

## **Appendix H: Agency and Peer Review Comments**

### **Halton Region Technical Comments**

OPA 1519.09, Z1519.09 and 24T-17003/O

LOPA, Zoning Amendment and Draft Plan of Subdivision – Preliminary FSR Comments

Clublink Corporation ULC and Clublink Holdings Limited  
1333 Dorval Drive

Adam,

I have reviewed the above noted application for a LOPA, zoning amendment and draft plan of subdivision and have the following comments:

An Functional Servicing and Stormwater Management Report prepared by SCS Consulting Group Ltd., dated October 2016, was submitted in support of the application. These preliminary comments will be in regards to this FSR.

#### **Water Servicing:**

Item #1:

The proposed subdivision is located on the boundary of two water pressure zones. These zones are Zone 3 and Zone 2. Currently the subject property is serviced from the Zone 2 pressure zone. The FSR proposes to connect the entire development to the Zone 3 pressure zone by providing to connections to the existing Zone 3 water system. One connection would be to the existing 750mm diameter watermain located on Upper Middle Road and the other would be to with a connection to the existing 200mm diameter watermain located at the end of Greeneagle Drive cul-de-sac where the 200mm diameter watermain crosses Dorval Drive. This proposal will only provide two watermain connections to this very large development and there is some concern that two connections may not provide enough security of the system should one of these connections be lost.

The FSR does provide some analysis on the proposed water system and some modeling was completed for Maximum Daily Demand conditions for two alternatives. One alternative was having both connections in operation and the other was with the connection to the 750mm diameter watermain on Upper Middle Road closed. There is some concerns with the pressures achieved with only the one connection in operation. Further consideration should be given to providing a further additional supply connection to the development for system security reasons.

Consideration should also be given to extending the 300mm watermain shown on Street C across Dorval Drive to connect to the existing 400mm diameter watermain on Oak Meadow Road instead of connecting this main to the 200mm diameter watermain as proposed.

The FSR should also be revised to provide additional water modelling for the Average Daily Demand and Peak Hour Demand and include node diagrams.

***Issue:***

***That an additional secondary watermain feed be provided to this development in order to provide security of the system to this development.***

**Item #2:**

The FSR shows that the proposed watermain connection to the existing watermain system on Greeneagle Drive will cross through the proposed SWM Pond facility located in this area. This will require a Regional easement. The location of this watermain in the SWM Pond is a concern to the Region due to the potential access and maintenance issues associated with such an alignment.

Consideration should be given to changing the alignment of this watermain to have it located within a municipal road allowance.

***Issue:***

***That Regional watermains not be located within the SWM pond blocks.***

**Item #3:**

The draft plan of this subdivision proposes a cul-de-sac for Street D. The proposed watermain required to service this roadway will result in a permanent dead-end watermain. This will result potential water quality issues, maintenance problems and additional costs to the Region. The Region prefers that cul-de-sacs be avoided due to this reason and that if they are to be included that provisions be made in the draft plan to allow for proper looping of the watermain.

***Issue:***

***That looping of the proposed watermain system be provided on street cul-de-sacs to ensure that dead-end watermains are avoided.***

**Wastewater Servicing:**

**Item #4:**

The FSR does provides analysis of the impact of the flows generated from this proposed development on the downstream sanitary sewer system that these drain to. This analysis indicates that there are sections of downstream sewer that will have capacity issues. The FSR notes that the hydraulic grade line analysis for these sections of sewer shows that there is no issue with the capacity being exceeded in these sewers. The Region has a concern with this and would require further analysis of this issue and may require upgrades and/or replacement of these sections of sewer to address this issue.

***Issue:***

***The impact that the sanitary drainage flow from the proposed development will have on the downstream sanitary sewer system.***

Item #5:

Please note that the sanitary drainage flow from this development eventually drains to the Third Line Pump Station. There is no mention of this pump station in the FSR and therefore the impacts to this pump station from the flows from this development have not been addressed. The FSR should be revised to provide analysis on the impacts this development will have on the Third Line Pumping Station and indicate if improvements and/or expansion of the station will be necessary to accommodate the proposed flows from this development. Should expansion of the station be necessary then the funding requirements and/or mechanism will also have to be determined prior to the development proceeding.

***Issue:***

***The impact to the downstream Third Line Pumping Station from the flows generated by the proposed development has not been addressed in the FSR.***

**Stormwater Drainage on Dorval Drive and Upper Middle Road:**

The FSR does not adequately address what the impacts of the development will be in regards to the existing storm drainage system on Dorval Drive and Upper Middle Road. The FSR does not note if any improvements to the storm infrastructure on Upper Middle Road or Dorval Drive will be required as a result of the proposed development. The FSR should be revised to address this issue.

**Halton Region Transportation Planning Comments:**

Transportation Planning has reviewed the above noted OPA, Zoning By-Law Amendment and Draft Plan of Subdivision and have the below transportation planning comments.

Based on the information provided, Halton Transportation Planning are not in a position to approve the Transportation Considerations Report by BA Group (October 2016) and the Noise Feasibility Study (October 2016) by HGC Engineering.

There is currently not enough information contained and/or analysed in the Transportation Reports (Transportation and Noise) to fully and accurately assess the development impacts and related mitigation measures.

**Transportation Considerations Report – BA Group (October 2016):**

The report has not been structured to be consistent with the suggested structure outlined in Halton Region's Transportation Impact Study (TIS) Guidelines.

**1.Study Area:**

Due to the development traffic volumes and impacts to the surrounding road network, the study area is insufficient as analyzed in the report.

## **2.Existing Traffic Counts:**

The Study turning movement counts (used for existing conditions) show different volumes from Halton's 2016 traffic counts. Halton Transportation Planning cannot support the existing conditions traffic volumes used in the report.

## **3.Background Traffic Analysis:**

A Sensitivity Analysis was not completed as part of the report to include area background development traffic, such as Bronte Green, Oakville Green, Cortel, etc.,

## **4. Study Analysis:**

An appendix was not included with traffic signal timing and turning movement counts used (obtained from Halton Region and independent data collection contractor) in the Study.

Appropriate horizon years are required in order to best capture the traffic demands of total build-out as well as interim periods.

Clarification was not provided on which growth rate was used to calculate AM peak hour volumes in future Background scenario.

The trip generation calculations need to be revised using appropriate rates and appropriate peak periods.

The trip generation calculations need to be updated to include the use of ITE rates for the high density residential trip generation.

The statement is inaccurate that the intersection of Upper Middle Rd at Dorval/West Oak Trails is "operating under capacity", while showing the v/c ratio of 1.04 (over capacity).

Mitigation measures were not included to address movements which are approaching capacity for the intersection of Dorval Drive at Old Abbey Lane/site driveway.

The results of the link capacity analysis which are greater than v/c ratios of 0.85 and appropriate recommendations for mitigation, was not identified.

Growth rates used for both the Phase 1 analysis as well as the Future Total Analysis were not reviewed to ensure they are consistent to prevent inconsistencies in background growth volumes.

Figure 6 shows incorrect route map illustrations as per current Oakville Transit information.

## **5.Upper Middle Road at Street A:**

A diversion has been assumed in the TIS for traffic by-passing the intersection of Upper Middle at Dorval Drive, by using the new development road Street A. The diversion percentage has not been stated, nor has it been justified. The diversion percentage works out to approx. 25%.

- there is a need to identify the volume and percent diversion assumed;
- there is a need to provide reasoning and justification for this diversion;



-there is a need to complete a sensitivity analysis with less diversion: at 10%, and at 0%;

The TIS assumes that Upper Middle Road will be widened “to 6 lanes in the year 2027.”

-a sensitivity analysis was not completed to assume Upper Middle Road will not be widened in 2027 (no widening to 6 lanes).

The Figure 17 total traffic volumes differ from the HCM analysis total traffic volumes at the Upper Middle Road at Street A intersection.

Upper Middle Road at Street A: The required design (storage, taper) of the development westbound left-turn lane for this new intersection is of concern, due to the limited spacing available (150m) from the new intersection easterly to the start of the structure. This leaves minimal space to design the left-turn lane without impeding onto the structure. **The structure space must be maintained without the westbound left-turn lane on it, in order to protect for the future widening of Upper Middle Road.**

## **6.Recommendations, Mitigation & Report Structure:**

A summary of the recommendations was not included in accordance with Halton Region’s TIS Guidelines.

Queue analysis and recommended/required mitigation measures was not completed as part of the report, for all study area intersections.

## **7.Ministry of Transportation:**

Due to the impacts to the QEW ramps at Dorval Drive, the Ministry of Transportation must review and approve the development impacts to their ramps.

### Regional Right-of-Way:

Any lands within 47m measured from the north side of Upper Middle Road southerly that are part of the subject property shall be dedicated to the Regional Municipality of Halton for the purpose of road right-of-way widening and future road improvements.

Any lands within **17.5m** of the centre line of the original 66ft right-of-way of **Dorval Drive (Regional Road 17)** that are part of the subject property shall be dedicated to the Regional Municipality of Halton for the purpose of road right-of-way widening and future road improvements.

A daylight triangle measuring 15m along Upper Middle Road (Regional Road 38) and 15m along Street A shall be dedicated to the Regional Municipality of Halton for the purpose of road right-of-way widening and future road improvements.

A daylight triangle measuring 15m along Dorval Drive (Regional Road 17) and 15m along Old Abbey Lane (north leg) shall be dedicated to the Regional Municipality of Halton for the purpose of road right-of-way widening and future road improvements.

A daylight triangle measuring 15m along Dorval Drive (Regional Road 17) and 15m along Street B shall be dedicated to the Regional Municipality of Halton for the purpose of road right-of-way widening and future road improvements.

All lands to be dedicated to Halton Region shall be dedicated with clear title (free and clear of encumbrances) and a Certificate of title shall be provided, in a form satisfactory to the Director of Legal Services or his designate.

#### Access:

Access is proposed at the following locations:

Upper Middle Road at Street A: This intersection is approximately 500m east of Dorval Drive, but only approximately 150m from the start of the 16 Mile Creek structure. The report did not address the potential impacts from the development traffic (westbound left-turn volumes) and the potential for impeding onto the 16 Mile Creek structure. **The structure space must be maintained without the westbound left-turn lane on it, in order to protect for the future widening of Upper Middle Road.**

Dorval Drive at Old Abbey Lane: The existing signalized intersection of Dorval Drive at Old Abbey Lane is a 4-leg intersection, with the golf course entrance on the east leg. This is proposed to become a full 4-leg intersection. The report did not consider or recommend the requirement for traffic signal modifications (signal heads, traffic controller upgrade), the requirement for a northbound right-turn lane, the requirement for the extension of the existing southbound left-turn lane, median works, and any other associated road works .

Dorval Drive at Street B: It is noted in the report that a restricted right-in/right-out intersection, located 300m north of Old Abbey Lane. Dorval Drive has an existing centre median in place for the access restriction (landscaped treed/grass median).

#### Agreements:

The owner must enter into a Servicing Agreement (through the Development Project Manager) for the completion of required Works for all development associated road improvements (traffic signals, turn lanes, intersection construction, existing traffic signal modifications (signal heads, traffic controller upgrade), median works, illumination, pavement markings/signage, utility/infrastructure relocation, etc.,). The owner is responsible for all costs associated with the improvements detailed as part of the works and must submit for approval detail design drawings and cost estimates.

#### Noise Feasibility Study – HGC Engineering (October 2016):

For noise studies to be reviewed and approved by Halton, every effort must be made to mitigate noise levels to as close to 55dBA as technically, economically and administratively feasible.

Halton's minimum recommended barrier height is **2.4m** and the maximum height is **3.5m**. All noise barriers shall be constructed of Western Red Cedar or Concrete and can be a combination of an acoustic wall and earth berm.

Lots with exposure to Dorval Drive traffic noise are Lots 35-39, 40, 43 and 49. The report does not review the impacts of road noise and whether noise mitigation is required for these specific lots.

Lots with exposure to Upper Middle Road traffic noise are Lots 1-4. The report does not review the impacts of road noise and whether noise mitigation is required for these specific lots.

Balconies and terraces in all apartment/condo buildings will be less than 4m in depth and will not require noise mitigation.

Townhouses will have decks or patios, but will be less than 4m in depth and will not require noise mitigation.

Block 142 – Townhouses at Upper Middle Road & Street A, recommendation for 2.4m noise barrier to achieve 56 dBA. The recommended noise barrier height must be to achieve 55 dBA.

Block 155 – Townhouses along Dorval/exposure to Dorval Drive road noise was not analysed.

Block 156 – Townhouse along Dorval/exposure to Dorval Drive road noise was not analysed.

Central Air Conditioning – Central Air Conditioning was not reviewed and considered for the Townhouse units (Block 142) with exposure to Upper Middle Road traffic noise. Central Air Conditioning was not reviewed and considered for the units with exposure to Dorval Drive traffic noise, as the Study only recommends forced air venting.

Warning Clauses A, B, C & D look accurate and acceptable. Town of Oakville must review and approve the warning clauses.

## Conservation Halton Comments



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Protecting the Natural  
Environment from  
Lake to Escarpment

July 31<sup>st</sup>, 2017

Mr. Charles McConnell, MCIP, RPP  
Manager- Planning, Current Planning - West District  
Town of Oakville, Planning Services Department  
1225 Trafalgar Road  
Oakville, ON  
L6H 0H3

### BY MAIL & E-MAIL

Dear Mr. McConnell,

**Re: Application for Official Plan Amendment; Zoning By-Law Amendment; and Draft Plan of Subdivision – Glen Abbey Golf Course Lands**  
**File Number: OPA 1519.09, Z.1509.09 and 24T-17003/O**  
**1333 Dorval Drive, Oakville**  
**Parts of Lots 17, 18, 19, and 20, Concession 2, S.D.S**  
**ClubLink Corporation ULC and ClubLink Holdings Limited**

### Part A - Introduction

Conservation Halton (CH) staff has reviewed the above-noted application as per our responsibilities under Ontario Regulation 162/06; the Provincial Policy Statement (PPS) (delegated responsibility for comments relating to provincial interests under Sections 3.1.1-3.1.7 inclusive); the Memorandum of Understanding (MOU, 1999) with Halton Region; and as a public body under the *Planning Act*. These responsibilities are not mutually exclusive. Comments that pertain to items contained in the MOU may also apply to areas regulated under Ontario Regulation 162/06.

The following comments relate to the items marked as "applicable" for this specific application. Comments under Ontario Regulation 162/06 are clearly identified and are requirements. Other comments are advisory.

#### Ontario Regulation 162/06

Lake Ontario/Burlington Bay/Hamilton Harbour Shoreline Hazards &/or allowances  
River and Stream Valley Hazards (flooding/erosion) &/or allowances  
Wetlands &/or Other Areas\*  
Hazardous Lands (Unstable Soil/Unstable Bedrock)  
CH Permit Requirements

#### Applicable

☐  
☒  
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☒  
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#### One Window Delegated Authority under PPS

Natural Hazards (Sections 3.1.1-3.1.7 inclusive)

☒

#### CA/MOU

Impacts on Lakes and Rivers

☒

Wildlife Habitat  
 Endangered & Threatened Species  
 Fish Habitat  
 Stormwater Management (as per Schedule D)  
 Sub-watershed Planning/Master Drainage Planning

☒  
☒  
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**Other Comments (as a Public Body)**

Niagara Escarpment Plan  
 Watershed Plan  
 Greenbelt Plan  
 Source Protection Plan  
 Hamilton Harbour Remedial Action Plan

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**Part B – Proposal**

An official plan amendment, zoning by-law amendment, and draft plan of subdivision are being proposed for the Glen Abbey Golf Course lands in the Town of Oakville. The approximately 93 ha parcel of land is generally located in the south-east quadrant of the Upper Middle Road and Dorval Drive intersection. The lands include tablelands as well as a portion of the Sixteen Mile Creek and valley. A mixed use subdivision including low, medium, and high density residential, as well as other community amenities is proposed. Three stormwater ponds are proposed to serve the development, two of the ponds are proposed to outlet to Sixteen Mile Creek, the third is proposed to outlet to a tributary of Glen Oaks Creek – also a regulated watercourse. There is a woodlot near Dorval Drive that is proposed to be retained; there are 2 regulated wetlands (less than 2ha) within the woodlot.

Staff have received and reviewed the following documents submitted with this application:

- *Cover Letter for Official Plan Amendment, Zoning By-Law Amendment, and Draft Plan of Subdivision; prepared by Glen Schnarr & Associates; dated November 10, 2016*
- *Planning Justification Report, prepared by Glen Schnarr & Associates; dated November 2016; received June 23, 2017*
- *Functional Servicing and Stormwater Management Report, Proposed Re-Development of the Glen Abbey Golf Club, Town of Oakville; prepared by SCS Consulting; dated October 2016; received June 23, 2017*
- *Environmental Impact Assessment, Glen Abbey Golf Club Redevelopment, Town of Oakville, Ontario; prepared by Beacon Environmental; dated October 2016; received June 23, 2017*
- *Tree Vegetation Study and Tree Protection Plan, Glen Abbey Golf Club Redevelopment, Town of Oakville; prepared by Beacon Environmental; dated October 2016; received June 23, 2017*
- *Geomorphic Assessment; prepared by Beacon Environmental; dated October 2016; received June 23, 2017*
- *Preliminary Geotechnical Investigation, Glen Abbey Golf Club Redevelopment Oakville, Ontario; prepared by Golder & Associates; dated October 2016; received June 23, 2017*
- *Preliminary Hydrogeological Assessment, Proposed Residential Development, Glen Abbey Golf Course, Oakville, Ontario; prepared by Golder & Associates, dated October 2016; received June 23, 2017*
- *Draft Plan of Subdivision Clublink Corporation ULC & Clublink Holdings Limited; prepared by Glen Schnarr & Associates; dated November 1, 2016; received June 23, 2017*
- *Official Plan Amendment; prepared by Glen Schnarr & Associates Inc.; dated October 2016; received June 23, 2017*

- *Zoning By-Law Amendment; prepared by Glen Schmarr & Associates Inc.; dated October 2016; received June 23, 2017*
- *Figure 2, Existing Conditions (ELC communities), Glen Abbey Community; prepared by Beacon Environmental; dated October 2016; received June 23, 2017*
- *Figure 5.1, Preliminary Grading Plan, Glen Abbey Golf Club Re-development; prepared by SCS Consulting Group; dated October 2016; received June 23, 2017*
- *Figure 2.2, Post-Development Storm Drainage Plan, Glen Abbey Golf Club Re-Development; prepared by SCS Consulting; dated October 2016; received June 23, 2017*
- *Figure 2.7, Storm and Sanitary Servicing Plan, Glen Abbey Golf Club Re-Development; prepared by SCS Consulting; dated October 2016; received June 23, 2017*

In addition Conservation Halton staff also considered the following information on the Town of Oakville's website as part of our review process:

- *Phase 1 Environmental Site Assessment; prepared by Golder Associates; dated October 2016*
- *Phase 2 Environmental Site Assessment; prepared by Golder Associates; dated October 2016*

### **Part C – Recommendation**

Conservation Halton staff are not in a position to support draft plan approval or provide conditions of approval. Similarly we are not in a position to support the official plan amendment and zoning by-law amendment. At this time, there are fundamental aspects of the subdivision which cannot be supported by Conservation Halton's regulatory and use policies. In addition many of the technical studies submitted are insufficient to support the proposed development. Conservation Halton's detailed comments are provided in Part D below, a summary of the key issues is provided in Part E.

