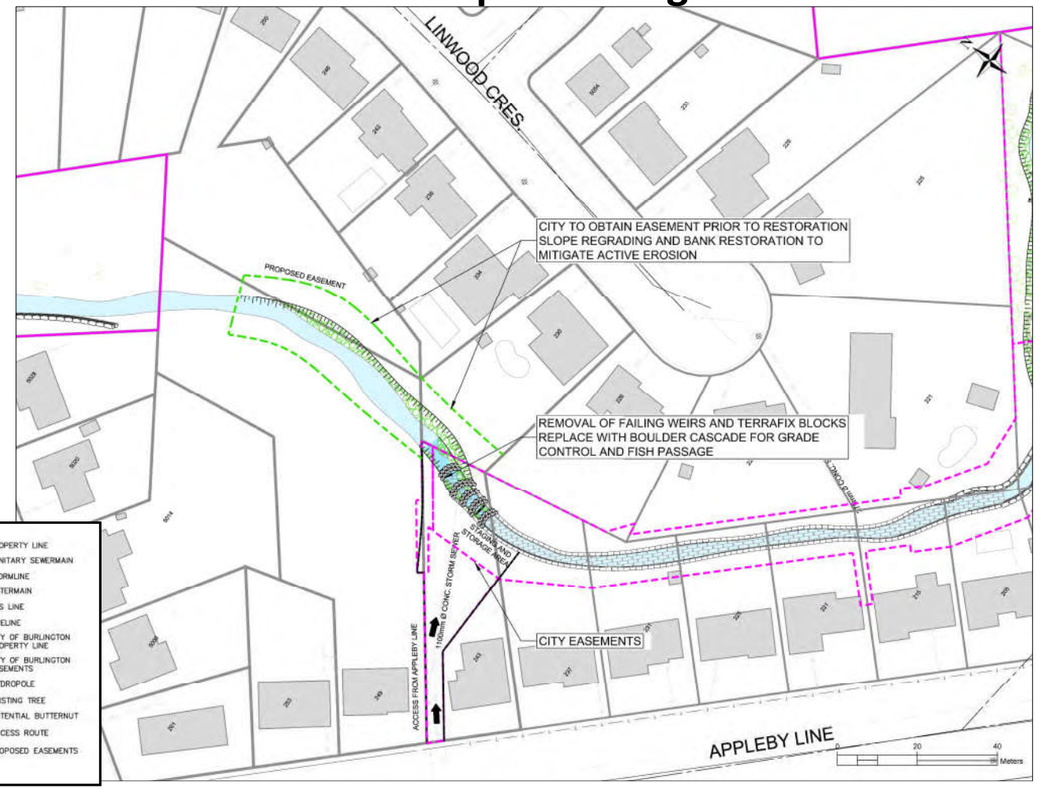



Photo A – Double Concrete Weir with Deteriorating Terrafix Bed


Photo B – Exposed Fence Post Foundation and Tree Roots Due to Erosion


Photo C – Bank Erosion with Evidence of Planform Adjustment

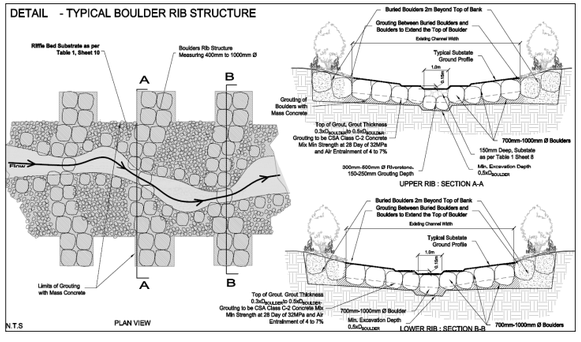
Risks to private property and aquatic habitat due to:

- Active bank erosion resulting in undermined trees and exposed fence pole foundation
- Deteriorating terrafix channel bed between concrete weirs

Level of risk: high

Other issues:

- Existing fish barrier at the double concrete weir
- Missing back-flow prevention covers for sewer outfalls within the concrete block wall reach




An Example of Channel Grade Control with Boulder and Armourstone Enhanced Cascade

Conceptual design notes:

- Selective works
- Slope regarding and stabilization to limit creek within City easement
- Boulder cascade structure for grade control and fish passage
- Roundstone riffle-pool features for erosion control and enhance fish habitat

Recommended maintenance work:

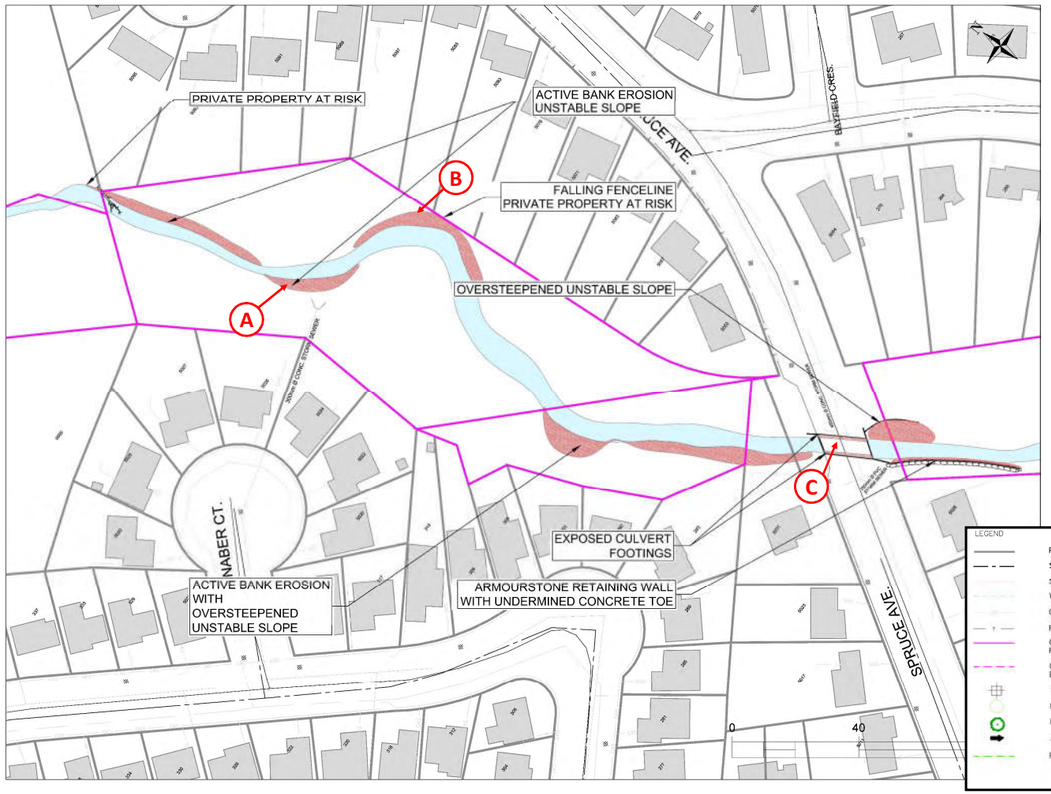
- Replace missing back-flow covers

EROSION SITE 4 & 5

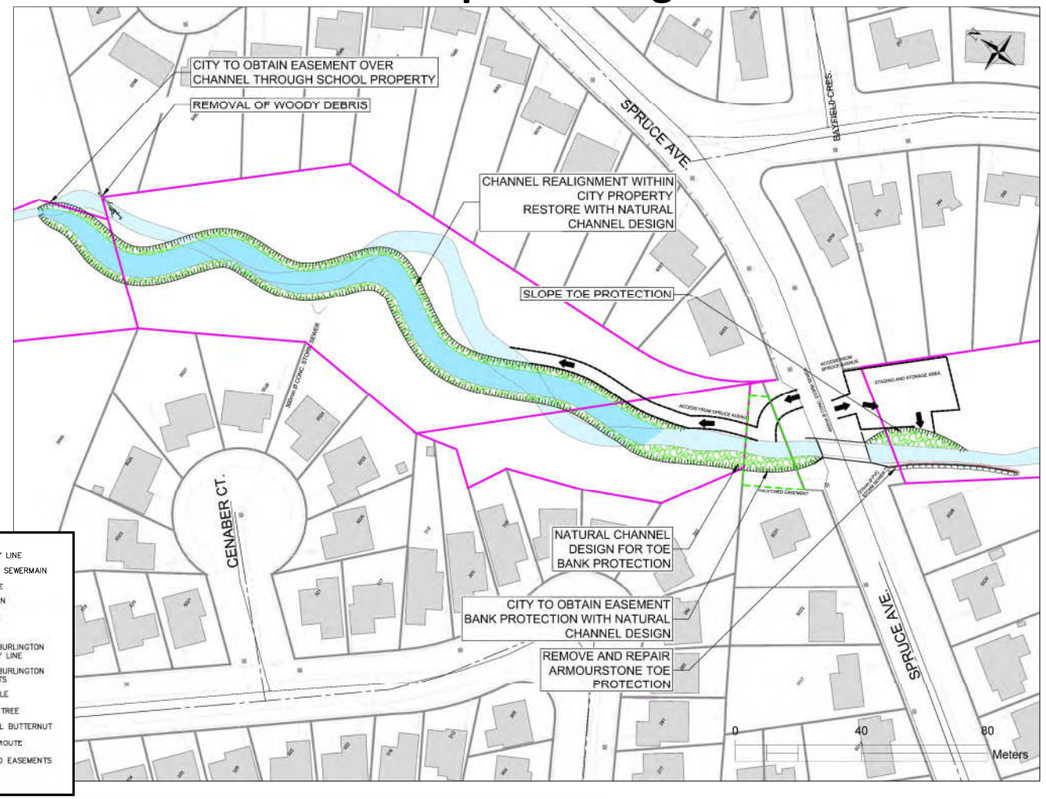
Aquafor Beech Limited | City of Burlington

Appleby Creek Erosion Control Environmental Assessment

Existing Conditions



Conceptual Design



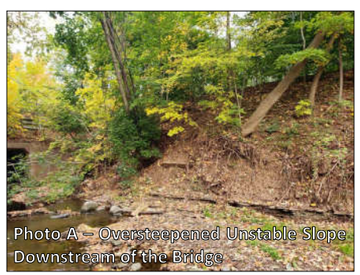


Photo A – Oversteepened Unstable Slope Downstream of the Bridge

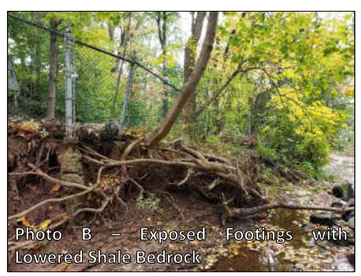
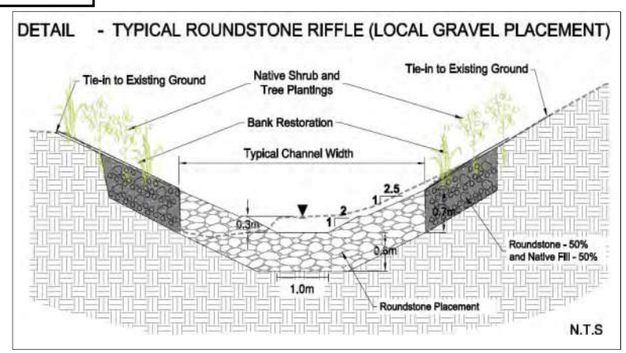
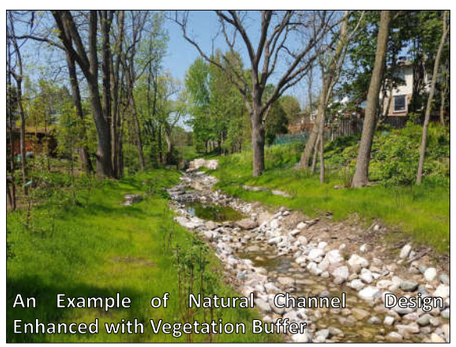


Photo B – Exposed Footings with Lowered Shale Bedrock



Photo C – Lowered Channel Bed Exposing Bridge Footing Border





An Example of Natural Channel Design Enhanced with Vegetation Buffer

Risks to private property, municipal infrastructure and aquatic habitat due to:

- Active bank erosion and over-steepened slope, undermined trees
- Shale bedrock lowering
- Failed bank protection measures

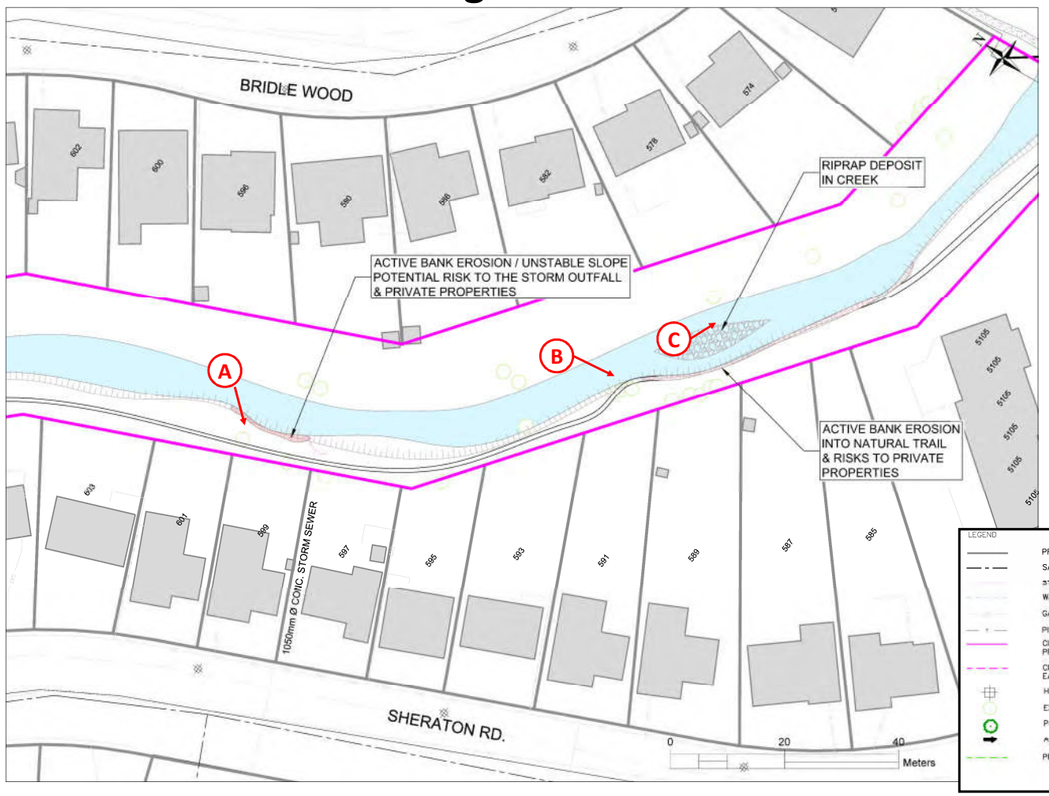
Risk Level: low

Conceptual design notes:

- Selective works
- Channel realignment to re-centralize the creek within City property and mitigate risks to private properties
- Natural channel design to provide erosion protection while enhancing creek riparian

EROSION SITE 6

Existing Conditions



Conceptual Design

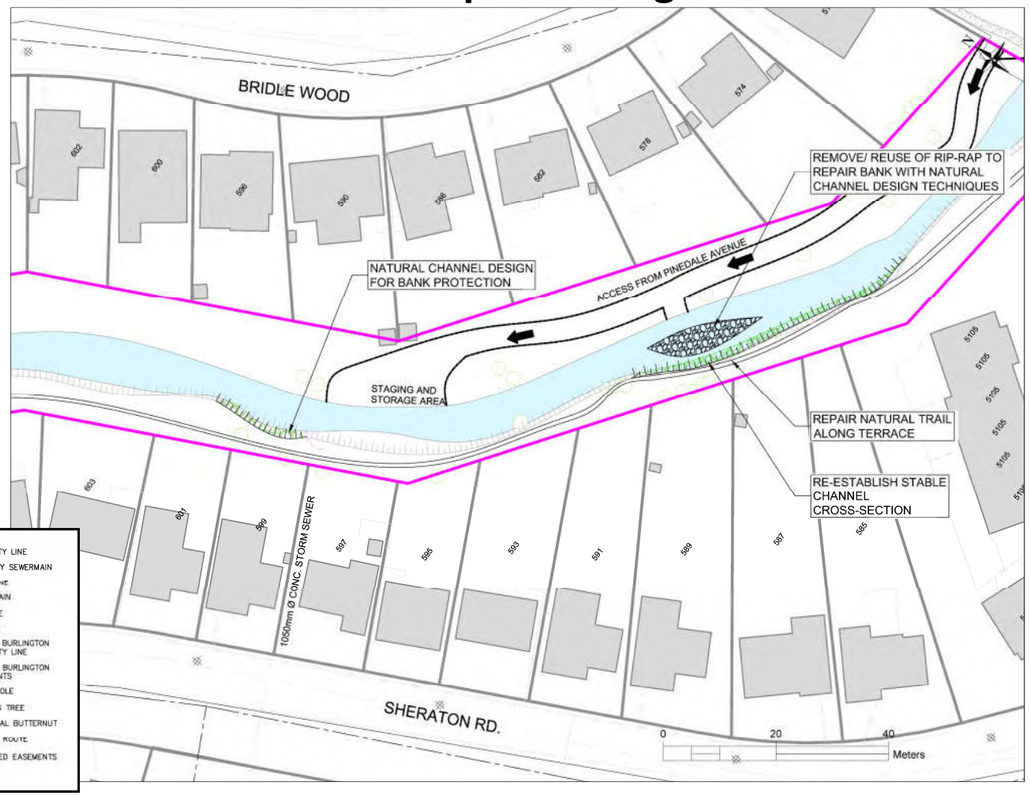



Photo A – Bank Erosion Upstream of Storm Outfall

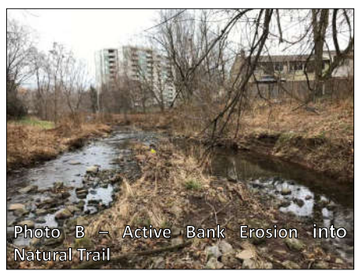
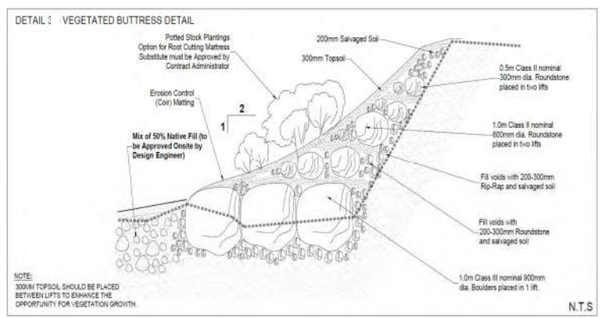

Photo B – Active Bank Erosion into Natural Trail


Photo C – Rip-rap Deposit in the Creek




An Example of Bank Restoration with Vegetated Buttress

Risks to private property, public safety, municipal infrastructure and aquatic habitat due to:

- Active bank erosion into natural trail
- Undermining of storm outfall
- Riprap deposits in the creek

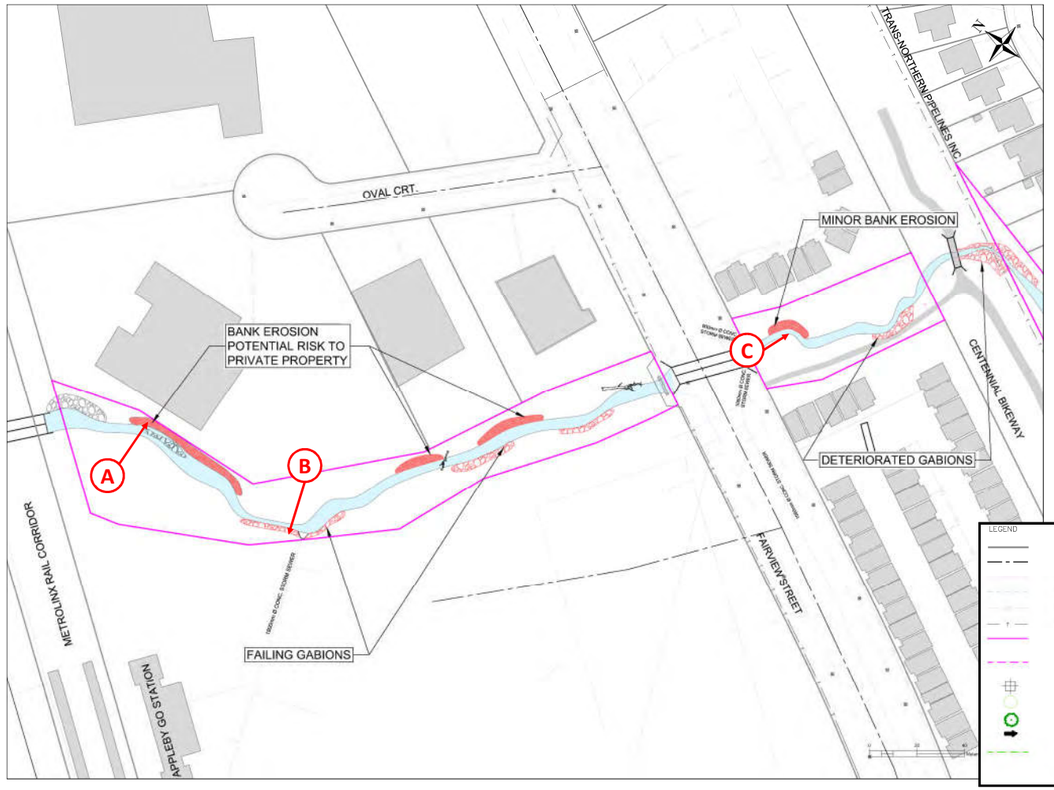
Level of risk: medium

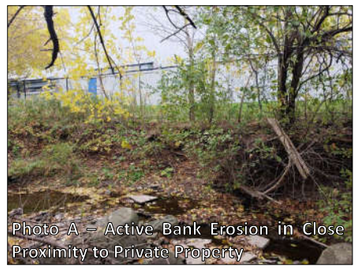
Conceptual design notes:

- Selective works
- Bank restoration with natural channel design to provide erosion protection while enhancing creek riparian habitat
- Remove / reuse rip-rap material for bank restoration

EROSION SITE 7

Existing Conditions




Photo A – Active Bank Erosion in Close Proximity to Private Property

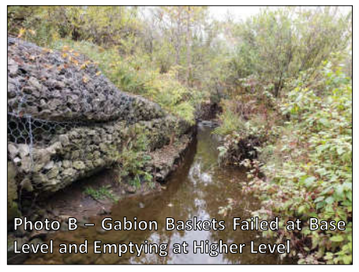

Photo B – Gabion Baskets Failed at Base Level and Emptying at Higher Level

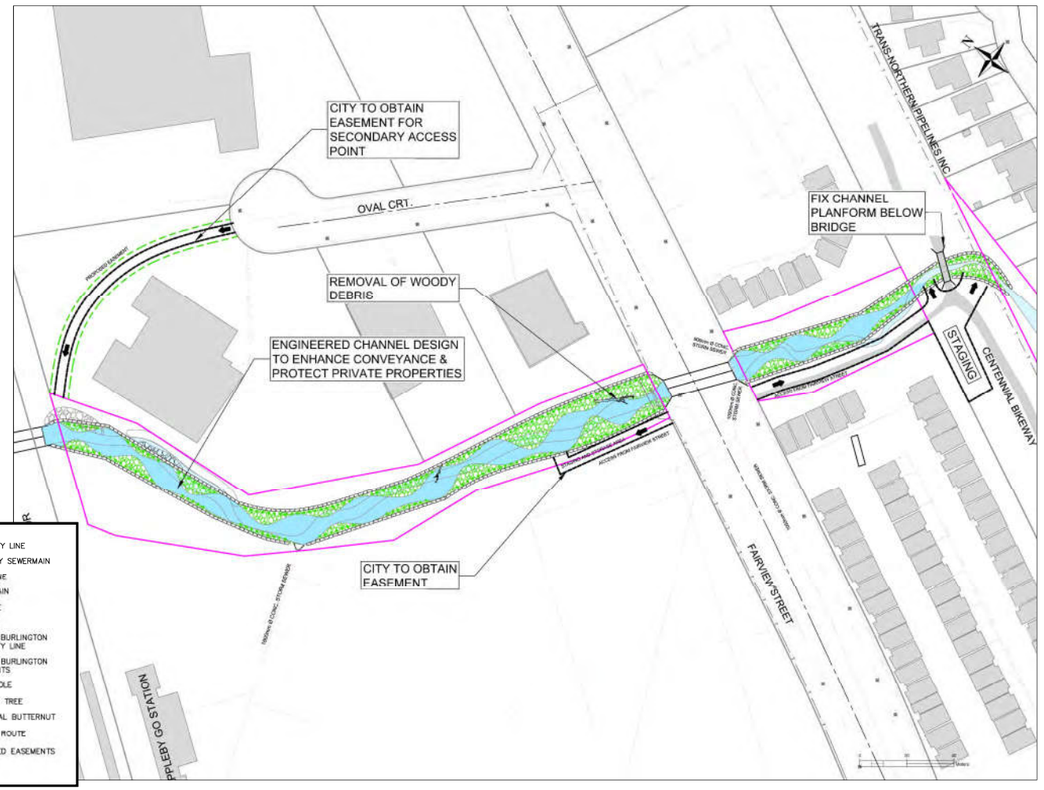

Photo C – Bank Erosion at Outer Meander Bend

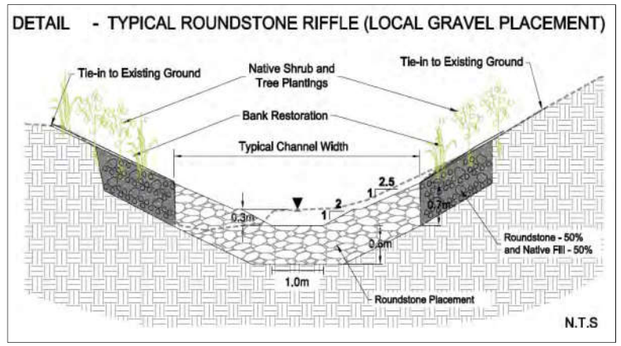
Risks to private property, municipal infrastructure and aquatic habitat due to:

