

EIS prepared for 179 Meadowlily Road by MTE dated April 30, 2021

Received by EEPAC at its October 2021 meeting

Reviewed by: S. Hall, S. Levin, R. Trudeau, I. Whiteside for EEPAC's Nov 2021 meeting

PREMATURITY?

Given the city is starting a servicing EA for this area, EEPAC is of the opinion that this proposed development may be premature. If the planning application precedes the completion of the EA, there should be holding provisions applied.

STORMWATER MANAGEMENT

The EIS refers to Stantec 2019, however there is a letter from Stantec (**Preliminary Stormwater Management Brief**) dated Jan 29, 2021, on the City web site file for this application.

In the Brief, it states:

“Additionally, concern has been raised during the planning process of outletting to the natural area post-development. Consideration has been made to fully contain the post-development flows later in this brief.”

“Based on the composition of the soils, the clayey silt and silt till are estimated to have a hydraulic conductivity greater than 10^{-6} cm/sec. Further infiltration testing should be carried out to determine appropriate infiltration rates for the evaluation of infiltration augmentation facilities. For this analysis, an infiltration rate of 7 mm/hr (8×10^{-8} cm/sec equivalent) was assumed, conducive to the areas general clay properties.”

RECOMMENDATION 1: EEPAC agrees further infiltration testing needs to be carried out.

The Brief goes on to add:

*“Two (2) stormwater management approaches are proposed. To satisfy water quality criteria, on-site containment of the 100-year runoff generated in catchment 201 is proposed. However, given the anticipated large footprint area of low-impact development (LID) measures required for self-containment, an alternative stormwater management approach is also proposed for your consideration. Note that the footprint area and storage volumes indicated for each SWM strategy are the main takeaways. Details regarding methods to provide adequate storage can be further evaluated at a **detailed design stage**. Final design of the storage for either scenario will occur at the detail design stage utilizing outlined targets. Flows exceeding the storage*

EIS prepared for 179 Meadowlily Road by MTE dated April 30, 2021

capacity of the system (i.e. 250-year storm runoff), will be safely controlled and flow overland to the downstream watercourse west of the site.”

Water quality and quantity work is still insufficient and both Stantec and the EIS indicate more detail is required at the detail design stage.

EEPAC wonders if the ditch will be removed at any point in the future when the road is widened?

RECOMMENDATION #2: A holding provision be applied until the detail design of the stormwater system is accepted.

RECOMMENDATION #3: Any infiltration galleries must not be built near snow storage areas. Salt loading would be detrimental to the wetland inclusion and the watercourse.

RECOMMENDATION #4: any LID facilities be on public property to ensure sufficient maintenance to retain its function.

WATERCOURSE

Attached are extracts from Phase 1 of the Conservation Master Plan for Meadowlily Woods ESA by Natural Resources Solutions Inc dated 2019. The watercourse is referenced from AECOM's earlier site work for the City. It is labeled 'Un-named Creek' and appears on the attached Map 8 from the Phase 1 document.

RECOMMENDATION #5: City staff review AECOM's study of this tributary of the Thames as data about it is not reported in the current EIS.

BUFFERS

The EIS states in page 18:

“The City of London has developed guidelines to establish recommended ecological buffer and setback limits for developments adjacent to natural heritage features. The guideline includes minimum recommended fixed-width buffers for specific features, but also recognizes that variable-width buffers can effectively protect the natural environment without undue cost.”

EEPAC believes this to be a misinterpretation of the current information in the section of the EMG dealing with buffers. There is nothing in the EMG regarding “undue cost.”

EEPAC is concerned that the buffer proposed from the ESA and the wetland inclusion is insufficient given the proposed grading to put in a retaining wall on the site. Although the buffer from the flow path of the watercourse appears to be sufficient protection, EEPAC

questions whether the proposed wetland buffer is sufficient as it is clear from the bottom of p. 18 that construction will encroach at least as close as 5 m to the feature.

RECOMMENDATION #6: A 10 m buffer be established and no construction take place within the 10 m buffer.

HYDROLOGIC FUNCTION

p. 19

It is not clear to EEPAC how the hydrological function will be protected, particularly as grading is proposed to a 3:1 slope. It is also not clear based on Stantec 2021 if or where an infiltration gallery will be.

We did not see a water balance assessment for flow into the wetland inclusion to the west of the site. It is important to have an understanding of water currently being contributed to ensure that post development flow continues.

RECOMMENDATION #7: A water balance be required before acceptance of the EIS. If after acceptance, it be a condition of development approval.

CONSTRUCTION IMPACTS

It will be difficult to prevent sedimentation - where will stuff be stockpiled? As pointed out by Stantec (Geotechnical investigation, 2019, in EIS Appendix), "appropriate scheduling of the work may also require specific consideration and revision from the typical adopted. The scope of work intended may have to be reduced or adjusted, and/or only select construction activities are undertaken during specific climatic conditions. The areas of planned engineered fill may have to be reduced on a daily basis, the extent of excavations may have to be limited, with all excavating and associated backfilling completed without delay."

RECOMMENDATION #8: Regardless of the final decision on how the buffer will be applied, any stockpiled materials must be kept at least 15 m from the wetland and drain and covered when weather forecasts call for intense rain of short or long duration.

In its recommendation 1, the EIS states: "Mitigation measures should be implemented to protect the wetland inclusion, drainage feature, and surrounding area from indirect impacts of construction activities."

This is a standard recommendation - there is no detail. As pointed out by Stantec, this is not a standard project. Grading and construction of the retaining wall are proposed to be within the 10 m buffer of the wetland inclusion, which EEPAC does not support.

EIS prepared for 179 Meadowlily Road by MTE dated April 30, 2021

RECOMMENDATION #9: A detailed sedimentation control plan must be to the satisfaction of the City and UTRCA prior to construction.

Recommendation #10 – a stormwater management plan for construction must be in place prior to construction and separate from the final stormwater plan due to amount of fill being replaced. EEPAC suspects dewatering will also be needed and any water must not be directed to the west.

RECOMMENDATION #11: EEPAC also recommends that avoidance measures must be implemented to protect the wetland inclusion, drainage feature and surrounding area from DIRECT impacts of construction activities.