### **Part D – Detailed Comments**

Conservation Halton's detailed comments are provided in 3 parts. Part 1 are our requirements under O.Reg. 162/06 and the PPS, Part 2 are our advisory comments under the MOU, Part 3 are other advisory comments as a Public Body under the *Planning Act*.

#### **D.1 - Ontario Regulation 162/06 & One Window Delegated Authority under PPS**

Sixteen Mile Creek is a regulated watercourse pursuant to O. Reg. 162/02. Sixteen Mile Creek is considered a major valley system and therefore Conservation Halton regulates 15m from the greatest flooding or erosion hazard. The Sixteen Mile Creek system would be considered a Natural Hazard pursuant to Section 3.1 of the PPS. Glen Oaks Creek to which SWM Pond B is proposed to outlet to is also a regulated creek. The following comments are related to Conservation Halton's technical and policy responsibilities under O. Reg. 162/06 and Sections 3.1.1-3.1.7 of the PPS. These comments should be considered requirements and would need to be addressed prior to draft plan approval. We have provided the comments based on the report or drawing in which the information was primarily presented in.

##### **D.1.1. Planning Justification Report dated November 2016**

1. **Section 5.5, Natural & Cultural Heritage, Page 41** – Sixteen Mile Creek is a major valley system and Conservation Halton policy requires a setback of 15m from the greatest natural hazard. In this case, as the flooding hazard is contained within the valley, a 15m setback is required from the greater of the staked top of bank and long term stable top of bank. The development proposal, land use concept, and all supporting reports must be revised to provide the appropriate setback. An "effective" buffer as described in the Planning Justification Report is not

an acceptable alternative. Similarly, Conservation Halton staff strongly recommends that the setback be included as part of the natural area block as opposed to separate blocks designated and zoned open space. In addition we note that the tableland significant woodlot and buffer are proposed to be zoned open space, we would recommend that this significant woodland and appropriate buffer be designated and zoned natural area.

2. **Section 2.0, Site Description and Surrounding Land Use – Raydor Estate, Page 1** – Conservation Halton staff recognize that the Raydor Estate is not included as part of the application. However, by virtue of the application the block containing Raydor Estates is being created. The Raydor Estates block would be encumbered by the long term stable top of bank and 15m setback. PPS and Conservation Halton policies do not allow the creation of new lots containing hazard lands. However it is recognized that this is a unique situation. We require that it be demonstrated that there is a sufficient building envelope to replace the building or a portion of the building if required or that the development application would recognize that the block is suitable only for the current existing use and commit that the existing building cannot be replaced. This could be done through a rezoning or other appropriate instrument.

*D.1.2. Functional Servicing and Stormwater Management Report dated October 2016*

3. **Section 2.4, Proposed Storm Drainage, Page 11** – Although it is not explicitly described in the FSR or other technical reports we assume that for the outlets of Pond A & C an open cut of the valley wall is proposed. Please note that Conservation Halton Policy 3.51 j) requires the use of a drop shaft and tunnel technique for valleys greater than 6m. The land use concept, draft plan, FSR, EIA, geotechnical and other reports should be revised to reflect this requirement.
4. **Section 2.5.4, Water Budget and Infiltration Methodology Details, Page 12** - There are two small wetlands contained within the tableland woodland that need to be considered when discussing water budgets and infiltration. We note on Figure 2.3 the existing drainage area for the woodland is 1.21ha. However details on the wetland catchment areas are not included. A feature based water balance is required for these two features to ensure that there is no impact on the hydrologic function of these wetlands from the development. Mitigation measure may be required to ensure that pre to post conditions for the wetlands is maintained depending on the results of the water balance.
5. **Figure 4.1 - Watermain Servicing Plan** - The existing 300 mm diameter watermain to be removed may be located within the regulated erosion hazard. A permit will be required to support the removal and any excavation within the hazard. Depending on the location and extent of impact, a geotechnical assessment may be required to support the proposed removal.

*D.1.3. Environmental Impact Assessment dated October 2016*

6. **Section 2.5, Conservation Halton and the Conservation Authorities Act, Page 7** - Please note that in addition to the regulation and policies listed, Conservation Halton also regulates wetlands. There are two tableland wetlands within the woodland at the closest to Dorval Drive that need to be considered from a regulatory aspect which are not discussed. These wetlands are less than 2 hectares in size, therefore the regulated setbacks for these features are 30m from the wetland limit. Development may be permitted between 15 – 30m from this limit, provided there are no impacts on the hydrologic function of the wetlands. This should be added to this section of the report and the regulation limits shown accordingly on the draft plan. The need to evaluate the hydrologic functions of the wetlands are discussed above.

7. **Section 7.1, Effects Assessment and Figure 3 – Staked Features and Development Limit, Page 38a:** The provided 8.5 x 11 Figure was not at a sufficient scale to assess all constraints, nor did it contain all potential constraint limits associated with development of this parcel. To confirm that the proposed development respects all constraints, at a minimum a full-sized, scaled figure (1: 2000 or better) that includes the following information is required:

- Topographic base mapping (contours)
- Aerial Photograph
- Proposed Draft Plan of Subdivision
- Top of Bank as staked by Conservation Halton (November 2, 2015) plus 15m setback
- Long term Stable Top of Slope (as evaluated by the Geotechnical Consultant and approved by Conservation Halton) plus 15m setback
- Extent and location of where a Toe Erosion Hazard is applied
- Cross Section Locations Analyzed relative to Slope Stability
- The staked wetland, woodlot dripline and appropriate setbacks
- Please note - additional elements would need to be shown should any of the Headwater Drainage Features present on site merit a management strategy involving protection or conservation.

8. **Section 8.5, Conservation Halton and the Conservation Authorities Act, Page 50 -** Our policies as it pertains to the stable top of bank of Sixteen Mile Creek and the wetlands within the woodland on the tableland have not been adhered to. Please revise the report to be in keeping with Ontario Regulation 162/06 and its associated Policies, Procedures and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document.

*D.1.4. Preliminary Geotechnical Investigation dated October 2016*

9. **Section 5.10.1, Background, Page 14 -** The referenced document “*Determining Regulatory Limits in the Conservation Halton’s Jurisdiction*” dated August 2015 is intended to be a graphic and overview of Conservation Halton’s policies only, it is not intended to be a technical guidance document. Conservation Halton requires slope stability analysis to be completed in accordance with Provincial Guidelines as indicated in MNR’s 2002 *Technical Guide – River and Stream Systems Erosion Hazard Limit* and the attached *Geotechnical Principles for Stable Slopes* prepared by Terraprobe Ltd. and Aqua Solutions, dated June 1998. For slope stability assessments, we require achievement of a minimum Factor of Safety of 1.5 (for normal groundwater conditions) and 1.3 (for elevated groundwater conditions such as seasonally high water tables) based on an Effective Stress Analysis. The report should be updated to reflect this.
10. **Section 5.10.2, Methodology and Parameter Selection, Page 15 -** Clarification should be given as to why the loose fill material identified as part of Slope B had a different Bulk Unit Weight than the Loose Fill analyzed in Slope C, when both required a blow count of 7. This is noted, but evaluation of parameter selection has been deferred to the Town’s Peer Review Consultant.
11. **Section 5.10.3, Slope Stability Results and Section 5.10.4, Erosion Hazard Limit Analysis, Pages 15 & 16 -** While stable inclinations ranging between 2.2H:1 V and 2.6H:1V may be appropriate, the provided report does not provide sufficient documentation of the analysis undertaken to confirm these inclinations. Additional documentation is required to demonstrate that overburden materials at the stated inclinations achieve a minimum Factor of Safety of 1.5 under normal conditions and 1.3 under a seasonally high water table. The recommended stable shale inclination of 1.6H:1V is accepted.



12. **Section 5.10.4, Erosion Hazard Limit Analysis, Page 16** - Given the variations in depth of fill and elevation of the top of bedrock, application of a composite Stable Slope Angle of 1.7H:1V to determine the location of the stable top of slope line universally across the property is not supported unless additional documentation is provided to demonstrate that this composite inclination fully contains the hazard across the entire property.
13. The attachment *Important Information and Limitations of This Report* identifies that the report has a validity of 18 months, unless Golder is requested to review and, if necessary, revise the report. The attachment indicates the report is for the sole benefit of the client and *"No other party may use or rely on this report or any portion thereof without Golder's express written consent."* Golder's written consent was not received as part of this submission. The report is also identified as a *'Preliminary Investigation'*. The Preliminary Investigation references the need to complete additional detailed assessments. Receipt of express written consent for Conservation Halton to rely on Golder's analysis as an approved user of this report and all subsequent reports, or addendums associated with development of this property is required. An assessment to extend the report validity for any reliance on the report should construction commence after April 2018 may also be required. To support detailed design, specific geotechnical assessment of the proposed stormwater management facilities, dewatering (should there be potential for slope stability impacts or hydrologic impacts to regulated wetlands) and any construction impacting the valley wall or long term stable top of slope will also be required.
14. **Figure 1 - Site and Borehole Location Plan** - The borehole spacing exceeds the 100m spacing recommended in the MNR Technical Guidelines. Per Table 3: Shale Bedrock Depths and Elevations, the bedrock elevation varies considerably across the tableland portion of the property from a reported low of 122.2 masl to a reported high of 135.8 masl. Bedrock Depths from boreholes 3, 5, 6, 7, and 8 (which are located closest to the edge of the valley wall and extend sequentially from north east to south west along the 16 Mile Creek Valley) are reported at 122.2 m, 126.5m, 127.3m, 124.3m, and 125.6m. The boreholes also display similar variability in the elevation of the top of till. Given the variability, additional boreholes should be advanced to refine the slope stability analysis. Failing that, discussion associated with the slope stability analysis should indicate how these discrepancies have been recognized in the analysis and what conservative factors have been incorporated in the design to account for this.
15. **Figures 2 through 5 – Slope A through D Stability Analysis (Static)** - The water surface elevation considered in the existing condition slope stability analysis has not been clearly documented by the provided Figure.
16. **Figures 2 through 5 – Slope A through D Stability Analysis (Static) and Figure 6 Slope Setback Analysis** - The source and sufficiency of the topographic mapping utilized in the analysis is unclear. The analyzed slope sections shown in Figures 2 through 5 all appear uniform (i.e. there is no variation in steepness along the slope face associated with each individual cut slope). Photos included in Appendix C show the slope steepness varies significantly, as is typical of natural slope conditions. Near vertical sections of slope were noted near the shale and overburden interface. The topographic information shown in plan view in Figure 6 is provided at a scale of 1:6,000, and does not clarify the source of the topographic information that was relied upon, indicating only Base Plan Received from SCS Consulting Group, Dated April 10, 2015. Please provide additional detail on the source and accuracy of the topographic information and provide a larger scale plan view with legible contour elevations. Please also clarify how the toe of slope was measured where the watercourse and toe of slope are co-incident, (i.e. is toe of slope the base of the channel at the outside bend or is it measured based on the water's edge?)

17. **Figure 6 - Slope Setback Analysis –**

- a. Figure 6 appears to indicate that 13 slope profiles may have been assessed, however analysis of existing conditions was only provided for sections A-D. Supporting analysis and/or cross section plots for sections 1-9 were not provided.
- b. The provided plan has not been provided at a scale sufficient to enable the reviewer to assess and confirm the accuracy of the placement of the Top of Stable Slope Line. Larger scale plans that more clearly identify the topography of the slope face are required.
- c. **RayDor Estate's Retained Lands** - the figure provides stable slope line through the RayDor Estate Site but does not show the location of existing buildings. Please include the location of the existing buildings on this figure.

18. **General Comment** - The preliminary geotechnical report fails to assess the impact that pond construction will have on long term slope stability. Per Figure 2.5 Stormwater Management Pond A, in SCS's October 2016's Functional Servicing and Stormwater Management Report, Pond A will involve construction of a pond berm up to 3 m high, with the toe of berm aligned with the proposed Limit of Development. Section 5.8.2 SWM Pond Berm Construction and Inspection and Maintenance of the Geotechnical Report identifies that prior to berm construction, underlying fill material (which is anticipated to extend to a depth of up to 4 m) must be stripped and replaced with engineered fill. Section 5.3 of the Geotechnical Report indicates engineered fill must be extended outward and downward in a 1:1 slope beyond any settlement sensitive area. This implies an anticipated disturbance area of 8 m or greater may be required extending beyond the limit of development. Additional disturbance may be required for the construction should the recommended detailed global instability analysis determine features such as shear keys will be required. Per Figure 3 Staked Features and Development Limit, contained in the Beacon EIA, the Limit of Development Line has been based on a 10 m Stable Top of Bank Buffer. The evaluation of the Long Term Stable Top of Slope failed to consider what impact proposed construction activities (particularly those with the potential to extend within the buffer) would have on bank stability.

19. **General Comment** - The preliminary geotechnical report did not evaluate the impact of outlet construction (associated with Ponds A and B) on the future Long Term Stable Top of Slope. Per Figure 2.5 of the SCS report and the Recommended Mitigation Measures in the EIA, the proponent is considering an open cut installation of the outfall. Per Conservation Halton's Policy 3.51 (j), outfalls to valleys with wall heights greater than 6 m should normally be constructed using trenchless methods. The Geotechnical Report should evaluate whether the outfalls could be constructed using trenchless methods. If trenchless methods cannot be used, the impact proposed trenched outfall construction would have on valley stability and the development envelope should be assessed, and the extent of the impacted area estimated and evaluated through the EIA.

20. **Slope Stability Analysis Summary Comment** - The conclusions of the Slope Stability Analysis is not sufficiently supported by documented analysis. Prior to supporting the conclusions of the report, the following will be required:

- Analysis of additional boreholes located adjacent to the slope crest and/or discussion indicating what conservative assumptions have been considered in the analysis recognizing the extent of the variation in overburden thickness and composition and top of bedrock elevation across the site

- Detailed Effective Stress analysis demonstrating that the indicated 2.2H:1V to 2.6H:1V will be stable and achieve a minimum Factor of Safety of 1.5 under normal conditions and a minimum Factor of Safety of 1.3 under temporary conditions (such as under seasonally high groundwater levels);
- Assessment of slope stability impacts associated with pond construction and pond outfalls; and
- Documentation must be presented at an appropriate scale to allow for a technical confirmation of the report conclusions.

#### D. 2 - CH/Halton Region MOU

The following comments are related to Conservation Halton's Memorandum of Understanding with Halton Region and the Area Municipalities. These comments should be considered advisory and we recommend that they be addressed prior to draft plan approval. We have provided the comments based on the report or drawing in which the information was primarily presented in.

##### *D.2.1 Functional Servicing and Stormwater Management Report dated October 2016*

21. **Section 1.1, Purpose of the Functional Servicing and Stormwater Management Report, Page 1** - This report indicates that both the RayDor Estate (Old Abbey Building) and the RCGA structures will be maintained on site outside of the Re-development application. The location of each of these separate buildings is unclear. Please provide clarification if these are a single or separate buildings and provide the location of these buildings. All other reports refer to the Raydor Estates building only.
22. **Section 2.1, Stormwater Runoff Control Criteria, Page 4** –
  - a. The provided document has not evaluated how development will impact downstream flood risk for the drainage contributing to the Glen Oak Tributary. Until a more fulsome assessment is completed, the selected quantity control criteria of post to pre control for the 1:2 year to 1:100 year storm events and no control for the Regional storm is not supported for the Glen Oak catchment area.
  - b. Section 4.1.2 Glen Oak Tributary of Beacon's October 2016 Environmental Impact Assessment, describes the Glen Oak Tributary as entrenched and subject to active erosion. The tributary is noted to originate off-site to the south of Dorval Drive. It is unclear how re-development of the Glen Abbey Golf Course will impact this headwater feature, and whether the proposed 48 hour Detention of the 25 mm rainfall event will adequately mitigate against the increased runoff volumes and flow durations that will be experienced by this drainage feature.
23. **Section 2.2, Existing Drainage, Page 5** - The text provided in this section indicates that Catchment 101 spills to Catchment 104, which drains to a DICB that is connected to a sewer that flows southeast along Dorval Drive. The ultimate watercourse receiver and location of storm sewer outfall is not identified. The existing conditions hydrologic model models catchment 101 as draining solely to catchment 102. The available contour information appears to show potential for a spill paths to both catchment 102 and catchment 104. It is unclear whether or not the existing conditions and associated stormwater management targets have been accurately modelled. It is unclear whether direction of excess flow from catchment 101 to catchment 102 as opposed to catchment 104 could represent an impactful diversion.