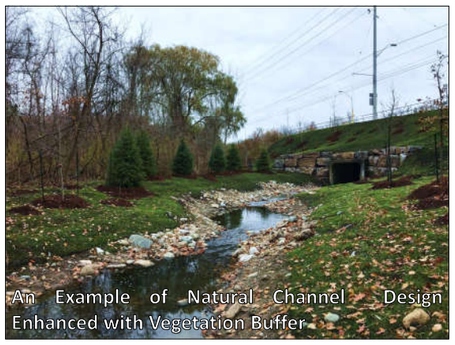
- Active bank erosion in close proximity to private property
- Failed gabion baskets adjacent to storm outfall and other locations

Level of risk: high

Conceptual Design






An Example of Natural Channel Design Enhanced with Vegetation Buffer

Conceptual design notes:

- Reach-based works
- Bank restoration with armourstone wall, roundstone riffle-pool, and in-creek vegetation buffer to provide erosion protection while enhancing creek riparian

EROSION SITE 8

Existing Conditions

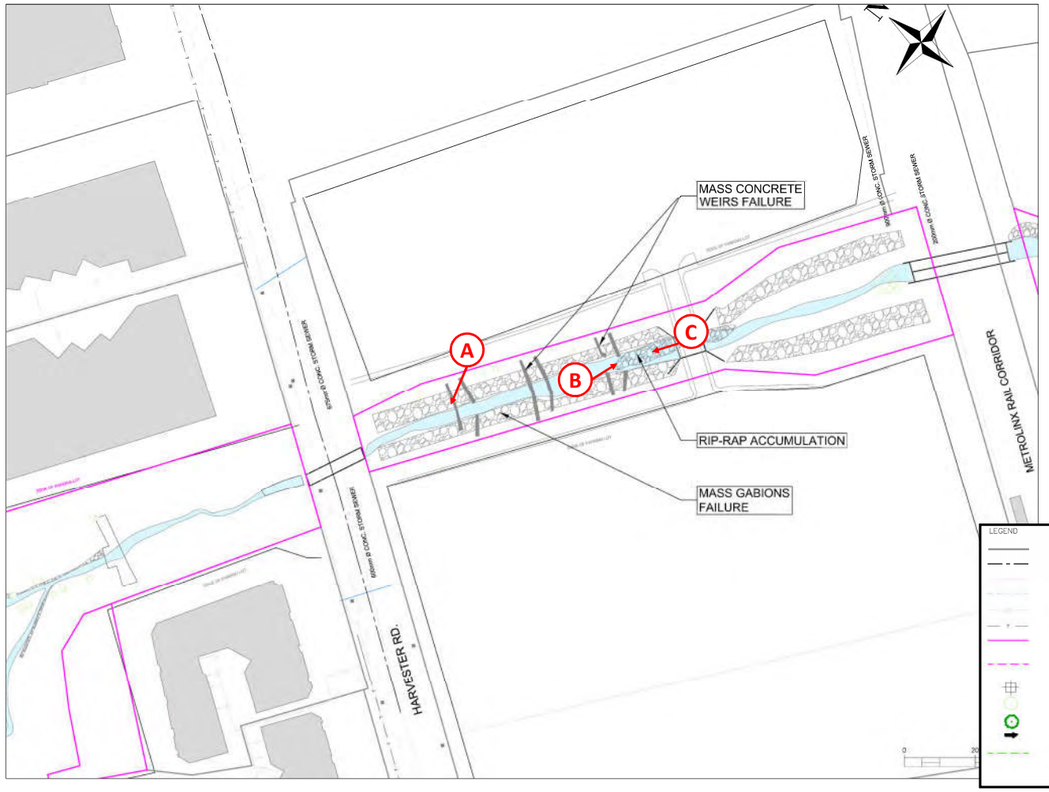



Photo A – Deteriorating Concrete Weir and Failed Gabion Baskets


Photo B – Failed Gabion Deposited in the Creek

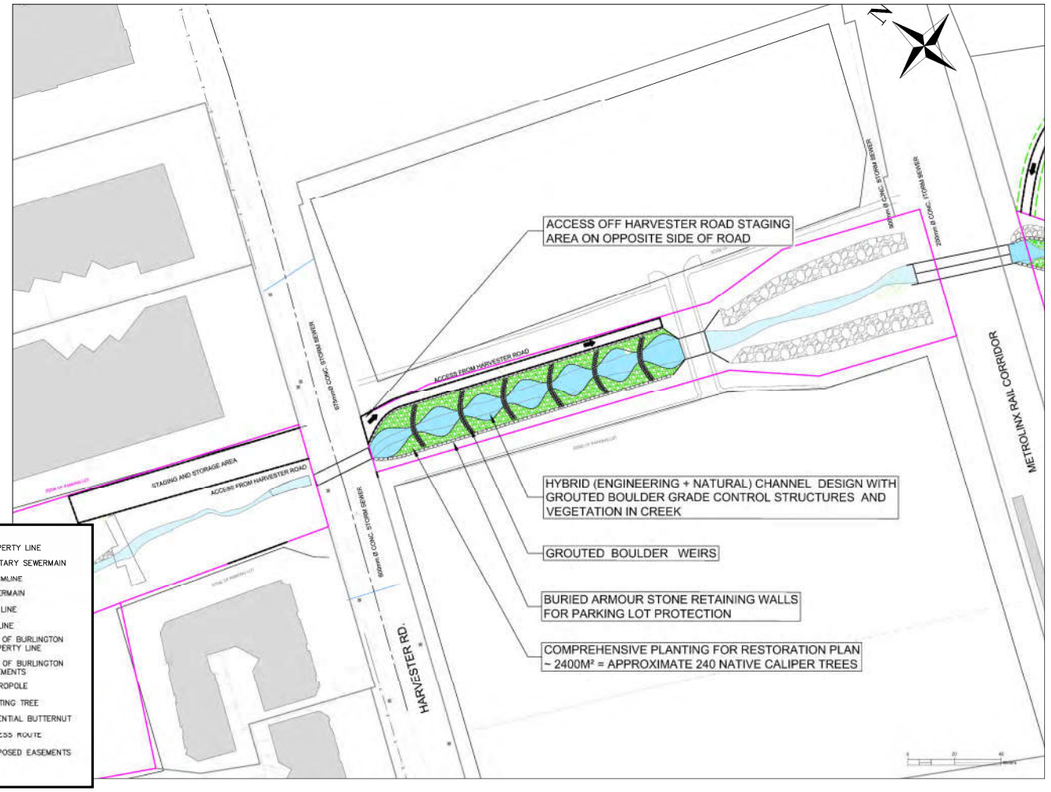

Photo C – Overview of Gabion Lined Channel, Looking Upstream

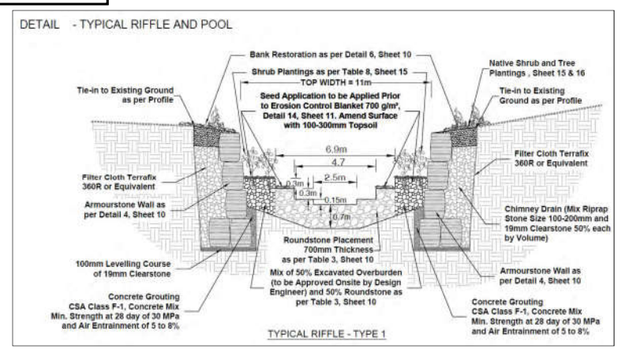
Risks to private property and aquatic habitat due to:

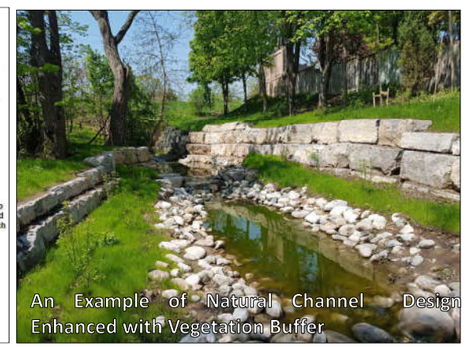
- Gabion baskets in poor conditions, with failure at multiple locations
- Failed and deteriorating concrete weirs
- Gabion basket debris deposits in the creek, obstructing flow conveyance

Level of risk: medium

Conceptual Design






An Example of Natural Channel Design Enhanced with Vegetation Buffer

Conceptual design notes:

- Reach-based works
- Boulder cascade structure for grade control and fish passage
- Bank restoration with armourstone wall, roundstone riffle-pool, and in-creek vegetation buffer to provide erosion protection while enhancing creek riparian

EROSION SITE 9 & MAINTENANCE SITE 3

Existing Conditions

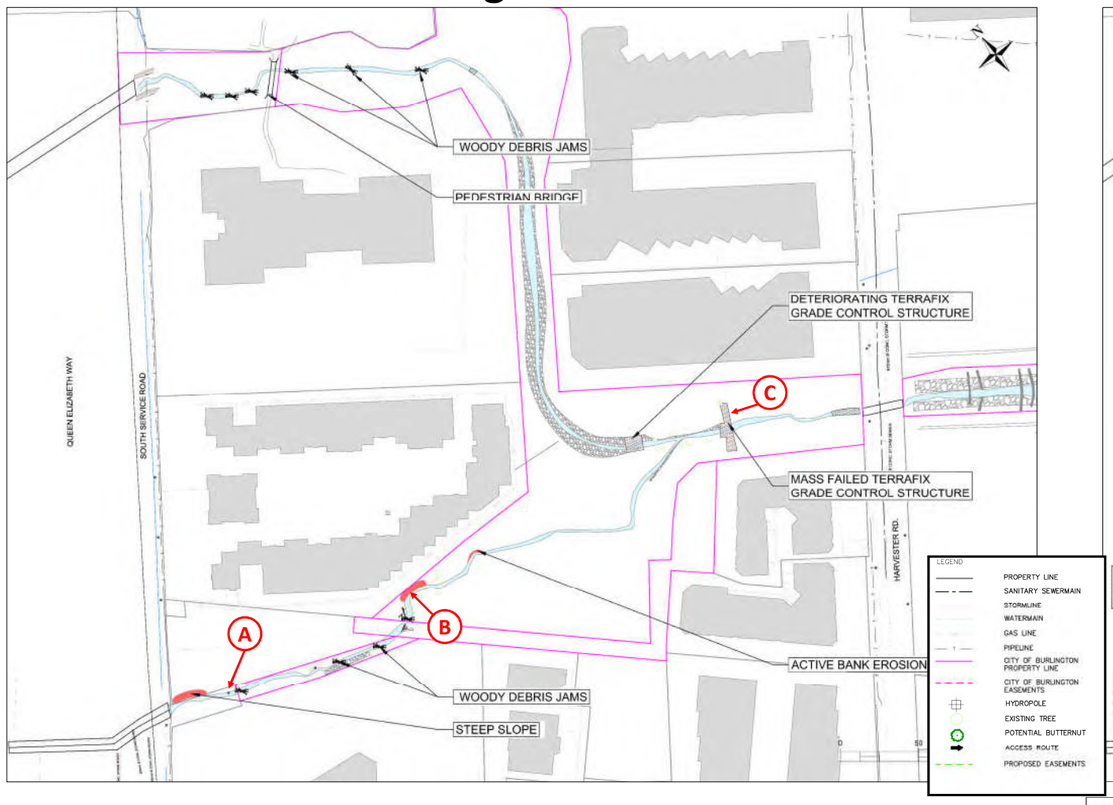



Photo A - Hydro Pole in Creek


Photo B – Over-steepened Slope Due to Erosion, Adjacent to Private Property

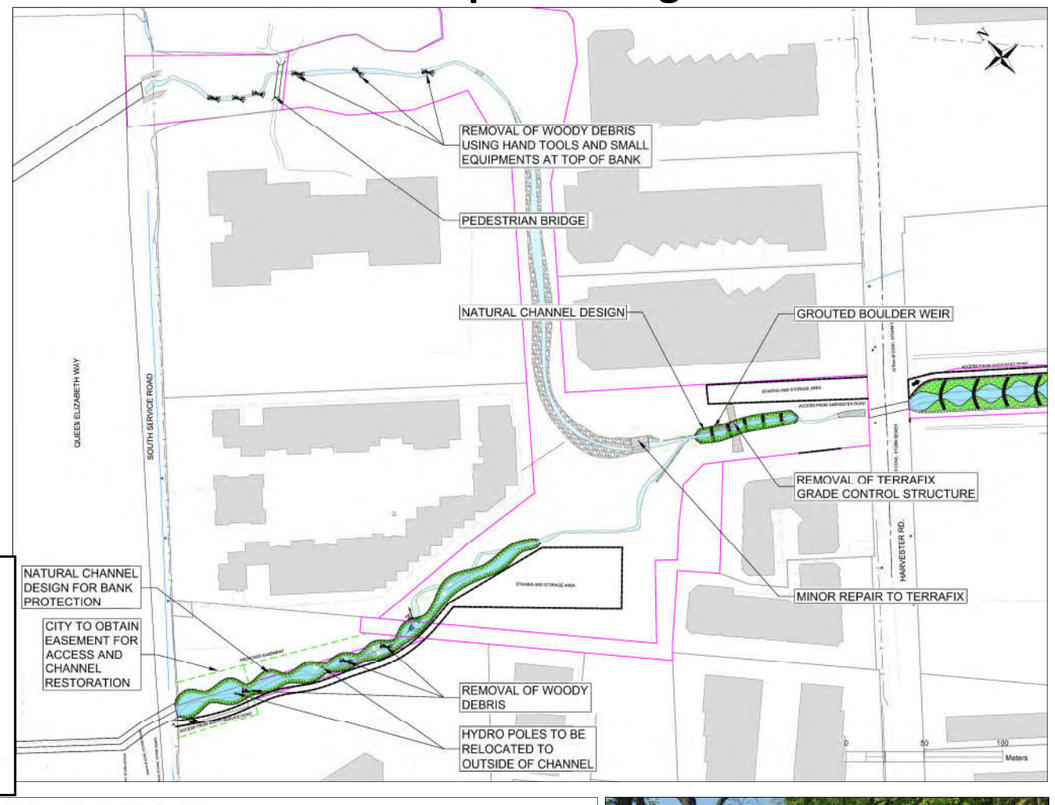

Photo C – Failed Gabion and Terrafix Grade Control Structure

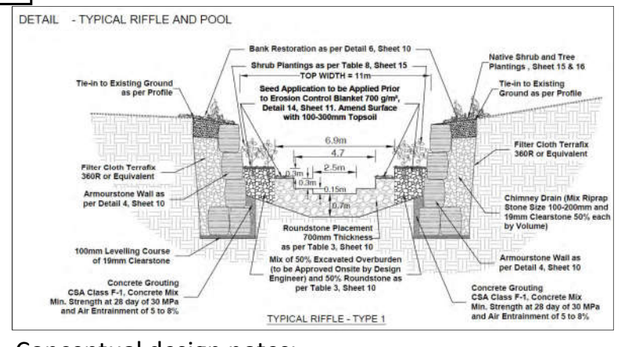
Risks to private property, municipal infrastructure, and aquatic habitat due to:

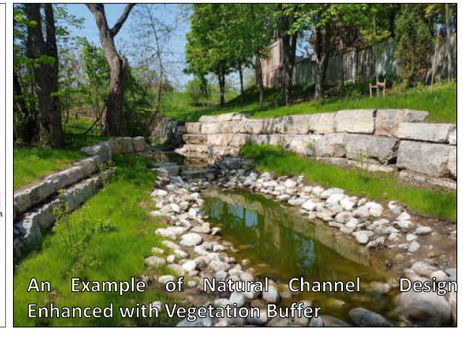
- Active bank erosion resulting in over-steepened and unstable slopes
- Failed gabion and terrafix grade control structure
- Hydro poles inside the creek
- Woody debris at multiple locations obstructing flow conveyance

Level of risk: high

Conceptual Design






An Example of Natural Channel Design Enhanced with Vegetation Buffer

Conceptual design notes:

- Reach-based works
- Boulder cascade structure for grade control and fish passage
- Bank restoration with armourstone wall, roundstone riffle-pool, and in-creek vegetation buffer to provide erosion protection while enhancing creek riparian
- Hydro poles to be relocated outside of creek

Recommended maintenance work:

- Removal of woody debris

NEXT STEPS

PUBLIC CONSULTATION – FEBRUARY, 2019

- Comment forms available for input.
- Compile and review feedback. Confirm or adapt preliminary preferred alternatives.

SUBMIT EA PROJECT FILE AND OBTAIN AGENCY APPROVALS – SUMMER 2019

- EA Project file posted for 30 day review period.

DETAILED DESIGN & IMPLEMENTATION

- Construction timing dependant on City of Burlington Capital Planning.

TO PROVIDE COMMENT, OR TO BE ADDED TO THE STUDY STAKEHOLDER LIST, PLEASE CONTACT:

Mr. Arif Shahzad, P. Eng.
Senior Project Manager
City of Burlington
426 Brant Street, PO Box 5013
Burlington, L7R 3Z6
Phone: 905-335-7600
E-mail: arif.shahzad@burlington.ca

Mr. Rob Amos, P. Eng.
Project Manager
Aquafor Beech Limited
2600 Skymark Ave., Suite 202,
Building 6, Mississauga, L4W 5B2
Phone: 905-629-0099 x 284
E-mail: amos.r@aquaforbeech.com

THANK YOU

FOR PARTICIPATING IN THE APPLEBY CREEK EROSION CONTROL ENVIRONMENTAL ASSESSMENT STUDY

Appendix F4 –

Agency Consultation

Conservation Halton

905.336.1158
Fax: 905.336.7014
2596 Britannia Road West
Burlington, Ontario L7P 0G3
conservationhalton.ca

Protecting the Natural Environment from Lake to Escarpment

January 17, 2020

BY MAIL AND E-MAIL

Mr. Arif Shahzad, M.Eng., P.Eng.
City of Burlington
426 Brant Street, P.O. Box 5013
Burlington, ON L7R 3Z6

Dear Mr. Shahzad:

Re: Appleby Creek Erosion Control EA from Lake Ontario to South Service Rd. – Draft for Review
City of Burlington
CH File: MPR 722

Conservation Halton (CH) staff have reviewed the *Appleby Creek Erosion Control Environmental Assessment Project File Report – Draft*, prepared by Aquafor Beech Ltd., dated September 25, 2019, received October 4, 2019, and provide key comments below and detailed comments in Appendix A. CH staff met with staff from the City of Burlington and Aquafor Beech on December 12, 2019 to discuss overarching comments relating to the evaluation framework. This letter provides the supporting details to be addressed through a revised report.

Key Comments and Outstanding Technical Issues

1. Staff recommend that the evaluation criteria be revised to include more detail and to refine the weighting to place emphasis on addressing erosion issues.

2. Staff recommend that Site 1 and Site 7 each be separated into two erosion sites to be evaluated separately to best assess the risk, impacts and opportunities for enhancement.

3. Staff recommend that during detailed design, opportunities to include softer approaches be explored.

Recommendation

Prior to finalization of this EA, staff request that the below comments be considered to support the preferred alternatives, which will require CH Permits. Staff would appreciate the opportunity to review the revised sections prior to finalization of the report and would be pleased to meet or arrange a phone call to discuss any further questions. Please contact the undersigned at extension 2335 if additional information is required.

Yours truly,

Emma DeFields
Environmental Planner

Encl. 1: Appendix A: Detailed Comments

Cc: Rob Amos, Aquafor Beech (amos.r@aquaforbeech.com)

Appendix A: Detailed Comments

Conservation Halton (CH) staff request that the following detailed comments be considered and addressed through a revised report and response matrix.

#	Section	Comment
1.	NA	Please provide the hydraulic model utilized in the preparation of this assessment.
		Section 2: Identification of Problems and Opportunities
2.	**2.1.1**, p. 12 – Erosion Site 1	Staff recommend that the EA evaluate two distinct erosion sites for this area; see comment 15 for further detail and revise this section accordingly.
3.	**2.1.7**, p. 18 – Erosion Site 7	Staff recommend that the EA evaluate two distinct erosion sites for this area; see comment 15 for further detail and revise this section accordingly.
		Section 3: Site Specific Inventories
4.	**3.10**, p. 113 - Utilities	Where utilities may affect the preferred alternative selected, it is recommended that more detailed utility investigations be advanced at the current stage.
5.	**3.2.3**, p. 30 – Reach 3 – Spruce Avenue to New Street	A large portion of this reach's bed and banks are composed of shale and/or limestone (ref. Photo 2-13, 2-14, 2-15, 3-11 re: Erosion Site 5). In this circumstance, staff anticipate that hydraulic scour may not be the dominant erosional process. The report should include further analysis/discussion in this regard. Additionally, to further justify the prioritization and planning horizon for the related alternatives, please include an estimate of recession rates for the banks and associated estimates of when impacts to adjacent property/infrastructure may be expected (i.e. 5085, 5083, and 5031 Spruce Avenue; 5095 Meadowhill Road).
6.	**3.3.1**, pp. 37-38 – Erosion and Maintenance Sites Inventory	**Table 3-1 Summary of Erosion and Maintenance Sites by Reach:** a. Erosion Site 4: Confirm what municipal infrastructure is at risk in the site condition descriptions as the risk is listed as "inactive" in Table 3-3. b. Erosion Site 6: Staff note a discrepancy between Table 3-1, which identifies active bank erosion into the natural trail, while Section 3.2.5 notes that there is limited risk associated with the erosion with the natural trail. Sections should be revised accordingly.
7.	**3.5.1**, p. 43 - Hydrology	**Table 3-4: Flows at different nodes along the Appleby Creek**: Please confirm the source of the hydrologic data presented within this table.
8.	**3.5.2**, p. 45 - Hydraulics	**Table 3-5: Hydraulics Results from the Hydraulic (HEC-RAS) Model**: Overbank flow velocities should also be presented within this table.
9.	**3.8**, pp. 50 & 51 – Natural Heritage Assessment	This section should be revised where necessary, as it appears to be written for the Appleby Creek Flood Study.

10.	**3.8.2.2**, pp. 53-54 – Conservation Halton Policies	The section should indicate that CH regulates a distance of 7.5 metres from the greater of the flooding or erosion hazards associated with Appleby Creek, pursuant to Ontario Regulation 162/06. CH Permits will be required for the proposed development (fill, grading, watercourse alterations, structures, etc.) within the regulated area. Further consultation with CH is recommended to confirm detailed design requirements. Note that it must be demonstrated that there will be no increase in flooding or erosion hazards or extension of regulated area on adjacent lands as a result of the works. Confirmation of an easement should be provided prior to Permit submission for works outside City property. If an easement does not exist, the landowner will need to submit the CH Permit application for works on their property.
11.	**3.8.7**, p. 104 – Species-at-Risk and Other Species of Conservation Concern	**Table 3-24: SAR and SOCC Screening Exercise:** a. Staff recommend that barn swallow habitat be changed to "potentially present" given the suitable nesting locations for barn swallows and the evidence of past nest building observed under the Lakeshore Road Crossing. b. Include a figure consolidating all natural heritage features of concern to clarify which areas are significant or opportunities for enhancement, and to clearly show where avoidance or mitigations are recommended.
		Section 4: Evaluation of Alternative Solutions
12.	**4.1.6**, p. 119 – Erosion Site 6	As the existing trail is informal and located within or very close to the flooding and erosion hazards, to remove public safety risk staff suggest the EA consider decommissioning the trail and restoring (replanting) the entire stretch. CH Policy may not support a formalized trail in this location.
13.	**4.2**, p. 121 – Evaluation Criteria	**Table 4-1 Alternative Evaluation Criteria**: Please elaborate on the criteria descriptions for the following items, as discussed at the December 12th meeting: a. **Potential to Reduce Stream Bank and Stream Bed Erosion**: Staff request that scoring for this criterion have consideration for the existing magnitude(s) of erosion risk (i.e. Table 3-1); maximum scores should not be obtainable where existing erosion risk is low. Table 3-2 and Table 3-3 may also be incorporated into this definition. b. **Potential to Reduce Flooding Risks**: It is not clear whether flooding risk reduction is based on the Municipal Class EA for the section of Appleby Creek between Fairview Street and New Street or based on localized flood risk reduction. c. **Potential to Improve Aquatic & Terrestrial Habitat**: Staff recommend separating ecological impacts from ecological opportunities for enhancement. Focusing only on potential for improving habitat features dismisses potential negative impacts to existing natural features that may result from the construction works. d. **Aesthetics/Recreation**: Elaborate on what is considered an aesthetic and a recreational benefit. e. **Compatibility with Adjacent Land Use**: Clarify what is considered compatible erosion control works. f. **Public Health and Safety**: Clarify how this category differs from reducing erosion and flooding risks to the public. g. **Agency Acceptance**: The definition in Table 4-1 does not match that in the Evaluation Matrix (Appendix E). Clarify how this criterion differs from criteria in the 'Technical and Engineering' and 'Economic Environment' categories.
14.	**4.2**, p. 122 – Evaluation Criteria	**Table 4-2 Category Weighting Factors**: Staff recommend that weighting of the categories be revised to prioritize those that directly relate to erosion control.