EEPAC agrees with Recommendation 3 of the EIS, except that the plan ‘must’ rather than ‘should’ and clarity as to what robust means is required.

EIS Recommendation 4 needs to be changed such that “Sediment and erosion control fencing **MUST** be inspected prior to and during construction to ensure proper installation, function, and maintenance. Any issues that are identified will be resolved in the same day.”

Recommendation 6 of the EIS is unclear. Which stormwater plan does it refer to - 2019 or 2021 which shows 2 approaches.

EEPAC agrees with EIS recommendations 5, 7 and 8, and encourages early implementation of recommendation #7 regarding revegetating the graded slope.

RECOMMENDATION #12: In addition to what is proposed in EIS recommendation 9, EEPAC recommends the proponent install an information sign or kiosk near the community mailbox with information about Meadowlily Woods ESA. EEPAC further recommends the proponent consult with Friends of Meadowlily Woods as to the content. EEPAC also recommend upon full occupancy, all residents receive the following city brochures:

**Living with Natural Areas
Meadowlily Woods ESA brochure (with trail map)
You, Your Dog and Nature in London
Is your cat safe outdoors?**

RECOMMENDATION #13 - The monitoring plan mentioned in 7.2 p. 22 of the EIS must be a condition of development and to the satisfaction of a City Ecologist.

OTHER

EEPAC takes exception to the selective quotes on page 15 of the EIS from the Meadowlily Woods ESA Conservation Master Plan. A more fulsome reading of the CMP would point out that the boundary delineation guideline from the EMG applies. Guideline 7 is clearly met -

EIS prepared for 179 Meadowlily Road by MTE dated April 30, 2021

“cultural savannahs and woodlands and old fields must be included within the ESA boundary if they minimize negative edge effects impacts, strengthen internal linkages, connect a patch to a permanent natural water course, connect two or more patches.”

In short, the reason the area was included in the ESA boundary is because the boundary delineation guideline applies.

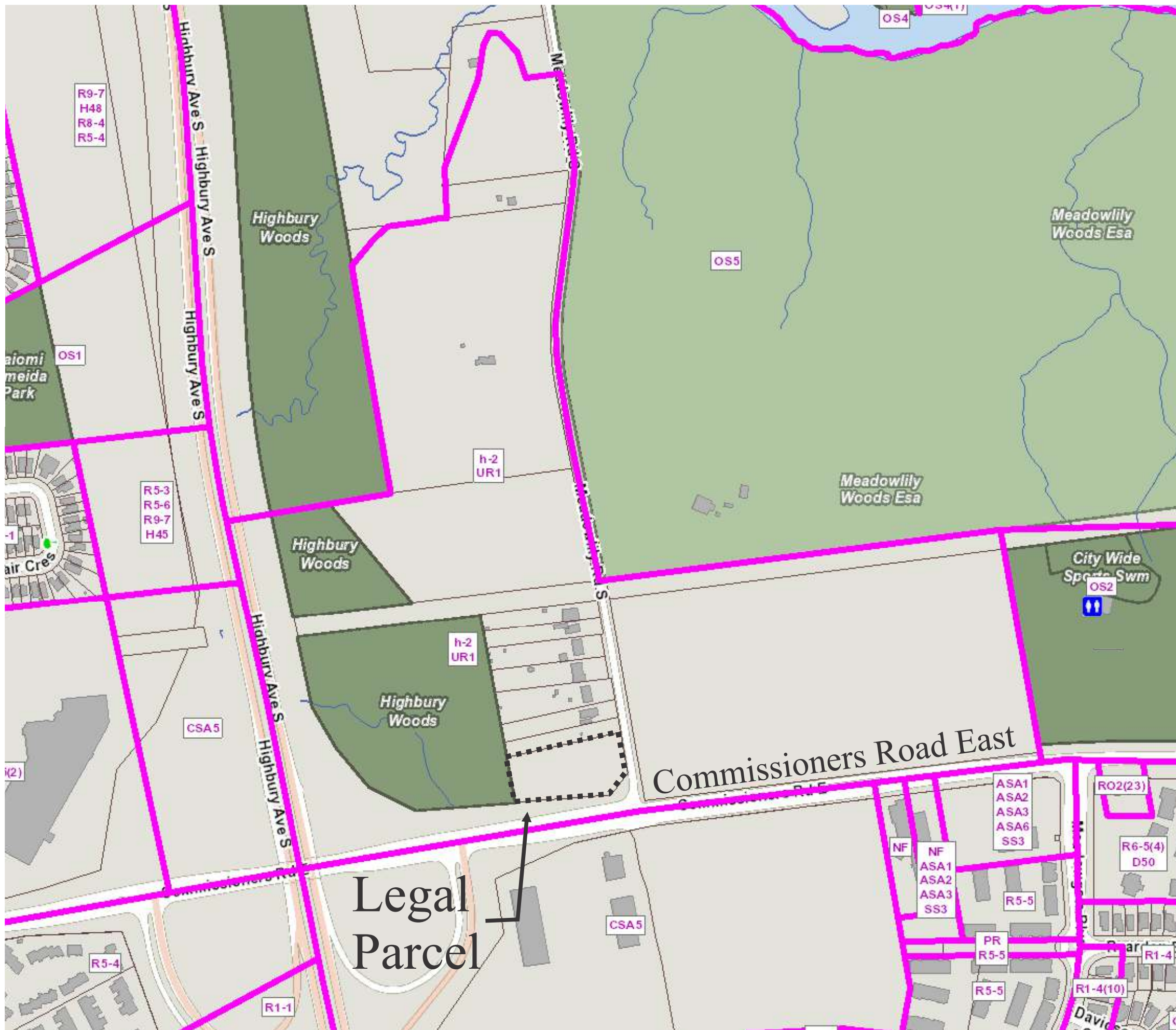


Figure 4: Zoning
(City of London Zoning)



0 1,000
Scale 1:50,000
Key Plan

Legend

- h-2 Holding Provision
- UR-1 Urban Reserve
- New Meadowlily ESA Boundary (OS5)
(MW ESA CMP, NRSI 2019)

* Locations are approximate and should be verified by survey where necessary.