24. **Section 2.2.1, Existing Site Characterization, Page 5** - It is unclear why the selected runoff coefficient for Lawn is significantly lower than the runoff coefficient for forest (i.e. 0.13 vs 0.35).
25. **Section 2.3, Best Management Practices, Page 6** - mentions that a single in-situ percolation test was completed to estimate a percolation rate, which is used to estimate post development infiltration mitigation across the entire site. No details are provided in terms of location, soils encountered, how well the single test represents the conditions across the entire site, etc.
26. **Section 2.4, Proposed Storm Drainage, Page 10** - The adequacy of the proposed drainage plan, stormwater management strategy and hydrologic modeling cannot be confirmed in advance of documentation of the Headwater Drainage Feature classification and establishment of associated management recommendations for all of the headwater drainage features present on-site. Should evaluation and classification of features result in management recommendations of protection, conservation, mitigation, or recharge protection for any of the headwater drainage features identified on site, the proposed stormwater management strategy must be revised to demonstrate how the form and/or function of the headwater feature will be maintained.
27. **Section 2.5.4, Water Budget and Infiltration Methodology Details, Page 12** -
- a. Shallow groundwater contour map and proposed grading plan should be used to assess areas suitable for low impact development measures in terms of pre to post development loss of infiltration mitigation. Based on the above assessment a spatial assessment should be completed to estimate if there is enough area for different LID techniques to achieve required mitigation target.
  - b. This section references the Preliminary Hydrogeological Assessment by Golder, but the actual numbers for pre-development infiltration volume for pre-development and post development without mitigation scenarios differ from the Golder assessment (Table 5 and Table 7).
  - c. The third paragraph mentions that various LID measures, will be constructed where feasible, to maintain or increase pre-development infiltration rates, and then it states that through construction of the proposed measures it is anticipated that a post development infiltration volume of approximately 109,000 m<sup>3</sup> can be achieved. This is a reduction of infiltration volume by some 10,900 m<sup>3</sup>. Staff would appreciate a clear message of what is actually proposed.
  - d. It is unclear why all infiltration mitigation measures are proposed to capture 100 % of 15 mm rainfall and if this is sufficient to meet the pre-development infiltration. Please note that the water budget calculations provided in the Golder hydrogeological assessment were based on infiltrating 85% of available rooftop surplus. For example: what is the relationship between the 15 mm rainfall captured from rooftops on annual basis and 85% of rooftop water surplus as proposed in the Golder report?
28. **Section 2.6.4, General Pond Design Criteria, Page 16** -
- a. It is recommended that the ponds be sized to maintain a minimum 0.3 m freeboard above the anticipated design high water level. It is further recommended that to account for construction tolerances, climate change, etc. a minimum of 0.1 m freeboard be accounted for

between the invert of the emergency spillway and the controlled water level. As the Regional storm has not been modelled, it is unclear whether or not the pond blocks have been sized to provide the recommended degree of freeboard. For Ponds A & C, which are located adjacent to the Sixteen Mile Creek Valley, conveyance of all flows, up to and including the Regional Storm, through the outlet control structure, may be supported, however, it is advised that the outlet structure be designed to reduce potential for blockage, and that a passive overland flow route to the valley also be provided as a fail-safe mechanism.

- b. Recent research has demonstrated that, due to winter salting practices, stratification occurs in SWM wet ponds and the coolest water that is released from the bottom also has elevated salt levels. Therefore, in order to minimize potential salt concentrations and provide some thermal mitigation, we recommend the use of submerged outlets which are to be located approximately at the midpoint of the permanent pool depth, and a minimum of 0.6m from the bottom of the facility, and 1.0m below the surface of the permanent pool. A multiple outflow configuration that blends flow from the top and bottom of the permanent pool between the depths noted above is preferred. A salt management plan is also recommended. Other factors that can assist with temperature mitigation and should be explored include cooling trenches, underground cooling chambers, cooling towers, providing shading, increasing permanent pool depth. In addition to the multiple outflow configuration recommended, ponds should be designed with a minimum length to width ratio of 5:1 to minimize large open areas of water or filtration media; appropriate orientation and perimeter planting to maximize shade coverage throughout the facility and cooling trenches.
  - c. This section states that a *'rock wall feature along portions of the pond perimeter'* may be included in the final design of the ponds. Please note that Conservation Halton would not be supportive of the use of rock walls / urban pond design in this location.
  - d. This section states that vegetation in the SWM ponds will be in accordance with the Town of Oakville Sustainable Development Checklist. We suggest that the appropriate standard for SWM pond plantings should be in accordance with Conservation Halton's Landscaping and Tree Preservation Guidelines.
29. **Section 2.7, Phosphorus Budget, Page 17 & Appendix H** – The review of this information is deferred to Town of Oakville staff.
30. **Section 2.8, Storm Servicing, Page 17** - It is recommended that the allowable depth velocity product along the major overland flow route be established in accordance with MNRF's Guidelines for low risk, which flags that safety is generally maintained when the depth velocity product is less than  $0.4\text{m}^2/\text{s}$ , with flow depths less than 0.3m (to prevent vehicle buoyancy) and flow velocities less than 1.7 m/s.
31. **Figure 2.1 - Existing Drainage Plan** - The Figure 2 Existing Conditions Plan prepared by Beacon Environmental indicates the presence of an ephemeral drainage connection (headwater channel) that bisects the boundary between existing drainage catchments 103 and 104. The topographic information in the vicinity of the Headwater Features should be reviewed to confirm the drainage boundary and flow paths associated with catchments 103 and 104 are fully characterized. Given the scale of the information presented in Figure 2.1, the presence of the drainage feature and its impacts on the drainage patterns cannot be confirmed. A larger scaled plan showing pre-development drainage boundaries is required to facilitate review.

32. **Figure 2.1 - Existing Drainage Plan** - The catchments presented in Figure 2.1 may need to be further refined to inform assessment of impacts related to the loss of Headwater Drainage Features. (Note: Per Beacon's EIA, 5 Headwater Drainage Features were identified on site, however only two were mapped.)
33. **Figure 2.3 - Woodlot Drainage Plan** - The drainage to the Woodlot should be re-assessed should the ephemeral drainage connection (identified in Beacon's Figure 2 Existing Conditions) drain to the woodlot. Additional undocumented drainage sources are referenced in Section 7.1 Effects Assessment, Changes to Hydrology/Water Balance to Wetlands, page 39 of the Beacon EIA, which states "...one wetland pond in Unit 7b receives storm drainage from two sources that likely originate from an old pipe system related to the tableland development." The reference to Unit 7b should be verified with Beacon to confirm if there are other contributing flow sources to the Mineral Shallow Marsh that is to be retained.
34. **Section 5.2, Proposed Grading Concept, Page 22 -**
- a. The report indicates that the southwest corner adjacent to the woodland will require additional fill due to infrastructure needs. Consideration of how this will impact the woodland is not included or discussed in the FSR or EIA and needs to be quantified, with mitigation measures proposed as necessary.
  - b. Discussion is needed in this section to address the grading and any associated filling that will be required for the SWM ponds adjacent to the NHS. It is our expectation that no grading for these ponds will be required within the NHS buffer or regulated allowance. Please provide a figure which more closely shows the SWM pond and NHS interaction and provide discussion on this point.
35. **Appendix E – Hydrology Modelling** - Given the storage available within the existing golf course ponds, the following comments are not anticipated to have significant impact on target flowrates, particularly to Sixteen Mile Creek, and have been provided as information only to help guide future studies:
- a. Given the undulating topography, presence of irrigation storage ponds, sand traps etc., insufficient detail has been presented to support the selected existing conditions IA values of 5mm for the golf course lands, particularly in light of the use of 5mm IA depth for residential lawns post construction.
  - b. The golf course irrigation ponds in Catchment 101 appear to have been modeled based on a CN value of 98, as opposed to a more industry standard value of 50 for wetlands and ponds. This is contrary to the modelling approach taken for the post development pond blocks, where ponds were modelled as 50-55% impervious.
36. **Appendix E – Proposed Conditions Percent Impervious Calculations** - It is recommended that additional documentation be provided to support the proposed impervious coverages for all development forms. For instance, it is unclear why single detached homes with 60' frontages are anticipated to be more impervious than single detached units with 32' to 50' frontages. Review of impervious coverages, however, is ultimately deferred to the Town.

37. **Appendix F** – Additional information is required to confirm it will be feasible and acceptable for entire rooftop from two buildings to be drained to the woodlot. The slight excess in drainage area may be needed as the proposed drainage area will be flatter than the golf course area draining to the pond and so less runoff may be generated. We will also need to ensure that there is sufficient space to spread flows – so as not to cause erosion within the woodlot. If the Town is in agreement, this issue could be deferred to detailed design.
38. **Appendix G – SWM Pond A Control Structure** – Based on the provided Hydrologic Model, a 25 mm storm event results in 2,456m<sup>3</sup> of storage within Pond A, which per the pond control summary would have a draw down time of approximately 47 hours. The control structure should be refined at detailed design to achieve the full 48 hour drawdown proposed.
39. **Appendix G – SWM Pond A, B, and C Control Structure Design** – Given that a standard DICB Type A has been specified, why was a grate size length of 1.338 m selected, when the internal width of the DICB is only 1.2 m? The Ditch Inlet Overflow Calculation could not be replicated using the standard weir equation. The calculation for the Ditch Inlet Overflow did not appear to transition from a weir to orifice equation once the ditch inlet overflow fully became submerged or fully submerged at depth.
40. The Functional Servicing and Stormwater Management Report failed to assess potential climate change. The functionality of the proposed stormwater management system should be assessed relative to anticipated climatic conditions.
41. **Stormwater Management Plan Summary Comment** - The proposed stormwater management plan not been demonstrated to sufficiently mitigate impacts associated with the proposed development. The report is not accepted for the following reasons:
- The stormwater management targets failed to assess downstream impacts for drainage discharging to the actively eroding headwater tributary of Glen Oak Creek.
  - The evaluation of Headwater Drainage Features was not completed, as classification and management recommendations were not provided. The stormwater management strategy will need to be altered if headwater features or functions need to be maintained.
  - Questions remain regarding the existing condition outlet for Catchment 101 and the contributing drainage area to the tableland significant woodlot/wetland located near Dorval Drive which is to remain.
  - Sizing of the proposed stormwater management ponds could not be confirmed to be sufficient as:
    - Targets needed to be re-assessed
    - Sizing failed to consider freeboard requirements relative to the design high water level associated with the Hurricane Hazel Storm; and
    - Elements of the control structure design could not be replicated.

*D.2.2 Environmental Impact Assessment dated October 2016*

**42. Section 3.1, Field Investigations, Page 8 -**

- a. Table 1- Please include the timing of the surveys and weather conditions in this summary table of the field studies. As per Conservation Halton's Guidelines for Ecological Studies, all field data sheets from the surveys should be included as an Appendix or in electronic form.



- b. Subsection Feature Staking - It is noted that features were staked on the site on November 2 and December 3, 2015, specifically the woodland features. The two wetland in the tableland woodland were not delineated at that time and will need to be during the appropriate field season (June to late-September) in order to establish the limits of development associated with those features. It is recognized that the adjacent land use is a park, however the regulated limits do need to be established or a 15m setback applied to the dripline rather than the 10m currently proposed around these wetlands.

- c. For clarity, please separate 'Aquatic Habitat' and 'Headwater Drainage Feature Assessment' entries in Table 1 into separate rows.

43. **Section 3.2, Aquatic Resources, Headwater Drainage Feature Assessment (H DFA), Page 13-14** - The report did not demonstrate that Headwater Drainage Features were assessed in accordance with the TRCA/CVC's *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (January 2014, hereafter referred to as the HDF Guidelines). Specifically:

- a. Headwater Drainage Features SMC-H3, H4, and H5 do not appear to be mapped and should be included on Figure 2 Existing Conditions. A map indicating the location of the features described in the text is requested. In addition, CH mapping identifies hydrologic connections not described in Beacon's EIS. CH can provide this information but require a data licensing in place in order to supply these data. See our website for more information (<http://www.conservationhalton.ca/mapping-and-data>).
- b. This section notes that the H DFA was completed over two site visits, April 28<sup>th</sup> and June 4<sup>th</sup>, 2015. The HDF Guidelines directs assessors to time site visits to capture spring freshet conditions, ideally between February and March – were freshet conditions occurring during the late April site visit? Per the HDF Guidelines and related Ontario Stream Assessment Protocol procedure, the assessment is “*best applied in the short period of time following a major freshet event*”, which corresponds to the period between March and the middle of June in Southern Ontario (Stanfield, 2013).
- c. A key component of the protocol is to consider what alterations are proposed for an HDF and then assess the impact of that alteration on the functionality of each feature. The guidelines note that only mandatory information (as opposed to more detailed) can be collected where no negative alterations to the HDF are proposed, i.e. the additional data requirements should be collected if HDFs are proposed to be eliminated. This allows adequate documentation of the conditions that will need to be replaced or restored, and to evaluate the project. Additional details on what alterations are considered for these features should be included.
- d. Per the HDF Guidelines, HDFs are classified according to hydrological, riparian, fish/fish habitat and terrestrial habitat conditions, then these components will translate into the management recommendations for the protection, conservation or mitigation of the HDF through the proposed development. Please provide this information.
- e. The document does not provide any field notes or detailed summaries of site findings to enable a reviewer to confirm feature classification.



- f. The report contained no evidence that features were classified or that feature specific management recommendations were made in accordance with the HDF Guidelines.
- g. The classification and management recommendations associated with the Headwater Drainage Features should inform the development potential and stormwater management strategy for the site.

Given the above concerns supplemental data interpretation and possibly field work is recommended to be conducted for these reaches before the conclusions in the report and land use plan can be supported.

- 44. **Section 3.5, Amphibian Surveys, Page 10** - Staff question the discussion on not needing to undertake the final amphibian survey. The third survey would assist in fully assessing the amphibian community using the site. We note very low calling numbers provided in Table 4, which could have benefited from an additional survey, as per the protocol. Will this lack of information alter the recommendations of the report? Were the mitigation measures developed to ensure that this missing survey is not an issue?
- 45. **Section 3.7, Incidental Wildlife Observations, Page 10** - We note that bats were not surveyed for. While discussion as it pertains to bats and the *Endangered Species Act* is provided in Section 4.3, the report did not consider those species whose habitat may be considered Significant Wildlife Habitat. How will potential impacts be considered if no surveys occur to confirm if this is present? A precautionary approach could be taken, where it is assumed that this type of Significant Wildlife Habitat is present and mitigation measures developed accordingly if surveys are not completed.
- 46. **Section 4.1, Aquatic Resources** - Additional details regarding the aquatic habitat assessment completed should be provided as per the following:
  - a. It is Conservation Halton staffs' position that a four-season Aquatic Ecosystem Assessment is appropriate for a development of this scale.
  - b. Information regarding the thermal regime within the various water resources on the property was anticipated as part of the biophysical inventory.
  - c. Aquatic invertebrates in intermittent and permanently flowing watercourses should be assessed at an appropriate scale and intensity within the study area using the Ontario Benthos Biomonitoring Network Protocol.
  - d. Surface water chemistry monitoring is requested at an appropriate number of sampling locations within the study area. Samples should be collected using grab sampling for a minimum of three wet weather and three dry weather events, between the months of March-September, in order to capture seasonal variations in surface water chemistry.
  - e. Water temperature monitoring should be collected using the Ontario Stream Assessment Protocol using continuously recording temperature data loggers. The temperature data should be presented and analyzed using the nomogram produced by Cindy Chu et al. 2009 <http://www.trca.on.ca/dotAsset/124131.pdf>.

- f. Analysis and interpretation of geomorphic data and its relevance to aquatic resources were also anticipated, especially information related to the meander belt of Sixteen Mile Creek, specific areas of erosion and deposition, sediment supply, flow regime and identification of dominant stream processes.
- g. Photographs and field sheets are also requested.

**47. Section 4.1.3, Headwater Drainage Feature Assessment (pp. 13-14): Section 4.1.4, Golf Course Features/Irrigation ponds, Page 14 –**

- a. Staff recognize that artificial waterbodies that are not connected to a waterbody that contains fish at any time during any given year do not require review by Fisheries and Oceans Canada (DFO). However, proponents are still required to avoid causing serious harm to fish. Following best practices such as those described in the measures to avoid harm will help avoid causing harm and ensure compliance with the *Fisheries Act*.
- b. The pond referred to in Section 4.2 (Ecological Land Classification, p. 22) as Unit 9 is an online waterbody connected to the main Sixteen Mile Creek. Given that the impacts may constitute serious harm to fish. A request for review to the relevant fisheries protection office should be submitted.
- c. It is understood that the four ponds present on the tablelands are constructed waterbodies, created for the functioning of the golf course (i.e. irrigation, hazards). However, the function of these features as supporting aquatic resources should be characterized in order to understand the cumulative impacts of the development on the ecological form and function of the site. There is evidence that golf courses can contribute to the support and conservation of wetland fauna, i.e., amphibians and macroinvertebrates (Chester & Robson, 2013).

**48. Section 4.1.6, Species at Risk - Silver Shiner, Page 15 -** Staff recommend that the General Habitat Protection prepared by the Ministry of Natural Resources and Forestry (MNRF) be summarized in this section. In addition, we note that until such time as a formal Habitat Regulation is enacted or other advice tailored to this species can be prepared by Ministry staff and other experts, the MNRF has recommended that the advice in the *Guidance for Development Activities in Redside Dace Protected Habitat* be followed for proposed developments in Silver Shiner habitat.

**49. Section 4.2, Ecological Land Classification and Flora, Page 15 -** It does not appear that the text of this section and the ELC communities presented on Figure 2 are consistent. For example, the descriptions for Unit 5 and 6 do not match their locations on the figure. Nor does it appear that Units 7, 8 or 9 are correct, while Unit 10 is not present on the mapping. This inconsistency makes this section challenging to comment on. Please note that additional comments may be warranted once revised.

**50. Section 4.2.2, Regionally Rare and Uncommon Species, Page 25 –**

- a. Virginia Bluebells is noted as being present in Unit 5a (which in the previous pages is a meadow marsh) as well as the valley. Figure 2 show them within 6a (also a marsh or SWD), however this is typically a woodland species. Please clarify where this species was observed on the site and update accordingly. When developing the restoration plan for the valley, this location will be an important consideration.