15.	**4.3**, pp. 122-123 – Evaluation of Alternatives; **4.5**, p. 124 - Selection and Description of the Preferred Alternatives; **Appendix E** – Detailed Alternative Evaluations	**Table 4-4 Evaluation Scoring Summary**: The detailed evaluations in Appendix E and summary in Table 4-4 should be updated based on the discussions during the December 12th meeting, as outlined below. The remainder of the EA (Sections 2, 3, 4, Appendices, etc.) should then be updated to reflect these changes. a. **Erosion Site 1**: In Staff's opinion there are two distinct erosion sites within this area; the Lakeshore Road crossing structure and the downstream reach. Staff request that the EA assess these areas independently in determining the preferred alternative. Given the proposed works may be undertaken in unison, evaluation of the works from a timing and construction perspective may still be grouped. Further to the above, vegetated restoration of both sides of the municipal easement should be included in the preferred alternative description (p. 124). Removal of private accessory buildings on public property should also be considered. b. **Erosion Site 7**: In Staff's opinion there are two distinct erosion sites within this area; the reach upstream and the reach downstream of Fairview Street (i.e. Reaches 5 and 6). Staff request that the EA assess these areas independently in determining the preferred alternative. In principle, CH would support a design that allows for reduction of flood impacts and containment of hazards in the corridor, as currently suggested in Section 4.5. Staff recommend that at the time of detailed design, opportunities to soften the approach should be explored. c. **Erosion Site 9**: It is staff's opinion that the conceptual design for this erosion site (i.e. Appendix G) does not reflect the extents of work required to mitigate the erosion risk. Staff request that a conceptual profile drawing and typical sections be developed for this erosion site. Staff request that all the erosion sites be re-evaluated considering the scoring criteria refinements discussed above and considering the magnitude of erosion risk mitigated by the alternative(s). When re-evaluating, consideration should be given to whether localized approaches including bioengineering works carried out by hand could address the issues raised. As discussed, staff's primary concerns with the current evaluations relate to Erosion Sites 1, 2, 5 and 7.
Section 5: Erosion and Maintenance Sites Priority Ranking and Project Phasing		
16.	**5.2.1**, p. 130 – Vegetation Loss to Significant Woodlands	Please identify the restoration approach to be used for private lands that are currently vegetated. Staff recommend following CH's Landscaping and Tree Preservation Plan Guidelines.
17.	**5.2.3**, p. 132 – Aquatic Communities	a. Given the observation of salmon during the fall 2018 site visits, a cold-water timing window will apply in the area from Lake Ontario to the first physical barrier in Reach 2, whereby no works are permitted between September 15 and June 30th. b. As per CH's EA checklist, where lands are available to achieve a 30 metre fisheries setback from bankfull, all efforts should be made to restore this setback with native vegetation to provide water quality and quantity benefits to the creek.

18.	**5.2.5**, p. 134 – Impacts to Significant Wildlife Habitat	**Bat Maternity Roost Colonies** – This section should include recommendations for replacement plantings, installation of bat condos and/or snags.
		Section 6: Implementation Programs
19.	**6.1.4**, p. 137 – Natural Heritage System	All publicly owned lands should be restored with woody plantings as part of the stabilization works.
20.	**6.4**, p. 141 – Monitoring Program	Staff recommend adopting the same Monitoring Plan approved through the Appleby Creek Flood Mitigation between Fairview Street and New Street (February 11, 2019) for vegetation success monitoring.
		Appendix A
21.	Existing Conditions Plan and Profile Drawings	Please highlight and/or identify each of the following details on the drawings included within this appendix: • Erosion Sites and Erosion Areas • Reach Limits • Contours • Drawing Extents on the Key Plan

March 18, 2020

Attn: **Ms. Emma DeFields**
Environmental Planner
Conservation Halton
2596 Britannia Road West
Burlington, Ontario, L7P 0G3
Phone: 905-336-1158 ext. 2335 | Email: edefields@hrca.on.ca

Cc: **Mr. Arif Shahzad,**
Senior Environmental Engineer
City of Burlington
426 Brant Street P.O. Box 5013
Burlington, Ontario, L7R 3Z6
Phone: 905-335-7600 ext. 7486 | Email: Arif.Shahzad@burlington.ca

Re: **Appleby Creek Erosion Control EA from Lake Ontario to South Service Rd. – Draft for Review**
City of Burlington
CH File: MPR 722

Dear Emma,

Please find below the responses to the Conservation Halton's (CH) comments on the Appleby Creek Erosion Control EA from Lake Ontario to South Service Road, which was submitted in draft format for review. The project file report has been updated to coincide with the responses.

Should you require any further information or discussion regarding this response letter, please do not hesitate to contact the undersigned.

Rob Amos, MASc, P.Eng.
Aquafor Beech Limited | Project Manager
Amos.r@aquaforbeech.com

Sachet Siwakoti, MASc., P.Eng.
Aquafor Beech Limited
Siwakoti.s@aquaforbeech.com

#	Section	CH Comment (January 17, 2020)	Aquafor's Responses (March 17th, 2020)
1.	NA	Please provide the hydraulic model utilized in the preparation of this assessment.	The hydraulic model is provided with this submission.
	Section 2: Identification of Problems and Opportunities		
2.	**2.1.1**, p. 12 – Erosion Site 1	Staff recommend that the EA evaluate two distinct erosion sites for this area; see comment 15 for further detail and revise this section accordingly.	Confirmed, Erosion Site 1 has been subdivided into 1A & 1B. 1A addresses risks to private property, while 1B to infrastructure within the Road Right of Way and upstream storm sewers.
3.	**2.1.7**, p. 18 – Erosion Site 7	Staff recommend that the EA evaluate two distinct erosion sites for this area; see comment 15 for further detail and revise this section accordingly.	Confirmed, Erosion Site 7 has been subdivided into 7A & 7B. 7A addresses risks to private property downstream of Fairview Street, while 7B addresses risks to areas upstream of Fairview Street.
	Section 3: Site Specific Inventories		
4.	**3.10**, p. 113 - Utilities	Where utilities may affect the preferred alternative selected, it is recommended that more detailed utility investigations be advanced at the current stage.	Aquafor has updated the report to include additional utility conflicts for each erosion site, as well as updated the conceptual design drawings with utilities to illustrate the locations of potential conflicts.
5.	**3.2.3**, p. 30 – Reach 3 – Spruce Avenue to New Street	A large portion of this reach's bed and banks are composed of shale and/or limestone (ref. Photo 2-13, 2-14, 2-15, 3-11 re: Erosion Site 5). In this circumstance, staff anticipate that hydraulic scour may not be the dominant erosional process. The report should include further analysis/discussion in this regard. Additionally, to further justify the prioritization and planning horizon for the related alternatives, please include an estimate of recession rates for the banks and associated estimates of when impacts to adjacent property/infrastructure may be expected (i.e. 5085, 5083, and 5031 Spruce Avenue; 5095 Meadowhill Road).	Hydraulic scouring is not typically the dominant erosional process that causes shale and limestone bedrock lowering. However, active hydraulic scouring and erosion exposes the underlaying bedrock, which may lead to higher level of susceptibility to bedrock weathering and degradation. Base level lowering of shale is typically at a rate of 3-5cm/yr. However, the hydraulic conditions and active erosion within this reach may expedite the lowering process. From a lateral erosion perspective, banks that consist of overburdens with shale bed systems typically are experiencing range between 5 to 15m of lateral migration per 100 year, which is consistent with MNRF guidelines for erosion hazard analysis. Section 2.1.6 and 3.2.3 has been revised accordingly.
6.	**3.3.1**, pp. 37-38 – Erosion and Maintenance Sites Inventory	**Table 3-1 Summary of Erosion and Maintenance Sites by Reach**: a. Erosion Site 4: Confirm what municipal infrastructure is at risk in the site condition descriptions as the risk is listed as "inactive" in Table 3-3.	a. There is potential risk to the Spruce Avenue bridge abutment as the lowered channel bed is exposing the bridge's footing border (see Photo 2.15). However, the level of risk is currently identified as low as no signs of footing undermining was observed at the time of field investigation.

#	Section	CH Comment (January 17, 2020)	Aquafor's Responses (March 17th, 2020)
		b. Erosion Site 6: Staff note a discrepancy between Table 3-1, which identifies active bank erosion into the natural trail, while Section 3.2.5 notes that there is limited risk associated with the erosion with the natural trail. Sections should be revised accordingly.	b. Section 3.2.5 has been revised to be consistent with Table 3-1.
7.	**3.5.1**, p. 43 - Hydrology	**Table 3-4: Flows at different nodes along the Appleby Creek**: Please confirm the source of the hydrologic data presented within this table.	The flows at different nodes are derived from the Appleby Creek Flood Mitigation EA study. The section 3.5.1 is updated to include the source of the hydrologic data.
8.	**3.5.2**, p. 45 - Hydraulics	**Table 3-5: Hydraulics Results from the Hydraulic (HEC-RAS) Model**: Overbank flow velocities should also be presented within this table.	Table 3-5 has been updated to include overbank flow velocities.
9.	**3.8**, pp. 50 & 51 – Natural Heritage Assessment	This section should be revised where necessary, as it appears to be written for the Appleby Creek Flood Study.	Noted, edits have been made to appropriate sections.
10.	**3.8.2.2**, pp. 53-54 – Conservation Halton Policies	The section should indicate that CH regulates a distance of 7.5 metres from the greater of the flooding or erosion hazards associated with Appleby Creek, pursuant to Ontario Regulation 162/06. CH Permits will be required for the proposed development (fill, grading, watercourse alterations, structures, etc.) within the regulated area. Further consultation with CH is recommended to confirm detailed design requirements. Note that it must be demonstrated that there will be no increase in flooding or erosion hazards or extension of regulated area on adjacent lands as a result of the works. Confirmation of an easement should be provided prior to Permit submission for works outside City property. If an easement does not exist, the landowner will need to submit the CH Permit application for works on their property.	Aquafor has added text as per the comment.
11.	**3.8.7**, p. 104 – Species-at-Risk and Other Species of	**Table 3-24: SAR and SOCC Screening Exercise:** a. Staff recommend that barn swallow habitat be changed to "potentially present" given the suitable nesting locations for barn swallows and the evidence of past nest building observed under the Lakeshore Road Crossing.	a. As per the comment, Barn Swallow has been upgraded to "potentially present".

#	Section	CH Comment (January 17, 2020)	Aquafor's Responses (March 17th, 2020)
	Conservation Concern	b. Include a figure consolidating all natural heritage features of concern to clarify which areas are significant or opportunities for enhancement, and to clearly show where avoidance or mitigations are recommended.	b. Aquafor has provided a comprehensive map that consolidates all natural heritage features in Section 5.2.
Section 4: Evaluation of Alternative Solutions			
12.	**4.1.6**, p. 119 – Erosion Site 6	As the existing trail is informal and located within or very close to the flooding and erosion hazards, to remove public safety risk staff suggest the EA consider decommissioning the trail and restoring (replanting) the entire stretch. CH Policy may not support a formalized trail in this location.	Agreed, the note regarding the trail has been removed from the concept plans, however, we have also included a terraced section (~1.5m wide) with limited plantings offset from the top of the bank which will aim to provide safe passage should use of the corridor under informal use continue.
13.	**4.2**, p. 121 – Evaluation Criteria	**Table 4-1 Alternative Evaluation Criteria**: Please elaborate on the criteria descriptions for the following items, as discussed at the December 12th meeting: a. **Potential to Reduce Stream Bank and Stream Bed Erosion**: Staff request that scoring for this criterion have consideration for the existing magnitude(s) of erosion risk (i.e. Table 3-1); maximum scores should not be obtainable where existing erosion risk is low. Table 3-2 and Table 3-3 may also be incorporated into this definition.	a. The criteria and scoring within the report have been updated as per the existing magnitude of erosion risk.
		b. **Potential to Reduce Flooding Risks**: It is not clear whether flooding risk reduction is based on the Municipal Class EA for the section of Appleby Creek between Fairview Street and New Street or based on localized flood risk reduction.	b. As the objective of this study is to specifically address erosion, opportunities to improve flooding of sensitive areas are local to and specific site, and are considered incidental opportunities which complement the erosion mitigation.
		c. **Potential to Improve Aquatic & Terrestrial Habitat**: Staff recommend separating ecological impacts from ecological opportunities for enhancement. Focusing only on potential for improving habitat features dismisses potential negative impacts to existing natural features that may result from the construction works.	c. The criteria description is sub-divided to separate ecological impacts from ecological enhancement and potential ecological impacts resulting from the construction works.

#	Section	CH Comment (January 17, 2020)	Aquafor's Responses (March 17th, 2020)
		d. **Aesthetics/Recreation**: Elaborate on what is considered an aesthetic and a recreational benefit.	d. Aesthetics of the watercourses are considered an improvement under naturalization opportunities in contrast to deteriorated or failing conditions. Recreation may include informal use of a corridor such as that observed within Site 5.
		e. **Compatibility with Adjacent Land Use**: Clarify what is considered compatible erosion control works.	e. Soft engineered structure adjacent to residential and parklands is considered compatible erosion control works.
		f. **Public Health and Safety**: Clarify how this category differs from reducing erosion and flooding risks to the public.	f. Agreed. This criterion is removed as evaluation criteria as public health and safety is already addressed in reducing erosion and flooding risks to the public.
		g. **Agency Acceptance**: The definition in Table 4-1 does not match that in the Evaluation Matrix (Appendix E). Clarify how this criterion differs from criteria in the 'Technical and Engineering' and 'Economic Environment' categories.	g. Agency Acceptance definition in Appendix E has been updated to be consistent with Table 4-1.
14.	**4.2**, p. 122 – Evaluation Criteria	**Table 4-2 Category Weighting Factors**: Staff recommend that weighting of the categories be revised to prioritize those that directly relate to erosion control.	As per the comment, the weighting of each Criteria Category has been updated to place the heaviest impact under Physical / Natural Environment, followed by Economic Environment. This weighting is in line with ensuring the preferred alternatives will address the overall objective of the study – stabilization of the City's watercourses to limit risks of erosion. With regard to criteria weighting, this approach has been considered, however, this increased level is considered to become complex to the point where the transparency and understanding of all persons may be difficult

#	Section	CH Comment (January 17, 2020)	Aquafor's Responses (March 17th, 2020)
15.	**4.3**, pp. 122-123 – Evaluation of Alternatives; **4.5**, p. 124 - Selection and Description of the Preferred Alternatives; **Appendix E** – Detailed Alternative Evaluations	**Table 4-4 Evaluation Scoring Summary**: The detailed evaluations in Appendix E and summary in Table 4-4 should be updated based on the discussions during the December 12th meeting, as outlined below. The remainder of the EA (Sections 2, 3, 4, Appendices, etc.) should then be updated to reflect these changes. a. **Erosion Site 1**: In Staff's opinion there are two distinct erosion sites within this area; the Lakeshore Road crossing structure and the downstream reach. Staff request that the EA assess these areas independently in determining the preferred alternative. Given the proposed works may be undertaken in unison, evaluation of the works from a timing and construction perspective may still be grouped. Further to the above, vegetated restoration of both sides of the municipal easement should be included in the preferred alternative description (p. 124). Removal of private accessory buildings on public property should also be considered.	a. Confirmed, Aquafor has subdivided Erosion Site 1 into 1A & 1B. Text added in the Project File to address comment.
		a. **Erosion Site 7:** In Staff's opinion there are two distinct erosion sites within this area; the reach upstream and the reach downstream of Fairview Street (i.e. Reaches 5 and 6). Staff request that the EA assess these areas independently in determining the preferred alternative. In principle, CH would support a design that allows for reduction of flood impacts and containment of hazards in the corridor, as currently suggested in Section 4.5. Staff recommend that at the time of detailed design, opportunities to soften the approach should be explored**.**	b. Confirmed, Aquafor has subdivided Erosion Site 7 into 7A & 7B. Project File has been updated to address further comment.

#	Section	CH Comment (January 17, 2020)	Aquafor's Responses (March 17th, 2020)
		b. **Erosion Site 9**: It is staff's opinion that the conceptual design for this erosion site (i.e. Appendix G) does not reflect the extents of work required to mitigate the erosion risk. Staff request that a conceptual profile drawing and typical sections be developed for this erosion site. Staff request that all the erosion sites be re-evaluated considering the scoring criteria refinements discussed above and considering the magnitude of erosion risk mitigated by the alternative(s). When re-evaluating, consideration should be given to whether localized approaches including bioengineering works carried out by hand could address the issues raised. As discussed, staff's primary concerns with the current evaluations relate to Erosion Sites 1, 2, 5 and 7.	c. Aquafor has re-evaluated the scoring criteria as per the comments.
Section 5: Erosion and Maintenance Sites Priority Ranking and Project Phasing			
16.	**5.2.1**, p. 130 – Vegetation Loss to Significant Woodlands	Please identify the restoration approach to be used for private lands that are currently vegetated. Staff recommend following CH's Landscaping and Tree Preservation Plan Guidelines.	Aquafor has added text in the Project File to address comment.
17.	**5.2.3**, p. 132 – Aquatic Communities	a. Given the observation of salmon during the fall 2018 site visits, a cold-water timing window will apply in the area from Lake Ontario to the first physical barrier in Reach 2, whereby no works are permitted between September 15 and June 30th.	a. Noted, the Project File is updated to address comment.
		b. As per CH's EA checklist, where lands are available to achieve a 30 metre fisheries setback from bankfull, all efforts should be made to restore this setback with native vegetation to provide water quality and quantity benefits to the creek.	b. Noted, the Project File is updated to address comment.
18.	**5.2.5**, p. 134 – Impacts to Significant Wildlife Habitat	**Bat Maternity Roost Colonies** – This section should include recommendations for replacement plantings, installation of bat condos and/or snags.	Noted, text added in the Project File to address comment.
Section 6: Implementation Programs			

#	Section	CH Comment (January 17, 2020)	Aquafor's Responses (March 17th, 2020)
19.	**6.1.4**, p. 137 – Natural Heritage System	All publicly owned lands should be restored with woody plantings as part of the stabilization works.	Noted, text added in the Project File to address comment.
20.	**6.4**, p. 141 – Monitoring Program	Staff recommend adopting the same Monitoring Plan approved through the Appleby Creek Flood Mitigation between Fairview Street and New Street (February 11, 2019) for vegetation success monitoring.	Aquafor has updated monitoring program to coincide with Appleby Creek Flood Mitigation report.
	Appendix A		
21.	Existing Conditions Plan and Profile Drawings	Please highlight and/or identify each of the following details on the drawings included within this appendix: • Erosion Sites and Erosion Areas • Reach Limits • Contours • Drawing Extents on the Key Plan	Aquafor updated the details on the Appendix A as per the comment.

Appendix F5 –

Indigenous Consultation

City of Burlington
426 Brant Street,
Burlington, ON L7R 3Z6
www.burlington.ca

February 13, 2019

Haudenosaunee Development Institute
16 Sunrise Court, Suite 600
P.O. Box 714
Ohsweken, ON NOA 1M0

Re: Appleby Creek Erosion Control Class Environmental Assessment

Dear Haudenosaunee Development Institute,

The City of Burlington is undertaking the Appleby Creek Erosion Control Class Environmental Assessment (Class EA) Study to identify solutions to reduce erosion, restore and rehabilitate select creek reaches at Appleby Creek from South Service Road to Lake Ontario. This EA study is subject to the requirements of the *Ontario Environmental Assessment Act*, and will follow the Municipal Class Environmental Assessment Schedule B process.

As part of the study, a number of areas of risks have been identified. Alternatives have been developed for each area of risk and are currently being evaluated. A Stage 1 archaeologic investigation is also required as part of the EA. Our archaeological consultants plan to undertake the Stage 1 archaeological investigations in the coming weeks.

Your input is important. If you have any questions or comments, or would like to receive copies of the Stage 1 archaeologic study when it becomes available, please contact me at (905) 335-7600, ext. 7486, or arif.shahzad@burlington.ca.

Sincerely,

Arif Shahzad, M.Eng., P.Eng.
Senior Project Manager, Stormwater Engineering
Capital Works Department

P. 905-335-7600 ext. 7486, Email: Arif.Shahzad@burlington.ca
Address 426 Brant Street P.O.Box 5013, Burlington, Ontario, L7R 3Z6

City of Burlington
426 Brant Street,
Burlington, ON L7R 3Z6
www.burlington.ca

February 13, 2019

Mississaugas of the Credit First Nation
Department of Consultation & Accommodation
2789 Mississauga Road R.R. #6,
Hagersville, ON N0A 1H0

Re: Appleby Creek Erosion Control Class Environmental Assessment

Dear Mississaugas of the Credit First Nation,

The City of Burlington is undertaking the Appleby Creek Erosion Control Class Environmental Assessment (Class EA) Study to identify solutions to reduce erosion, restore and rehabilitate select creek reaches at Appleby Creek from South Service Road to Lake Ontario. This EA study is subject to the requirements of the *Ontario Environmental Assessment Act*, and will follow the Municipal Class Environmental Assessment Schedule B process.

As part of the study, a number of areas of risks have been identified. Alternatives have been developed for each area of risk and are currently being evaluated. A Stage 1 archaeologic investigation is also required as part of the EA. Our archaeological consultants plan to undertake the Stage 1 archaeological investigations in the coming weeks.

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Burlington, ON L7R 3Z6
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February 13, 2019

Six Nations of the Grand River
Land Use Unit
1695 Chiefswood Road
P.O. Box 5000
Oshweken, ON N0A 1M0

Re: Appleby Creek Erosion Control Class Environmental Assessment

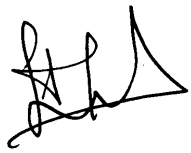
Dear Six Nations of the Grand River,

The City of Burlington is undertaking the Appleby Creek Erosion Control Class Environmental Assessment (Class EA) Study to identify solutions to reduce erosion, restore and rehabilitate select creek reaches at Appleby Creek from South Service Road to Lake Ontario. This EA study is subject to the requirements of the *Ontario Environmental Assessment Act*, and will follow the Municipal Class Environmental Assessment Schedule B process.

As part of the study, a number of areas of risks have been identified. Alternatives have been developed for each area of risk and are currently being evaluated. A Stage 1 archaeologic investigation is also required as part of the EA. Our archaeological consultants plan to undertake the Stage 1 archaeological investigations in the coming weeks.

Your input is important. If you have any questions or comments, or would like to receive copies of the Stage 1 archaeologic study when it becomes available, please contact me at (905) 335-7600, ext. 7486, or arif.shahzad@burlington.ca.

Sincerely,



Arif Shahzad, M.Eng., P.Eng.
Senior Project Manager, Stormwater Engineering
Capital Works Department

P. 905-335-7600 ext. 7486, Email: Arif.Shahzad@burlington.ca
Address 426 Brant Street P.O.Box 5013, Burlington, Ontario, L7R 3Z6

Appendix F6 –

Letter from Urbantech Consulting

March 18, 2019

Project: 18-580

Mr. Rob Amos
Aquafor Beech Ltd.
6-202 2600 Skymark Avenue
Mississauga, ON
L4W 5B2

Mr. Arif Shahzad
City of Burlington
426 Brant Street, P.O. Box 5013
Burlington, ON
L7R 3Z6

Re: Appleby Creek Erosion Control Class EA
City of Burlington, Regional Municipality of Halton

Dear Mr. Amos and Mr. Shahzad:

Thank you again for taking the time to speak with us at the Public Information Centre (PIC) held on February 19, 2019. As discussed, Urbantech has been retained by Branthaven Development Corporation and Jennifer Lawrence and Associates has been retained by 5135 Fairview Holdings Inc. Combined, these two landowners own all of the property along the eastern limit of Appleby Creek between Fairview Street and the railway line (see **Figure 1**).

Appleby GO Mobility Hub

In addition to being within the study area for the Erosion Control Class Environmental Assessment (EA), the properties are also within the Appleby GO Mobility Hub Study Area. The City of Burlington staff report (PB-65-18) identifies preliminary land use precincts for the Mobility Hub and shows the subject properties as being within the Appleby GO Central and Fairview Frequent Transit Corridor Precincts. The staff report notes that both of these precincts anticipate a significant concentration of residential, office, retail and commercial uses, as opposed to the current business/industrial park uses that exist today.

Urbantech Consulting, A Division of Leighton-Zec Ltd.
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TEL: 905.946.9461 FAX: 905.946.9595
www.urbantech.com



Figure 1 - Location of Subject Lands

Appleby Creek Erosion Mitigation Class Environmental Assessment

Our clients' lands are adjacent to Erosion Site 7, as identified in the PIC materials. This site has been assigned a high level of risk to private property, municipal infrastructure and aquatic habitat by the EA Study Team. This high level of risk is due to active bank erosion in close proximity to private property and failed gabion baskets adjacent to storm outfall and other locations. The conceptual design as presented at the PIC, to address these risks, includes reach-based works consisting of bank restoration with an armourstone wall along the entire reach (east and west banks of the creek), roundstone riffle-pool and in-creek vegetation buffer to provide erosion protection while enhancing creek riparian areas. An engineered channel is proposed along the entire reach to enhance conveyance and protect private properties.

As outlined in our comments for the Flood Mitigation Class EA in the letter of January 21, 2019, our clients are willing and interested in working with the City to identify an alternative that would result in benefits to:

- the watercourse system, through the reduction in the amount of erosion and associated negative impacts on aquatic and terrestrial habitat;

- the City through the reduction in capital infrastructure and long-term maintenance costs by potentially reducing the amount of hard infrastructure required to protect the eastern bank of the watercourse; and,
- the adjacent landowners through the reduction in the extent of Regional Storm flood plain on their properties. This would also benefit the City through the provision of developable land to achieve their Mobility Hub goals and targets.

As mentioned at the PIC, Urbantech is currently undertaking an optimization analysis of the extent of corridor widening, in combination with the downstream crossing size, to maximize the benefit of effectively managing the natural hazards associated with the corridor, i.e. erosion reduction, flood plain reduction and/or containment, and optimizing/maximizing the tableland areas made available for re-development as part of the Mobility Hub. We note from the PIC display boards that the spacing of armourstone for the subject reach (Erosion Site 7) does not reflect the recommended 17m span of the future bridge. As such, the full hydraulic potential of the future bridge structure is not fully realized and thus, flood levels along the reach within the mobility hub area are not reduced to the extent that they could be. This issue warrants further consideration and discussion with your team at a future meeting.

Page 23 of the PIC slide deck indicated a possible construction access point from the end of Oval Court. The City and its consultants should further consult with the landowners on an appropriate location for the easement for the secondary access point to Erosion Site 7 in order to determine the most appropriate/suitable location and to ensure that it is acceptable to all parties.