Print on 11X17, Landscape Orientation

0 80

Scale 1:4000

March 2021



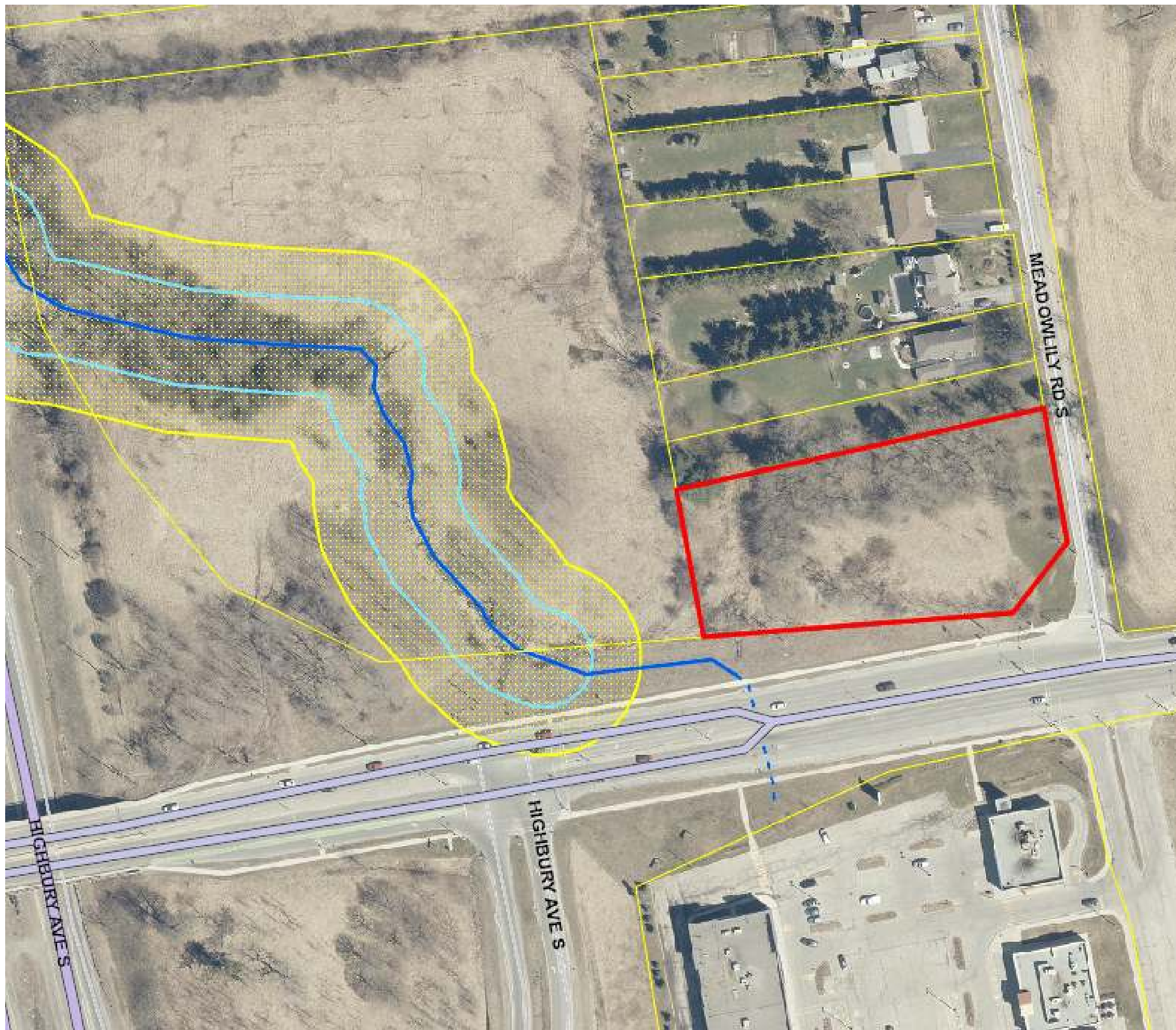


Figure 5: UTRCA Regulated Area
(2019 UTRCA)



0 1,000
Scale 1:50,000
Key Plan

Legend

- Assessment Parcel (MPAC)
- Legal Parcel
- Watercourse
 - Open (Class F Municipal Drain)
 - Tiled
- Wetland Hazard
- Flooding Hazard
- Regulation Limit 2015

* Locations are approximate and should be verified by survey where necessary.

Print on 11X17, Landscape Orientation

0 24

Scale 1:1200
August 2020



Figure 6a: Natural Heritage Features
(2018 City of London Air Photo)



0 1,000
Scale 1:50,000
Key Plan

Legend

- 1 Maintained Lawn (0.06ha onsite)
- 2 CUM1 Mineral Cultural Meadow Ecosite (0.23ha onsite)
- 3 CUM1 Mineral Cultural Meadow Ecosite (0.03ha onsite)
- 4 CUW1 Mineral Cultural Woodland Inclusion (Manitoba Maple) (0.22ha onsite)
- 5 MAM2-10 Forb Mineral Meadow Marsh Type Inclusion (0.08ha onsite)

- Candidate Bat Maternity Roost Tree
- Mammal Burrow
- UTRCA Regulated Wetland (based on regulation text)
- - - UTRCA Regulation Limit (30m)
- - - 10m Wetland Setback

* Locations are approximate and should be verified by survey where necessary.

Print on 11X17, Landscape Orientation

0 10

Scale 1:500

March 2021



Figure 9: Conceptual Grading Plan

Stantec
 600-171 Queens Avenue
 London ON N6A 5J7
 Tel. 519-645-2007
 www.stantec.com

Liability Note:
 The Contractor shall verify and be responsible for all dimensions.
 DO NOT scale the drawing - any errors or omissions shall be
 reported to Stantec without delay.