- b. Kentucky Coffee-tree were documented. We recommend that consultation with the Ministry of Natural Resources and Forestry (MNRF) occur to determine if there are any *Endangered Species Act* requirements for this species.
- 51. **Section 4.2.6, Mammals, Page 29** - As noted above, while we appreciate the discussion pertaining to bats as they relate to the *Endangered Species Act*, species not protected under the ESA were not discussed nor surveyed for, therefore we question what impact the development may have on these species. As described above, a precautionary approach should be considered when assessing impacts and developing mitigation.
- 52. **Section 4.2.8, Butterflies and Odonates, Page 30** - The reports notes that Monarch were observed in the site however it notes that this species is only a S4 species. Monarchs are listed as Special Concern at a Provincial level and Endangered at the Federal level. We understand that provincial direction on their potential reassessment has been deferred until the end of 2017. Discussion on this species should be included as it pertains to the proposed development.
- 53. **Section 4.3, Endangered and Threatened Species, Page 33** -
  - a. The letter referred to from the MNRF in Appendix C is not in regards to this project and is from 2015. We recommend that consultation with the MNRF be initiated specific to this proposal.
  - b. Please provide a discussion on Barn Swallow in this section, given that it is a listed species observed on the site.
- 54. **Section 5, Proposed Development, Page 35** - The location of the belvedere and the location of the SWM outfall are shown in the EIA as unknown. However they should be discussed in the EIA with some certainty at least to a potential zone of impact. Without this information, the full impacts of the proposed development are unknown and the assessment incomplete. We note that the Tree Preservation Plan and Functional Servicing Report have locations provided.
- 55. **Section 6, Key Natural Heritage Features and Functions, Page 35** -
  - a. While we appreciate that the slopes were not inventoried due to safety considerations, a discussion on what could be present along the slope should be included in the report. If the significance of these areas cannot be determined, we recommend a conservative approach be taken, where it is assumed that they are significant and they should therefore be buffered appropriately.
  - b. There is very little discussion included in the report as it pertains to Significant Wildlife Habitat. Given that this is a Key NHF in the Region's official plan as well as a significant feature under the Provincial Policy Statement, more discussion on this feature as it pertains to the site is warranted. Please provide and make reference to the Natural Heritage Reference Manual (2010) and associated Ecoregion Criteria Schedules (2015).
  - c. It is unclear why wetlands are listed as "Other Wetlands" in Table 8. These are unevaluated wetlands and they should simply be labelled as wetlands.

56. Section 7.1, Effects Assessment, Page 38 –

- a. **Stormwater Discharge to Sixteen Mile Creek and Glen Oaks Creek Tributary, Page 40** - CH staff recommend that further effort be taken to incorporate low-impact development measures into the proposed stormwater management approach, especially given the status of Sixteen Mile Creek as habitat for Silver Shiner. Per MNRF advice, potential impacts from stormwater can change hydrologic regimes, raise water temperatures and introduce deleterious materials into receiving watercourses. Stormwater management approaches should aim for discharged effluent consistent with Silver Shiner habitat requirements, based on consultation with MNRF. Further, staff note that the threat status for the Sixteen Mile Creek population of Silver Shiner was assessed to be high for contaminants and toxic substances, nutrient loading and flow management (Bouvier et al., 2013). Staff suggest this underscores the need for a treatment-train approach to stormwater management that mimics the pre-development (i.e. prior to golf course operation) hydrological cycle.
- b. **Stormwater Discharge to Sixteen Mile Creek and Glen Oaks Creek Tributary, Page 40** - We note that the current bypass/irrigation pond is proposed as an outlet for the northern pond. The benefit of discharging the SWM water to the existing pond is unclear. Why is this the preferred approach to the management of this water? Will this result in further warming of the water before it enters the creek? What impacts are anticipated from this? Our preference is that as part of the overall restoration of the valley, the need for this pond be examined to determine its need in the system. Should it be determined that it is detrimental to the NHS, having the outfall lead to it could be problematic. Additional information characterizing the pond's existing ecological form and function should be required before it is confirmed that this approach will not impact the ecology of this feature.
- c. **Loss of Golf Course Habitats, Page 38** - Given that the actively maintained greens and fairways associated with the course have reduced wildlife values for both terrestrial and aquatic resources, CH recommends that a comprehensive restoration plan for the valleylands be explored with all stakeholders.

57. Section 7.2, Recommended Mitigation Measures –

- a. **Mitigation by Design, Page 41** - Staff suggest that the key natural heritage functions and features of the subject property have not been characterized sufficiently to conclude that the site specific effects have been mitigated by the design of the development plan.
- b. **Watercourse Buffers, Page 45** - Please provide more information regarding the ephemeral drainage feature close to Dorval Drive that will be piped. Is there any potential to retain this feature on the landscape? Similarly, staff understand that there are currently a series of water features draining through the golf course into the Glen Oak Creek watershed. This represents an excellent opportunity within the property for rehabilitation and compensation. Staff recommend that the potential removal of the existing infrastructure and implementation natural channel design be explored, especially within the discussion in the HDFA.
- c. **Significant Woodland Buffers Page 40** - While we acknowledge that the determination of the woodland buffer is the responsibility of the Region of Halton for this property,

there are concerns that should be raised within this section that pertain to Conservation Halton's regulation and policies. The final buffer conclusion paragraph notes that buffer proposed is 5m less than that required by Conservation Halton. Given that the 15m allowance is not driven by ecology, the discussion provided therefore cannot direct the regulated allowance in this area. Please revise the document to indicate that this policy will be achieved and ensure that direction as it pertains to what can be permitted in this regulated allowance be in keeping with Conservation Halton's Policies, Procedures and Guidelines for the Administration of Ontario Regulation 162/06 and Land Use Planning Policy Document.

- d. **"Other" Wetlands, Page 45** - It is indicated that the wetlands within the tableland woodland will be adequately protected by the woodland buffer, however the woodland buffer is 10m while the regulatory setback for the wetlands is at minimum 15m. It is premature at this stage to suggest that they will be protected by this as the features have not yet been delineated on the site by Conservation Halton staff. The staking and delineation of these wetlands remains outstanding.
- e. **Other Wetlands – Hydrology, Page 45** - Please submit a feature based water balance for the wetlands in the tableland woodland, to ensure that the proposed development will not have an impact on their hydrologic function. Figure 2.3 of the FSR provides some detail on the proposed water that will be directed to the woodland, however further details are required.
- f. **Stormwater Outfalls, Page 45** - As raised above, in order to full assess the impacts of the proposed development, the locations of the outfalls should be known and their impacts understood. Otherwise, the report is not comprehensive in that not all of the potential impacts are understood. We recommend that the location of the outfalls be assessed and note that their design and location must be in keeping with Conservation Halton's policies.
- g. **Stormwater Outfalls, Page 45-46** - Please see earlier comments above regarding stormwater management and impacts to Silver Shiner populations.
- h. **Restoration Opportunities and Monitoring, Page 48** – Technical documents in support of a draft plan of subdivision should outline pre-, during and post-development monitoring requirements, including but not limited to the proposed frequency and duration of monitoring, parameters to be assessed and proposed analysis approaches. The monitoring plan should discuss management actions that will be taken in the event that the environmental systems or the impacts of the proposed development itself are not functioning or transpiring as predicted. The monitoring plan should have adaptive management contingencies incorporated that will trigger modifications to any aspect of the system (e.g. LID measures, SWM pond, wetland restoration, groundwater dynamics) if the predicted absence of impacts is not borne out. Staff have found performance measures or triggers to be an important part of an effective monitoring plan such as this. Metrics can be used for each of these categories (i.e. % change in initial value, actual threshold value, etc.). Staff suggest that percent threshold approach is valuable because it offers an impartial, tangible decision metric that provide the proponent, Town and relevant agencies with an a priori decision rule to help decide whether any problem areas need to be remediated or not. This approach is consistent with advice from the MNRF (*Guidance for Development Activities in Redside Dace Protected Habitat*), who note that

a best management practice to avoid impacts to Redside Dace is to ensure that adaptive management is part of the subwatershed plan. Please indicate what actions are proposed to be taken, in the event that the design of any aspect (realigned channels, swales, SWM facilities, etc.) is not functioning as intended.

- i. **Restoration Opportunities and Monitoring, Page 48** - As outlined in the Town's signed pre-consultation form (dated November 18, 2015) Schedule A, a Natural Features Restoration Plan, restoring altered valley back to natural valley conditions would be required. Currently the EIA suggests that a Restoration Plan will be developed in consultation with the agencies. While staff are not looking for the specific details of restoration at this time, it is our expectation that guiding principles and a concept plan would have been included in this report. This is key to understanding how the valley will function in the future. It would also indicate the appropriate location for outfalls and the belvedere at this time, ensuring that conflicts do not arise between the proposed infrastructure and the suitable restoration in the valley. The Cultural Heritage Landscape and Master Planning Strategy (prepared by SGL) indicates that there will be restoration that includes a series of recreated/curated landscapes, however without a Restoration Plan, we cannot confirm if this is in keeping with the naturalization.
58. **Section 8.1, Federal Fisheries Act, Page 48** - Staff note that work to construct stormwater outfalls to the main branch of Sixteen Mile Creek may be considered in-water work.
59. **Section 8.2, Provincial Policy Statement, Subsection Significant Wildlife Habitat, Page 49** - As noted above, there is very little discussion included in the report as it pertains to Significant Wildlife Habitat. Given that this is a Key NHF in the Region's official plan as well as a significant feature under the Provincial Policy Statement, more discussion on this feature as it pertains to the site is warranted. Please provide and make reference to the Natural Heritage Reference Manual (2010) and associated Ecoregion Criteria Schedules (2015). Mitigation measures may be warranted and should be in keeping with the SWH Mitigation Support Tool (2014). Where surveys were not completed to determine if SWH is present on the site and suitable habitat exists, we recommend that a precautionary approach be taken, wherein it is assumed that the SWH is present and protected appropriately as per the PPS, until such time that surveys are completed to confirm it is not.
60. **Section 9, Review of Recommendations, Page 51** - Staff recommend that efforts be made to reduce impacts associated with the stormwater outfalls on the ecological form and function of Sixteen Mile Creek and associated valleylands. Potential mitigation measures include trenchless installation methods, retention of or restoration with native vegetation, avoiding permanent access into the valley, etc.
61. **Appendix A - Breeding Birds, Page A-1** - The breeding bird discussion on page 30 indicates that a single wood thrush was heard calling from the woodlands along the Sixteen Mile Creek valley, yet this species is not included in the breeding bird list. Wood thrush is listed as Special Concern in Ontario and Threatened at the federal level. Their habitat on the site may be Significant Wildlife Habitat, therefore it is important to consider this species in the baseline and impact assessment.
62. **General Comment** - The EIA should incorporate direction from the Region (Environmental Impact Assessment Guidelines, Regional Official Plan Guidelines) to apply a 'Systems Approach' that considers the importance of protecting and enhancing ecological features,

ecological functions and ecological interactions in the environment. This approach is also recommended to demonstrate that the cumulative impact of the proposed development has been evaluated.

#### *D.2.3 Tree Vegetation Study and Tree Preservation Plan*

63. **Section 2, Methods, Page 1** - Please note that Conservation Halton did not delineate the dripline in the field, rather it was the Region of Halton who completed this.

64. **Section 5.1, Tree Removals, Page 4** -

- a. The EIA report did not indicate the location of the SWM outfall, although the tree assessment in this report indicates that the route has been selected. As noted above, the impact assessment for the property needs to be comprehensive and consistent between all of the reports. We are not supportive of clearing a 12m wide swath of trees for the outfall. Conservation Halton policies would not support an open cut of the valley to install the SWM pond outfalls. A drop shaft and tunnel installation will be required.
- b. A multiuse pathway is proposed within the woodland on the tableland, however this is not discussed in the EIA. Further, there are two wetlands present within the woodland that need to be protected from development. The location of this proposed pathway will need to be established not only with just Conservation Halton, but also the Region of Halton and the Town of Oakville.
- c. Landscaping Plans are referred to in this section, as prepared by ERA Architects, however these do not appear to have been included in our circulation package.

#### *D.2.4 Preliminary Hydrogeological Assessment*

65. Hydrogeological investigations in Conservation Halton's watershed should be completed in accordance with *Requirements for completion of hydrogeological studies to facilitate Conservation Halton's reviews* document, which is available on Conservation Halton's website at: <http://www.conservationhalton.ca/policies-and-guidelines>
66. Conservation Halton Staff note that this is a preliminary hydrogeological investigation only, and does not utilize and assess subsurface data collected for different studies, such as the Phase Two Environmental Site Assessment (ESA).
67. **Table1 - Groundwater Levels, Page 3** - this table lists BH2 groundwater level for March 22, 2016 at 21.06 mbgs, although the well is only 6.1 metres deep - please correct.
68. **Section 4.4, Ground Water Level, Page 3** - Further work should be completed as recommended in the last sentence of this section: *that data loggers should be installed in selected monitoring wells to monitor the range of water level fluctuations over time*. It should be noted that 2016 was a dry year and the groundwater level measurements collected on three occasions in 2016 as reported in Table 1 on page 3 may not fully represent groundwater conditions at the site.
69. **Section 4.0, Site Characterization** - Shallow groundwater contour map should be presented in the report. This map is needed to estimate what portion of the site contributes to baseflow of Sixteen Mile Creek, feasibility to construct Low Impact Development measures to mitigate post

development infiltration loss, assess the needs for dewatering for site servicing and stormwater management pond design in terms of requirements for liner construction, subdrains, etc.

70. **Section 4.5, Hydraulic Conductivity, Page 4** – the hydraulic conductivity assessment is done using the Hazen method. The method is suited for larger particle size soils such as sands rather than silty clays/ clayey silts. The method is solely based on the soil grain size distribution and it does not take into account weathering processes which in terms of silty and clayey soils at surface can increase hydraulic conductivity a few orders of magnitude. Caution should be exercised in using these numbers.

71. **Section 7.0, Conclusions and Recommendations, Page 13** –

- a. Conservation Halton Staff support the recommendation to instrument monitoring wells with data-loggers to monitor the range of seasonal water level fluctuations.
- b. Conservation Halton Staff support the recommendation for a site reconnaissance to determine the locations of possible springs or seeps that discharge along the side of the Sixteen Mile Creek valley.
- c. Staff supports the applicant consultant's recommendation to collect additional information on potential groundwater surface water interactions around the area of ponded water adjacent to BH16 by installation of a staff gauge and mini piezometers in the pond area near the existing well. Please note that this information will be needed to establish hydrologic function of the wetland if development is proposed between 15 and 30 metres from the wetland limit.
- d. Last bullet states that even though mitigation measures are proposed, the site development could decrease the site infiltration by some 7% from present conditions. Considering the status of Sixteen Mile Creek as habitat for Silver Shiner an impact of the decrease of the onsite infiltration on the Silver Shiner habitat should be assessed and/or mitigation measures proposed.

*D.2.5 Phase Two Environmental Site Assessment*

72. Soil and groundwater information collected for the Phase Two Environmental Site Assessment should be used to supplement the Hydrogeological Assessment.
73. The Phase Two ESA identified soil and groundwater contaminants on the site. A risk assessment for the intended use and/or remediation will be needed before the proposed land use can be approved for the portion of the site. A clear plan how this will be resolved is needed. At this point it is not known if remediation is possible, and if not what land uses would be possible in the contaminated area.

D.3 - Other Comments

The following comments are related to Conservation Halton's role as a Public Body under the *Planning Act*. These comments should be considered advisory and we recommend that they be addressed prior to draft plan approval.



74. The Province completed a co-ordinated land use planning review in 2017 with the Growth Plan, Greenbelt Plan, Oak Ridges Moraine Conservation Plan, and Niagara Escarpment Plan being updated. All decision on planning matters made after July 1<sup>st</sup>, 2017 must conform to these plans. For your consideration we note the following updates which may have an impact on this application:

- a. **Stormwater Management** – Section 3.2.7.2 of the Growth Plan requires that “*Proposals for large-scale development proceeding by way of a secondary plan, plan of subdivision, vacant land plan of condominium or site plan will be supported by a stormwater management plan or equivalent, that: ...a) is informed by a subwatershed plan or equivalent.*” Although the application is supported by a stormwater management plan, there is no current subwatershed plan in place. As the subject lands are located within an urbanized area, at a minimum, impacts of the proposed SWM system to 16 Mile Creek should be fully considered.
- b. **Urban River Valley** – Sixteen Mile Creek is now designated as an Urban River Valley through the updated Greenbelt Plan. Although it is recognized that this designation only applies to publically owned lands, as it is proposed that these land would be dedicated to the municipality it is our recommendation that the policies be considered through this application. Specifically Section 6 of the Green Belt Plan includes policies related to Urban River Valleys, Section 3.2.6. includes policies on External Connections, many of which would apply to the Urban River Valleys.

#### **Part E - Summary/Conclusion**

The following is a summary of Conservation Halton’s comments on the application. These comments are provided to assist the reader only. For complete and detailed comments please see above.

- A. Conservation Halton requires a 15m setback from the greatest hazard; in this case the greater of the staked top of bank and the long term stable top of bank. This has not been provided.
- B. Conservation Halton recommends that the valley buffer be included in the natural area block and be designated and zoned natural area.
- C. Conservation Halton staff are concerned with the size and configuration of the retained Raydor Estates block as it relates to the ability for redevelopment with respect to the valley slope.
- D. Conservation Halton policies require that for valleys greater than 6m a drop-shaft and tunnel technique be used to install the stormwater outfalls. This has not been shown in the application.
- E. Conservation Halton staff are not in a position to support the geotechnical investigation and the slope stability analysis. The stable top of bank and limit of development cannot be confirmed
- F. The proposed SWM plan has not been shown to sufficiently mitigate the impacts of the development.
- G. Sizing of the SWM ponds cannot be confirmed.
- H. The form and functions of the ecological features of the site have not been adequately assessed through the EIA to confirm no impact. For example:

- The report did not demonstrate that headwater drainage features were assessed in accordance with the CVC/TRCA guidelines
  - The wetlands in the tableland woodlot are regulated by Conservation Halton. The staking of these features is outstanding. A feature-based water balance is required.
  - Additional grading information is required. It is unclear if the SWM ponds can be constructed without grading into the NHS and regulated area.
  - The development area is adjacent to the highly sensitive Sixteen Mile Creek and Valleylands, extremely significant in terms of its form and function. The scale of development and magnitude of potential negative impacts warrants a more comprehensive characterization than has been described in the EIA, FSR and Geomorphic Assessment.
  - Consideration of species covered by the Endangered Species Act is insufficient.
- I. The hydrogeological assessment is preliminary, and requires additional field work and integration with other technical studies before its conclusions can be accepted.
- J. The application has not demonstrated that it is in conformance with co-ordinated review of Provincial land use documents.