General Comments on Future Work

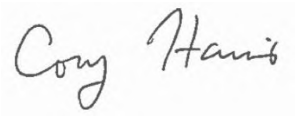
We would request that the City allow the landowners and their consultants to be present during any field assessments along this stretch of the creek (i.e. fluvial geomorphic assessments, NHS assessments, tree inventories, vegetation community classification, vascular plants, breeding birds, species at risk, significant wildlife habitat, fisheries, etc).

Summary

We recommend that the City, in collaboration with the adjacent landowners, work together to capitalize on a unique opportunity to improve an urban creek system through recommendations made in the Flood Mitigation Class EA and the on-going Erosion Control Class EA. These natural hazard and natural heritage improvements to the watercourse corridor will also provide a benefit to the adjacent landowners and the City through the provision of additional developable land to assist the City in achieving their goals to maximize residential, office, retail and commercial uses in close proximity to the GO Station while reducing long-term maintenance costs associated with erosion in the creek corridor.

We trust the above is of assistance and look forward to meeting with you to discuss this option further. If you require additional information, please do not hesitate to contact us.

Yours truly,





Cory Harris, P.Eng., CAN-CISEC
Senior Water Resources Engineer

Jennifer Lawrence, MCIP, RPP
President, Jennifer Lawrence and Associates

cc: Mr. G. Hansen, Mr. D. Civiero, Hodero Holdings
Mr. A. Semper, Mr. A. Eldebs, Branthaven Development Corp.
Mr. T. Korsiak, Korsiak Planning
Ms. Rosa Bustamante, Mr. Kyle Plas, City of Burlington
Ms. S. Gorenc, Beacon Environmental

urbantech

June 7, 2019

Project: 18-580

Mr. Rob Amos
Aquafor Beech Ltd.
6-202 2600 Skymark Avenue
Mississauga, ON
L4W 5B2

Mr. Arif Shahzad
City of Burlington
426 Brant Street, P.O. Box 5013
Burlington, ON
L7R 3Z6

Re: Appleby Creek Flood Mitigation and Erosion Control Class EAs
City of Burlington, Regional Municipality of Halton

Dear Mr. Amos and Mr. Shahzad:

Further to our technical memo of April 1st, 2019 and our meeting of April 5th, please find enclosed supplementary information for the reach of Appleby Creek west of Oval Court between the CNR line and the pedestrian bridge south of Fairview Street. We have completed our analysis to refine and optimize Option 4B from our previous memo (now referred to as Option 4D) to determine the type and size of structure that would be the most appropriate for the Fairview Street crossing. We have also identified the property impacts associated with the recommended revisions to the corridor on the lands at 720 and 740 Oval Court and 5135 Fairview Street.

As you may recall from the previous memo, Option 4A included the widening of the corridor into the adjacent properties in addition to channel improvements between Fairview Street and the pipeline lands but included the use of the existing Fairview Street culvert. This scenario reduced the water levels along the corridor for both Oval Court properties with a local increase of 46 cm for the 5135 Fairview Street property (which could be accommodated within the corridor) but only reduced flood levels for Fairview Street by 2 cm, resulting in a depth of flooding of 37 cm over the road. While this option was an improvement over the existing condition and removed floodplain areas from the subject properties, it does not achieve flood free access and egress to the intersection of Oval Court and Fairview Street which would limit the redevelopment options for the lands. As such, the corridor and culvert option described herein is recommended as the preferred option for any improvements to Appleby Creek within Reach 5/Erosion Site 7 of the EA.

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Fairview Street Structures

The preferred sizing of structures for Fairview Street that resulted from numerous iterations of Option 4D within the HEC-RAS model resulted in three concrete box culvert structures (one larger centre culvert and two relief culverts). The centre culvert has dimensions of 6.4 m x 2.1 m and would be set at a lower elevation (upstream invert = 97.28 m; downstream invert = 97.14 m), to contain the bankfull channel of Appleby Creek with the addition of natural substrate and small benches at either side of the culvert. The two additional relief culverts are proposed on either side of the larger centre culvert and would be 3.9 m x 1.8 m in size, installed at a higher elevation, (upstream invert = 97.58 m; downstream invert = 97.44 m). These relief culverts would not only facilitate additional hydraulic conveyance to provide flood free access to Fairview Street under Regional Storm conditions but would also serve to benefit the creek system from an ecological perspective by providing wildlife passage under the road and accommodating the width of the bankfull channel in the larger centre culvert. An additional benefit to the box culverts includes a minimized/reduced requirement for bedding over top of the culvert given the enhanced structural integrity of the box culverts versus a span structure. Note, all culvert obverts match and the length and slope are the same for each culvert (29 m and 0.5%, respectively). See **Figure 1** below for the upstream and downstream cross-sections of the recommended culverts.

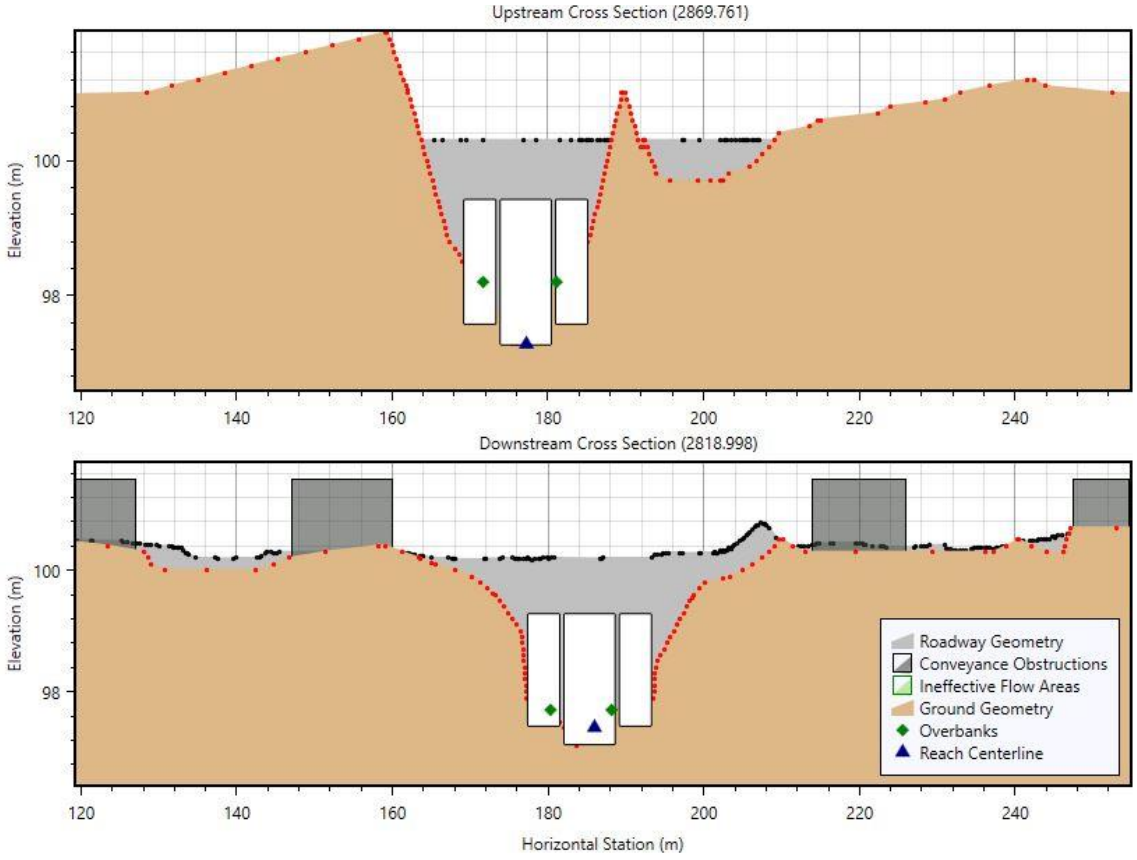


Figure 1: Upstream / Downstream Cross-Section of Culverts

The 17 m bridge structure originally proposed in the Flood Mitigation EA was assessed by Urbantech through this modelling exercise and was deemed to be sub-optimal from a hydraulic performance perspective due to the thickness of the bridge deck. Also, installation of footings for the abutments would impact the shallow depth of the existing 900 mm diameter sanitary sewer which is estimated to be at elevation 96.17 meters (to be verified) and the proposed box culverts eliminate the need for footings as they can be installed onto compacted bedding material. This affords a higher level of protection to the existing sanitary sewer as well.

The final results from the optimized hydraulic model are summarized in **Table 1** below and are compared against the existing conditions model (Option 1B from the April 1st memo).

Table 1: Comparison of Options 1B and 4D

Station	WSEL (masl)		Difference (m)
	1B	4D	
3226.566	105.29	105.29	0.00
3206.556	104.80	104.80	0.00
3186.542	Culvert	Culvert	Culvert
3146.411	103.07	102.69	-0.38
3122.614	103.14	102.67	-0.47
3057.861	102.32	102.09	-0.23
2992.953	102.06	101.73	-0.33
2967.573	102.25	101.35	-0.90
2932.249	101.3	100.94	-0.36
2910.239	100.76	100.71	-0.05
2893.629	101.18	100.53	-0.65
2869.761	101.14	100.28	-0.86
2845.459	Culvert	Culvert	Culvert
2818.998	99.91	99.91	0.00
2798.804	99.46	99.46	0.00

Please see **Figure 2** below and **Drawing FPM-08** for the extent of the updated floodplain.

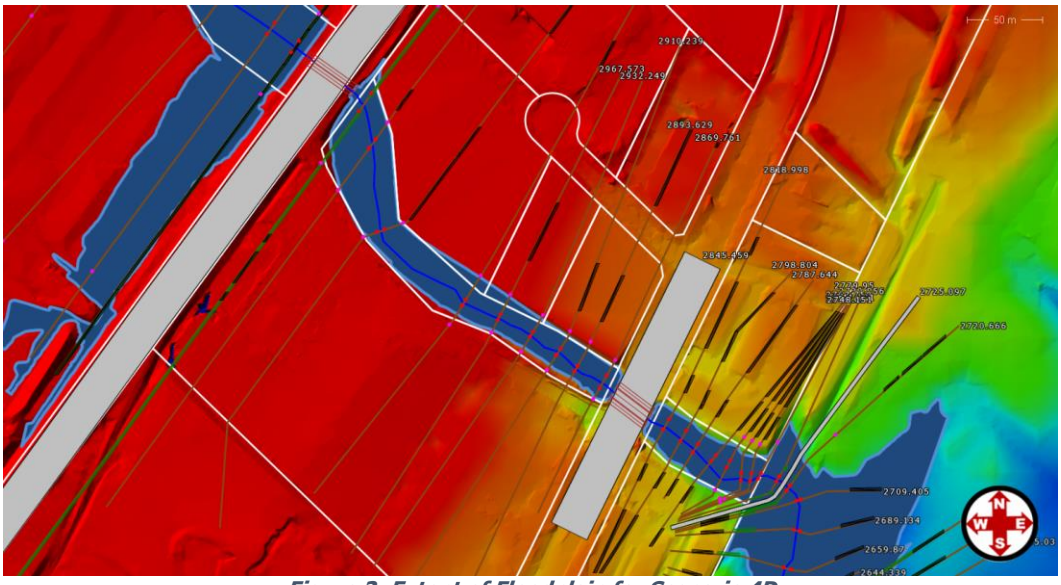


Figure 2: Extent of Floodplain for Scenario 4D

As noted in the **Table 1, Figure 2** and **Drawing FPM-08**, Option 4D allows for the floodplain to be contained in the reconfigured channel corridor and achieves flood free access and egress for Fairview Street and the subject properties.

It is worth noting that the model is sensitive to the use of ineffective flow areas for the Fairview Street crossing and produced unreasonable results under a number of flow conditions and in some instances resulted in an 85% reduction in flow capacity when ineffective flow areas were applied. The culvert performance was tested and validated using other models and culvert analysis tools to confirm hydraulic capacity under the proposed flow conditions and confidence in the results. It was determined that the model results were not consistent with expected conveyance through the culvert when ineffective flow areas were assigned in this particular location; therefore, it is recommended that they be removed from the Fairview Street crossing. Further refinements in the model will be completed during detailed design.

CAD Drawings

The CAD drawings provided with this letter indicate the recommended revised property limits to accommodate a slightly larger and wider channel to accommodate the Regional Storm flood plain associated with Appleby Creek north of Fairview Street. The proposed corridor design north of Fairview Street assumes 3:1 side slopes and alteration of the east overbank areas in addition to a wider bottom width for the south portion of the corridor between Fairview Street and the existing pedestrian bridge. You will note that the west side of the channel north of Fairview Street was assumed to be marginally altered (i.e. no alteration of slope and minimal alteration of overbank areas between the west toe of slope and the low flow channel). This assumption has produced conservative results in the hydraulic model. Should Aquafor Beech and the City apply an armour stone treatment to the west side of the corridor with some minor slope modifications there would be ample opportunity to improve the overbank conditions within the channel corridor. This would result in additional hydraulic efficiencies for storage and conveyance of flood flows.

Property Impacts

As discussed in the previous memo, the existing conditions Regional Storm floodplain (Option 1B) extends onto the properties at 720 and 740 Oval Court and floods across Fairview Street, preventing safe access and egress under flood conditions. The corridor concept recommended under Option 4D accommodates the floodplain within the corridor, completely removes floodplain areas from both of the Oval Court properties, and prevents flooding of Fairview Street, thus facilitating safe access and egress to the Oval Court/Fairview Street intersection. Floodplain and property area totals have been summarized in **Table 2** below and on **Drawing FPM-08** with the recommended areas for dedication (by property) necessary to accommodate the floodplain within the corridor.

Table 2 - Summary of Property Area Totals for Preferred Option 4D

Property	Ex. Lot Area (ha/ac)	Ex. Floodplain Area (ha/ac)	Recommended Dedication for Proposed Channel/ Floodplain Area (ha/ac)	Proposed Lot Area (ha/ac)	Development Area* (ha/ac)
740 Oval Court	1.3737 / 3.3945	0.0096 / 0.0236	0.0275 / 0.0680	1.3462 / 3.3265	1.2190 / 3.0122
720 Oval Court	0.4119 / 1.0178	0.1042 / 0.2575	0.0316 / 0.0781	0.3803 / 0.9397	0.3476 / 0.8589
5135 Fairview Street	0.4640 / 1.1466	0.0001 / 0.0002	0.0241 / 0.0596	0.4399 / 1.0870	0.3961 / 0.9788

*Development Area = Proposed Lot Area - 7.5m Buffer Area

The development area totals provided in the last column of the above table highlight the area within the property available for future development once a 7.5m setback is applied to the property. While this setback will not be required through the EA process, this requirement will be triggered through the planning applications associated with the redevelopment of the properties. This 7.5m setback along the creek corridor will likely require dedication of this setback/buffer block to the City. The 7.5m setback line has been depicted on **Drawing FPM-08** with a dashed line to assist with visualizing the property impacts of this future requirement.

Appleby Creek Erosion Mitigation Class Environmental Assessment

As noted in our correspondence of January 21st, 2019, we recommend that, as part of the Erosion Control Class EA, the City continue to work with the adjacent landowners to assess alternatives that include widening of the watercourse corridor along this reach in order to reduce the amount of erosion and to reduce the long-term infrastructure costs to the City associated with maintaining erosion control measures (i.e. gabion or armourstone walls). The extent of corridor widening should be examined in conjunction with the flood plain works mentioned above, in order to maximize the benefit of effectively managing the natural hazards associated with the corridor, i.e. erosion reduction/mitigation, flood plain reduction and/or containment, and optimizing/maximizing the tableland areas made available for re-development as part of the Mobility Hub. The corridor and culvert option described herein is recommended as the preferred option for any improvements to Appleby Creek within Reach 5/Erosion Site 7 of the EA.

Summary

We appreciated the opportunity to meet with City and CH staff on April 5, 2019 to discuss this unique opportunity to improve the watercourse corridor between the CNR line and Fairview Street. We look forward to continuing to work with the City and CH, through the EA and detailed design process, to optimize benefits to the natural heritage system, natural

hazard management and re-development potential. These natural hazard and natural heritage improvements to the watercourse corridor will also provide a benefit to the adjacent landowners and the City through the provision of additional developable land to assist the City in achieving their goals to maximize residential, office, retail and commercial uses in close proximity to the GO Station.

We trust that the information we have provided to your team is of assistance and look forward to working with you through the remainder of the Erosion Control Class EA. If you require additional information, please do not hesitate to contact us.

Yours truly,



Cory Harris, P.Eng., CAN-CISEC
Senior Water Resources Engineer

Encl.

cc: Mr. G. Hansen, Mr. D. Civiero, Hodero Holdings
Mr. A. Semper, Mr. A. Eldebs, Branthaven Development Corp.
Mr. T. Korsiak, Korsiak Planning
Ms. Rosa Bustamante, Mr. Kyle Plas, City of Burlington

Meeting Minutes and Action Items
Oval Court, Appleby GO Mobility Hub, and
Appleby Creek Erosion Control Class EA
Conservation Halton – 2596 Britannia Road West
April 5, 2019

Attendees: *Conservation Halton:* E. DeFields, D. Irwin, K. McCormack
City of Burlington: A. Shazhad, R. Amos (Aquafor Beech), Xuewen He (Aquafor Beech)
Oval Court Reps: A. Eldebs, G. Hansen, C. Harris (Urbantech), D. Hoover (Urbantech), J. Lawrence (Jennifer Lawrence & Associates)

Agenda

1. Background
2. Oval Court and Appleby Creek Opportunities
3. Next Steps

Minutes

1. Background

a. Ownership

CH – Branthaven and 5135 Fairview Holdings are working together to advance potential re-development options for the lands on Oval Court; properties are adjacent to Appleby Creek and contain flooding and erosion hazards

b. Mobility Hub

JL – City of Burlington prepared Draft Precinct Plans for lands in vicinity of GO Stations to identify land use designations to support residential, employment and commercial uses; subject properties are immediately east of Appleby GO Station within Mobility Hub area; preliminary land use designations suggest potential for significant re-development and intensification opportunities on Oval Court lands however, we recognize planning for this area is on hold pending decisions related to employment conversions

c. Environmental Assessments (Flooding and Erosion)

CH - Appleby Creek Flood EA submitted to MECP; preferred alternative for this reach includes a 17m bridge crossing at Fairview Street only when existing culvert is at end of life cycle; ESR acknowledged the potential to work with landowners along Oval Court to widen the watercourse corridor through the re-development of the lands

CH - Appleby Creek Erosion EA on-going; preliminary preferred alternative for this reach includes armourstone and partially re-constructed creek within the existing creek block limits

[p] 289.442.2829 [w] jlplanning.ca [e] jennifer@jlplanning.ca
8 Fieldgate Street Dundas ON L9H 6M6

2. *Oval Court and Appleby Creek Opportunities*

Cory provided an overview of the modelling that Urbantech has undertaken to assess various scenarios related to improving flood conveyance through the reach between the railway line and Fairview Street and explained that the owners are willing and interested in participating in studies and discussions that could provide benefits from both a land use and natural heritage perspective.

Urbantech has assessed several scenarios to optimize the potential creek block width. Option 4B pulls the entire Regional Storm flood plain into the modified creek corridor and results in Fairview Street being flood free. Cory noted that there may be additional benefit if the City were to consider box culverts, rather than a span bridge, in terms of passing the Regional Storm to maximize the height/rise of the structure and minimize deck thickness.

AS - City is willing to discuss these options and will accommodate as appropriate; bridge replacement is not within the City's 10-year budget; erosion works likely to start at downstream end (i.e., Lake Ontario)

RA - can include preferred cross-sections in EA; would be helpful to understand the extent of modifications being proposed to the property lines along eastern limit of creek block; **ACTION CH**

ED - Conservation Halton has not yet provided comment on the EA design concepts

JL - given that the scenario presented by the landowners is tied to re-development of the lands, it may be appropriate for the Erosion EA to identify two potential preferred alternatives in this area: (1) the alternative as presented at the PIC that does not involve any private lands; and, (2) the alternative as outlined in Urbantech's April 1/19 memo

DI - questioned which models are being used for the Mobility Hub

CH - the models that Urbantech has prepared can be provided to the City for their use in Mobility Hub planning, if agencies are in agreement with model; **ACTION CH**

JL - inquired as to whether any additional fieldwork proposed this year for the Erosion EA and, if so, requested opportunity for Beacon to attend with Aquafor Beech

RA - no additional ecological fieldwork anticipated

ED - questioned whether an EIA had been started for the Oval Court lands

JL - not yet; given the unknown timing of the Mobility Hub, owners are considering appropriate timing to initiate studies

KM - CH confirmed that they are open to considering the concept of a wider channel corridor to contain the flood plain hazards.

3. *Next Steps*

KM - would rather that CH comment on the Urbantech memo through the EA process; **ACTION ED**

CH - will provide CH and City with copy of model and drawing(s) of preferred concept; **ACTION CH**

Minutes prepared by: J. Lawrence

MEETING MINUTES

Today's Date:	December 16th, 2019	**Project No.:**	18-580
Meeting Date:	December 12th, 2019	**Recorded by:**	David Hoover

Attendees:	Arif Shahzad, City of Burlington	Arif.Shahzad@burlington.ca
	Rob Amos, Aquafor Beech	amos.r@aquaforbeech.com
	Emma DeFields, CH	edefields@hrca.on.ca
	Elisa Bernier, CH	ebernier@hrca.on.ca
	David Irwin, CH	dirwin@hrca.on.ca
	Thomas Kastelic, Branthaven	tkastelic@branthaven.com
	David Hoover, Urbantech	dhoover@urbantech.com
	Jennifer Lawrence, J. Lawrence & Associates	jennifer@jlplanning.ca
	Shelley Gorenc, Beacon	sgorenc@beaconenviro.com
Meeting Location:	City of Burlington	
Topic:	**Erosion Control alternatives at Fairview Street - Re: Appleby Creek Erosion Control Class EA**	

Any errors or omissions should be reported to the author in writing within seven (7) days or at the next regularly scheduled meeting, failing which, these minutes will stand as an accurate record.

ITEM	DISCUSSION SUMMARY	ACTION
1	**City of Burlington: Construction of Fairview St. Crossing (Erosion Site 7)**	
a)	Budget to consist of Erosion Control works only (does not include structure)	
b)	AS noted that the City has budgeted $11 million over the next 5 years in anticipation of erosion control works but has not made a decision regarding which projects to move forward / in what order • Projects to be rolled out in 4 phases to 2024 • Individual cost for initial projects will determine how many erosion sites can be addressed	
c)	RA noted that the EA identifies erosion site 7 as falling within the 5-10-year planning horizon	

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www.urbantech.com

ITEM	DISCUSSION SUMMARY	ACTION
	AS noted that the Fairview structure is not currently in the City's capital budget so cannot say whether there will be interest to agree to cost share plan. Works will not likely be in City budget for another 20-30 years	
2	**Option to have Developer Complete Construction of Crossing**	
a)	AS noted that the City is **not** currently in agreement with Branthaven fronting the project (corridor + structure) Further discussions with City & Planner → to be discussed through development process	
3	**Compare City's design to Developer's Design**	
a)	CH has not completed detailed review of hydraulic model & memo completed by Urbantech • Minor concerns & edits to be completed prior to review • Overtopping still occurs in model • Manning's values too low for re-constructed corridor • RA recommends that the reach D/S of the crossing be included as part of the works Branthaven is proposing	
b)	Urbantech to provide RA with plan showing proposed property limits and conceptual structure design	**Urbantech to circulate plan**
c)	RA clarified that the EA only evaluated clear span, open footing crossing structure options • noted that Urbantech design for 3 cell culvert provides similar total span compared to EA 17 m clear span bridge • thinks that both upstream and downstream corridor enhancement works are likely required to fully address floodline issue	
d)	DH provided rationale for culvert vs bridge • Able to accommodate the regional storm without overtopping (if combined with corridor enhancement works) • Can be constructed without necessitating replacement of existing servicing under road	
e)	ED noted that reduced risk is CH's goal. Justification for the work through the EA is the first step to address CH policy requirements.	
f)	RA has rough cost estimates for both structure/crossing and channel / corridor (U/S & D/S of crossing) works	

ITEM	DISCUSSION SUMMARY	ACTION
g)	Urbantech to provide approximate cost estimates for structure/crossing and channel/corridor (U/S & D/S of crossing) works	**Urbantech to provide estimates**
h)	RA & DH to come to agreement on the principle of the structure design to be included in EA through further discussions & analysis	
i)	DH requested that all parties outline the steps required to allow Branthaven to move forward with the crossing improvement so that the process is documented for future reference	
4	**Channel Re-design / Naturalization**	
a)	JL noted that the proposed crossing replacement and proposed creek works would be beneficial to all parties (i.e., Regional Storm flood plain is removed from tableland thereby increasing developable land; Regional Storm flood plain overtopping of Fairview Street eliminated thereby providing flood free access to existing residential lands east of Appleby Creek; wider creek block and 3:1 slopes on east side will provide for a better valley system through this reach	
b)	AS noted that the City is open to upgrading the crossing structure, as documented in the Flood EA, but prefers that this type of proposal move forward through the development application process	
c)	JL acknowledged City preference but noted that CH has very specific wording in their policies that require any major watercourse or flood plain alterations to be supported by an approved SWS or EA (or similar comprehensive study), that is why it is important to the landowners on Oval Court/Fairview Street to ensure that the current Erosion Control and Flood Mitigation EAs have incorporated sufficient detail surrounding the potential for crossing structure and corridor improvements such that any future development proposals would then be in conformance with CH's policy	
d)	RA questioned whether an addendum to the EA would be required to address this. JL noted that it would be in everyone's interest to avoid the time and cost of an EA Addendum. Preferable that the current EA acknowledge that, should a development proposal come forward for the lands on Oval Court, that there is an option to widen the creek valley and address flooding concerns, through the development process ED will look into whether an addendum to EA would be required to incorporate revision to crossing (i.e., from bridge to 3 culverts)	

ITEM	DISCUSSION SUMMARY	ACTION
e)	CH would want to review the design concept in greater detail to ensure that they could support the works. While a single span and open footing structures are generally preferred, CH would weigh the benefits of flood mitigation provided by box culverts over an open bottom, multi span design in their evaluation	
f)	CH commented that they would like to see Manning coefficients adjusted to reflect channel / corridor works in model and that model still shows some overtopping	
g)	DH to provide property requirements for proposed corridor enhancements, structure details, confirmation that model does not show overtopping under regional event, and confirm downstream works are consistent with EA, along with a cost estimate. City to share information with Conservation Halton if they are supportive of the submission by Urbantech.	**Urbantech to review model** **City to share information with CH**
5	**Channel Access / Phasing**	
a)	AS noted that mobility hub works may also result in improved hydraulics	
b)	RA targeting to file notice of completion for February 2020	
c)	RA to include both Urbantech memos as appendix and potentially any concepts for corridor (to be further discussed with RA)	
d)	CH wants site 7 split into 2 sites (U/S & D/S of crossing)	
e)	Urbantech to provide updated model showing preferred scenario only • RA noted that the City's preferred option is the existing culvert with the proposed EA works U/S & D/S of the crossing • AS noted that the main concern is the impact on the system	**Urbantech to circulate requested model**
f)	RA & Urbantech to collaborate and verify that EA scoring lines up with proposed design	
g)	RA to circulate EA prior to submission	
	Further discussions:	
a)	Will monitoring be part of development? JL noted that, if the works are completed as part of a development application, then monitoring could be attached to the approval of the application.	