Notes

Legend

- PROPOSED SWALE
- PROPOSED STORM MANHOLE
- PROPOSED STORM CATCH BASIN MANHOLE
- PROPOSED SANITARY MANHOLE
- EX. STORM MANHOLE
- EX. SANITARY MANHOLE
- PROPOSED CATCH BASIN
- EX. CATCH BASIN
- HYD PROPOSED 3-WAY FIRE HYDRANT C/W STORZ CONNECTION
- PROPOSED GRADES
- EXISTING GRADES
- MAJOR OVERLAND FLOW ROUTE
- SITE BOUNDARY

- UTRCA Regulated Wetland (based on regulation text)
- 10m Wetland Setback

Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD

File Name: 161413930_c-1b	DR	DV	DR	19.12.12
	Dwn.	Chkd.	Disgn.	YY.MM.DD

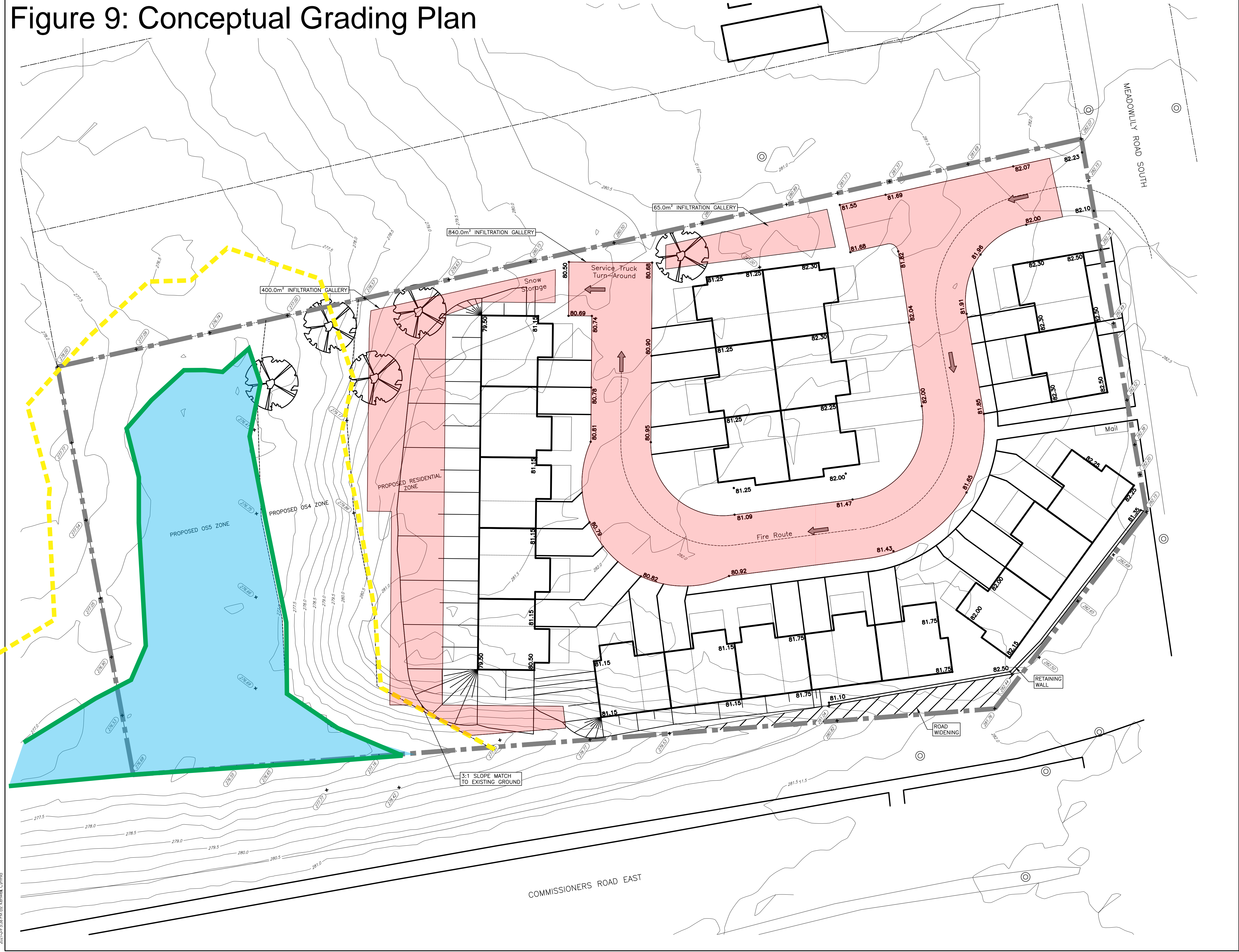
Permit-Seal

Client/Project
 SHANTI DEVELOPMENTS INC.
 179 MEADOWLILY ROAD SOUTH

London, ON Canada

Title
 CONCEPTUAL GRADING PLAN

Project No. 161413930	Scale HORZ - 1 : 200
Drawing No.	Sheet
	Revision



V:\10164\161413930\Design\Grading\CivilModel\Plan\Surfaces\161413930_C-1b.dwg
 2019-12-12 10:00:00 AM
 ORIGINAL SHEET - ANS/D

Reach 5

Reach 5 starts approximately 60m upstream of Reach 4 and continues for approximately 40m ending just upstream of the Hamilton Road crossing. At 1140hrs on June 20, 2013 water temperature and air temperature were measured at 16°C and 20°C, respectively. Dissolved oxygen was measured at 9.32ppm and 96% and was taken just upstream of the bridge. Reach 5 was more impacted than the other reaches with a few stormwater pipes discharging into the creek and gabion baskets lining the banks. Although this reach is impacted, there is still fish habitat present which is characterized by a run-riffle-run sequence. Fish were observed throughout this section. The average wetted width for this reach is 7.1m with a maximum width of 9.4m. Within the middle of the reach exposed clay is present and the primary flow is down the east side of the channel. The average depth of Reach 5 is 0.20m with the maximum depth being 0.44m within the deeper channel along the east side. Adjacent lands to the west are primarily scrubland and residential, and to the east the primary land use is residential. Substrates within this reach consist of cobble (30%), clay (30%), sand (10%), gravel (10%), boulder (10%), pebble and silt (10% each). Bank stability is poor as the gabion baskets, which are piled 4-5 high, are failing in different locations. Vegetation density along the bank is also poor. In-stream habitat and cover for fish is provided through small pools, riffles, backwater, undercut banks, woody debris, overhanging shrubs, boulders, and cobble. The canopy type is comprised of deciduous trees and the Hamilton Road bridge, which together provide shading to 75% of the creek. Riparian vegetation consists of herbaceous plants, grasses and shrub species. No aquatic in-stream vegetation is present within this reach. Overall, Reach 2 provides suitable fish habitat for all life history stages.