If you require additional information, please contact me at extension 2317.

Yours truly,



Sean Norman, PMP, MCIP, RPP  
Environmental Planner

Copy: Ms. Rita Juliao & Mr. Phillip Kelly, Town of Oakville Engineering (via e-mail)  
Mr. Adam Huycke, Halton Region Planning (via e-mail)

## Hydrogeological Matters

### **Blackport & Associates**

7839 Wellington County Road 45  
RR2  
Wallenstein, Ontario  
N0B 2S0  
(519-698-0134)

## Memo

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**To:** Charles McConnell, Town of Oakville

**From:** William Blackport, M.Sc., P.Geo.

**Date:** July 27, 2017

**File:** 1707

**cc:** Philip Kelly, Town of Oakville  
Paul Barrette, Town of Oakville  
Ron Scheckenberger, Amec Foster Wheeler

**Re:** **Peer Review of Hydrogeological Matters Related to  
Proposed Development of Glen Abbey Golf Club, Town of Oakville**

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### Introduction

- ▶ The following technical memorandum documents a review of the methodology and interpretation related to:
  - Field data including borehole drilling, logging, monitoring well installation, groundwater level monitoring
  - Physical characterization of the groundwater flow system including groundwater surface water interactions
- ▶ Scope of work:
  - Background documentation review
  - Meetings with Town, Conservation Halton (CH), and Region June 29, 2017, July 12, 2017, July 25, 2017
  - Proponent meeting July 5, 2017.
- ▶ The following technical studies have been reviewed.
  - Preliminary Hydrogeological Assessment – Proposed Redevelopment, Glen Abbey Golf Club, Oakville, Ontario ( Golder Associate's Ltd., October 2016)
  - Preliminary Geotechnical Investigation – Glen Abbey Golf Club Redevelopment, Oakville, Ontario ( Golder Associate's Ltd., October 2016)
  - Phase One Environmental Site Assessment – Glen Abbey Golf Club, Oakville, Ontario ( Golder Associate's Ltd., October 2016)
  - Phase Two Environmental Site Assessment – Glen Abbey Golf Club, Oakville,

### **Fundamental Issues**

- ▶ There is limited groundwater characterization and a lack of integration of the groundwater characterization with the ecological components. As a result the detail within the water management strategy may not be sufficient to protect the potential groundwater discharge function.

### **Other Issues and Concerns**

- ▶ Transient groundwater level monitoring is limited and longer term seasonal trends are necessary for a more refined characterization of the horizontal and vertical groundwater gradients and related groundwater flow pathways, groundwater surface water interactions, potential dewatering, infrastructure design and water management.
- ▶ The incorporation of groundwater discharge observations and any additional groundwater monitoring to characterize the groundwater surface water interaction is necessary to refine the overall water management strategy.
- ▶ It has been presented that the removal of the more permeable fill or weathered shale will be necessary in some areas to address geotechnical constraints. This removal should be assessed in relation to any current preferential groundwater pathways through the fill and weathered shale which provide functional groundwater discharge.
- ▶ Any current water management (eg. Irrigation) for the Glen Abbey golf course must be incorporated into the current baseline characterization and groundwater level trend analysis.
- ▶ A more comprehensive hydrogeological report would be necessary combining the hydrogeological characterizations presented in the *Preliminary Hydrogeological Assessment – Proposed Redevelopment, Glen Abbey Golf Club, Oakville, Ontario (Golder Associate's Ltd., October 2016)* and *Phase Two Environmental Site Assessment – Glen Abbey Golf Club, Oakville, Ontario ( Golder Associate's Ltd., October 2016)*. It is necessary that this report would further characterize the groundwater flow incorporating the data and interpretation gaps discussed above and integrate this refined characterization with the ecological characterization and water management strategy.

## Fisheries and Aquatic Ecology Matters – Peer Review

# Memo :

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**To:** Charles McConnell, Town of Oakville

**From:** Cam Portt, C. Portt and Associates

**Date:** July 28, 2017

**File:** CP17-918

**cc:** Philip Kelly, Town of Oakville  
Paul Barrette, Town of Oakville  
Ron Scheckenberger, Amec Foster Wheeler

**Re:** **Peer Review of Fisheries and Aquatic Ecology Matters Related to Proposed Development of Glen Abbey Golf Club, Town of Oakville**

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### Introduction

C. Portt and Associates was retained to review fisheries and aquatic ecology matters related to proposed development of Glen Abbey Golf Club, Town of Oakville.

During the course of the review I reviewed the following documents:

- Environmental Impact Assessment Glen Abbey Golf Club Redevelopment Town of Oakville, Ontario prepared by Beacon Environmental Limited. October 2016.
- Geomorphic Assessment Glen Abbey Golf Club Redevelopment Town of Oakville, Ontario prepared by Beacon Environmental Limited. October 2016.
- Preliminary Hydrogeological Assessment Proposed Redevelopment, Glen Abbey Golf Club, Oakville, Ontario. Prepared by Golder Associates, October 2016.
- Preliminary Geotechnical Investigation Proposed Redevelopment, Glen Abbey Golf Club, Oakville, Ontario. Prepared by Golder Associates, October 2016.
- Proposed Re-Development of the Glen Abbey Golf Club, Town of Oakville Functional Servicing and Stormwater Management Report. Prepared by SCS Consulting Group Ltd., October 2016.

During the course of the review I attended the meetings with Town of Oakville, Conservation Halton and Region of Halton and other members of the peer review team on June 29, 2017, July 12, and July 25, 2017. I also attended the Glen Abbey kick off technical review meeting on July 5, 2017. George Coker, a senior biologist with C. Portt and Associates attended the site visit on July 19, 2017.

### Fundamental Issues

There is no information presented regarding the aquatic habitat or biota associated with the pond located within the Sixteen Mile Creek floodplain. The Environmental Impact Assessment (EIA) states that this pond has an inlet and outlet to Sixteen Mile Creek and that it was discharging to Sixteen Mile Creek during both of the Beacon visits conducted to assess aquatic resources. The EIA states, in Section 7.1, "The drainage from the northeast portion of the

subject property will be piped down the valley slope toward the existing pond facility and discharge through the existing pond facility.” Although the EIA states that the locations of the stormwater facilities are provided on Figure 4, Figure 4 of the EIA does not show the facilities. The Functional Servicing and Stormwater Management Report (Figure 2.5) however, shows that stormwater management Pond A discharges directly to the existing floodplain pond. An assessment of the existing habitat and biota within the existing pond in the Sixteen Mile Creek floodplain, the relative contribution that stormwater could make to that existing pond and the potential impacts of the stormwater to the existing habitat and biota are required in order to assess the potential impacts of the proposed redevelopment.

### **Other Issues and Concerns**

For existing fish community information for Sixteen Mile Creek, the report relies upon a report cited as Conservation Halton 2013. This document is not present in the References section (Section 11) of the EIA; therefore the information cannot be corroborated.

The fish community information in the EIA is very limited. It appears that the first paragraph of Section 4.1.5 is discussing the results of sampling conducted across the entire Sixteen Mile Creek watershed. The second paragraph is a single sentence describing the fish community at a sampling location downstream from the subject property in generalities (“high diversity”, “low number of total fish”). No list of the fish species present in Sixteen Mile Creek in the vicinity of the project is provided. The only fish species mentioned are the two species at risk, Redside Dace (*Clinostomus elongatus*) and Silver Shiner (*Notropis photogenis*) that are present in the Sixteen Mile Creek watershed. It should be noted that the scientific names of these species are incorrect (they are reversed) in the EIA.

The EIA states “A request for a Species at Risk (SAR) screening for the subject property was submitted to the MNRF and a response was received on May 20th, 2015 from A. Godfrey (Fish and Wildlife Technical Specialist, Aurora District).” That letter, provided as Appendix C, has as its subject line “Sixteen Mile Creek Bank Rehabilitation at Glen Abbey Golf Course”. Thus, it does not appear that the request for screening applied to the entire subject property. The adequacy of the SAR inquiry should be assessed by OMNRF.

The report states that the “assessment of aquatic resources and habitat within the subject property was completed following a modified version of the Rapid Assessment Methodology”. There is no reference provided for this methodology in the References (Section 11), which prevents the reviewer from assessing if the methodology was followed.

Table 8 of the EIA states “Fish habitat is restricted to the Sixteen Mile Creek. However, a fish rescue will be required for any golf course irrigation ponds that are removed.” The report should explain why, if fish are present in areas other than Sixteen Mile Creek, those areas are not considered fish habitat.

Section 2.2 of the EIA states “As described in Section 2.1 above, identification and verification of fish habitat is now self-regulated although enforcement of the related policies and regulations is still managed by MNRF and regulated by DFO.” It is correct that proponents are required to conduct a self-assessment of their project to determine if the project cause serious harm to fish and therefore will required DFO review, but it is not accurate to say that identification and verification of fish habitat is self-regulated.

## **Geotechnical Matters – Peer Review**

# Memo

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**To:** Charles McConnell and Philip Kelly, Town of Oakville  
**From:** Michael Patterson  
**Date:** July 28, 2017  
**File:** TBP178089S  
**cc:** Paul Barrette, Town of Oakville  
Ron Scheckenberger, Amec Foster Wheeler  
**Re:** **Geotechnical Comments**  
**Peer Review of Matters Related to**  
**Proposed Development of Glen Abbey Golf Club, Town of Oakville**

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## Introduction

I have been retained by the Town of Oakville to review the geotechnical aspects of the application by Clublink Corporation ULC & Clublink Holdings Limited (Proponent), to redevelop the property known as the Glen Abbey Golf course into a mixed use community including residential, commercial and recreational zones.

In execution of this review I have engaged in a number of activities aimed at obtaining an understanding of the physical character of the site, the proposed infrastructure developments and the anticipated interaction of the proposed development with the surface and subsurface environment. These activities included the following:

- A review of geotechnically relevant reports submitted by the Proponent and supporting reference documentation.
- Technical group meetings with the Town of Oakville, Conservation Halton and Halton Region on June 29<sup>th</sup> 2017 and July 12<sup>th</sup> 2017.
- The Proponent's presentation on July 5<sup>th</sup>, 2017 where leaders of the Proponent's team explained their approach and fundamental conclusions of their respective studies.
- A tour of the Glen Abbey Golf Course accompanied by key members of the Proponent's team on July 19<sup>th</sup> 2017 to observe significant physical features on the site.
- Performed a slope stability analysis on a cross section modelling the proposed Stormwater Pond "A" and its theoretical effect on the adjacent slope.

I have reviewed the following report in detail:

*"Preliminary Geotechnical Investigation Glen Abbey Golf Club Redevelopment Oakville, Ontario"*  
by Golder Associates, dated October 2016.

I have also reviewed selected sections dealing with geotechnical topics of the following reports:



Town of Oakville  
July 28, 2017

- *"Environmental Impact Assessment Glen Abbey Golf Club Redevelopment Town of Oakville, Ontario"* by Beacon Environmental, dated October 2016.
- *"Functional Servicing and Stormwater Management Report"*
- *"Geomorphic Assessment Glen Abbey Golf Club Redevelopment Town of Oakville, Ontario"* by Beacon Environmental, dated October 2016.
- *"Phase 1 Environmental Site Assessment"*
- *"Phase 2 Environmental Site Assessment, Glen Abbey Golf Club, Oakville, Ontario"* by Golder Associates, dated October 2016.
- *"Preliminary Hydrogeological Assessment Proposed Redevelopment, Glen Abbey Golf Club"* by Golder Associates, dated October 2016.
- *"Transportation Consideration Report"*

The following reference documents were also consulted for compliance criteria:

- *"Technical Guide River and Stream Systems: Erosion Hazard Limit"* by Ontario Ministry of Natural Resources (2002).
- *"Geotechnical Principles for Stable Slopes"* prepared by Terraprobe Limited and Aqua Solutions for Ontario Ministry of Natural Resources, June 1998.
- *"Town of Oakville Development Engineering Procedures and Guidelines Manual"*

## **Fundamental Issues**

Based on the information and opinions outlined in the Preliminary Geotechnical Investigation Report, fundamental issues identified are discussed in the following paragraphs:

### Scope of Investigation

- a) The preliminary Geotechnical Investigation by Golder Associates provides geotechnical engineering analysis and recommendations for foundations, road design, site servicing and general comments related to residential, commercial and community infrastructure based on twenty (20) boreholes drilled on the tableland above Sixteen Mile Creek. This is a low number for such a large site (approx. 1 borehole per 4.5 hectares) however it is recognized that the current land use as a golf course will have presented several constraints on borehole locations.

Town of Oakville  
July 28, 2017

- b) The MNR Technical Guide recommends a spacing of 100m for boreholes along the crest of the slope. The 4 boreholes along the crest vary from 140 to 425 m apart.
- c) Section 4.3.4 of the MNR Technical Guide indicates that topographic mapping on the site should be at a scale of 1:500 or better to establish positions of surface features. The topographic mapping presented in the geotechnical report is at a scale of 1:6000 and this is considered insufficient. According to the guidelines, detailed topographic surveying will be necessary to depict the important physiographic features as well as to measure slope profile (cross section) or configuration (inclination).
- d) The MNR Technical Guide also recommends that a profile showing the soil stratigraphy across the site should be prepared. Apart from the slope stability cross sections close to the crest of the west slope of Sixteen Mile Creek no overall stratigraphic profile is presented or referenced in the report.
- e) Standard Penetration Testing (SPT) was performed at regular intervals during drilling of the boreholes and selected samples were subjected to physical laboratory testing for water content, grain size distribution and Atterberg limits. Visual observations and laboratory test results were used to classify the soils encountered and to characterize the soils, behaviour, while the SPT tests provided useful indices for empirical correlations to engineering properties. However, no strength testing (triaxial or direct shear testing) was performed, but it should be noted that the very stiff to hard consistency of the native Till would have precluded the acquisition of conventional undisturbed (Shelby Tube samples which would have been required for laboratory shear strength testing.

#### Groundwater Conditions

Fourteen groundwater monitoring wells were installed in fourteen of the boreholes and results of the monitoring between February 16 and April 13, 2016 are tabulated. The reader is referred to the Preliminary Hydrogeological Report for further details. There is no discussion on potential perched water table or seepage on the valley wall which could lead to piping or gullyng and ensuing slope instability.

#### Foundation Recommendations

The recommended Limit States Design Parameters appear to be reasonable based on the stiff to hard native soils or bedrock which will support the foundations according to the results of the borehole investigations.

Town of Oakville  
July 28, 2017

### Pavement Design

The recommended road pavement structure exceeds the minimum requirements of the Town of Oakville's Development Engineering Procedures & Guidelines Manual. It should be mentioned that, because of the relatively impervious nature of the cohesive subgrade, a sub-drainage system will be required.

### Erosion Hazard Limits

The geotechnical report states that the Consultant used criteria defined in the Conservation Halton document entitled *"Determining Regulatory Limits in the Conservation Halton's Jurisdiction"* dated August 2015. This document provides a basic illustration of the components of the Regulated Area forming the Erosion Hazard Limit but does not describe or define the methodology for quantifying the value of each component which requires applying the methods detailed in Section 3.0 of the MNR Technical Guide. This implies that the total setback would consist of the Toe Erosion Allowance + Stable Slope Allowance + 15m for Sixteen Mile Creek which is considered to be a "major valley system".

The Toe Erosion allowance of 5m is based on the Geomorphic Assessment by Beacon Environmental which complies with Table 3 of the MNR Technical Guide River or Stream System, and is therefore considered to be acceptable. However it is possible that the accumulative annual recession rates of the creek channel over a 100 year period may result in a larger toe erosion having to be considered. The applicable study should be done to confirm the most appropriate toe erosion allowance.

The Stable Slope Allowance is based on 24 to 31m high slopes mainly comprised of shale bedrock with 4 to 5m of native clayey silt to silty clay till and variable thicknesses of fill. The report assumes a stable slope of 1.6H : 1V in the shale bedrock. Although this is within Conservation Halton's practice (not steeper than 1.4H : 1V), the report does not provide any justification for this selection, especially since the preliminary letter presented in their Appendix C recommends a stable slope allowance of 1.7H : 1V for the weathered shale slopes.

The geotechnical report assumes 2.2 to 2.4H : 1V as the stable slope in the overburden soil but does not show any example of Slope Stability Analysis which give a factor of safety of 1.5 or more to support these assumptions. Figures 2 to 5 inclusive presents slope stability analyses showing factors of safety ranging from 0.37 to 1.02 for existing slopes in the soil. No analyses are shown for the hypothetical slopes that would theoretically give a factor of safety of 1.5 or greater. This is usually derived from iterative trials using different slope inclinations until one compatible with the desired Factor of Safety is found.



Town of Oakville  
July 28, 2017

The effective friction angles for the site soils shown in the Table in Section 5.10.2 of the geotechnical report appear to be biased towards the higher end when compared to recommended values in Table 2.10 of Geotechnical Principles for Stable Slopes, however it is noted that the strength parameters chosen for cohesive soils have not taken advantage of inherent cohesion which is a characteristic of this type of soil. Inclusion of the effective cohesion would result in higher Factors of Safety.

Provided that the 2.2 to 2.4H : 1V slope are proven then a composite slope of 1.7H : 1V for the stable slope allowance is an approximation since, depending on the proportion of shale to soil in the applicable slope configuration, the value could be more or less..

The report acknowledges that the access allowance of 15m for the Erosion Hazard Limit is required for major valley systems, however, the development team has apparently applied 10m instead. This is a regulatory and logistical issue and may be acceptable if the developments between the 10 and 15m allowance is limited to public use and will not hamper access to the slope for maintenance and emergency repairs. Either one is acceptable from a geotechnical perspective and it would be up to the regulatory authorities to determine.