ITEM	DISCUSSION SUMMARY	ACTION

Distribution: All Attendees

cc:

Umar Malik, City of Burlington	Umar.malik@burlington.ca
Sachet Siwakoti, Aquafor Beech	siwakoti.s@aquaforbeech.com
Arden Semper, Branthaven	asemper@branthaven.com
Andrew Fata, Urbantech	afata@urbantech.com
David Civiero/Glen Hansen, Hodero	DCiviero@hodero.ca and ghansen@hodero.ca
Ken Ursic, Beacon	kursic@beaconenviro.com


LAND TO BE DEDICATED TO CITY
(APPROX. 815m²)
OVAL COURT
FAIRVIEW STREET

Appendix F7 –

Letter from Hydro One Networks Inc.

Hydro One Networks Inc
483 Bay St
Toronto, ON

August 26, 2019

Re: Appleby Creek Erosion Control

Attention:
Arif Shahzad, M.Eng. P. Eng.Senior Project Manager

In our preliminary assessment, we have confirmed that Hydro One has a corridor reserved for future use within your study area. At this point in time we do not have enough information about your project to provide you with meaningful input with respect to the impacts that your project may have on our infrastructure. As such, this response does not constitute any sort of approval for your plans and is being sent to you as a courtesy to inform you that we must be consulted on your project.

In addition to the existing infrastructure mentioned above, the affected transmission corridor may have provisions for future lines or already contain secondary land uses (i.e. pipelines, watermains, parking, etc). Please take this into consideration in your planning.

Also, we would like to bring to your attention that should (Appleby Creek Erosion Control) result in a Hydro One station expansion or transmission line replacement and/or relocation, an environmental assessment (EA) will be required as described under the Class Environmental Assessment for Minor Transmission Facilities (Hydro One, 2016). This EA process would require a minimum of 6 months to be completed and associated costs will be allocated and recovered in accordance with the Transmission System Code. Furthermore, to complete an EA it can take from 6 months (to complete a Class EA Screening Process) to 18 months (to complete a Full Class EA Process) based on the level of assessment required for the EA. In order to achieve speedy completion of the EA, Hydro One will need to rely on studies and/or reports completed as part of the EA for your project.

Please allow the appropriate lead-time in your project schedule in the event that your proposed development impacts Hydro One infrastructure to the extent that it would require modifications to our infrastructure.

In planning, please note that developments should not reduce line clearances or limit access to our facilities at any time in the study area of your Proposal. Any construction activities must maintain the electrical clearance from the transmission line conductors as specified in the Ontario Health and Safety Act for the respective line voltage.

Please note that the proponent will be held responsible for all costs associated with modification or relocation of Hydro One facilities, as well as any added costs that may be incurred due to increase efforts to maintain our facilities.

We reiterate that this message does not constitute any form of approval for your project. Hydro One must be consulted during all stages of your project. Please ensure that all future communications about your project are sent to us electronically to secondarylanduse@hydroone.com.

Sent on behalf of,

Secondary Land Use
Asset Optimization
Strategy & Integrated Planning
Hydro One Networks Inc.

Appendix F8 –

Letter from Ministry of the Environment, Conservations and Parks

Ministry of the Environment, Conservation and Parks

Environmental Assessment Branch

1st Floor
135 St. Clair Avenue W
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax.: 416 314-8452

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Direction des évaluations environnementales

Rez-de-chaussée
135, avenue St. Clair Ouest
Toronto ON M4V 1P5
Tél. : 416 314-8001
Téléc. : 416 314-8452

Ontario

August 10, 2020

Arif Shahzad, M.Eng., P.Eng.
Senior Project Manager
City of Burlington
arif.shahzad@burlington.ca
BY EMAIL ONLY

Re: **Appleby Creek Erosion Control Project**
City of Burlington
Schedule B Municipal Class Environmental Assessment
Project File Report

Dear Mr. Shahzad,

The Ministry of the Environment, Conservation and Parks (MECP) has reviewed the Environmental Project Report (PFR) for the Schedule B Municipal Class Environmental Assessment for the Appleby Creek Erosion Control Project in the City of Burlington, dated June 1, 2020. We understand that the preferred solution is a combination of Alternative 2 – Local Restoration Works and Alternative 3 – Comprehensive Reach Based Works for the different erosion sites identified in the PFR. MECP is generally supportive of this project, as it aims to benefit the environment by providing a healthier aquatic habitat in Appleby Creek compared to existing conditions. The following comments are offered for your consideration.

Surface Water Comments

1. A parallel project (Appleby Creek Flood Mitigation EA) was completed in 2019. The report indicated that hydrologic/hydraulic models developed from the flood mitigation project were used to simulate the streamflow conditions for this EA under 2-year to 100-year and Regional storm events. Although the current EA is mainly focused on erosion control and river channel instability issues, it would be helpful if the EA could clarify whether the implementation of these recommended projects would result in any changes to these simulated streamflow rates or the streamflow regime for both low flow and high flow events/seasons; especially it is noted that the recommended projects will remove several concrete weirs on the stream which were installed many years ago.

2. It is recommended that Section 5.2 of the report include a discussion on potential impacts of the proposed projects on the creek water quality during the construction, together with the proposed mitigation measures.

3. Figure 3.3 of the report shows that there are about 37 stormwater outfalls located within the study area. Based on the report, much development in this area occurred prior to the early 1980s which pre-dates the use of stormwater management techniques. Since uncontrolled stormwater discharge would generally cause river channel erosion problem, we would like to know if any erosion site/issue identified in this project is related to the stormwater/outfall

discharge. In this regard, please also clarify if the City has a stormwater masterplan prepared to resolve any stormwater discharge related erosion problems in order to prevent future erosion.

4. Finally, please also be advised that, during the construction phase, if a project requires construction dewatering other than surface water diversion, a Permit to Take Water (PTTW) or EASR registration may be required for taking/pumping water over 50,000 litres per day. Guideline documents for Permit to Take Water or EASR registration can be found directly from the MOECP website. If the construction includes the discharge of any collected water from the dewatering activities into a surface watercourse, or a stormwater sewer that directly discharges into a surface watercourse, appropriate treatment and control/ mitigation measures shall be prepared to ensure that the proposed discharge will not result in any undesirable impact on the receiving waters.

General Comments

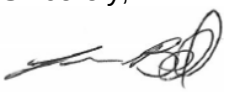
1. As indicated in the PFR, the final implementation of the recommended projects may require further Schedule B Class EAs. Considering that details of these projects have not been provided and finalized at this stage, it is recommended that further MECP review of these proposed projects be required during the detailed design or when the EA studies for each proposed project are completed.

2. Page 10 of the report refers to Section 0 in two locations, please clarify where to find the section in the report.

3. Please note that MECP has taken over responsibility for administering the Endangered Species Act (ESA). For consultation regarding potential permit requirements for species at risk, please contact SAROntario@ontario.ca.

Thank you for the opportunity to review and comment on the PFR. Should you or any members of your project team have any questions regarding the material above, please contact me at trevor.bell@ontario.ca.

Sincerely,



Trevor Bell
Regional Environmental Assessment Coordinator

cc: Tina Dufresne, Manager, Halton Peel District Office, MECP
Agni Papageorgiou, Supervisor, Project Review Unit, MECP
Robert Amos, Project Manager, Aquafor Beech Limited

August 20, 2020

Attn: **Mr. Trevor Bell**
Regional Environmental Assessment Coordinator
Ministry of Environment, Conservation and Parks
1st Floor, 135 St. Clair Avenue West
Toronto, Ontario, M4V 1P5
Phone: 416-314-8001 ext. 2335 | Email: trevor.bell@ontario.ca

Cc: **Mr. Arif Shahzad,**
Senior Environmental Engineer
City of Burlington
426 Brant Street P.O. Box 5013
Burlington, Ontario, L7R 3Z6
Phone: 905-335-7600 ext. 7486 | Email: Arif.Shahzad@burlington.ca

Re: **Appleby Creek Erosion Control Project, City of Burlington**
Schedule B Municipal Class Environmental Assessment
Project File Report

Dear Trevor,

Please find below the responses to the MECP's comments on the Appleby Creek Erosion Control EA from Lake Ontario to South Service Road, which was submitted in draft format for review. The project file is updated to coincide with the responses.

Should you require any further information or discussion regarding this response letter, please do not hesitate to contact the undersigned.

Sachet Siwakoti, MASc., P.Eng.
Aquafor Beech Limited
Siwakoti.s@aquaforbeech.com

Rob Amos, MASc, P.Eng.
Aquafor Beech Limited | Project Manager
Amos.r@aquaforbeech.com

#	MECP Comment (August 10, 2020)	Aquafor's Responses (August 20, 2020)
1.	A parallel project (Appleby Creek Flood Mitigation EA) was completed in 2019. The report indicated that hydrologic/hydraulic models developed from the flood mitigation project were used to simulate the streamflow conditions for this EA under 2-year to 100-year and Regional storm events. Although the current EA is mainly focused on erosion control and river channel instability issues, it would be helpful if the EA could clarify whether the implementation of these recommended projects would result in any changes to these simulated streamflow rates orthe streamflow regime for both low flow and high flow events/seasons; especially it is noted that the recommended projects will remove several concrete weirs on the stream which were installed many years ago.	The implementation of these recommended projects would not result in any changes to the stream flow rates or stream flow regime.
2.	It is recommended that Section 5.2 of the report include a discussion on potential impacts of the proposed projects on the creek water quality during the construction, together with the proposed mitigation measures.	Section 5.2.6 on potential impacts of the proposed projects on the creek water quality during the construction, along with mitigation measures is added to the project file.
3.	Figure 3.3 of the report shows that there are about 37 stormwater outfalls located within the study area. Based on the report, much development in this area occurred prior to the early 1980s which pre-dates the use of stormwater management techniques. Since uncontrolled stormwater discharge would generally cause river channel erosion problem, we would like to know if any erosion site/issue identified in this project is related to the stormwater/outfall discharge. In this regard, please also clarify if the City has a stormwater masterplan prepared to resolve any stormwater discharge related erosion problems in order to prevent future erosion.	The erosion sites identified in this project are not related to the stormwater/outfall identified in the project.
4.	Finally, please also be advised that, during the construction phase, if a project requires construction dewatering other than surface water diversion, a Permit to Take Water (PTTW) or EASR registration may be required for taking/pumping water over 50,000 litres per day. Guideline documents for Permit to Take Water or EASR registration can be found directly from the MOECP website. If the construction includes the discharge of any collected water from the dewatering activities into a surface watercourse, or a stormwater sewer that directly discharges into a surface watercourse, appropriate treatment and control/ mitigation measures shall be prepared to ensure that the proposed discharge will not result in any undesirable impact on the receiving waters.	Noted.

#	MECP Comment (August 10, 2020)	Aquafor's Responses (August 20, 2020)
General Comments		
1.	As indicated in the PFR, the final implementation of the recommended projects may require further Schedule B Class EAs. Considering that details of these projects have not been provided and finalized at this stage, it is recommended that further MECP review of these proposed projects be required during the detailed design or when the EA studies for each proposed project are completed.	Noted. MECP will be consulted during the detailed design for each proposed project.
2.	Page 10 of the report refers to Section 0 in two locations, please clarify where to find the section in the report.	The Project File is updated accordingly.
3.	Please note that MECP has taken over responsibility for administering the Endangered Species Act (ESA). For consultation regarding potential permit requirements for species at risk, please contact SAROntario@ontario.ca.	Noted.

Appendix F9 –

Notice of Study Completion from Jennifer Lawrence and Associates

August 7, 2020

Mr. Arif Shahzad
City of Burlington
426 Brant Street
P.O.Box 5013
Burlington, ON
L7R 3Z6

Mr. Rob Amos
Aquafor Beech Ltd.
6-202 2600 Skymark Avenue
Mississauga, ON
L4W 5B2

Dear Mr. Shahzad and Mr. Amos:

Re: Notice of Study Completion
Appleby Creek Erosion Control Class Environmental Assessment
City of Burlington

Thank you for providing the Notice of Study Completion for the above noted EA. We appreciate having the opportunity to meet with City and Conservation Halton staff during the EA process to discuss options in relation to the creek block associated with Erosion Site 7B and we look forward to continued discussions as part of a future redevelopment proposal for the Oval Court lands.

We note that Section 4.4.4 includes details with respect to the Oval Court landowners and Appendix F includes two letters (March 18, 2019 and June 7, 2019) from the Oval Court Study Team. A third letter, dated October 18, 2019 was also provided as part of the correspondence between the City and Oval Court Study Team. A copy of that letter is enclosed for reference. We recommend it would be appropriate to include a copy of this letter in Appendix F as well, for a complete documentation of the discussions that took place.

In addition, minutes from the December 12, 2019 agency meeting are included in Appendix F however, comments were received from Conservation Halton on the draft meeting minutes. The final minutes, that incorporate the recommended revisions by Conservation Halton, have also been attached to this letter. We recommend it would be appropriate to replace the December 12, 2019 meeting minutes in Appendix F with the attached revised meeting minutes.

Finally, we appreciate the findings from the fieldwork and the associated ELC mapping. We look forward to providing more detailed, site-specific natural heritage feature mapping for the Oval Court lands/Appleby Creek valley that will also incorporate the woodland dripline as staked by the Region of Halton.

[p] 289.442.2829 [w] jlplanning.ca [e] jennifer@jlplanning.ca
8 Fieldgate Street Dundas ON L9H 6M6

We trust the above is of assistance. If you require any additional information, please contact the undersigned.

Yours truly,



Jennifer Lawrence, MCIP, RPP
President

encls. (2)

cc: Ms. Emma DeFields, Conservation Halton
Mr. Thomas Kastelic, Branthaven
Mr. Ken Ursic, Ms. Shelley Gorenc, Beacon Environmental
Mr. Andrew Fata, Mr. Jeff Ormonde, Beacon Environmental

urbantech

October 18th, 2019 **Project:** 18-580

Mr. Rob Amos
Aquafor Beech Ltd.
6-202 2600 Skymark Avenue
Mississauga, ON
L4W 5B2

Mr. Arif Shahzad
City of Burlington
426 Brant Street, P.O. Box 5013
Burlington, ON
L7R 3Z6

Re: Appleby Creek Flood Mitigation and Erosion Control Class EAs
City of Burlington, Regional Municipality of Halton

Dear Mr. Amos and Mr. Shahzad:

Upon review of the Appleby Creek Erosion Control Environmental Assessment, the Urbantech and Jennifer Lawrence and Associates' joint memo dated March 18th, 2019 was only referenced in Section 4.4.4 and Appendix F of the report. We met with City and CH staff on April 5th, 2019 to discuss our technical memo dated April 1st, 2019 with the impression that the details would be reflected within the Environmental Assessment. Additionally, an amended memo dated June 7th, 2019 was circulated to your attention but was not referenced within the report.

We believe that the Draft EA document should be revised to reflect the hydraulic modelling, corridor reconfiguration and Fairview Street crossing structures design analysis developed by Urbantech. Further, as described in the sections below, we have noted missing information and inconsistencies that we believe should be addressed before finalizing the EA report.

Erosion Site 7 – Preferred Design Alternative

The Draft EA identifies the watercourse corridor adjacent to Oval Court as Erosion Site 7, Priority #4 and recommends comprehensive reach-based works to address existing issues of erosion. Sections 4.1.7 and 4.5 of the Draft EA state that integrated channel widening between Fairview Street and the Metrolinx lands would allow for flood relief which ties into the Appleby Flood EA recommendations. However, the preliminary design drawing provided in Appendix G of the Draft EA does not appear to show this proposed watercourse corridor widening, as all of the works are shown within the City's existing corridor. The Draft EA should provide a clearer connection between text recommendations and preliminary design drawings.

Section 4.5 of the Draft EA spoke to the preferred design alternative, which would include the installation of bank and bed protection works, including removal of existing failing / failed gabion baskets, installation of armour stone retaining wall and round stone riffle-pool features, along with retrofit of existing storm outfall into the restorative bank works. Removal/remediation of the gabion weir structure was not mentioned and, as previously noted, the preliminary design drawing provided

Urbantech Consulting, A Division of Leighton-Zec Ltd.
3760 14th Avenue, Suite 301 Markham, Ontario L3R 3T7
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www.urbantech.com

in Appendix G does not appear to show this proposed watercourse corridor widening and does not speak to any of the proposed design solution details outlined in Urbantech's April and June memorandums.

Similarly, Section 7.1 of the Draft EA states that conceptual designs have been prepared for the preferred alternatives at each erosion site, however there was no further detail regarding these designs beyond those stated in Section 4.5 are mentioned within the report and no mention is made of the Urbantech detailed designs provided in both April and June memorandums. While a typical for the corridor cross-section was provided in the public consultation appendix, Appendix G should provide a cross-section for the corridor based on the existing topography.

The Executive Summary identifies an estimated cost of $1.19 million to address the reach-based works, while Table 5-1 shows an estimated cost of $2.5 million. Please correct this inconsistency.

Fairview Street Structures

As detailed in the April 1st, 2019 memo, Option 4B removed floodplain areas from the subject properties but did not achieve flood free access and egress to the intersection of Oval Court and Fairview Street which would limit the redevelopment options for the lands. Further to our April 2019 memo, our June 2019 memo summarized additional analysis undertake to refine and optimize Option 4B (referred to as Option 4D) and determine the type and size of structure that would be the most appropriate for the Fairview Street crossing. As such, Option 4D (see June 2019 memo) described herein is recommended as the preferred option for any improvements to Appleby Creek Erosion Site 7.

The preferred sizing of structures for Fairview Street that resulted from numerous iterations of Option 4D within the HEC-RAS model resulted in three concrete box culvert structures (one larger centre culvert and two relief culverts). The centre culvert has dimensions of 6.4 m x 2.1 m and would be set at a lower elevation (upstream invert = 97.28 m; downstream invert = 97.14 m), to contain the bankfull channel of Appleby Creek with the addition of natural substrate and small benches at either side of the culvert.

The two additional relief culverts are proposed on either side of the larger centre culvert and would be 3.9 m x 1.8 m in size, installed at a higher elevation, (upstream invert = 97.58 m; downstream invert = 97.44 m). These relief culverts would not only facilitate additional hydraulic conveyance to provide flood free access to Fairview Street under Regional Storm conditions but would also serve to benefit the creek system from an ecological perspective by providing wildlife passage under the road and accommodating the width of the bankfull channel in the larger centre culvert.

An additional benefit to the box culverts includes a minimized/reduced requirement for bedding over top of the culvert given the enhanced structural integrity of the box culverts versus a span structure. Note, all culvert obverts match and the length and slope are the same for each culvert (29 m and 0.5%, respectively). See **Figure 1** below for the upstream and downstream cross-sections for the crossing of Reach 6. Cross section details for entire channel are included at the end of this report.

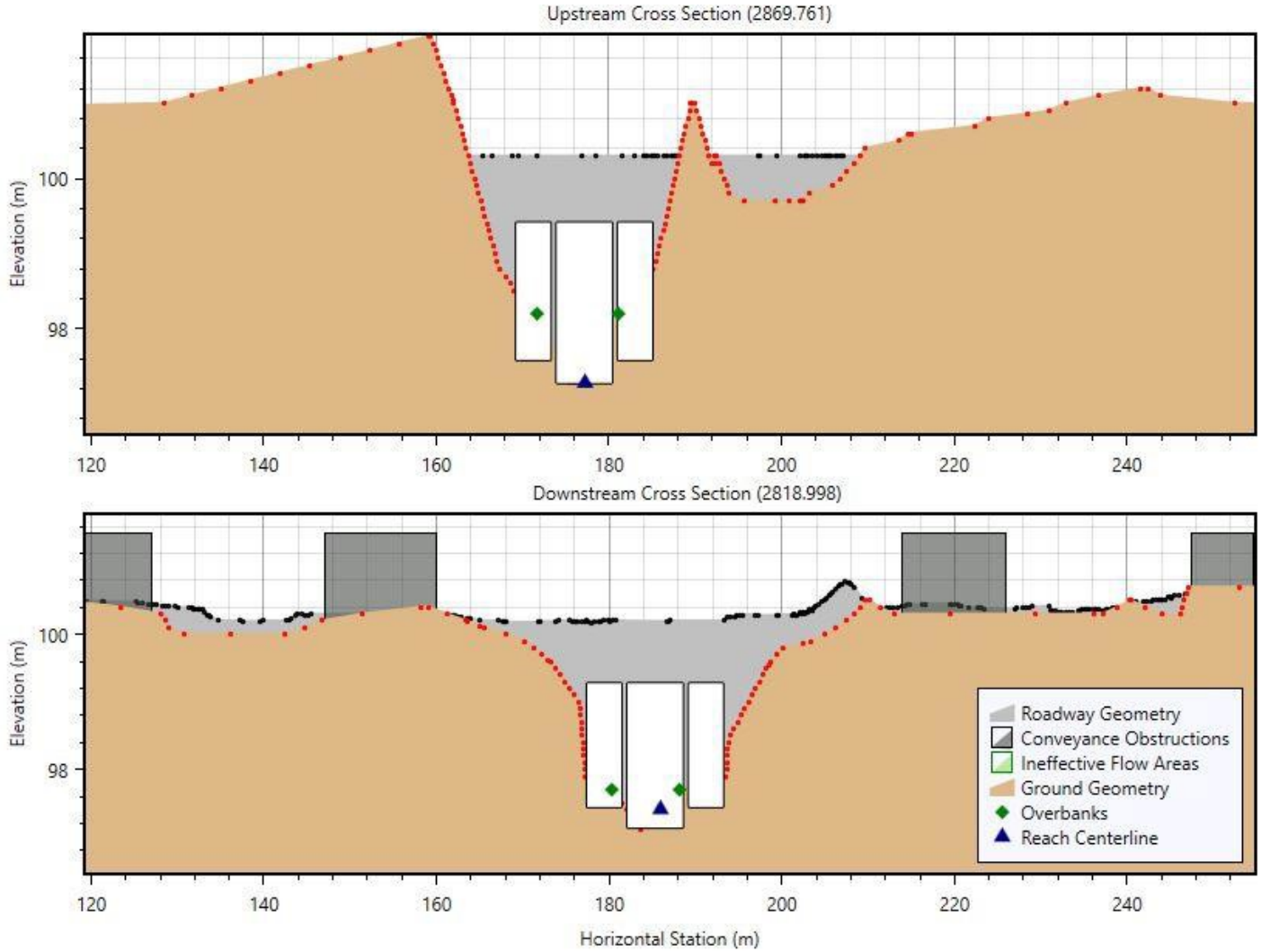


Figure 1: Upstream / Downstream Cross-Section of Culverts

The 17 m bridge structure originally proposed in the Flood Mitigation EA was assessed by Urbantech through this modelling exercise and was deemed to be sub-optimal from a hydraulic performance perspective due to the thickness of the bridge deck (0.8 m depth). Also, installation of footings for the abutments would impact the shallow depth of the existing 900 mm diameter sanitary sewer which is estimated to be at elevation 96.17 m (to be verified). The proposed box culverts eliminate the need for footings as they can be installed onto compacted bedding material. This affords a higher level of protection to the existing sanitary sewer as well.

The final results from the optimized hydraulic model are summarized in **Table 1** below and are compared against the existing conditions model (Option 1B from the April 1st, 2019 memo).

Table 1 – Comparison of Options 1B and 4D

WSEL (masl)			
Station	**1B (Existing Conditions)**	**4D (Proposed 3 Culverts)**	**Difference (m)**
3223.566	105.29	105.29	0.00
3206.556	104.80	104.80	0.00
3186.542	Culvert	Culvert	Culvert
3146.411	103.07	102.69	-0.38
3122.614	103.14	102.67	-0.47
3057.861	102.32	102.09	-0.23
2992.953	102.06	101.73	-0.33
2967.573	102.25	101.35	-0.90
2932.249	101.30	100.94	-0.36
2910.239	100.76	100.71	-0.05
2893.629	101.18	100.53	-0.65
2869.761	101.14	100.28	-0.86
2845.459	Culvert	Culvert	Culvert
2818.998	99.91	99.91	0.00
2798.804	99.46	99.46	0.00

Please see **Figure 2** below and **Drawing FPM-08** for the extent of the updated floodplain.