4.5.3 Un-named Creek

In 2010, AECOM conducted a background and field review of this un-named tributary to the Thames River as part of the Meadowlily Area Plan: Draft Natural Heritage Study (AECOM 2011). The following information has been summarized from the draft document. The un-named creek is located on the southwest side of the study area and flows in a northerly direction into the South Thames River (Map 8). The area surrounding the watercourse is forested and consists primarily of Fresh-Moist Lowland

Deciduous Forest (FOD7-3) and Cultural Woodland (CUW) where the creek meets the Thames River, and Dry-Fresh Sugar Maple-Beech (FOD5-2) where the creek flows through the Thames Talbot Land Trust, along with a few residential properties. The headwaters of the creek are mostly within the subject site and originate just to the north of Commissioners Road. A small wetland feature (MAS2-1) with indicators of groundwater seepage was observed at that location by AECOM (2011). It was assumed that groundwater seepages combine with surface run-off to provide the base flow for the creek. The creek can be classified as intermittent in the upstream reaches and permanent within the mid to lower reaches (AECOM 2011). Information on fish and fish habitat can be found within the AECOM (2011) report. No information is provided on freshwater mussels or benthic invertebrates.

4.5.3.1 Fish

The un-named creek is described as a warmwater system that supports a warmwater fishery (UTRCA 2012a). The UTRCA has a sampling record from this creek, which has been included in Appendix XI. The location was sampled in July 2010 and yielded five species. All the species sampled are considered abundant and widespread within the South Thames River and include Blacknose Dace (*Rhinichthys atratulus*), Brook Stickleback (*Culea inconstans*), Central Stoneroller (*Campostoma anomalum*), Creek Chub (*Semotilus atromaculatus*), and White Sucker (*Catostomus commersoni*). AECOM also conducted electrofishing within four different reaches of the creek in June 2010 in conjunction with the Natural Heritage Study (AECOM 2011). Throughout the four reaches electrofished, the same species of fish were observed as surveyed by the UTRCA, with the exception of Central Stoneroller, which was not observed. All of the different life stages were noted in the fish caught.

4.5.3.2 Freshwater Mussels

The UTRCA has no sampling sites within the un-named creek for freshwater mussels. In 2010 when AECOM conducted their field assessments there was no mention of any freshwater mussel findings.

4.5.3.3 Water Quality and Benthos

The UTRCA has no sampling sites within the un-named creek for water quality and benthic invertebrates.

4.5.3.4 Fish Habitat Assessment

Fish habitat assessments were conducted by AECOM in June 2010 within the selected 40m reaches (Reaches 1, 2, 3, 4, 5) and are discussed further below under each reach (Map 8). The creek was walked in an upstream manner, starting at the confluence with the Thames River to Commissioners Road, which is the study area boundary. Aquatic assessment locations are shown on Map 8.

At the time of the assessments, AECOM conducted in-situ water quality measurements within each of the selected reaches by using a portable YSI water quality meter. Air temperature during the day of the assessment was 22°C and water temperature ranged from 16 to 18°C. Dissolved oxygen was also taken at this time and had concentrations of 7.09 and 8.68mg/L, which is within the acceptable range for aquatic life.

Reach 1

Reach 1 starts approximately 20m upstream of the confluence with the Thames River and continues for approximately 40m, ending upstream at a woody debris dam that acts as a seasonal barrier to fish (Map 8). Reach 1 is described as naturalized and slightly meandering within the subject site and features good quality fish habitat. The reach is characterized as a riffle-run sequence with a few pools and flats. The average wetted width of Reach 1 is 0.93m, with a maximum width of 2.0m at the pool feature immediately downstream of the woody debris dam. The average depth of Reach 1 is 0.04m with the maximum depth being 0.36m within the pool feature. The pool feature at the upstream extent of this reach likely provides overwintering refuge for resident species. Adjacent lands on both sides of the reach are primarily forest/scrubland. The stream banks are gradual and appear to be stable and well vegetated. Substrates within this reach consist primarily of sand with gravel and cobble and some silt. In-stream habitat and cover are provided through several large fallen trees, other woody debris, and cobble. The canopy is comprised of deciduous trees and some shrubs which provide good shading to the creek. Riparian vegetation consists of herbaceous wetland

plants, grasses and shrubs, with some deciduous trees. In-stream vegetation is limited to woody debris and overhanging shrubs and plants which provide excellent cover for fish. Watercress (*Nasturtium officinale*) is present along the banks of the creek, which indicates that groundwater discharge likely occurs in the area. Overall, Reach 1 provides suitable fish habitat for all life history stages including spawning, rearing, foraging, feeding and refuge for resident species.

Reach 2

Reach 2 starts immediately upstream of Reach 1 and continues for approximately 40m, ending upstream of a pedestrian bridge (Meadowlily Nature Reserve Trail). Reach 2 is described as primarily naturalized with the exception of the area immediately around the pedestrian bridge, which has been cleared for the construction of the bridge. The average wetted width of Reach 2 is 1.27m, with a maximum width of 3.8m at a pool feature immediately downstream of a woody debris dam. The average depth of Reach 2 is 0.07m with the maximum depth being 0.61m within the same pool feature. There are a few pool features within this reach which likely provide overwintering refuge for resident species. In addition, downstream of the pedestrian bridge is a large sand bar that creates a braid within the main channel, which redirects the flow into a small tributary that flows in a north westerly direction towards the Thames River. There is evidence that this tributary was created fairly recently as the channel is not defined and the surrounding vegetation does not appear to show signs of prolonged inundation.