#### **Other Issues and Concerns**

##### **Proposed Location of Stormwater Pond "A"**

From a geotechnical perspective, the proposed location of Stormwater Pond "A" raises concerns on two levels:

- i. The location close to the crest of the slope at the northeast corner of the redevelopment area may encroach on the Erosion Hazard Limit defined as a 15 m setback from the Stable Top of Slope.
- ii. The Geotechnical Consultant has calculated a Factor of Safety of 1.02 for the existing slope (Slope A) in the vicinity of the proposed pond. Since the acceptable target for the Factor of Safety is 1.5, it is unlikely that this target will be achieved without significant modifications to the slope in the proximity of the pond or ensuring that the applicable setback is specifically established by more detailed topographic surveys and stratigraphic profiling.

I carried out a quick slope stability analysis of the post-construction configuration in the area and obtained a Factor of Safety of 1.1 which justifies the stated concerns.

Town of Oakville  
July 28, 2017

### **Stormwater Ponds "A" and "C Outfalls**

According to the Functional Servicing and Stormwater Management Report, the redevelopment team proposes to pipe the outflows from the two ponds mentioned down the slope to an existing pond or swale respectively. It is not clear how this is going to be achieved, whether they intend to anchor the pipes to the surface, bury them in open-cut trenches or implement a trenchless installation or tunnelling method. Since a surface installation on an active slope is not recommended and an open-cut excavation is not feasible because of the inability to adequately restore the steep slope it is apparent that only a trenchless excavation or tunnelling method should be considered.

### **Excavations for Deep Service Installations**

It is indicated that some service installations may be as deep as 10 metres. The proposed excavation methods and controls are basically feasible. Future structure-specific investigations will be necessary to facilitate final design.

It is not clear what protective/support measures are being recommended for the deeper excavations which could be up to 5 m through overburden and 5 m through shale bedrock. Cutting back the slopes to 1H:1V or sheet piles or other shoring techniques in the overburden is standard but nothing is said about the side walls in bedrock which will be vertical or near vertical and will require some form of temporary stabilization to protect workers in the trenches.

Prepared by:



Michael A. Patterson, M.A.Sc., P.Eng.  
Amec Foster Wheeler, Environment and Infrastructure.  
A division of Amec Foster Wheeler Americas Limited

# Environmental Site Assessment – Peer Review



## Memo

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**To:** Charles McConnell, Town of Oakville  
**From:** Tracey Schranz, Jeff Carson, Amec Foster Wheeler Environment & Infrastructure  
**Date:** July 27, 2017  
**File:** TPB178089S  
**cc:** Philip Kelly, Town of Oakville  
Ron Scheckenberger, Amec Foster Wheeler Environment & Infrastructure  
**Re:** **Peer Review of Environmental Site Assessment Reports Related to the Proposed Development of Glen Abbey Golf Club, Town of Oakville**

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### Introduction

Amec Foster Wheeler has been retained by the Town of Oakville to conduct a peer review of the following Environmental Site Assessment ("ESA") reports:

- Golder Associates Ltd. *Phase One Environmental Site Assessment Glen Abbey Golf Club, Oakville, Ontario*. Submitted to ClubLink Corporation, dated October 2016.
- Golder Associates Ltd. *Phase Two Environmental Site Assessment, Glen Abbey Golf Club, Oakville, Ontario*. Submitted to ClubLink Corporation, dated October 2016.

The following is a brief overview of the ESA reports and key findings to date with respect to the ESAs and applicable Ontario Regulation 153/04 for the proposed development of the Glen Abbey Golf Club (the "Site").

The intent of a Phase One ESA report is to determine Potential Contaminating Activities ("PCAs") at a Site and from surrounding land use and identify corresponding Areas of Potential Environmental Concern ("APECs"). The Phase Two ESA is to assess the APECs identified on the Site from the Phase One ESA, test soil and ground water for contaminants of concern, delineate any contamination which is above the applicable site condition standards and recommend remedial action (if needed), prior to filing a Record of Site Condition ("RSC") with the Ontario Ministry of Environment and Climate Change ("MOECC").

### Phase One ESA – Report Summary

The Phase One Property appeared to have included agricultural fields and associated buildings since at least 1934 and was developed as a golf course between 1960 and 1966. The Site reconnaissance was completed in 03 December 2015 and a second reconnaissance was completed on an undeveloped landscaped yard area on 22 August 2016. The Site consisted of a 229 acre (93 hectare) parcel of land with various buildings including a clubhouse and event centre,

Golflogix (GPS service), residential dwelling, maintenance building and storage, maintenance office, pesticide/fertilizer storage shed, golf cart storage, indoor driving range and golf store, halfway refreshment house and two pump house buildings.

PCAs identified during the Phase One ESA activities included:

- Importation of fill of unknown quantity
- Commercial autobody shops
- Pesticides bulk storage
- Transformer manufacturing, processing and use
- Gasoline and associated products in fixed tanks
- Fertilizer bulk storage
- Other – vehicle wash station, oil/water separator

The Phase One ESA concluded a Phase Two ESA was required to support the submission of a Record of Site Condition for the Site.

#### Phase Two ESA – Report Summary

As noted in the report, the Phase Two ESA focused on the Maintenance Yard with the exception of the fill throughout the Site. Nine (9) boreholes with monitoring wells were completed on 25, 26, 27 January 2016. Six (6) of the boreholes used for concurrent geotechnical investigation drilled 20 January and 03 February 2016 were also sampled for soil. Soil and ground water samples were submitted for analysis of petroleum hydrocarbons (PHC), volatile organic compounds (VOCs) including benzene, toluene, ethylbenzene and xylenes (BTEX), trihalomethanes, metals and inorganics, organochlorine and organophosphate pesticides (OCP, OPP) and polycyclic aromatic hydrocarbons (PAHs). Analytical results were compared to the MOECC's Table 8 Site Condition Standards ("SCS") for Use within 30 metres of a Water Body in a Potable Ground Water Condition.

Exceedances of the MOECC Table 8 SCS were identified in soil for PHC F1, F2 and F3, ethylbenzene and xylenes in the area of the residential building. Exceedances of the MOECC Table 8 SCS were identified in ground water for PHC F2 and F3 and ethylbenzene in the area of the residential building. Sheen was observed in boreholes BH16-2, BH16-2B, BH16-12 and BH16-13. Golder states, "The [petroleum] impacts have been vertically and horizontally delineated as a result of the supplemental drilling and sampling activities" and "The completion of a risk assessment or remediation is required prior to the submission of a Record of Site Condition ("RSC") for the Site".

#### **Fundamental Issues**

The table below is derived from information from both the Phase I and II ESA reports. Comments and recommendations specific to each identified APEC are provided below. Please note that recommendations provided by Amec Foster Wheeler are intended only as a guide to assist in meeting regulation requirements, which may include further assessment work (such as additional field data collection) or report clarification/rationale in the ESA reports.



Memo  
Peer Review of Environmental Site Assessment Reports  
Proposed Development at Glen Abbey Golf Course, Oakville, Ontario  
27 July 2017



APEC/PCA (APEC # Inferred from Figures)	Boreholes in Vicinity (Based on Figures)	Inferred Analysis (Depth)	Phase I ESA Contaminants of Concern	Amec Foster Wheeler Recommendations
#1 Widespread Fill over Site	BH4 BH7 BH11 BH13 BH14 BH19 BHESA-4	Soil: 7 OCP and Metals Site-wide (~0-2.2 m) (predominately silty clay soil)	Soil Metals	Although soil samples were below Table 8 SCS, additional coverage could be collected from topsoil and sand layers. Based on the Geotechnical Investigation, fill was noted in twelve boreholes ranging in depth from 0.3 to 4.1 m thick. Metals analysis was carried out in two of the geotechnical boreholes that noted fill (BH13 and BH7) at a depth of 0.8 – 1.2 m for each.
#2 Turf Maintenance Shop (Vehicle Maintenance)	ESA-BH16-3 ESA-BH16-4 ESA-BH16-5 ESA-BH16-6 (Outside building footprint)	Soil: 1 Metals/OCF (~1.9-2.2 m) 1 PHC/VOC (~1.5-2.6 m) Ground Water: 1 Metals/OCF, 2 PHC/VOC	Soil and Ground Water PHC, VOC, trihalomethanes	Soil and ground water samples met the Table 8 SCS for the parameters analyzed. Recommend soil and ground water sampling within building footprint (in particular, near the in-ground hoist, exact location unclear) or provide rationale for not assessing this area.
#3 Fertilizer Bulk Storage (and application)	ESA-BH16-4 ESA-BH16-3	Soil: 1 Metals/OCF (~1.9-2.2 m) Ground Water: 1 Metals/OCF	Soil and Ground Water Phosphorus, Nitrate, Nitrite, Ammonia	Soil and ground water samples met the Table 8 SCS for the parameters analyzed. Recommend soil and ground water sampling for site-wide application of fertilizers and addition of metals as a COC.
#3 Pesticide Bulk Storage (and application)	ESA-BH16-4 ESA-BH16-3	Soil: 1 Metals/OCF (~1.9-2.2 m) Ground Water: 1 Metals/OCF	Soil and Ground Water OCF, OPP, Metals	Soil and ground water samples met the Table 8 SCS for the parameters analyzed. However, does not address site wide application of pesticides. Recommend soil and ground water sampling for site-wide application of pesticides.
#4 Turf Maintenance Shop – Gasoline and Diesel ASTs	ESA-BH16-7 ESA-BH16-8 ESA-BH16-9	Soil: 3 PHC (~0.1-2.4 m) 1 VOC (~0.2-0.5 m) 2 BTEX (~1.5 – 2.5 m) Ground Water: 3 PHC, 2 BTEX, 1 VOC	Soil and Ground Water PHC, BTEX	Soil and ground water samples met the Table 8 SCS for the parameters analyzed. Recommend lead and PAHs in soil and ground water as additional COC.



APEC/PCA (APEC # Inferred from Figures)	Boreholes in Vicinity (Based on Figures)	Inferred Analysis (Depth)	Phase I ESA Contaminants of Concern	Amec Foster Wheeler Recommendations
#5 Residence Southwest Corner – One Heating Oil AST, Two ASTs removed	ESA-BH16-1	Soil: 1 PHC/BTEX (1.8-2.5 m)	Soil and Ground Water PHC, BTEX	Soil and ground water samples met the Table 8 SCS for the parameters analyzed. Recommend PAHs in soil and ground water as an additional COC.
		Ground Water: 1 BTEX/PHC		
		Soil: 7 PHC/BTEX (~1.2 – 7 m)		
#6 Residence Northwest Corner – One Heating Oil AST, two ASTs removed	ESA-BH16-2 ESA-BH16-2B ESA-BH16-10 ESA-BH16-11 ESA-BH16-12 ESA-BH16-12B ESA-BH16-13 ESA-BH16-14	Ground Water: 7 PHC/BTEX (1 deep BH)	Soil and Ground Water PHC, BTEX	Soil exceedances of PHC F1, F2 and F3, ethylbenzene and xylenes were identified in BH16-2 and BH16-12. Ground water exceedances were identified in BH16-2, MW16-12 and MW16-13 for PHC F2, F3 and F4 and ethylbenzene. Ground water sheen was noted in BH16-2, BH16-2B, MW16-12 and MW16-13. Recommend PAHs in soil and ground water as an additional COC.
#7 Turf Maintenance Building – Heating Oil AST and UST	ESA-BH16-5	Soil: 1 PHC/VOC (1.5-2.3 m)	Soil and Ground Water PHC, BTEX	Soil and ground water samples met the Table 8 SCS for the parameters analyzed. Recommend PAHs in soil and ground water as an additional COC. Consider electromagnetic (EM) or ground penetrating radar (GPR) survey to aid in confirming present/absence and location of former UST.
		Ground Water: 1 PHC/VOC		
#8 Maintenance Building – Waste Oil AST	ESA-BH16-6	Soil: 1 PHC/VOC (~2-2.6 m)	Soil and Ground Water PHC, VOCs, trihalomethanes	Soil and ground water samples met the Table 8 SCS for the parameters analyzed. Recommend PAHs and metals in soil and ground water as additional COC.
		Ground Water: 1 PHC/VOC		
#9 Vehicle Wash Station and Oil/Water separator	No boreholes appear in vicinity.	n/a	Soil and Ground Water PHC, VOCs, trihalomethanes	Soil and ground water sampling required as this has been identified as an APEC. Recommend metals as an additional COC.

Memo  
Peer Review of Environmental Site Assessment Reports  
Proposed Development at Glen Abbey Golf Course, Oakville, Ontario  
27 July 2017



APEC/PCA (APEC # Inferred from Figures)	Boreholes in Vicinity (Based on Figures)	Inferred Analysis (Depth)	Phase I ESA Contaminants of Concern	Amec Foster Wheeler Recommendations
#10 Maintenance Yard - Historical Diesel and Gas USTs	Area unclear. No BHs in assumed area	n/a	Soil and Ground Water PHC, BTEX	Soil and ground water sampling required as this has been identified as an APEC.
#11 - Turf Maintenance Building – Historical Diesel AST	Area unclear. No BHs in assumed area	n/a	Soil and Ground Water PHC, BTEX	Soil and ground water sampling required as this has been identified as an APEC.
Historical Transformers	N/A	Unknown location. No PCB sampling conducting during assessment.	Soil PHC, PCBs	PCB sampling required as this has been identified as an APEC.

*Note: AST/UST – above/underground storage tank; COC – contaminant of concern; PCBs – polychlorinated biphenyls*

Additional comments noted in review of the Phase One and Two ESA reports is provided in the table below.

Summary of Comments – Phase One and Two ESA		
Item No.	Report	Comment
<b><u>Phase One ESA</u></b>		
1.0	Section 4.2	The Freedom of Information (FOI) response from the Ministry of Environment and Climate Change (MOECC) regarding the environmental condition of the Site was noted as pending. No request appeared to have been submitted to the Town of Oakville or Region of Halton.
1.1	Section 4.1.6 and 4.2.2	Correspondence with the Technical Standards and Safety Authority (TSSA) was noted in the 2006 Phase I ESA whereby four (4) fuel tanks were noted to be located at the Site; however, the current correspondence with the TSSA indicated no records were available for the Site. A copy of the email correspondence with the TSSA was not included in the report.
1.2	Section 4.3.4	Although four (4) ponds are noted to be present, five (5) ponds appear to be located on-Site.
1.3	Section 4.2	Noteworthy records were obtained from EcoLog ERIS including a spill from Oakville Hydro and water wells located in the area; however no comments were provided as to the relevance to the Site.
1.4	Section 7.3	APECs are numbered on the figure; however they are listed as a description in the text of the report. Numbering APECs in the text assists in understanding the assessment of the Site.
1.5	Figure 4	Two APECs were not listed in the colour block legend; however, two coloured blocks are shown on the inset map with no APEC identification.
1.6	N/A	Wash water from the maintenance yard was noted to flow into a three phase oil/water separator which discharges to the west irrigation pond. The discharge into the pond may represent an APEC.
1.7	N/A	Septic tanks were noted to be present for the maintenance, Golflogix and residence buildings. Although they are currently noted as tanks, septic beds may have been present historically. The maintenance building septic system may represent a PCA due to the potential historical discharging of vehicle maintenance-related contaminants into the system.
1.8	N/A	Oil spraying may have been conducted at the Site in parking lots, vehicle wash areas and cart paths.

Summary of Comments – Phase One and Two ESA		
Item No.	Report	Comment
1.9	APEC Table	Sediment is recommended to be included as media potentially impacted by oil/water separator discharge and run-off of pesticides, fertilizer and fill contaminants.
1.10	APEC Table	Polycyclic aromatic hydrocarbons (PAHs) may be as COC for maintenance activities and waste oil.
1.11	Section 7.2	Three (former) oil-filled transformers were located on-Site and were listed as a PCA. The transformers are not listed in the APEC table and their location is unknown. As the transformers were listed as an APEC, soil and ground water testing is required.
<b><u>Phase Two ESA</u></b>		
2.0	Section 1.0	The Phase II ESA was noted to focus mainly on the maintenance yard where all the APECs were identified with exception of the fill and former transformers located on-Site. As pesticide and fertilizer application may have been widely used across the Site additional assessment or rationale would be expected to address shallow fill and native soils and ground water. As previously noted, the ponds also represent an APEC from on-Site activities.
2.1	Section 2.4	Further rationale is required for “There are no features on the Phase Two Property that would meet the conditions of an environmentally sensitive site as described in Section 41”. The Site was noted as an environmentally sensitive area in Golder’s Hydrogeological Investigation (2016). The Region of Halton also indicates environmentally sensitive areas at Glen Abbey. Sensitive areas should be clarified and the use of Table 8 SCS should be confirmed (versus Table 1 Background).
2.2	Section 3.2.1	Polychlorinated biphenyls (PCBs) were noted as a COC for the former on-Site transformers in the Phase I ESA; however, no PCB sampling was undertaken and no rationale was provided.
2.3	Section 4.2	“No sediment was present within any of the APECs at the Site and therefore no sediment sampling was completed”. Further clarification and rationale is required as sediment may be a media potentially impacted by oil/water separator discharge and run-off of pesticides, fertilizer and fill contaminants. Sediment COC may include PHC, VOCs, metals and inorganics, OCP, OPP and PAHs.