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www.urbantech.com

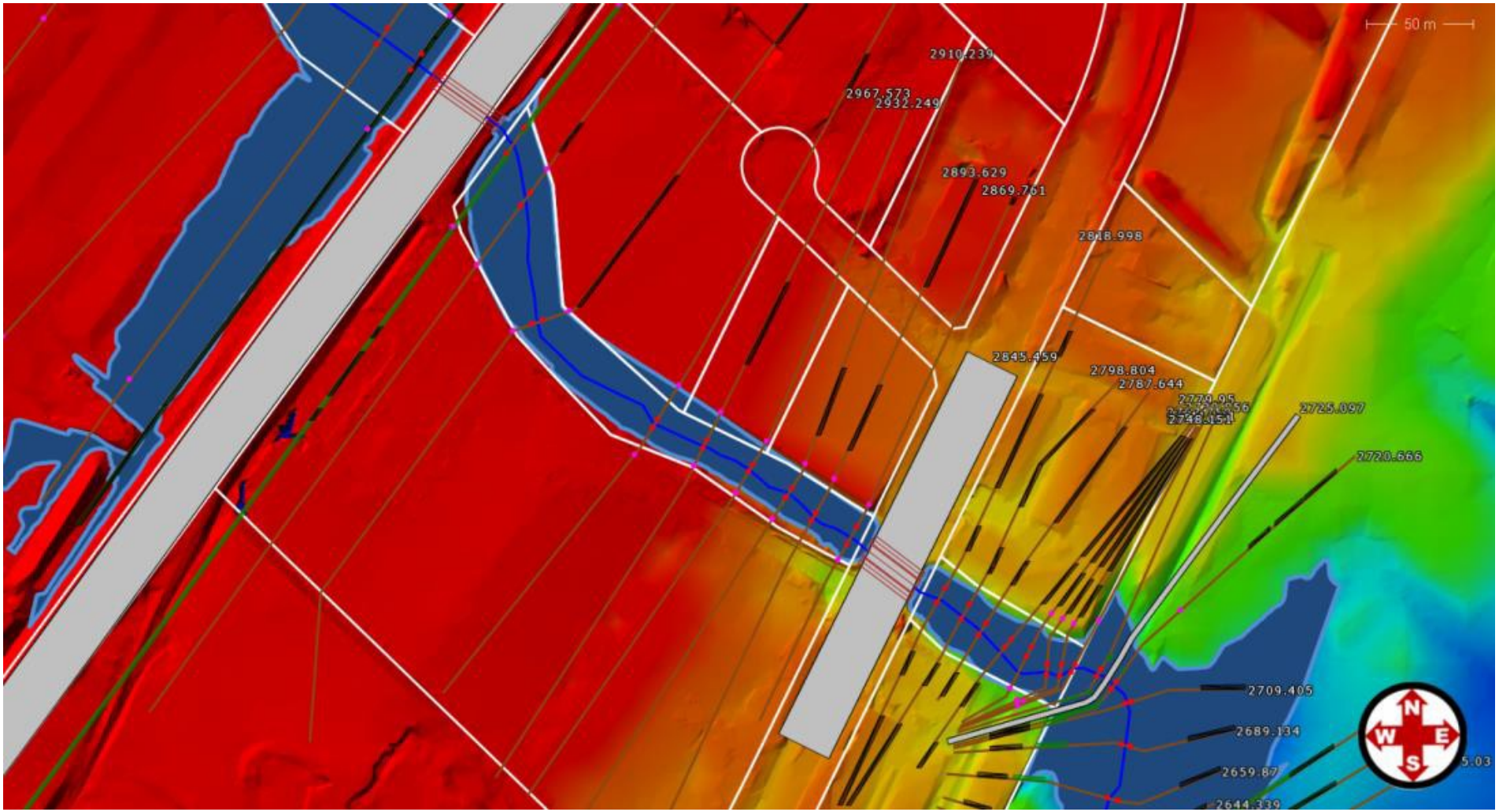


Figure 2: Extent of Floodplain for Scenario 4D

As noted in the **Table 1**, **Figure 2** and **Drawing FPM-08**, Option 4D allows for the floodplain to be contained in the reconfigured channel corridor and achieves flood free access and egress for Fairview Street and the subject properties.

It is worth noting that the model is sensitive to the use of ineffective flow areas for the Fairview Street crossing and produced unreasonable results under a number of flow conditions and in some instances resulted in an 85% reduction in flow capacity when ineffective flow areas were applied. The culvert performance was tested and validated using other models and culvert analysis tools to confirm hydraulic capacity under the proposed flow conditions and to provide additional confidence in the HEC-RAS results. It was determined that the model results were not consistent with expected conveyance through the culvert when ineffective flow areas were assigned in this particular location; therefore, it is recommended that they be removed from the Fairview Street crossing, particularly if Option 4D is pursued. Further refinements in the model will be completed during detailed design.

CAD Drawings

The CAD drawings provided with this letter indicate the recommended revised property limits to accommodate a slightly larger and wider channel to accommodate the Regional Storm flood plain associated with Appleby Creek north of Fairview Street. The proposed corridor design north of Fairview Street assumes 3:1 side slopes and alteration of the east overbank areas in addition to a wider bottom width for the south portion of the corridor between Fairview Street and the existing pedestrian bridge. You will note that the west side of the channel north of Fairview Street was assumed to be marginally altered (i.e. no alteration of slope and minimal alteration of overbank areas between the west toe of slope and the low flow channel). This assumption has produced conservative results in the hydraulic model. Should Aquafor Beech and the City apply an armour stone treatment to the west side of the corridor with some minor slope modifications, there would be ample opportunity to improve the overbank conditions within the channel corridor. This would result in additional hydraulic efficiencies for storage and conveyance of flood flows.

Property Impacts

As discussed in the previous memo, the existing conditions Regional Storm floodplain (Option 1B) extends onto the properties at 720 and 740 Oval Court and floods across Fairview Street, preventing safe access and egress under flood conditions. The corridor concept recommended under Option 4D accommodates the floodplain within the corridor, completely removes floodplain areas from both of the Oval Court properties, and prevents flooding of Fairview Street, thus facilitating safe access and egress to the Oval Court/Fairview Street intersection. Floodplain and property area totals have been summarized in **Table 2** below and on **Drawing FPM-08** with the recommended areas for dedication (by property) necessary to accommodate the floodplain within the corridor.

Urbantech Consulting, A Division of Leighton-Zec Ltd.
3760 14th Avenue, Suite 301 Markham, Ontario L3R 3T7
TEL: 905.946.9461 FAX: 905.946.9595
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Table 2 - Summary of Property Area Totals for Preferred Option 4D

Property	Ex. Lot Area (ha/ac)	Ex. Floodplain Area (ha/ac)	Recommended Dedication for Proposed Channel/ Floodplain Area (ha/ac)	Proposed Lot Area (ha/ac)	Development Area* (ha/ac)
740 Oval Court	1.3737 / 3.3945	0.0096 / 0.0236	0.0275 / 0.0680	1.3462 / 3.3265	1.2190 / 3.0122
720 Oval Court	0.4119 / 1.0178	0.1042 / 0.2575	0.0316 / 0.0781	0.3803 / 0.9397	0.3476 / 0.8589
5135 Fairview Street	0.4640 / 1.1466	0.0001 / 0.0002	0.0241 / 0.0596	0.4399 / 1.0870	0.3961 / 0.9788

*Development Area = Proposed Lot Area - 7.5m Buffer Area

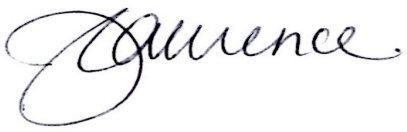
The development area totals provided in the last column of the above table highlight the area within the property available for future development once a 7.5 m setback is applied to the property. While this setback will not be required through the EA process, this requirement will be triggered through the planning applications associated with the redevelopment of the properties. This 7.5 m setback along the creek corridor will likely require dedication of this setback/buffer block to the City. The 7.5 m setback line has been depicted on **Drawing FPM-08** with a dashed line to assist with visualizing the property impacts of this future requirement.

Appleby Creek Erosion Mitigation Class Environmental Assessment Recommendations

As noted in our correspondence of January 21st, 2019, we recommend that, as part of the Erosion Control Class EA, the City continue to work with the adjacent landowners to assess alternatives that include widening of the watercourse corridor along this reach in order to reduce the amount of erosion and to reduce the long-term infrastructure costs to the City associated with maintaining erosion control measures (i.e. gabion or armour stone walls). The extent of corridor widening should be examined in conjunction with the flood plain works mentioned above in order to maximize the benefit of effectively managing the natural hazards associated with the corridor, i.e. erosion reduction/mitigation, flood plain reduction and/or containment, and optimizing/maximizing the tableland areas made available for re-development as part of the Mobility Hub. The corridor and culvert design option described herein is recommended as the preferred option for any improvements to Appleby Creek within Erosion Site 7.

Yours truly,





David Hoover, B.A.Sc., P.Eng.
Water Resources Engineer, Urbantech

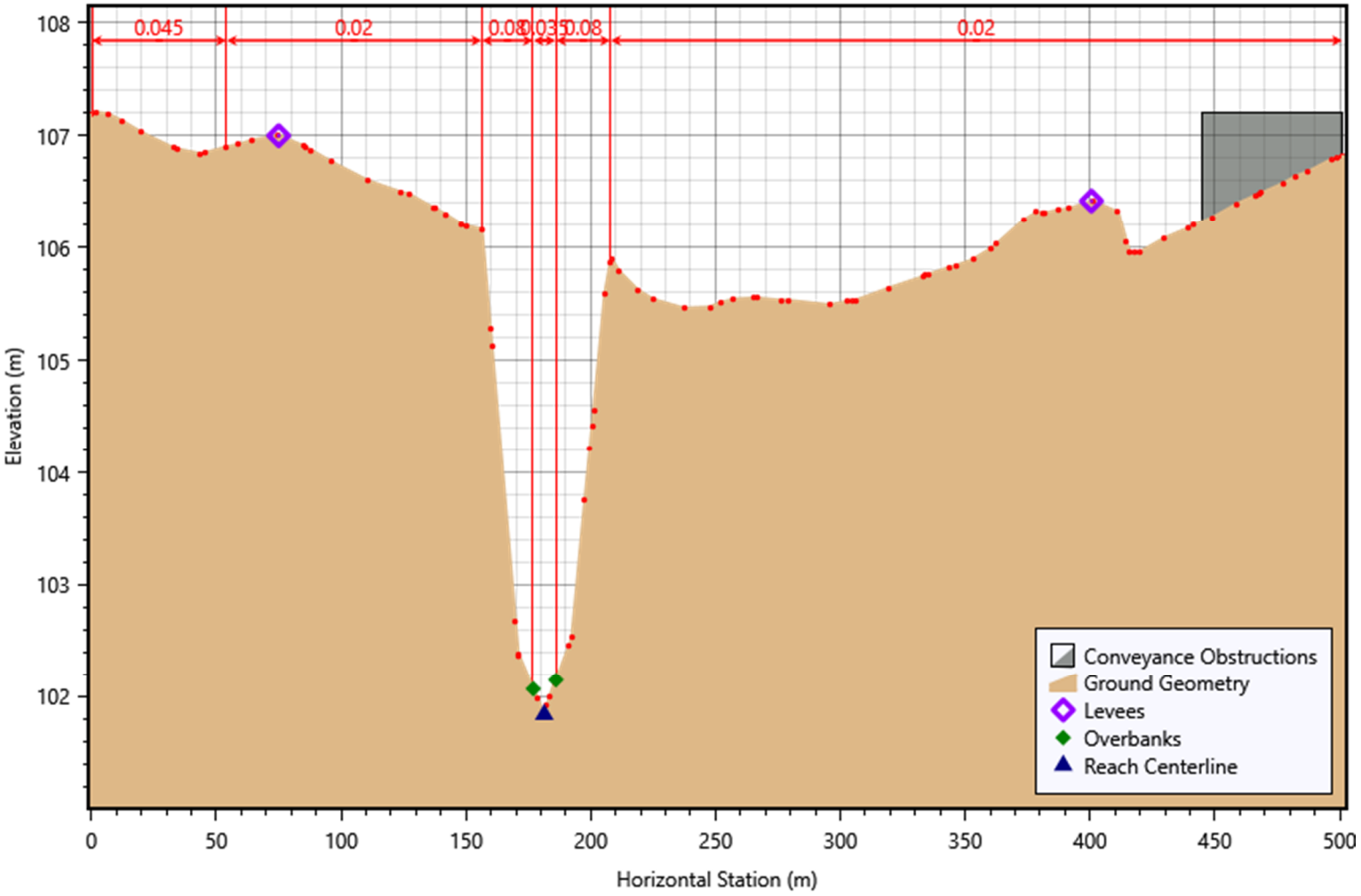
Jennifer Lawrence, MCIP, RPP
President, Jennifer Lawrence and Associates

Encl.

cc: Mr. G. Hansen, Mr. D. Civiero, Hodero Holdings
Mr. A. Semper, Mr. A. Eldebs, Branthaven Development Corp.
Mr. T. Korsiak, Korsiak Planning
Ms. Rosa Bustamante, Mr. Kyle Plas, City of Burlington

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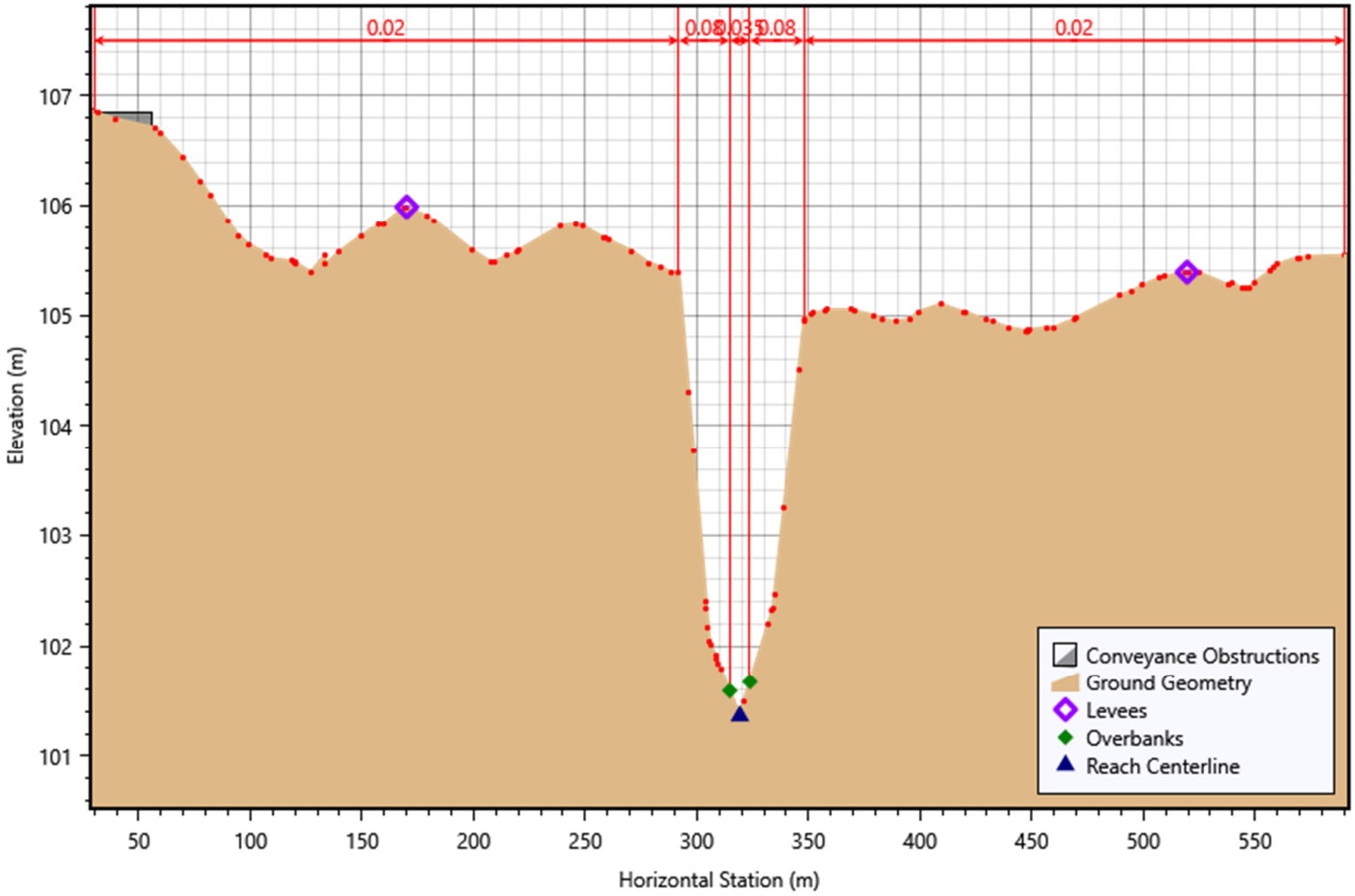
Cross-Section 3265.256



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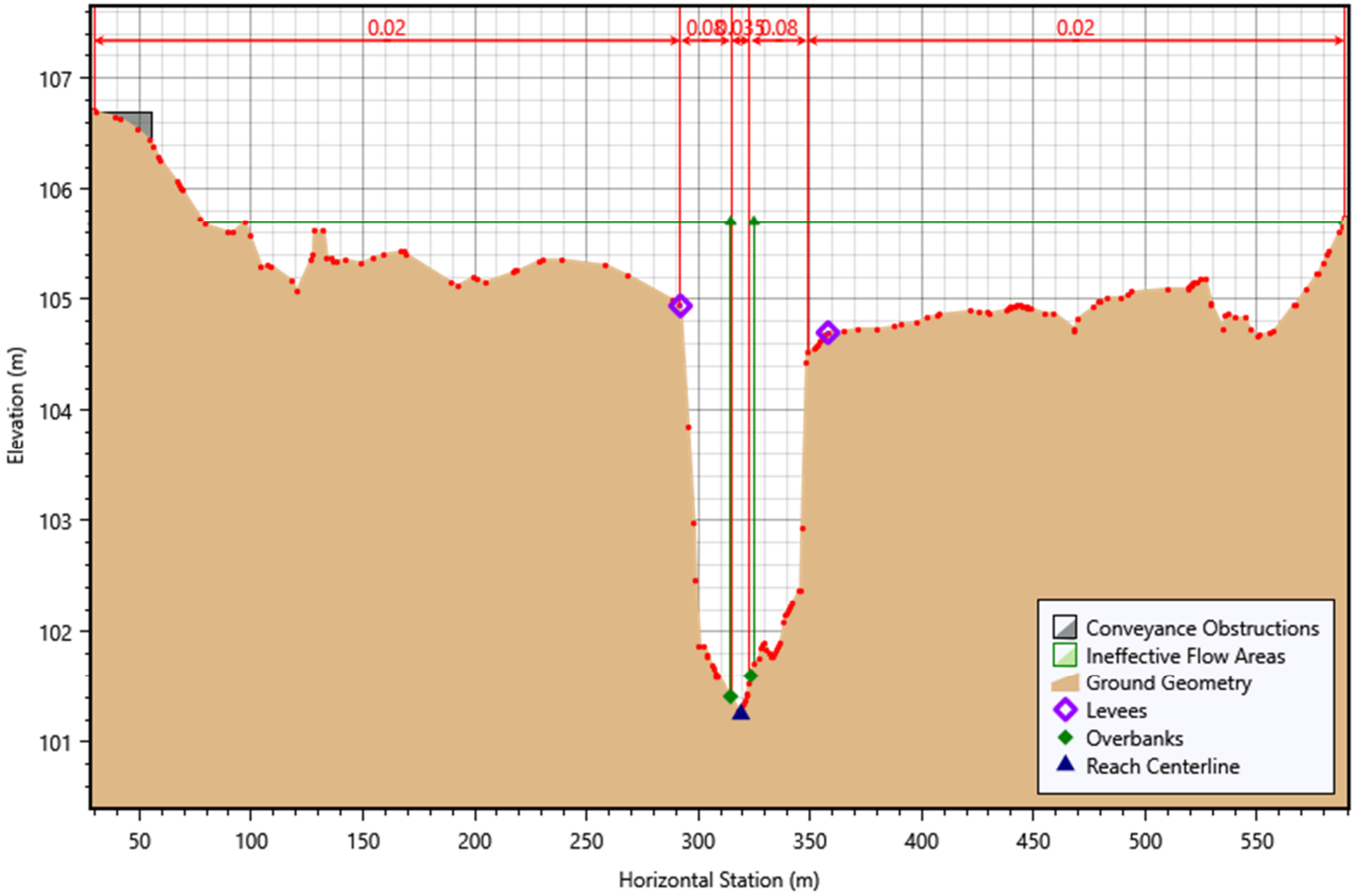
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Cross-Section 3223.566



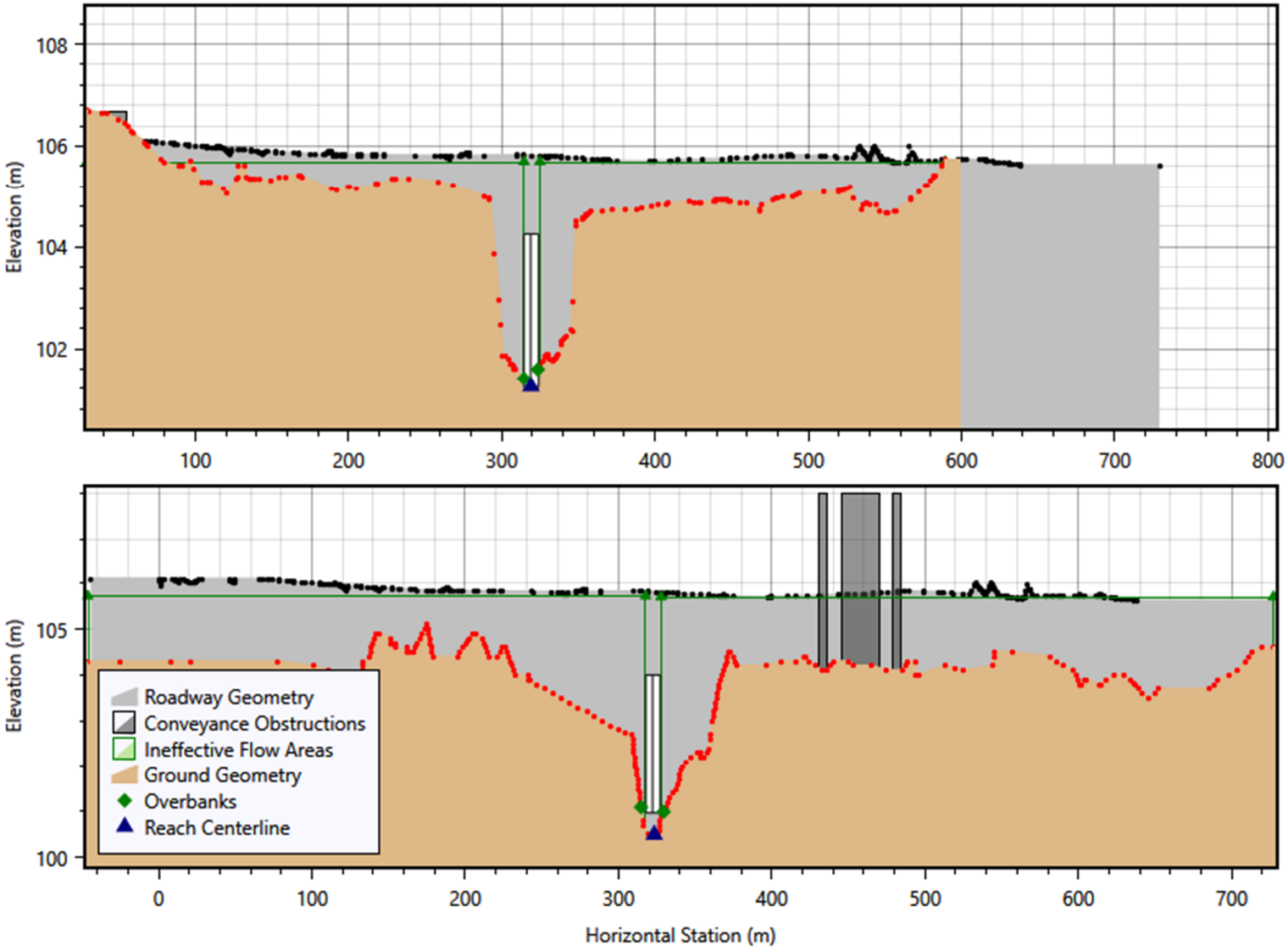
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Cross-Section 3206.566



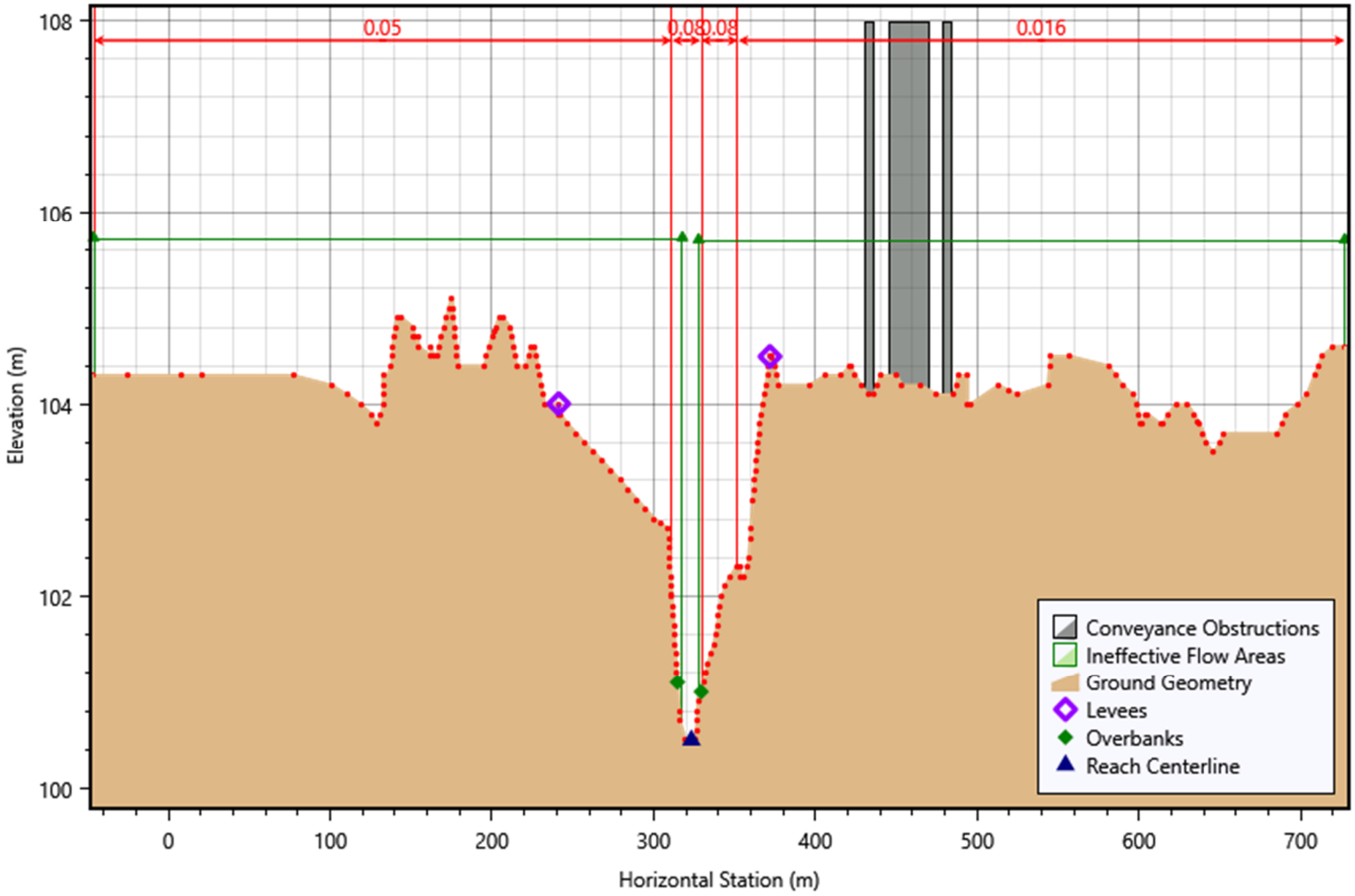
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Cross-Section 3186.542 Upstream and Downstream Culvert