Adjacent lands on both sides of the reach are primarily forest/scrubland. The stream banks downstream of the pedestrian bridge are gradual and appear to be stable and well vegetated. The bank upstream of the bridge is less stable with exposed roots. Substrates within this reach consist primarily of sand with gravel and cobble and some silt. In-stream habitat and cover are provided through several large fallen trees, other woody debris, and cobble. The canopy is comprised of deciduous trees and some shrubs which provide good shading to the creek. Riparian vegetation consists of herbaceous wetland plants, grasses and shrubs species with some larger deciduous trees. In-stream vegetation is limited to the woody debris and overhanging shrubs and plants, which provide excellent cover for fish. Overall, Reach 2 provides suitable fish habitat for all life history stages.

Approximately 200m upstream of Reach 2 a driveway crosses the un-named creek through a CSP culvert. Immediately downstream of the culvert is a perched shelf which would act as a permanent barrier to fish migration. Severe erosion is also present along the east bank and the bank appeared very unstable. Large pieces of concrete are present in this area and have created a build-up of debris. Approximately 40m upstream of the culvert is a man-made pond that appeared to be recently constructed. The dimensions of the pond are approximately 10m wide and 0.5m deep with substrates consisting of sand and some silt. An earthen dam is used to create the pond and may act as a barrier to fish passage. At the time of the field investigation by AECOM in 2010 it appeared that there was groundwater upwelling within the pond.

Reach 3

Reach 3 starts approximately 400m upstream of Reach 2 and continues for approximately 40m. Reach 3 is described as naturalized and meandering. The meanders throughout the reach create large pools in the outside bends. Moderate quality fish habitat is found within the reach and is characterized by riffles, pools, and some flats. The average wetted width of Reach 3 is 1.15m, with a maximum width of 2.16m at a pool feature within a meander. The average depth of Reach 3 is 0.14m with the maximum depth being 0.36m within one of the pool features. There are a few pool features within this reach which likely provide overwintering refuge for resident species. Adjacent lands on both sides of the reach are primarily forest/scrubland. The stream banks throughout this reach are slightly to moderately unstable and showed signs of recent scouring. Substrates within this reach consist primarily of sand with gravel and cobble and some silt. In-stream habitat and cover are provided through several large fallen trees, other woody debris, cobble, and undercut banks. Riparian vegetation consists of herbaceous plants and larger deciduous trees, which provide excellent canopy cover. In-stream vegetation is limited to the woody debris and overhanging plants. Overall, Reach 3 provides suitable fish habitat for all life history stages for resident species.

Reach 4

Reach 4 starts approximately 150m upstream of Reach 3 and continues for approximately 40m, ending downstream of Highbury Road. Reach 4 is described as very disturbed, likely due to its close proximity to the road. The reach provides different

habitat than Reaches 1, 2 or 3, and was considered poor fish habitat. It has several sharp meanders, increased erosion, as well as increased debris accumulation. The reach has some larger pools along the outside meanders, as well as riffle-run-flat sequences. The larger pools may provide overwintering refuge to resident species. The average wetted width of Reach 4 is 0.89m, with a maximum width of 2.0m at one of the pool features. The average depth of Reach 4 is 0.2m with the maximum depth being 0.44m within one of the pool features. Adjacent lands on both sides of the reach are primarily forest/scrubland. The stream banks on both sides are moderately unstable to unstable and showed signs of recent scouring. Substrates within this reach consist primarily of sand with gravel and cobble and some silt. In-stream habitat and cover are provided through several large fallen trees, other woody debris, cobble, and some undercut banks. Riparian vegetation consists of herbaceous plants, grasses and some larger deciduous trees. In-stream vegetation is limited to the woody debris and overhanging plants, which provide limited cover for fish. Overall, Reach 4 provides suitable fish habitat for all life history stages, although the habitat is poor quality.

Reach 5

Reach 5 is found within the headwater area of the un-named creek, north of Commissioners Road. As recent development has happened within the headwater area, there is no longer a connection between the north and south side of Commissioners Road. During an April 2010 field investigation conducted by AECOM, a potential groundwater seepage area was observed within the subject area, on the north side of the road. This seepage area and surface run-off is expected to provide base flow to the channel downstream. During the June 2010 field investigations conducted by AECOM, the creek channel was observed to run parallel with Commissioners Road before heading north through a small wetland pocket comprised of Reed Canary Grass. Iron staining was also observed within this area, which is an indicator of groundwater seepage. The channel flows under a farm laneway through a small cast iron pipe. Following the pipe, the channel continues down a steep gradient to a CSP culvert under Highbury Road. This 70m pipe likely acts as a barrier to fish passage. A build-up of debris and garbage was noted at this location. Within the section of Reach 5 that had a defined channel there are riffle-run sequences. The average wetted width was not measured due to very low water levels. The average depth within the reach was

measured at 0.04m, with no maximum depth being recorded. The stream banks on both sides are moderately unstable and showed signs of recent scouring. Substrates within this reach consist primarily of sand and silt with some gravel. In-stream habitat and cover were limited to grasses and herbaceous plants along the banks. Riparian vegetation consists of herbaceous plants, grasses and some larger deciduous trees which provide a decent amount of canopy cover. Overall, Reach 5 provides poor fish habitat due to its lack of in-stream habitat and cover, steep gradients, and the likely barrier of the culvert under Highbury Road.

4.5.4 Ravine Features

The south side of the Thames River has numerous ravine and gully features that are common all along the South Thames River Valley. Of the 11 ravines, AECOM assessed A-D in 2010 within the Draft Heritage Study (AECOM 2011). All of the features are labeled on Map 8. Information on Ravines A through D is summarized from AECOM's (2011) report. More detailed information can be found within their report. Ravines E through H were assessed by NRSI biologists in 2013 and information on these features is provided below. Property access was not provided to assess Ravines I, J, or K. Appendix XII shows representative photos from the following aquatic features.