Summary of Comments – Phase One and Two ESA		
Item No.	Report	Comment
2.4	N/A	Electrical conductivity (EC) and sodium adsorption ratio (SAR) samples have not been collected in areas where salt may have been deposited (i.e. walkways, vehicle wash stations, parking lots and areas adjacent to roads). Rationale for not sampling should be included and identify whether bulk salt storage was present (potentially-contaminating activity).
2.5	Figure 6	The ground water contour plan focuses on the maintenance building and is not representative of the conditions at the Site.
2.6	Figures, Borehole Logs, Analytical Tables, Monitoring Well Data	Naming conventions for the boreholes and monitoring wells is not consistent between figures, borehole logs, sample analysis list and analytical tables. For example ESA-BH16-2 as noted on borehole logs and ground water exceedance figure is also labelled as MWESA-2 on soil and ground water summary tables, MW16-2 on the soil exceedance figure, and BHESA-2 on analytical tables.
2.7	Figures, Monitoring Well Data, Borehole Logs, Analytical Tables	Deep well ID ESA-BH16-2B and shallow well ID ESA-BH16-12B are used interchangeably between figures, monitoring well data, borehole logs and analytical tables.
2.8	N/A	Lead was a possible constituent of historical fueling operations. No soil or ground water sampling was conducted for this COC.
2.9	N/A	Metals analysis in ground water was limited to the area of former pesticide storage. Additional metals analysis is recommended for pesticide/fertilizer application, widespread fill and bulk fuel storage.
2.10	N/A	Pesticide and metals analysis in ground water was investigated in the area of storage and not in the area of application (i.e. across site).
2.11	Geotechnical Report	Based on the Geotechnical Investigation, fill was noted in twelve boreholes ranging in depth from 0.3 to 4.1 m thick. Metals analysis was carried out in two of these identified boreholes (BH13 and BH7) at a depth of 0.8 – 1.2 m for each. Recommend additional sampling of fill materials from these boreholes at varying and deeper depths and/or rationale to clarify lack of fill samples across the property.
2.12	Figure 7	Vertical delineation of PHC appeared to end at shale in BH16-2B; however, no ground water samples were taken from the deeper BH. Further clarification/rationale/evidence should be provided to illustrate PHC migration within the shale has not occurred.

Summary of Comments – Phase One and Two ESA		
Item No.	Report	Comment
2.13	Plan of Survey	Plan of Survey denotes a “chemical storage”, “pest control”, “golf cart garage” and “hydro” buildings. It is unclear whether these areas were assessed during the Phase I ESA. No sampling appears to have been conducted in these areas.
2.14	N/A	Geotechnical borehole logs where environmental sampling was conducted (i.e. all metals and pesticides with exception of MWESA-4) are not included in the report for soil stratigraphy review.
2.15	N/A	In reference to the requirements listed in the “Protocol for Analytical Methods Under in the Assessment of Properties under Part XV.1 of the <i>Environmental Protection Act</i> ,” dated 01 July 2011; relative percent differences are not provided or commented on and missing samples include a pH duplicate, trip spike for VOC analysis and methanol trip blanks during soil sample collection.
2.16	Table 5C	Only two soil samples analyzed for pH, both greater 1.5 m depth. Additional pH sampling or data may be needed to confirm soil pH range is applicable to site condition standards utilized.
2.17	Borehole Logs	ESA-BH14, BH-16 and BH-17 measured high organic soil vapour levels (up to 2,200 parts per million [ppm]); however no VOC sampling was conducted near these depths.
2.18	Borehole Logs	A headspace combustible soil vapour measurement of 540 ppm was detected in ESA-BH16-12 around 6.5 m; however the well screen was placed roughly 2 metres above this vapour (~2.5-4.5 m). Petroleum odour with no staining was observed at this level. A soil sample taken around 2.5 m confirmed petroleum contamination. Vertical delineation of this borehole may not be complete. A second borehole is inferred to be drilled in this vicinity (ESA-BH16-12B). The borehole log for ESA-BH16-12B is not provided.
2.19	Table 2	The ground water level in ESA-BH16-12B is noted to be 4.8 metres below ground surface (mbgs) in April then drops to 11.0 mbgs in June of the same year. Suggest providing rationale for drop in water level (appears limited to this well) and effect on analytical results.
2.20	Borehole Logs	In reviewing borehole logs, it appears solid stem augers were utilized to drill the deeper borehole BH16-2B to 13.7 m, which was located directly beside BH16-2 with noted sheen and PHC contamination. An explanation of how this may affect soil and ground water should be discussed including potential conduits created and potential for contamination to reach deeper depths due to soil cave etc.

Summary of Comments – Phase One and Two ESA		
Item No.	Report	Comment
2.21	Table 6A	Monitoring well MWESA-2, PHC F2 and F3 concentrations seem to fluctuate widely between seasons. Ground water levels also appear to fluctuate between seasons.  A discussion should be provided to compare and evaluate these conditions as it may relate to migration and potential receptors.

### Other Issues and Concerns

Editorial oversights were identified in the Phase I and II ESAs as noted in the table below. These comments may assist in improving the clarity of the reports.

Editorial Comments		
Item No.	Report Location	Comment
1.0	APEC Table Phase I ESA	In the APEC table, fertilizer storage is listed as PCA #28 Gasoline and Associated Products Storage in Fixed Tanks (editorial comment).
2.0	N/A Phase I ESA	Aerial photographs were reviewed during the Phase I ESA; however, copies were not included in report.
3.0	Table 2 Phase II ESA	Ground water elevations taken on 12 June 2016 were cut off on the table.
4.0	Figure 4 Phase II ESA	MW16-17 is shown twice and MW16-15 and MW16-16 are missing.
5.0	Figure 7 Phase II ESA	Horizontal ground water contamination should extend past ESA-BH16-13.
6.0	Phase II ESA	The summary of soil samples submitted for laboratory analysis does not match the analytical tables.
7.0	All Tables Phase II ESA	Review sample IDs and duplicates as various inconsistencies noted (i.e. Table 3: Dup13B noted as a duplicate of sample BH16-13SA2B; however on Table 5A, Dup13B is shown with sample BH16-12BSA2B and there are no results shown for BH16-13SA2B on the table [results are available]).
8.0	Analytical Tables Phase II ESA	“Table 3” site condition standards noted on analytical tables (inferred to be a typo).



Editorial Comments		
Item No.	Report Location	Comment
9.0	Table 4 Phase II ESA	As a general recommendation, duplicate samples should be clearly identified to avoid confusion (i.e. sample BH16-16 and duplicate MW16-16 appear to be from different well locations).

## Conclusions

Overall, Amec Foster Wheeler has identified several information gaps as detailed above, in particular with the Phase Two ESA report, which in our opinion will require additional work and/or clarification. As noted by Golder, additional remediation and/or risk assessment work will also be required prior to filing a record of condition.

The current primary concerns identified during the peer review include:

- Lack of testing for pesticides and metals across the property to address widespread application of pesticides and importation of fill;
- Further clarification/rationale is needed for the application of Table 8 SCS, including correspondence with appropriate agencies such as Halton Region and Conservation Halton. Sixteen Mile Creek and the associated valley lands are depicted as an environmentally sensitive area in Golder's Hydrogeological Investigation (2016). Other environmentally sensitive areas may also be present. Table 1 background SCS are typically applied when sensitive areas present. Table 1 SCS provides more stringent soil and ground water standards for some parameters.
- The presence or absence of former underground storage tank(s) and associated petroleum impacts;
- A headspace combustible soil vapour measurement of 540 ppm was detected in ESA-BH16-12 around 6.5 m; however the well screen was placed roughly 2 metres above this vapour (~2.5-4.5 m). Petroleum odour with no staining was observed at this level and continued to the depth of the borehole. A soil sample taken around 2.5 m confirmed petroleum contamination above Table 8 SCS. Vertical delineation of this borehole may not be complete.
- Delineation of petroleum impacts in soil may not be complete as sheen was identified in BH16-13. Soil sample BH16-13SA2B at a depth of 2.3-2.7 m was non-detect for PHC and BTEX parameters.
- Vertical and horizontal delineation in soil for petroleum contamination is not complete as deeper soil samples were not collected west of the exceedances identified in BH16-2 and BH16-12).



- No sediment sampling was conducted in any of the five (5) on-Site ponds;
- Soil sampling in area of former transformers was not conducted although it was identified as an APEC; and
- Boreholes ESA-BH14 and BH-17 measured high organic soil vapour levels (400 parts per million [ppm] and 1,548 ppm); however no VOC sampling was conducted near these depths. Borehole BH-17 ended with the highest vapour reading at 1,548 ppm.

### **Recommendations**

Amec Foster Wheeler has identified several information/data gaps in the Golder Phase One and Two ESA reports (October 2016). Recommendations provided above are intended for consideration only, which may include further assessment work (collection of additional field data) or simply report clarifications/rationale in order to meet RSC requirements under Ontario Regulation 153/04.

As noted by Golder, further remediation and/or risk assessment is required to be completed before an RSC can be filed with the MOECC.

## Natural Heritage Matters – Peer Review

### Memo

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To: Adam Huycke, Region of Halton; Charles McConnell and Philip Kelly, Town of Oakville  
From: North-South Environmental Inc.: Mirek Sharp  
Date: July 25, 2017  
File:  
cc: Ron Scheckenberger, Amec Foster Wheeler  
Re: Peer Review of Natural Heritage Matters Related to  
Proposed Development of Glen Abbey Golf Club, Town of Oakville

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This memo provides our comments based on our review of the application as of 24<sup>th</sup> July. Further review of the application material and/or discussion with others involved with this application may result in refinements to these comments.

#### Introduction

We have been retained by the Region of Halton and the Town of Oakville jointly to review the application for the redevelopment of the Glen Abbey Golf Course as it relates to natural heritage issues. The primary documents reviewed in this regard were:

- Environmental Impact Assessment prepared by Beacon Environmental (2016)., and
- Draft Plan of Subdivision prepared by Glen Schnarr & Associates.

We have also referred to several other reports as needed to comment on the natural heritage issues including:

- Proposed Redevelopment of the Glen Abbey Golf Course, Urban Design Brief

We have attended a presentation by the applicant's team (July 5<sup>th</sup>) and a site visit (July 19<sup>th</sup>). We have also met with and discussed various aspects of the file related to natural heritage with staff from the Region of Halton, Town of Oakville and Conservation Halton. Sal Spitale, attended two meetings of the review agencies on June 29<sup>th</sup> and July 12<sup>th</sup> on behalf of Mirek Sharp and also attended the site visit.

We have a number of comments on the reports that are categorized as "Fundamental Issues", that, in our opinion need to be resolved prior to the approval of a draft plan of subdivision, and "Other Issues and Concerns" that should be addressed, but would not likely preclude approval of a draft plan.

#### Fundamental Issues

##### 1. Woodland Buffers

The lack of analysis for determining woodland buffer widths, and the recommendation that the 10 m minimum required by the Livable Oakville policies is adequate, are major concerns with



the application. Because of the importance of this issue, we have provided a relatively long explanation of our concern.

We agree with the Beacon EIA (page 43) where it notes that the policy requirement of 10 m from drip-line is a minimum and that any need for a wider buffer needs to be determined through an EIS (or in this case an EIA). The Beacon report (page 43-46) provides a discussion of buffers, largely taken from the study Beacon undertook for Credit Valley Conservation, and notes there have been very few studies on the effectiveness of various buffer widths for woodlands and conclude that this, "... makes it very difficult to recommend appropriate buffers to forested areas based on the science." We do not totally agree with this conclusion because while we acknowledge the lack of specific guidance on buffer widths in the scientific literature, as ecologists, we have an understanding and knowledge of the ecology of many woodland communities and species that make them significant and/or vulnerable to disturbance, as well as a general understanding of the impacts that result from human use. Thus, while science does not provide us with definitive guidance on buffer widths for various woodlands, it does equip us with a sufficient understanding to provide a science-based best judgement on appropriate buffers.

Beacon conclude that, "... the subject property should have a no development buffer of 10 m width measured from the drip-line." No rationale is provided in the EIA that explicitly supports this conclusion. A short and general discussion on "Sensitivity of Functions and Features" is provided (page 42), but not in reference to why the minimum of 10 m is adequate.

In our opinion, the EIA needs to provide a rationale for a woodland buffer that discusses:

- the significance of the woodland and its function (including site-specific and regional functions and/or significance), as well as any wildlife that inhabits it that may be affected by the proposed development (i.e., any species with limited tolerance for urban development as proposed),
- the vulnerability of the woodland to impacts with consideration of the entire development (i.e., not just the lands immediately adjacent to the feature); as well as
- the compatibility of the proposed adjacent land use which is provided in the EIA.

The determination should recognize the context provided by the applicable policy frameworks. The policies of the Town and the Region, in addition to conforming to the necessary Provincial guidance, represent community values and collectively reflect a vision for the community. In its Vision, the ROP recognizes its natural heritage system as part of a "permanent landscape" (s. 26 and 27), and speaks to "*increasing certainty that the biological diversity and ecological functions within Halton will be preserved.*" (s.114). One of the Town's Guiding Principles is "*Achieving Sustainability in order to: b) preserve, enhance and protect the Town's environmental resources, natural features and areas, natural heritage systems and waterfronts*" (Liveable Oakville, s. 2.2.3). Enhancing the Town's natural environment is the first direction listed in the Mission Statement (Liveable Oakville, s.2.1). The inclusion of these directions in the guiding statements for the Region's and the Town's official plans indicates the importance the community places on the protection of natural heritage, and in our opinion, justifies providing a high level of confidence that features will be protected.

With regard for providing high confidence, we note that the Beacon (2012) report referenced in the EIA provides a range of possible buffer widths for different functions and features (Beacon 2012, Table 7). For Upland Woodlands, for the two functions where guidance is given, the



recommended buffer range to achieve a low probability of not achieving buffer function (using the wording in the Beacon report) is 21-30 m for "Screening of Human Disturbance/Changes in Land Use" and 31-40 m for "Core Habitat Protection". We are not commenting on or proposing these as appropriate buffer widths for the Glen Abbey application, but we do suggest that the Region's and Town's policies warrant aiming at achieving a high confidence that features will be protected. In light of this, providing buffers that achieve only the minimum amount of protection is deemed inappropriate.

Moreover, it is logical that the Livable Oakville policy that specifies a minimum 10 m buffer for woodlands would be intended to apply to situations where the woodland is least significant and sensitive, and the least impacts are expected from adjacent land use. This might be characterized by a woodland without slopes, with no significant or sensitive species or features or local or regional functions, and with a compatible adjacent land use. Any situation where there is a greater susceptibility to impacts, presence of significant features or functions or less compatible land uses, such as the proposed Glen Abbey development, the minimum buffer would logically be insufficient. This speaks to achieving the level of confidence that is sought by the policy framework. The Beacon EIA notes that, "... it is important to consider site-specific factors (e.g., local hydrologic dynamics, soils, slopes, woodland/forest type and size), species and functions which the buffer is expected to protect, as well as land use context as part of buffer determination." (Beacon 2016, page 44). An analysis that incorporates these considerations has not been provided.

Also from a policy perspective, we note the guidance from the Greenbelt Plan (2017), which identifies Sixteen Mile Creek Valley as an Urban River Valley. Although the Urban River Policies (s. 6.0) indicate that only publicly owned lands are subject to the policies of the Urban River Valley designation, it also notes that for lands falling within the Urban River Valley, the policies of the Protected Countryside do not apply except for 3.2.6 and 3.3. Section 3.2.6, subsection 2 notes, "*In recognition of the function of the urban river valleys, municipalities and conservation authorities should: b) In considering land conversions or redevelopments in or abutting an urban river valley, strive for approaches that: i) Establish or increase the extent or width of vegetation protection zones [i.e., buffers] in natural self-sustaining vegetation, especially in the most ecologically sensitive areas (i.e. near the stream and below the stable top of bank);* ..."

Regarding the consideration of adjacent land use, we recognize the proposed plan design incorporates a substantial area of park and open space uses immediately adjacent to the buffer, as part of the approach to protecting the woodland edge. However, the other important consideration of plan design is the overall high density of the proposed development. The proposed plan will accommodate well over 6000 residents and their pets (the Justification Report predicts 6345 residents), the majority of whom can be expected to use the proposed Open Space system to varying extents. In addition, a "key element" of the Open Space Structure is connectivity with surrounding neighbourhoods and trail systems (SGL 2016, page 38). Thus, in addition to use from residents of the future community, there is the expectation of use from residents throughout the general area. It is worth noting that hitherto, the site has been largely protected from this level of recreational pressure through its management as a prestige Golf Course. We anticipate that with the proposed change in land use the proposed open space system will be more intensively used, especially that area adjacent to the top of slope owing to the appeal of the dramatic slopes and periodic vistas over the valley. This further indicates the need for buffers that are greater than the proposed minimum. We also request



that the EIA provide specific recommendations regarding the treatment and use in the open space where it abuts the setback to the stable top of bank and/or buffer to the drip-line of the Significant Woodland. We also note that there are two development blocks (Blocks 163 and 164) which abut the stable top of bank/trail system, which may require a greater buffer than the area assigned as open space.

The EIA (page 44) also indicates a 10 m buffer from stable top of bank is provided (even though 15 m is mapped on Figure 3 and the draft plan indicates the greater of 10 m from woodland or stable top of bank or 15 m from physical top of bank). The EIA acknowledges this is less than the 15 m from top of stable slope buffer requirements of the Town and Conservation Halton, but no rationale for the reduction is provided other than from an ecological perspective the EIA claims the difference is "not measurable". We especially note in this regard the Livable Oakville policy 16.1.9 g), which indicates that geotechnical studies may be required to determine stable top of bank, but this will not result in a reduction in the specific setbacks (our underscore).

In summary, we suggest that the EIA re-evaluate the buffer requirements for the significant woodlands on the site taking into consideration all of the discussion provided above. This should include a detailed and site-specific rationale for the recommended buffer. The stable top of bank buffer needs to be 15 m to conform to policy requirements; there is no provision for a reduction from this that we are aware of.

As part of the field visit we examined the woodland near the entrance road at Dorval Drive, where minimum buffers cannot be achieved, and agree with the Beacon EIA that if the road geometry requires the proposed alignment, it will be impossible to provide minimum buffers in this specific area. Because of this we have no issue with the proposed reduction/lack of buffers at the entrance, but encourage the protection of the edge of the significant Woodland in this area to the extent possible.

## 2. Identification of Key Features

Section 6 of the EIA addresses "Key Natural Heritage Features and Functions". This same terminology is used in the title of Table 8 which summarizes the findings. The terminology used in the Region's Official Plan is "Key Features" (s. 115.3(1)) and it is unclear if this is what is meant in section 6. If the intent is to demonstrate conformity with the ROP, then the EIA should use the Region's terminology. Table 8 presents a mix of Key Features and another component of the RHNS (other wetlands), but omits watercourses. The Table or text should indicate the Key Features and other components of the RHNS that are not present on the site.

Also, the identification of Key Features is not complete, as it is missing, or incompletely addresses, at least bats and Significant Wildlife Habitat, as noted in the comments below.