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Cross-Section 3146.411



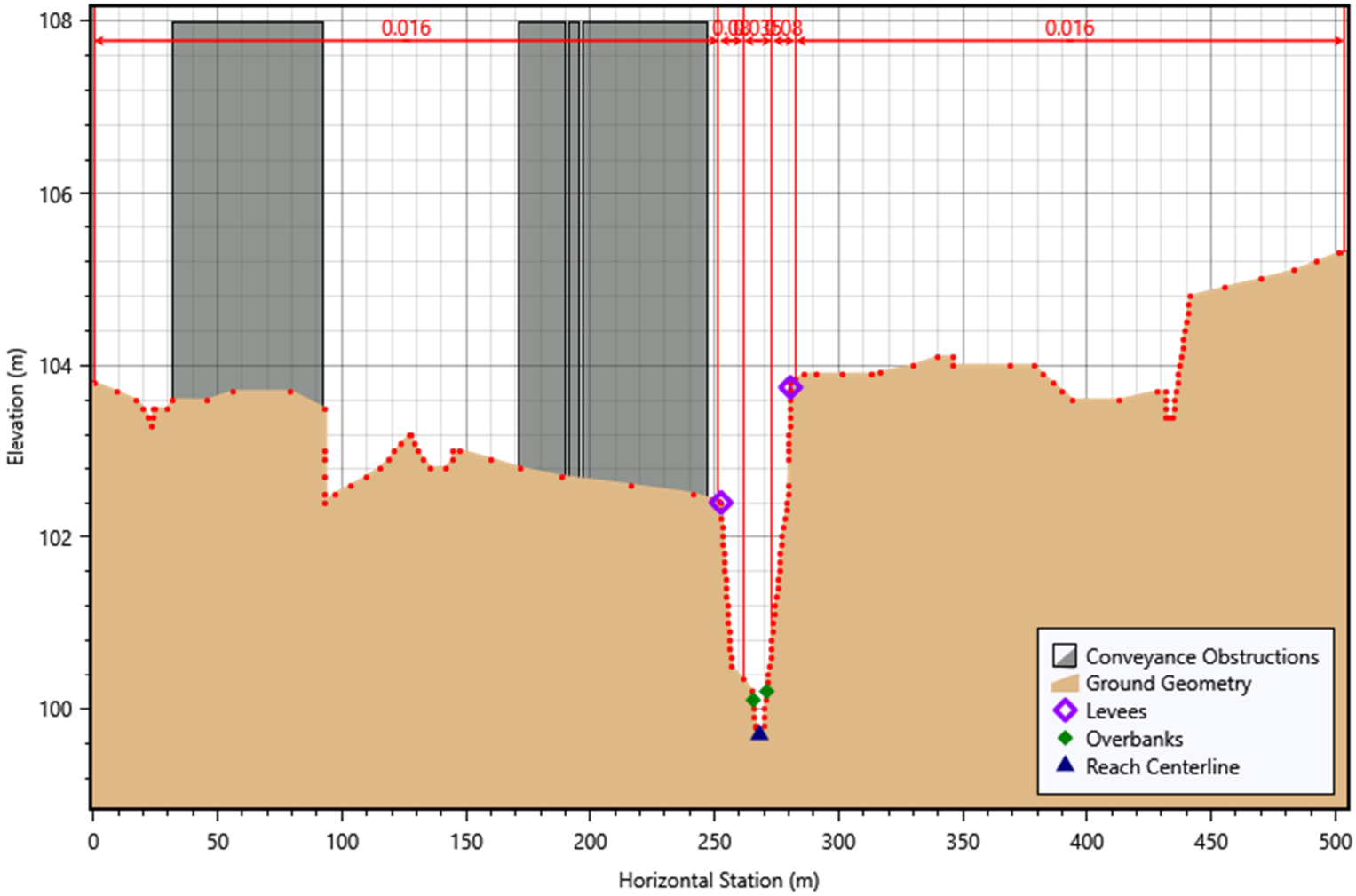
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Cross-Section 3122.614



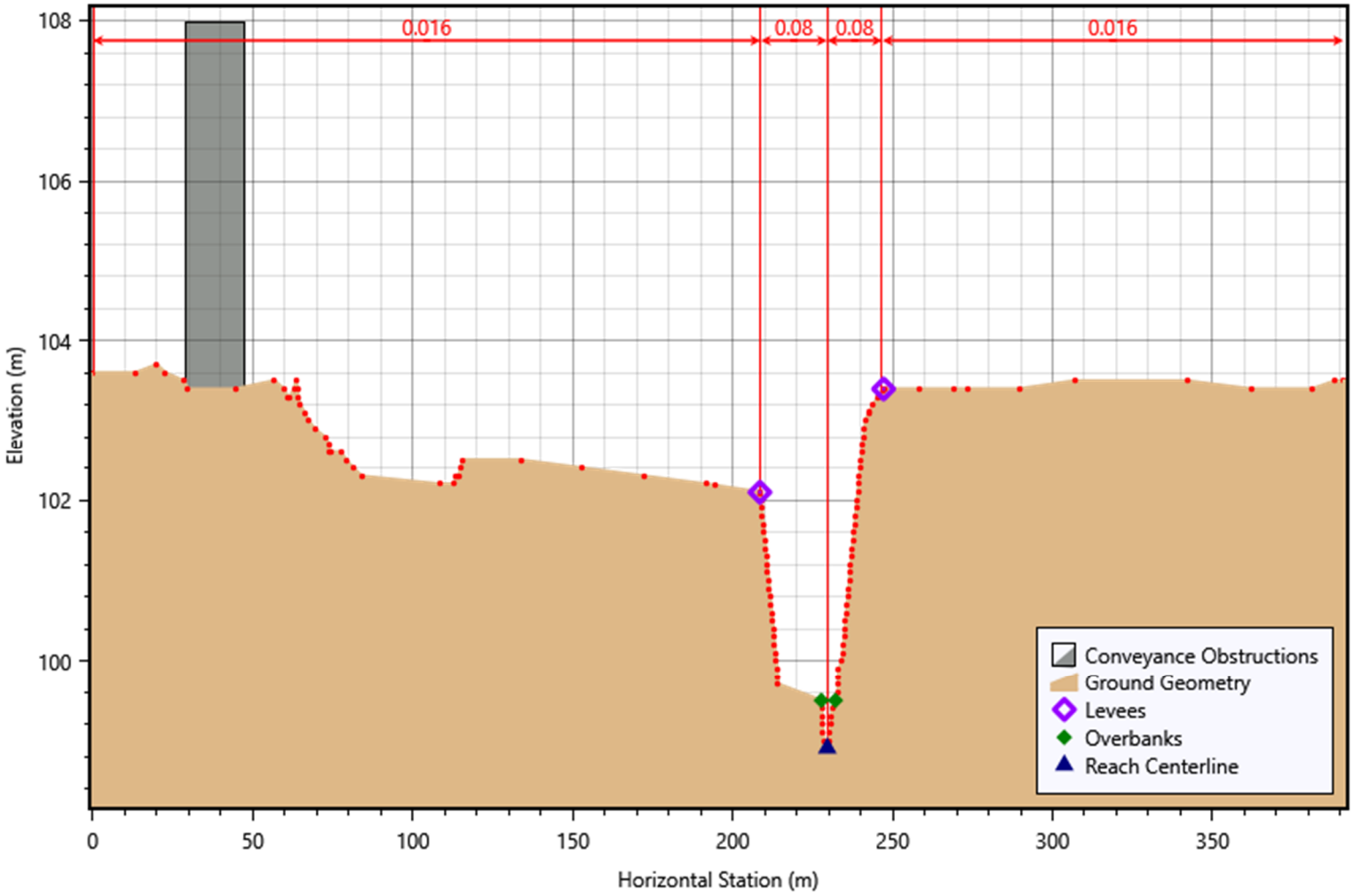
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Cross-Section 3057.861



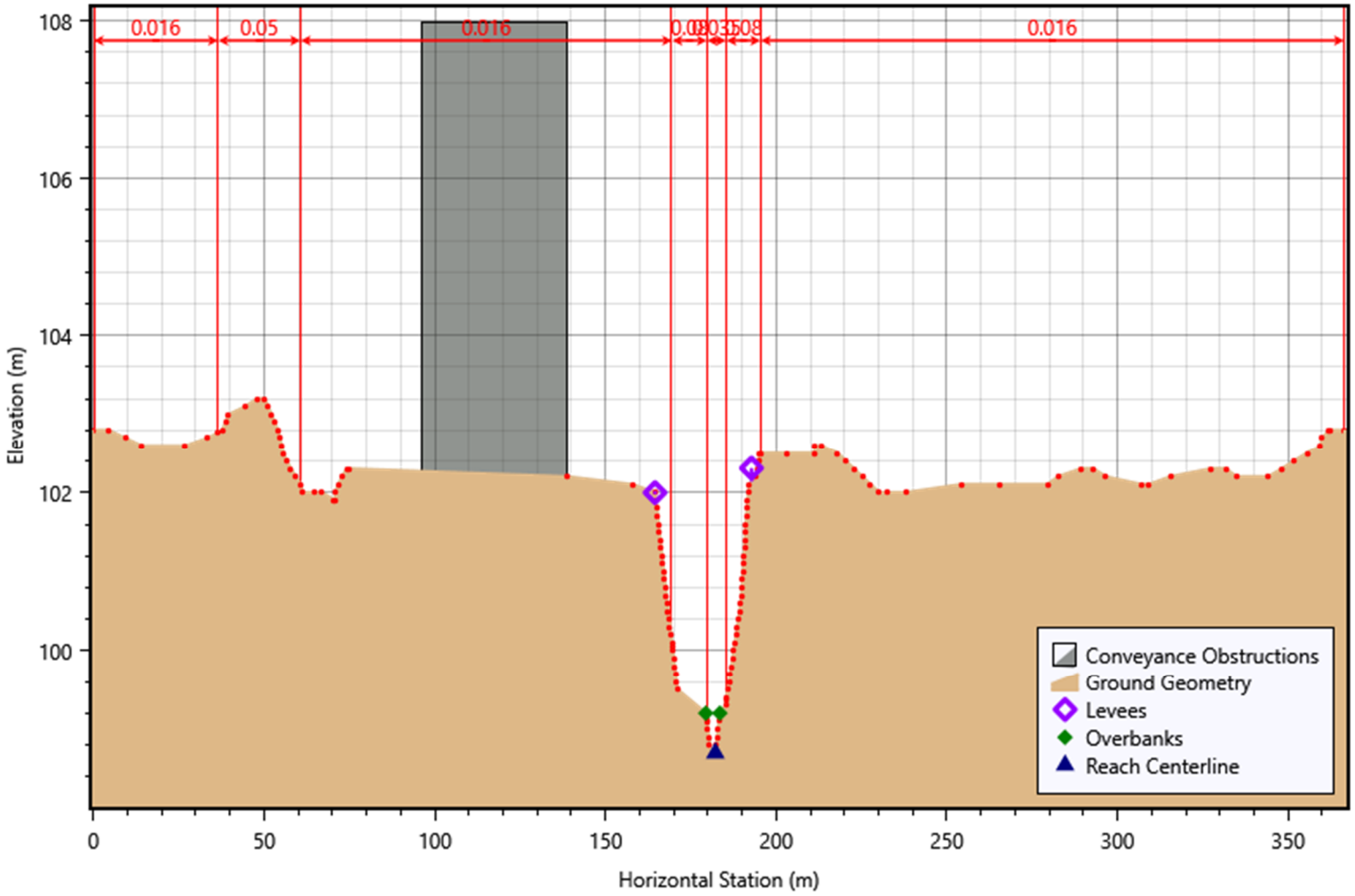
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Cross-Section 2992.953



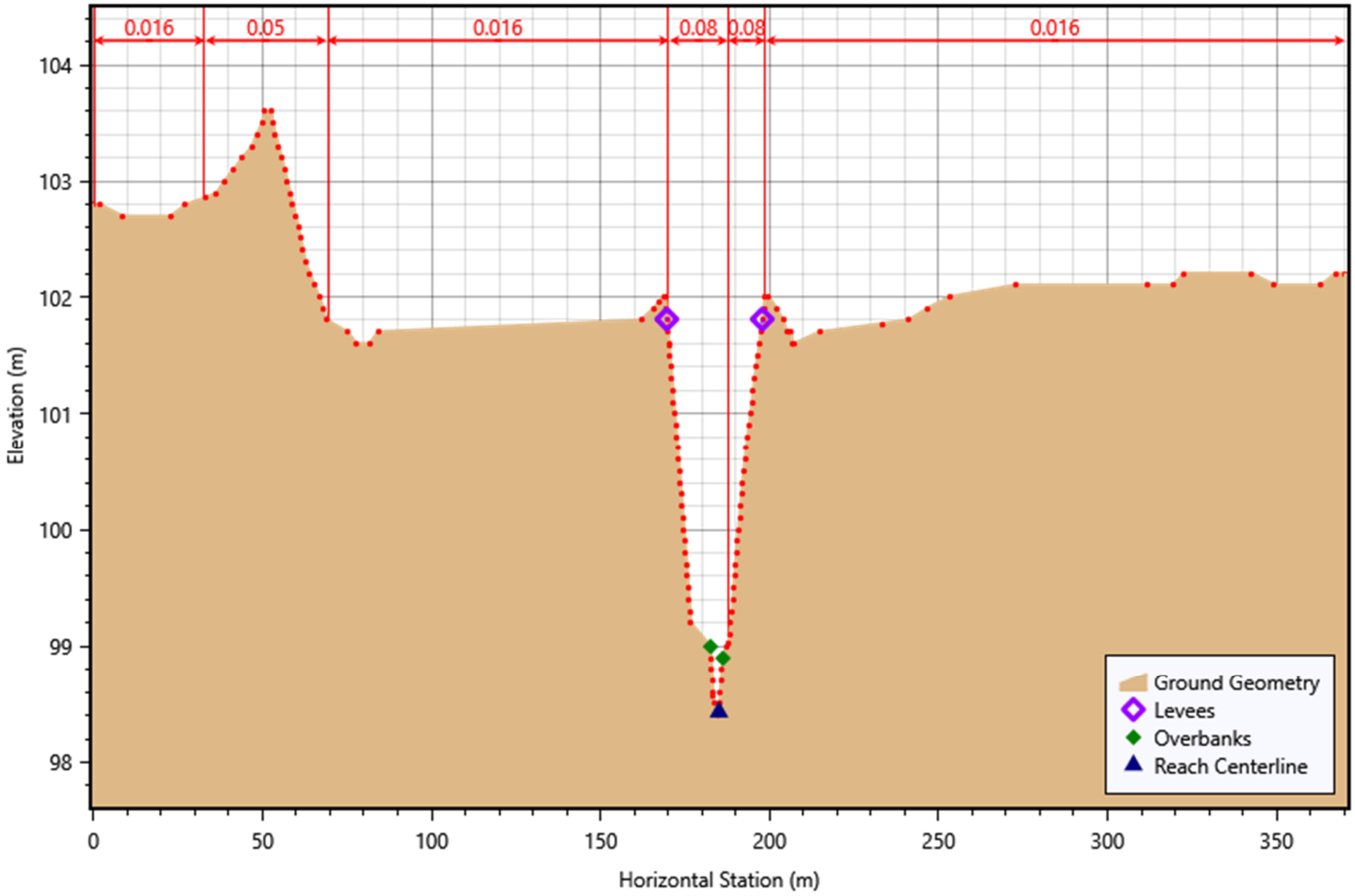
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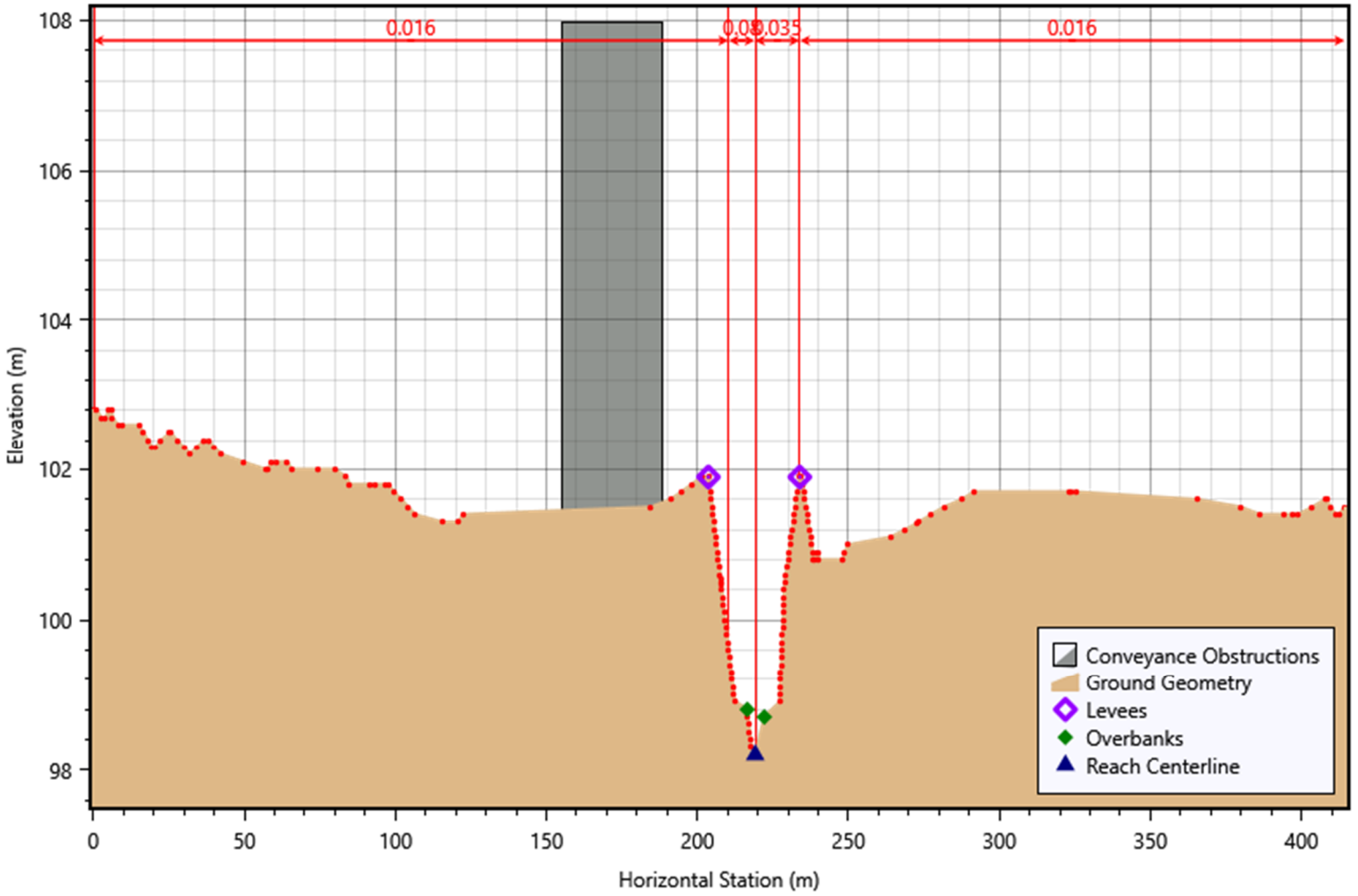
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Cross-Section 2932.249



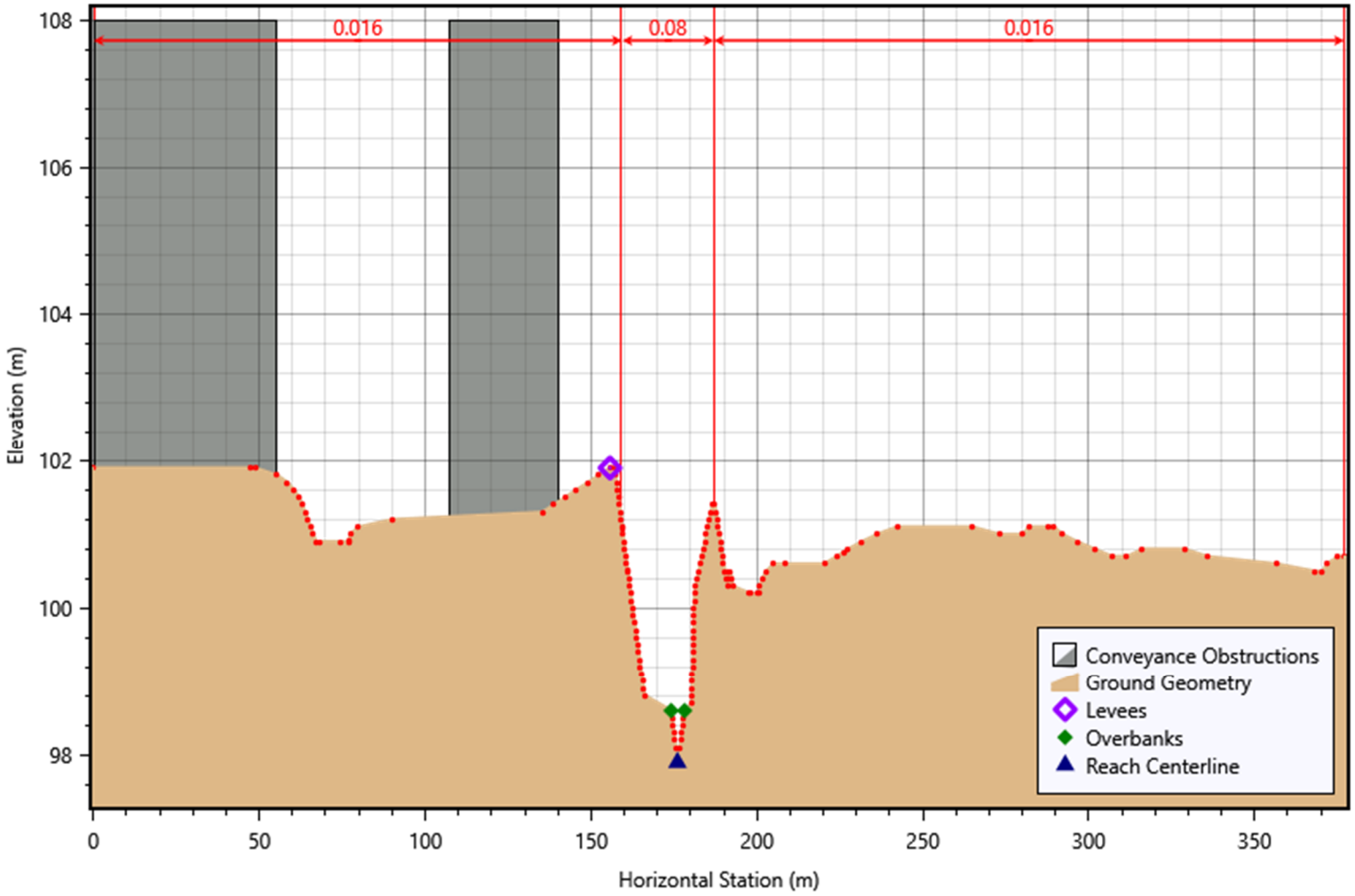
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Cross-Section 2910.239