4.5.4.1 Ravine A

Ravine A was assessed by AECOM in June 2010 and the following is a summary of the assessment from the Meadowlily Area Plan: Draft Natural Heritage Study (AECOM 2011). This ravine originates east of Meadowlily Road within an agricultural field. There are several drainage swales within the field that form three branches at the beginning of Ravine A. These three branches all receive surface water run-off and have contributions from groundwater seepages and run down through steep gully features to form the main branch of Ravine A, which then flows westerly towards Meadowlily Road. The upper reach of Ravine A is a well-defined channel although it has severe erosion and unstable banks. The banks throughout this area are bare soil and not well vegetated and large tree roots are exposed. Woody debris, detritus, and other materials have built up in this area causing scouring of the banks and changes in flow. The upper reaches of Ravine A have intermittent flow, high gradient with steep slopes and substrates primarily

UTRCA Fish Sampling Records

Location		Species at Risk (SAR) Status		Provincial Status	Site Number	Sample Date	
Species (Common Name)	Scientific Name	COSEWIC	SARA	ESA 2007	SRank	Abundanc	Distribution

South Thames tributary

Northeast of Highbury and Commissioners		UTM x: 484652	UTM y: 4757712	TF32	7/14/2010
---	--	---------------	----------------	------	-----------

Blacknose Dace	<i>Rhinichthys atratulus</i>			S5	Abundant	widespread
Brook Stickleback	<i>Culaea inconstans</i>			S5	Abundant	widespread
Central Stoneroller	<i>Campostoma anomalum</i>			S4	Abundant	widespread
Creek Chub	<i>Semotilus atromaculatus</i>			S5	Abundant	widespread
White Sucker	<i>Catostomus commersoni</i>			S5	Abundant	widespread

Pottersburg Creek

at Hamilton Road		UTM x: 485701	UTM y: 4758089	PO01	6/11/2003
------------------	--	---------------	----------------	------	-----------

Creek Chub	<i>Semotilus atromaculatus</i>			S5	Abundant	widespread
Smallmouth Bass	<i>Micropterus dolomieu</i>			S5	Abundant	widespread

at Hamilton Road		UTM x: 485701	UTM y: 4758089	PO01	8/24/2006
------------------	--	---------------	----------------	------	-----------

Blacknose Dace	<i>Rhinichthys atratulus</i>			S5	Abundant	widespread
Bluntnose Minnow	<i>Pimephales notatus</i>			S5	Abundant	widespread
Central Stoneroller	<i>Campostoma anomalum</i>			S4	Abundant	widespread
Common Shiner	<i>Luxilus cornutus</i>			S5	Abundant	widespread
Creek Chub	<i>Semotilus atromaculatus</i>			S5	Abundant	widespread
Greenside Darter	<i>Etheostoma blennioides</i>			S4	Abundant	widespread
Johnny Darter	<i>Etheostoma nigrum</i>			S5	Abundant	widespread
Rock Bass	<i>Ambloplites rupestris</i>			S5	Abundant	widespread
Smallmouth Bass	<i>Micropterus dolomieu</i>			S5	Abundant	widespread
Striped Shiner	<i>Luxilus chrysocephalus</i>			S4	Abundant	widespread
White Sucker	<i>Catostomus commersoni</i>			S5	Abundant	widespread

at Hamilton Road		UTM x: 485701	UTM y: 4758089	PO01	5/8/2012
------------------	--	---------------	----------------	------	----------

Rainbow Darter	<i>Etheostoma caeruleum</i>			S4	Uncommon	localized
----------------	-----------------------------	--	--	----	----------	-----------

South Thames River

Eastside Park		UTM x: 486936	UTM y: 4757315	SAR022	8/28/1974
---------------	--	---------------	----------------	--------	-----------

Central Stoneroller	<i>Campostoma anomalum</i>			S4	Abundant	widespread
---------------------	----------------------------	--	--	----	----------	------------

Eastside Park		UTM x: 486936	UTM y: 4757315	SAR022	8/25/2003
---------------	--	---------------	----------------	--------	-----------

Blackside Darter	<i>Percina maculata</i>			S4	Abundant	widespread
Bluntnose Minnow	<i>Pimephales notatus</i>			S5	Abundant	widespread
Central Stoneroller	<i>Campostoma anomalum</i>			S4	Abundant	widespread
Common Carp	<i>Cyprinus carpio</i>			SNA	Abundant	widespread
Common Shiner	<i>Luxilus cornutus</i>			S5	Abundant	widespread
Golden Redhorse	<i>Moxostoma erythrurum</i>			S4	Abundant	widespread
Greenside Darter	<i>Etheostoma blennioides</i>			S4	Abundant	widespread
Johnny Darter	<i>Etheostoma nigrum</i>			S5	Abundant	widespread
Mimic Shiner	<i>Notropis volucellus</i>			S5	Abundant	widespread

Location	Species at Risk (SAR) Status		Provincial Status	Site Number	Sample Date		
Species (Common Name)	Scientific Name	COSEWIC	SARA	ESA 2007	SRank	Abundanc	Distribution

COSEWIC Status: The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses species for their consideration for legal protection and recovery (or management) under the Species at Risk Act (SARA).

Extinct: A wildlife species that no longer exists.
 Extirpated: A wildlife species no longer existing in the wild in Canada, but exists elsewhere.
 Endangered: A wildlife species facing imminent extirpation or extinction.
 Threatened: A wildlife species likely to become endangered if limiting factors are not reversed.
 Special Concern: A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
 Not at Risk: A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
 Data Deficient: A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

Reference: www.cosewic.gc.ca (current to November 2011)

SARA Status: The federal at risk designation for species under the Species at Risk Act (SARA)
 Reference: www.sararegistry.gc.ca (current to December 2011)

ESA 2007 / SARO Status: Species at Risk in Ontario (SARO) are designated by the Ontario Ministry of Natural Resources (OMNR) in accordance with the provincial Endangered Species Act (ESA) through the Committee on the Status of Species at Risk in Ontario (COSSARO).

Extirpated: A native species that no longer exists in the wild in Ontario but still occurs elsewhere.
 Endangered: A native species facing imminent extinction or extirpation in Ontario.
 Threatened: A native species that is at risk of becoming endangered in Ontario.
 Special Concern: A native species that is sensitive to human activities or natural events which may cause it to become endangered or threatened.