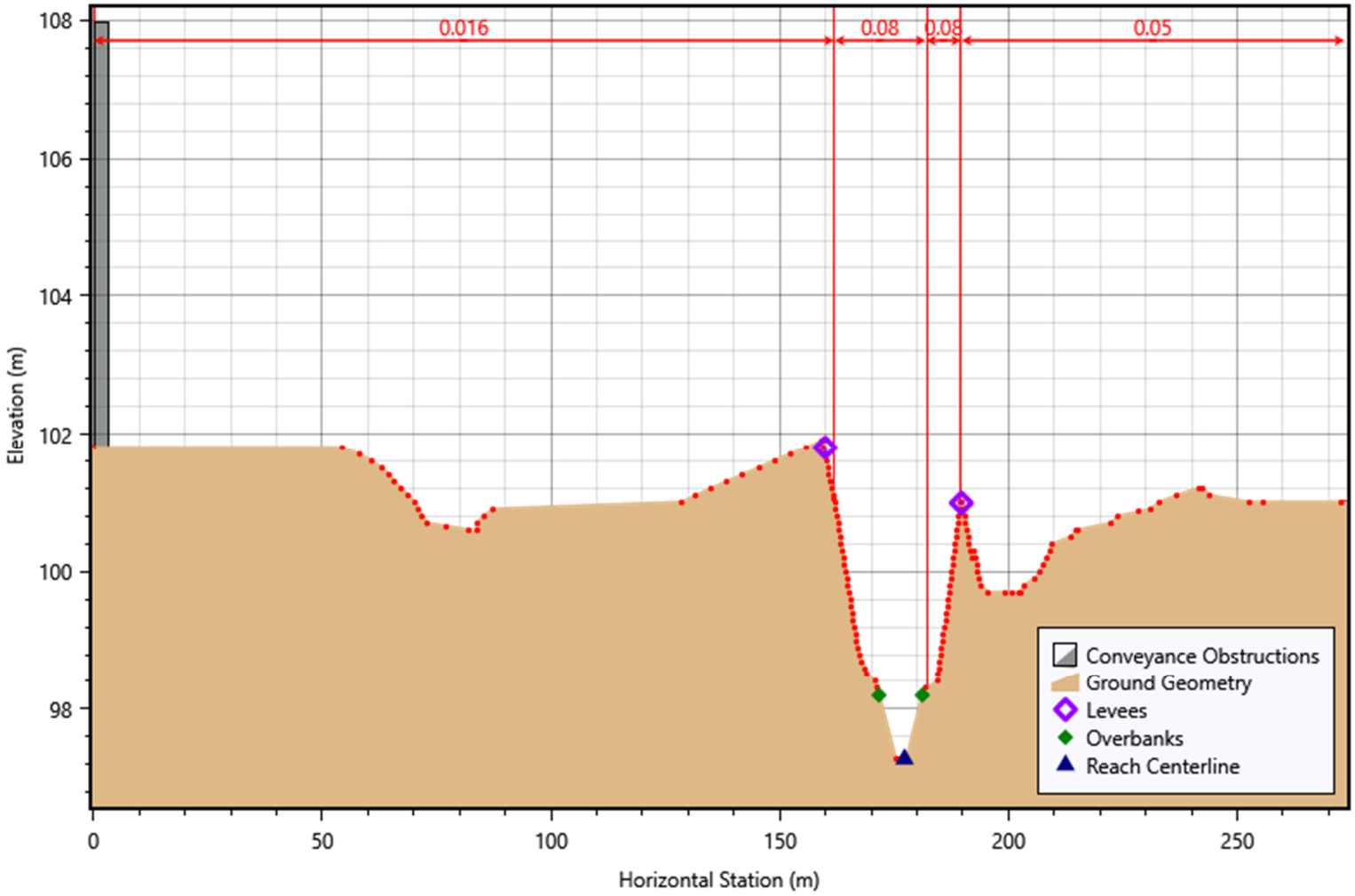
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Cross-Section 2893.629



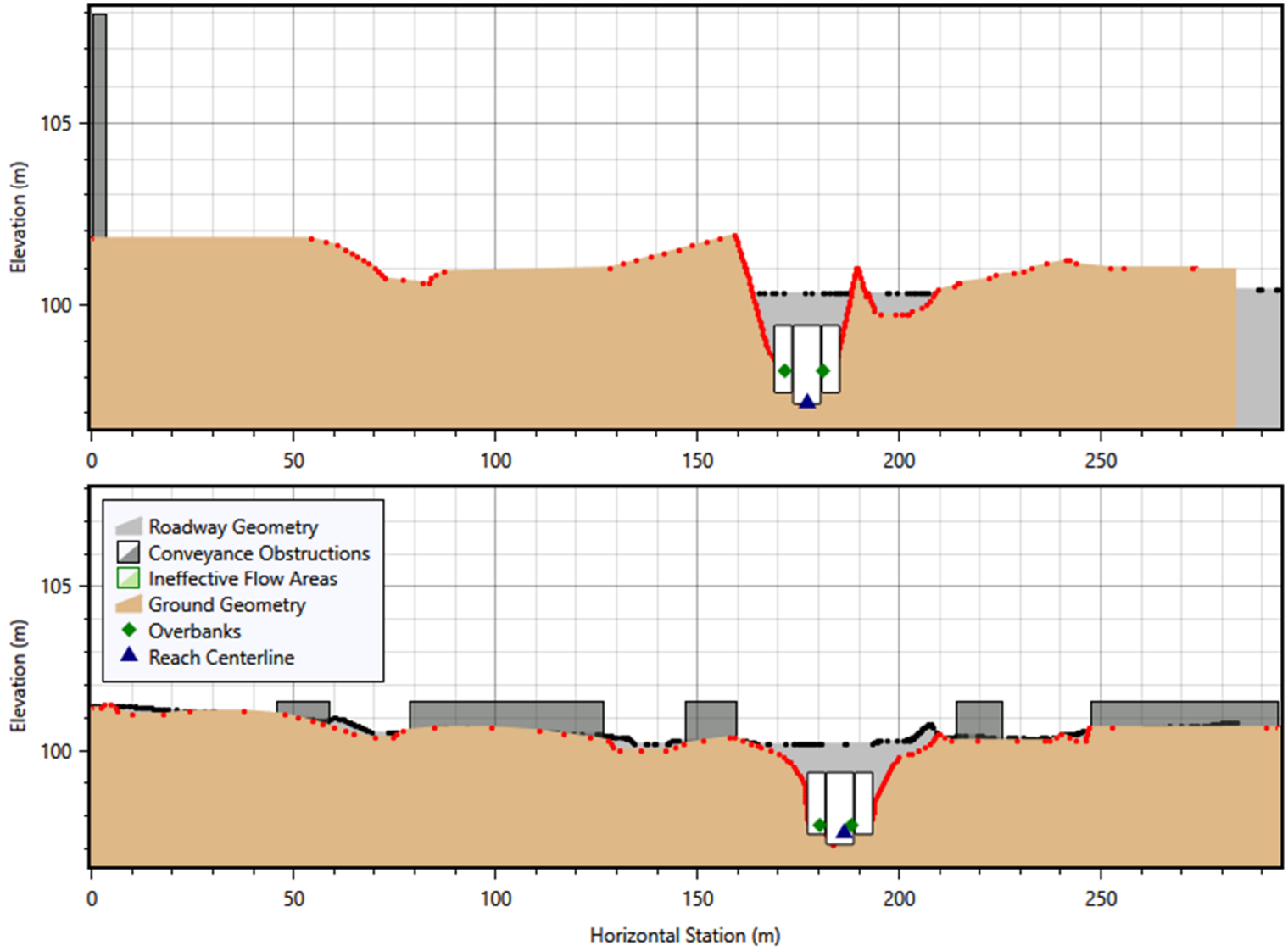
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Cross-Section 2869.761



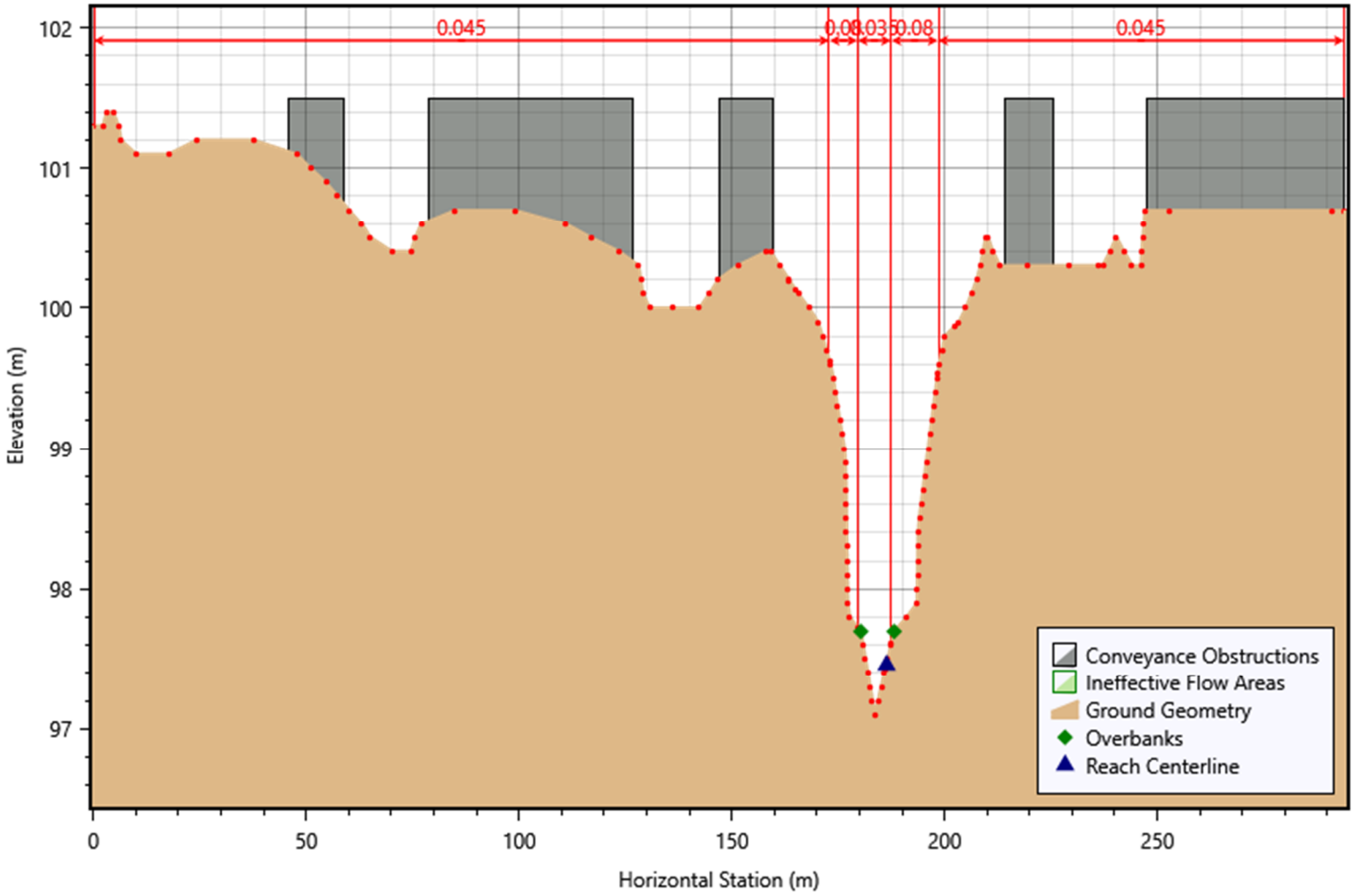
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Cross-Section 2845.459 Upstream and Downstream Culvert



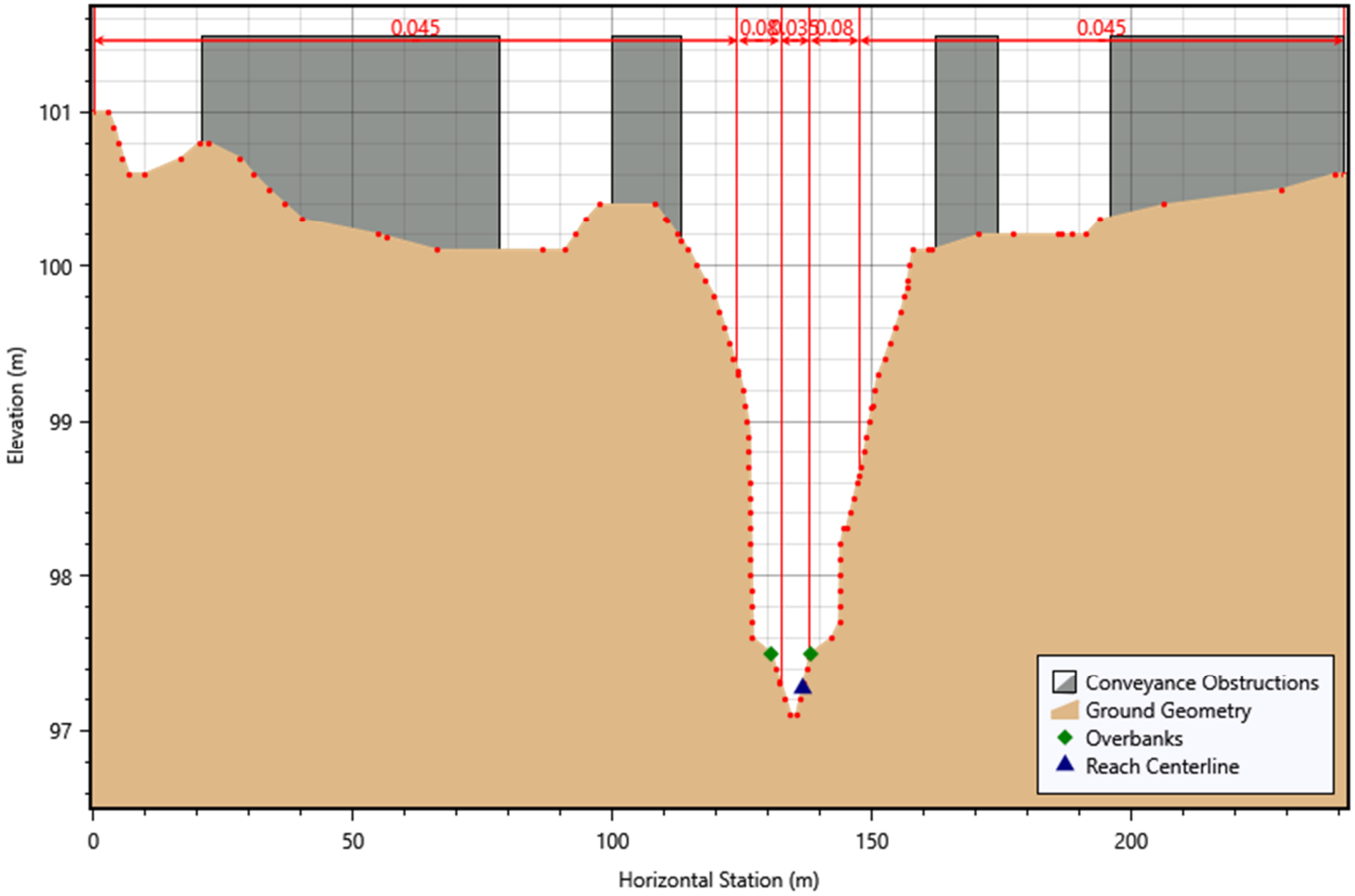
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Cross-Section 2818.998



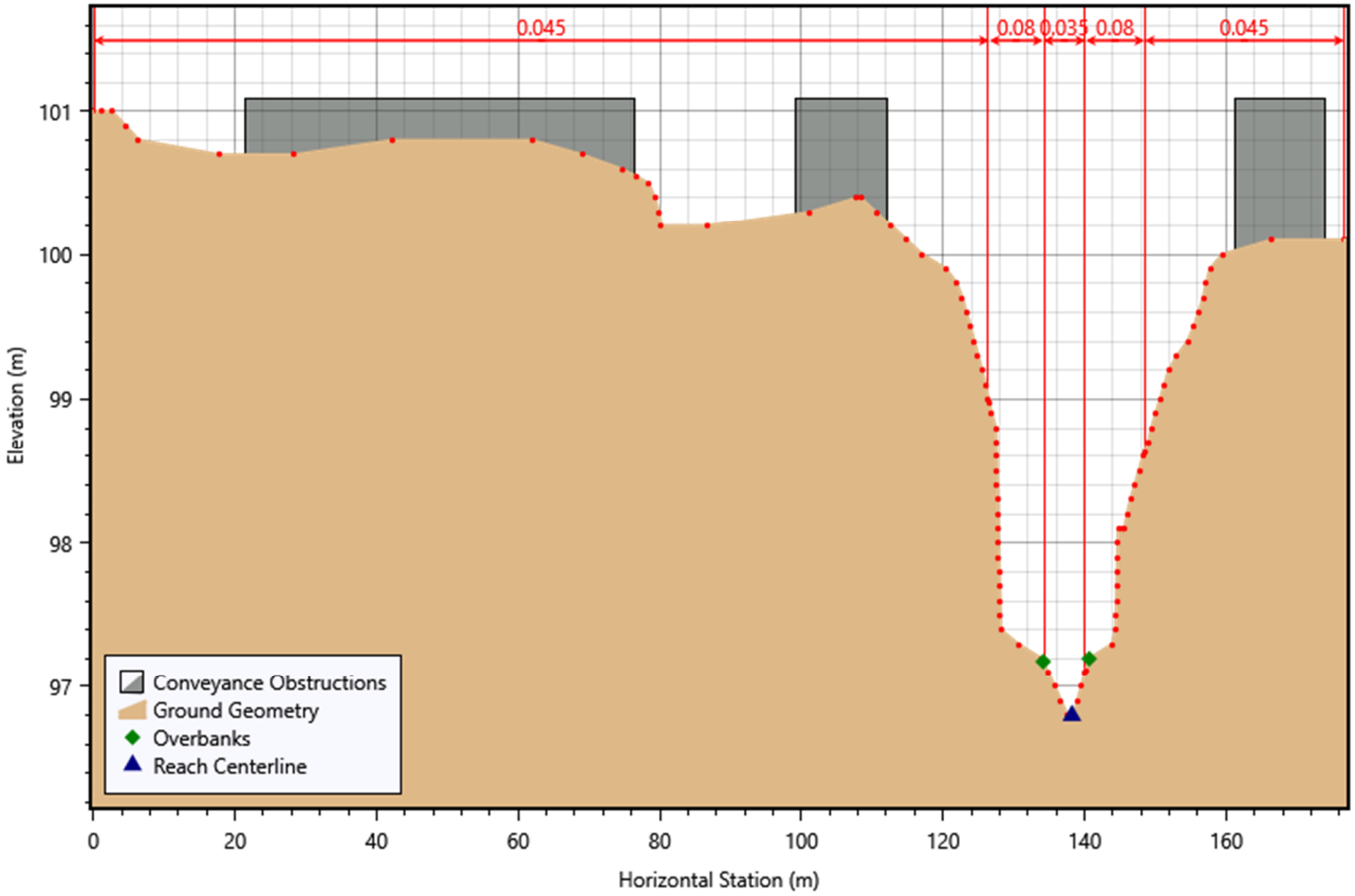
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Cross-Section 2798.804



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Cross-Section 2787.644



MEETING MINUTES

Today's Date:	December 16th, 2019 (revised May 2020)	**Project No.:**	18-580
Meeting Date:	December 12th, 2019	**Recorded by:**	David Hoover
Attendees:	Arif Shahzad, City of Burlington Rob Amos, Aquafor Beech Emma DeFields, CH Elisa Bernier, CH David Irwin, CH Thomas Kastelic, Branthaven David Hoover, Urbantech Jennifer Lawrence, J. Lawrence & Associates Shelley Gorenc, Beacon		Arif.Shahzad@burlington.ca amos.r@aquaforbeech.com edefields@hrca.on.ca ebernier@hrca.on.ca dirwin@hrca.on.ca tkastelic@branthaven.com dhoover@urbantech.com jennifer@jlplanning.ca sgorenc@beaconenviro.com
Meeting Location:	City of Burlington		
Topic:	**Erosion Control alternatives at Fairview Street - Re: Appleby Creek Erosion Control Class EA**		

Any errors or omissions should be reported to the author in writing within seven (7) days or at the next regularly scheduled meeting, failing which, these minutes will stand as an accurate record.

ITEM	DISCUSSION SUMMARY	ACTION
1	**City of Burlington: Construction of Fairview St. Crossing (Erosion Site 7)**	
a)	Budget to consist of Erosion Control works only (does not include structure)	
b)	AS noted that the City has budgeted $11 million over the next 5 years in anticipation of erosion control works but has not made a decision regarding which projects to move forward / in what order • Projects to be rolled out in 4 phases to 2024 • Individual cost for initial projects will determine how many erosion sites can be addressed	
c)	RA noted that the EA identifies erosion site 7 as falling within the 5-10-year planning horizon	

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ITEM	DISCUSSION SUMMARY	ACTION

AS noted that the Fairview structure is not currently in the City's capital budget so cannot say whether there will be interest to agree to cost share plan. Works will not likely be in City budget for another 20-30 years

2 Option to have Developer Complete Construction of Crossing

a) AS noted that the City is **not** currently in agreement with Branthaven fronting the project (corridor + structure)

Further discussions recommended with City & Planner → to be discussed through development process

3 Compare City's design to Developer's Design

a) CH has not completed detailed review of hydraulic model & memo completed by Urbantech
- Minor concerns & edits to be completed prior to review
- Overtopping still occurs in model
- Manning's values too low for re-constructed corridor
- RA recommends that the reach D/S of the crossing be included as part of the works Branthaven is proposing

b) Urbantech to provide RA with plan showing proposed property limits and conceptual structure design — **Urbantech to circulate plan**

c) RA clarified that the EA only evaluated clear span, open footing crossing structure options
- noted that Urbantech design for 3 cell culvert provides similar total span compared to EA 18 m clear span bridge
- thinks that both upstream and downstream corridor enhancement works are likely required to fully address floodline issue

d) DH provided rationale for culvert vs bridge (i.e., the approach proposed by Branthaven vs. the preferred alternative as identified in the City of Burlington's Appleby Creek Flood Mitigation EA, prepared by Aquafor Beech, February 2019):
- Based on Urbantech's analysis, which still needs to be reviewed and confirmed by review agency staff, able to accommodate the regional storm without overtopping (if combined with corridor enhancement works)
- In Urbantech's opinion, can be constructed without necessitating replacement of existing servicing under road

ITEM	DISCUSSION SUMMARY	ACTION
e)	ED noted that reduced risk is CH's goal. Justification for the work through the EA is the first step to address CH policy requirements.	
f)	RA has rough cost estimates for both structure/crossing and channel / corridor (U/S & D/S of crossing) works	
g)	Urbantech to provide approximate cost estimates for structure/crossing and channel/corridor (U/S & D/S of crossing) works	**Urbantech to provide estimates**
h)	Branthaven/Urbantech will continue to correspond with the City/Aquafor Beech through the on-going Appleby Creek Erosion Control EA to come to agreement on the principle of the structure design to be included in EA through further discussions & analysis	
i)	DH requested that all parties outline the steps required to allow Branthaven to move forward with the crossing improvement so that the process is documented for future reference. **Subsequent to the meeting**, CH advised through their review of the meeting minutes that next steps should be confirmed in consultation with the City.	
4	**Channel Re-design / Naturalization**	
a)	JL noted that the proposed crossing replacement and proposed creek works would be beneficial to all parties (i.e., Regional Storm flood plain is removed from tableland thereby increasing developable land; Regional Storm flood plain overtopping of Fairview Street eliminated thereby providing flood free access to existing residential lands east of Appleby Creek; wider creek block and 3:1 slopes on east side will provide for a better valley system through this reach	
b)	AS noted that the City is open to upgrading the crossing structure, as documented in the Flood EA, but prefers that this type of proposal move forward through the development application process	
c)	JL acknowledged City preference but noted that CH has very specific wording in their policies that require any major watercourse or flood plain alterations to be supported by an approved SWS or EA (or similar comprehensive study), That is why it is important to the landowners on Oval Court/Fairview Street to ensure that the current Erosion Control and Flood Mitigation EAs have incorporated sufficient detail surrounding the potential for crossing structure and corridor improvements such that any future development proposals would then be in conformance with CH's policy	

ITEM	DISCUSSION SUMMARY	ACTION
d)	RA questioned whether an addendum to the EA would be required to address this. JL noted that it would be in everyone's interest to avoid the time and cost of an EA Addendum. Preferable that the current EA acknowledge that, should a development proposal come forward for the lands on Oval Court, that there is an option to widen the creek valley and address flooding and erosion concerns, through the development process ED will look into whether an addendum to EA would be required to incorporate revision to crossing (i.e., from bridge to 3 culverts). Subsequent to the meeting, ED advised that it should be demonstrated that the proposed works (crossing structure, corridor improvements, etc.) generally adhere to the preferred alternatives identified in the Flood and Erosion EAs. If this cannot be demonstrated, further study or modifications to the proposed works may be necessary. Specific requirements would be determined in consultation with the City.	
e)	CH would want to review the design concept in greater detail to ensure that they could support the works. While a single span and open footing structures are generally preferred, CH would consider other approaches based on the management of hazards/risks and impacts to the environment.	
f)	CH commented that they would like to see Manning coefficients adjusted to reflect channel / corridor works in model and that model still shows some overtopping	
g)	DH to provide property requirements for proposed corridor enhancements, structure details, confirmation that model does not show overtopping under regional event, and confirm downstream works are consistent with EA, along with a cost estimate. City to share information with Conservation Halton if they are supportive of the submission by Urbantech.	**Urbantech to review model**
5	**Channel Access / Phasing**	
a)	AS noted that mobility hub works may also result in improved hydraulics	
b)	RA targeting to file notice of completion for February 2020	
c)	RA to include both Urbantech memos as appendix and potentially any concepts for corridor (to be further discussed with RA)	
d)	CH wants site 7 split into 2 sites (U/S & D/S of crossing)	`
e)	Urbantech to provide updated model showing preferred scenario only	**Urbantech to circulate**

ITEM	DISCUSSION SUMMARY	ACTION
	• RA noted that the City's preferred option is the existing culvert with the proposed EA works U/S & D/S of the crossing • AS noted that the main concern is the impact on the system	**requested model**
f)	City & Urbantech to collaborate through the EA process to review the EA scoring approach and to ensure the proposed design has considered that scoring approach appropriately.	
g)	RA to circulate EA prior to submission	
	Further discussions:	
a)	Will monitoring be part of development? JL noted that, if the works are completed as part of a development application, then monitoring could be attached to the approval of the application. **Subsequent to the meeting**, CH advised that they will likely require monitoring.	

Distribution:	All Attendees	
cc:	Umar Malik, City of Burlington	Umar.malik@burlington.ca
	Sachet Siwakoti, Aquafor Beech	siwakoti.s@aquaforbeech.com
	Arden Semper, Branthaven	asemper@branthaven.com
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	David Civiero/Glen Hansen, Hodero	DCiviero@hodero.ca and ghansen@hodero.ca
	Ken Ursic, Beacon	kursic@beaconenviro.com