Reference: www.ontario.ca/speciesatrisk (current to January 2012)

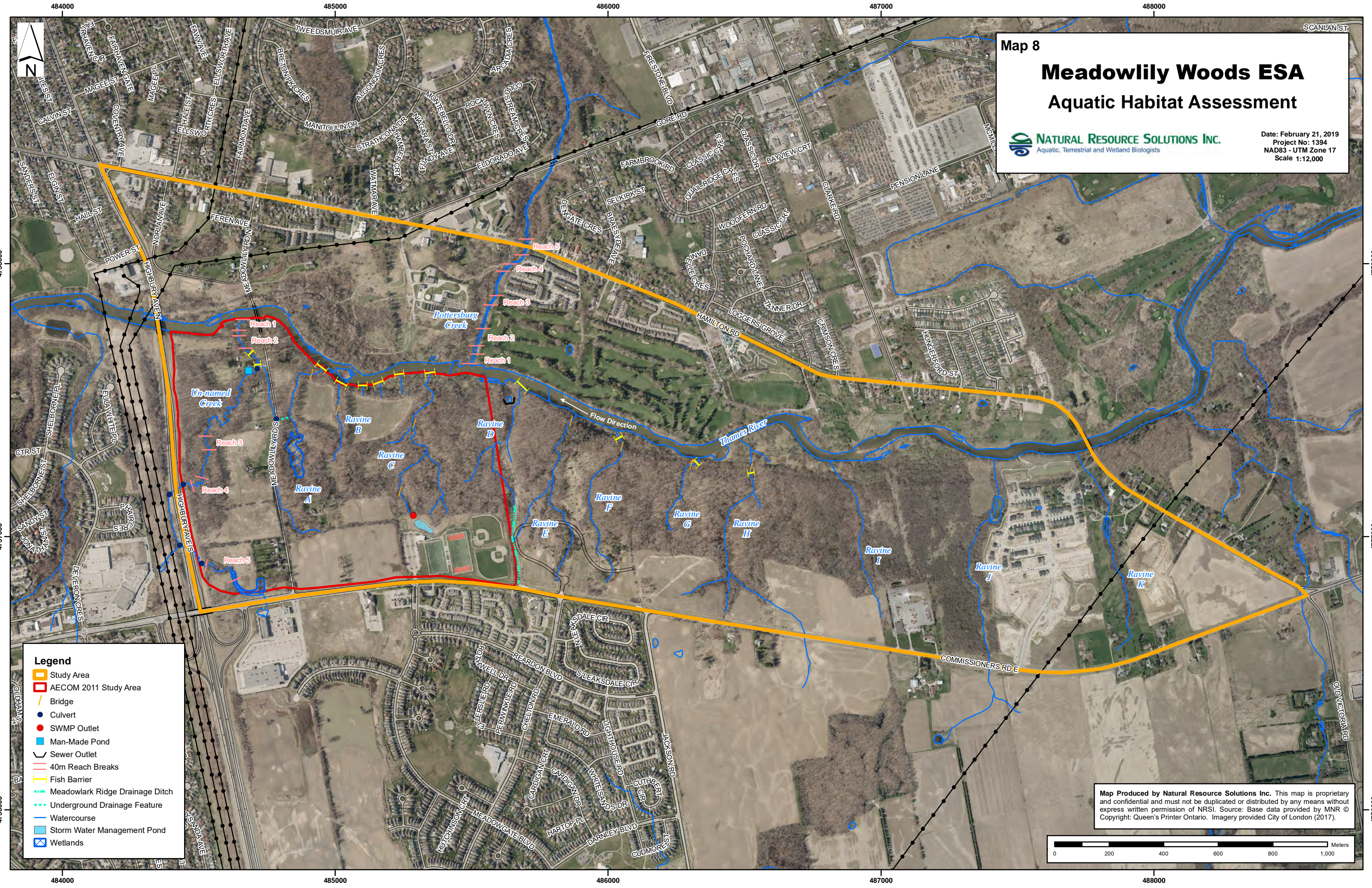
Provincial Rank (SRANK): Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are assigned to consider only those factors within the political boundaries of Ontario.

SX Presumed Extirpated: Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
 SH Possibly Extirpated (Historical): Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
 S1 Critically Imperiled: Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
 S2 Imperiled: Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
 S3 Vulnerable: Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
 S4 Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors.
 S5 Secure: Common, widespread, and abundant in the nation or state/province.
 SNR Unranked: Nation or state/province conservation status not yet assessed.
 SU Unrankable: Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
 SNA Not Applicable: A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
 S#S# Range Rank: A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

Reference: <http://nhic.mnr.gov.on.ca/MNR/nhic/nhic.cfm> (current to March 2012)

Abundance: Refers to the relative abundance or common occurrence of the species found within the waters of the Thames River watershed based on sampling results. Consideration was given to accurately reflect the species presence within the watershed due to the sampling capture method, effort, and biases, difficulty in capturing certain species and anecdotal reporting.
 Abundant: Greater than 50 sample records in the database
 Common: Between 15 and 50 sample records in the database
 Historical: . species that have been previously recorded in the Thames
 Rare: Less than 5 sample records in database
 Uncommon: Between 5 and 15 sample records in database

Distribution: Indicates whether species are sampled throughout the watershed or restricted to specific locales.



Map 8

Meadowlily Woods ESA

Aquatic Habitat Assessment

NATURAL RESOURCE SOLUTIONS INC.
 Aquatic, Terrestrial and Wetland Biologists

Date: February 21, 2019
 Project No: 1394
 NAD83 - UTM Zone 17
 Scale 1:12,000

- Legend**
- Study Area
 - AECOM 2011 Study Area
 - Bridge
 - Culvert
 - SWMP Outlet
 - Man-Made Pond
 - Sewer Outlet
 - 40m Reach Breaks
 - Fish Barrier
 - Meadowlark Ridge Drainage Ditch
 - Underground Drainage Feature
 - Watercourse
 - Storm Water Management Pond
 - Wetlands

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Source: Base data provided by MNR © Copyright: Queen's Printer Ontario. Imagery provided City of London (2017).