## 3. Evaluation of Tableland Woodlands

There is no evaluation to demonstrate which woodlands are significant and which are not. Table 8 says only that, "*The subject property supports portions of woodlands that have been identified in planning documents as significant.*" (Beacon 2016, Table 8). The table notes this includes the valleyland woodlands and extension, and tableland woodland 8a (marked as 5a on Figure 2).

There is no evaluation or rationale for the exclusion of the other woodlands. This evaluation is needed, especially because several of the tableland woodlands are identified for complete or partial removal.

The future need to undertake a feature-based water budget for the woodlands on the south slope of the valley is acknowledged in the EIA to determine if existing hydrology regime can be maintained. We suggest this is needed now, rather than at a future time, to fully characterize woodland sensitivity.

#### 4. Wetlands

There is a lack of correlation between the ELC descriptions in Section 4.2 of the EIA and what is mapped on Figure 2. There appear to be mistakes in the text, but with the confusion in labelling, it is difficult to tell.

Several small wetlands have been identified associated with tableland woodlands. Although noted in Table 8, it is unclear if they are acknowledged as components of the RNHS (see ROP 115.3(6)). All three of these wetlands, 6h, 7a and 7b on Figure 2, appear to be retained (confirmation that 7a will be retained is requested as the text in the section on "hydrology/water balance" is unclear). However, there is no identification of wetland buffers identified per Livable Oakville and Conservation Halton policies, just a statement that the woodland buffers will be adequate to protect them (page 45). There is no discussion or mapping that addresses the relationship between the minimum required buffers for wetlands per Livable Oakville and Conservation Halton policies, and the 10 m woodland buffer. A water balance should be undertaken on at least the two wetlands in woodland 5a to enable a discussion on how they will be maintained post development.

The text and/or mapping needs to be revised so they agree, and the wetlands need to be clearly identified as components of the RNHS with appropriate buffers per existing policies.

#### 5. Significant Wildlife Habitat

The EIA does not provide an analysis of Significant Wildlife Habitat (SWH). SWH is addressed in Table 8 and notes Sixteen Mile Creek Valley "could" be considered SWH, but does not indicate if it is for the purpose of the EIA. Likewise it acknowledges Wood Thrush, amphibian breeding and turtle habitat could meet the test of SWH, but no analysis was undertaken to confirm this.

Given that knowledge of SWH would contribute to the understanding of the significance and function of the valleyland, including the woodlands (and thus could influence buffer determination), it needs to be evaluated. Moreover, rehabilitation will be required in the valley before conveyance to a public agency, and an understanding of SWH as it pertains to the valley will be necessary to develop a Rehabilitation and Monitoring Plan.



## 6. Threatened and Endangered Species

We note that bat surveys are needed to provide a complete understanding of the site, especially as several species are designated as Endangered. We acknowledge that the EIA indicates the requirements to the Endangered Species Act (ESA) will need to be met and the EIS recommends deferring this until just prior to buildings and woodland are removed. We suggest this approach should be discussed and confirmed with MNRF, and preferably a letter from MNRF confirming it is an acceptable approach can be provided in the EIA.

However, there are also Region and Town policies regarding threatened and endangered species that need to be addressed. For example significant habitat of endangered and threatened species constitutes a Key Feature in the RNHS (ROP s. 115.3(1)). Although surveys associated with existing buildings that are proposed to be removed could be deferred, a bat survey would contribute to a fuller understanding of the significance and sensitivity of the valleyland and tableland woodlands. This is necessary to fully evaluate woodland significance with respect to the buffer determination as described above. Section 4.3 in the EIA notes that no forest is being removed by the proposed development (page 34), however, woodland 5b (per Figure 2) will be completely removed, as will portions of some of the cultural woodlands.

We note that the Livable Oakville policy 16.1.6 provides an outright prohibition on development within the Significant Habitat of Endangered and Threatened Species. Strictly speaking, this necessitates an evaluation of the entire site to identify significant habitat. The EIA will need to provide a rationale for any exception to this policy.

We suggest that in order to avoid a full and complete survey that would likely need to be repeated in the future just prior to building removal, that a preliminary survey be undertaken that would at least indicate the species that are present, even if the features they are using are not confirmed at this time. The EIA could then take a "worst case" scenario and provide justification and commitments to compensation as part of addressing Regional and Town policies. At present, there is no indication of which species are present and would be impacted by the proposed development. Ultimately, the approval authority for issues related to Threatened or Endangered species is the MNRF and discussions will be required with MNRF to determine an acceptable approach to proceed, including the timing of surveys.

We note that with respect to the SAR letter provided in Appendix C of the EIA, dated May 20, 2015, is for a bank rehabilitation project, not this development application. We recommend a SAR letter be resubmitted to the MNRF regarding this development application.

## 7. Bird Strikes

In addition to the comments on impacts to features noted elsewhere in these comments, we note that the "effects" analysis (as noted below the term "impacts" is preferred in keeping with policy wording), does not address the potential for bird strikes against windows. Given the number of possible apartment structures and the proximity to Sixteen Mile Creek valley, which may serve as an important bird migration route and/or landbird migratory stopover area, this is a potential impact which should be discussed and mitigation provided (we note that there are glass products on the market designed to reduce the potential for bird strikes).



## 8. Lack of Restoration/Management Plan for the Sixteen Mile Creek Valley

The EIA recognizes that there are opportunities for restoration on the valley slopes and bottomlands (page 48), however, there is no corresponding recommendation to develop a Restoration Plan.

At present the valley supports manicured golf greens and fairways, as well as infrastructure such as hard-surface pathways, bridges, irrigation pipes, pumps and an on-line pond. Much of this, if not all of it, will likely need to be removed and a comprehensive restoration plan will need to be developed. Moreover, there is the potential for impacts associated with the removal of infrastructure that will need to be addressed. A Restoration and Monitoring Plan should be viewed in part as mitigation for the inevitable impacts associated with the removal of the golf course and associated infrastructure in the valley.

It is understood that such a plan cannot be developed until there is agreement on what has to be removed, and it is thus reasonable that a process for developing a detailed restoration and monitoring plan be a condition of draft plan approval. However, it is appropriate that the EIA provide guidance as to what the restoration plan should achieve. For example, the pros and cons from a natural heritage perspective of removing the existing on-line irrigation pond, and recommendations on the communities that should be re-created should be provided. Additionally, the EIA should provide a Vision for the bottomlands that enhances natural heritage values and provides a goals and possible principles for developing the final plan. We suggest the discussion on a Restoration and Management Plan be a separate section in the EIA.

## 9. Location of Stormwater Outfalls

We agree with the proposed general location of the eastern outfall route as it is located in a cleared area that traverses the slope from tableland to valley bottom. However, the western outfall route is located such that it will require a 12 m wide swath of mature trees on the southern valley slope to be removed. On the site walk, it was noted that impact could be substantially reduced if the route of the outfall I was moved to the west where the vegetation was younger and the slope appeared to be shallower. We recommend that the EIA address this alternative and explicitly recommend the relocation of the outfall to a location that minimizes impacts to the wooded slope, or provide an alternative construction method (e.g. trenchless technology) that avoids impacting the natural heritage features on the slope entirely.

The ultimate discharge of two of the stormwater outfalls to Sixteen Mile Creek is not addressed and defers dealing with them at a detailed design stage. The EIA acknowledges the presence of Silver Shiner, a threatened species, in Sixteen Mile Creek in section 7.1 "Effects Assessment", but this is not mentioned in the mitigation section on the stormwater outfalls. We recognize that detailed design is not needed for draft plan approval but a conceptual plan, including the location, should be provided in the description of the proposed undertaken, and any potential impacts identified in section 7.1.



## 10. Policy Conformity – Region of Halton

It is our opinion that at present the application does not conform to the natural heritage policies of the Region's Official Plan. Issues include:

- no recognition or use of the Region's EIA guidelines (s.141(2) and 141(3);
- no complete and clear identification of components of the RNHS, including identification of Key Features and mapping of the RNHS as it occurs on the property, per s. 115.3(1),
- insufficient demonstration that there are no negative impacts to natural features and areas or their ecological functions (s.118.2 and 118.3).

## 11. Policy Conformity – Town of Oakville

It is our opinion that at present the application does not conform to the natural heritage policies of the Town of Oakville's Official Plan, Livable Oakville. Issues include:

- insufficient information to evaluate Significant Habitat of Endangered Species and Threatened Species (s.16.1.6);
- no identification of buffers for wetlands and possibly development within the minimum wetland buffer width of 30 m (s.16.1.7);
- no demonstration that the minimum buffer width of 10 m is sufficient to avoid impact to woodlands on steep slopes (16.1.8);
- application does not provide the minimum setback of 15 m from stable top of bank (s.16.1.9).
- insufficient analysis of Significant Wildlife Habitat (s.16.1.10)
- the application does not conform with the requirements for Fish Habitat (s.16.1.13), in particular 16.1.13 a and b, which require determination of buffer widths.

## Other Issues and Concerns

12. Section 2.2, (page 4) the EIA notes that it is a municipal responsibility to identify Significant Woodlands, Significant Valleylands and Significant Wildlife Habitat. This is partially true, but municipalities can implement that responsibility by requiring the identification of these features through the development process (e.g., as part of an EIA). It is the expectation of the Region and the Town that these features be identified and evaluated in the EIA report.
13. On page 5 the EIS makes reference to the Urban Area and Regional Natural Heritage System being overlays on Regional mapping. This is incorrect as neither of these are overlays.
14. Section 3.5 of the EIA is entitled "Amphibian Surveys". This would more properly be called "Frog Surveys" as other amphibians, notably salamanders were evidently not surveyed. That said, based on the site characterization and our field visit, we appreciate that there is no habitat on the tableland for salamanders, especially those that would constrain development. The EIA notes that one red-backed salamander was found on the wooded slopes, but we agree that their steepness precludes a thorough field investigation. Despite this, salamanders should have been discussed in the methodology, as some level of investigation must have occurred to have discovered the single individual noted in section 4.2.4.

15. It would be helpful to map the Glen Oak stream (which we understand is off-site), as well as the on-site tributary on the Figures.
16. Section 4.1.5, the scientific names of Red-side Dace and Silver Shiner are reversed.
17. As noted in discussion of the fundamental issues, the numbering of the vegetation communities for Units 5 through 8 in section 4.2 do not match the mapping on Figure 2.
18. For section 7, the term "impacts" is preferred over "effects" to clearly indicate that the report is addressing policy requirements.
19. In section 7, in the sub-section "Noise and Light Effects", it is unclear what is meant by the edges of the system being "well-sealed". Please provide a better description of what is meant.
20. Section 7.2, Recommended Mitigation Measures, includes discussion on Significant Woodland – Hydrology. This is not considered mitigation but is part of the characterization of the site.
21. Recommendation #2 (Section 9), indicates the need for chain link fencing between "ground-level" residential lots where they interface with natural area buffers, but excludes "multi-unit management units". We recommend that the fencing requirement also extend to these units (Blocks 163 and 164) to control human access to the buffer area and to clearly delineate it. In the area behind blocks 163 and 164, the fence should be between the lot line and the 5 m trail allowance.

## Air Quality Matters – Peer Review



### Technical Memo

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**To:** Charles McConnell, Town of Oakville **Date:** July 31, 2017  
**From:** Stephen Lamming and Alex Breido, Amec Foster Wheeler  
**CC:** Paul Barrette, Philip Kelly, Town Of Oakville  
Ron Scheckenberger, Amec Foster Wheeler  
**Ref:** TPB1780895  
**Re:** Peer Review of Air Quality Matters Related to the Proposed Development of  
Glen Abbey Golf Club, Town of Oakville

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#### INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, was retained by the Town of Oakville to conduct a technical peer review of the air quality report completed by Golder Associates (Golder) for the proposed redevelopment of Glen Abby Golf Club located in the south east quadrant of Dorval Drive and Upper Middle Road in the Town of Oakville, the 'Site'.

As part of the above requirement, the air quality review team has participated in the following meetings:

Date	Organization(s)	Description
July 05, 2017	Development Group, Town of Oakville, Peer Review Team	Development Group presentation of technical reports
July 12, 2017	Town of Oakville, Peer Review Team	General discussion of issues
July 17, 2017	Town of Oakville, Air Quality Review Team	Discussion of primary air quality issues in context of Town air quality objectives

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The air quality review team has reviewed the following documents<sup>1</sup> as part of this assessment:

- i. "Proposed Redevelopment of Glen Abbey Golf Club", Air Quality Report, No. 1547245, October 2016, Golder.
- ii. "Environmental Impact Assessment Glen Abbey Golf Club Redevelopment", Beacon Environmental Limited, October 2016
- iii. Glen Abbey Golf Club Proposed Redevelopment Transportation Considerations", BA Group, October 2016
- iv. Communication from Jeffrey Lee, Town of Oakville dated July 23, 2017

In addition, the following regulatory and guideline documents and public information sources have been referenced, where relevant:

- i. Ministry of the Environment and Climate Change (MOECC) Guideline D-6, 'Land Use Compatibility', July 1995;
- ii. D6 Guideline for Compatibility between Industrial facilities, accessed July 19<sup>th</sup> 2017 <https://www.ontario.ca/page/d-6-compatibility-between-industrial-facilities>
- iii. The Region of Halton Land Use Compatibility Guideline;
- iv. The Region of Halton Air Quality Guidelines (2014) (referenced in the report)
- v. The Corporation of the Town of Oakville by-law 2010-187 (to amend by-law 2010-035 referenced in the report under review);
- vi. MOECC Access Environment database of current and historical ECAs for Air & Noise, Waste Disposal Sites, and others;
- vii. Ontario Environmental Bill of Rights database on applications for ECA (Air & Noise) and MOECC decisions; and
- viii. National Pollutant Release Inventory (NPRI), Environment and Climate Change Canada (ECCC).

An air quality review for any development will typically consider the following:

- Background air quality information for the study area;
- Impacts of the surrounding built environment on the project; and
- Impacts of the project on the surrounding environment and community;

#### Background air quality

In regards to background air quality, Golder<sup>2</sup> uses data available for the period 2009-2014 from the MOECC air monitoring station at 8<sup>th</sup> Line and Glenashton Drive (NAPS ID 61603), and

<sup>1</sup> Documents accessed from <http://www.oakville.ca/business/da-14541.html>

<sup>2</sup> Air Quality Report, October 2016



located approximately 3.5 kilometres north of the proposed development. Station data was available for fine particulate matter (PM<sub>2.5</sub>) and nitrogen oxides (NO<sub>2</sub>) and was referenced to the provincial (AAQC) and federal (CAAQS) ambient air quality criteria. Additional reference PM/PM<sub>10</sub> was calculated from the PM<sub>2.5</sub> numbers. While all parameters were reported as below criterion levels, fine particulate (PM<sub>2.5</sub>) was noted to be at 71% of the annual CAAQS limit. There was no information provided as to any exceedance frequency over the record period.

#### Impacts of the surrounding environment on the development area

In the *Livable Oakville Plan (2009 Town of Oakville Official Plan)* at *S 10.5 Energy Generation 10.55(b)* "Studies demonstrating no adverse impacts on existing or proposed development with regard to the natural environment, noise and vibration, plume, air quality and affected airshed, natural and cultural heritage, viewsheds, shadows, land use compatibility, public health and safety, risk, and soils stability and geotechnical engineering."

A number of existing industrial facilities were referenced in the consultant's report. Emissions from three of these were quantified based on NPRI data although one of these (Greif Bros Canada Inc) is no longer in operation. While we agree that the impacts of the remaining facilities on the development is limited, it is noted that to compare local criteria air contaminants (CAC) emissions to the provincial totals is essentially meaningless. In addition 14 other facilities were identified from the MOECC registry of Environmental Compliance Approvals as being within 1.5km of the development, however no further air emissions information (point or cumulative) was provided other than noting the type of facility and the stack height.

While O.Reg. 419/05 governs emissions impact for each individual facility at or beyond the property line this does not consider cumulative impact from all facilities and cumulative impact has not been considered in the present report.

Transportation sources – no analysis of potential mobile source impacts to the development was provided.

In the discussion on land use compatibility reference was made to the D6 guidance. The D-Series identifies "potential areas of influence" in which adverse effects 'may' be experienced within industrial use areas as follows:

#### **Ministry of Environment: D-Series – INDUSTRIAL USES** **Potential Areas of Influence and Minimum separation Distances\***

Industrial Facility	Potential Area of Influence (metres)	Minimum Separation Distance (metres)
Class I	70	20
Class II	300	70
Class III	1000	300

The intent of the D6 guidance was to ensure that a sufficient buffer was established between any industrial facility and a sensitive area or development. Given the distances involved each separate industrial facility quoted in the report is outside a D6 zone of influence based on the proposed development location. However it is noted that the potential for cumulative impact from the list of facilities quoted, has not been assessed.

#### Impacts of the Project on the surrounding environment or community

The Town of Oakville through various planning documents and policies is trying to ensure the continuous improvement of air quality in the community. In particular:

- **Town of Oakville Health Protection Air Quality By-law 2010-035, 2010.** The by-law's purpose is to protect the health of Oakville residents from the negative effects of fine particulate matter measuring 2.5 microns or less (fine PM) by collecting emissions information from Oakville facilities and implementing regulatory controls for major emitters. In the introduction to Section 4 of the Bylaw Guidance documents it was also noted that: *"recent studies by the province have found that the residents of Oakville are living in a taxed airshed, which is defined as a geographical region covered by a volume of air that has similar characteristics and in which air quality is comprised of elevated levels of air contaminants. A key contributor to the poor air quality in Oakville is fine particulate matter" (PM2.5)* The section goes on to note that while *"Industrial facilities are major stationary sources of such emissions, commercial, institutional and residential buildings also emit fine PM and precursor pollutants. Vehicular traffic is another major source of emissions of fine PM and precursors."* While the primary context of the bylaw is related to the impact of facilities and their emitted pollutants on the community, it is noted in the staff report that there was significant community concern related to the need to protect and improve the Oakville airshed. The bylaw also notes particularly in the definitions that a facility *"does not include a residential site that contains less than 25 dwelling units"*. Since the current development project includes more than 3000 such units it is difficult to see why this definition would not apply. The Town should therefore reasonably expect that a project of the magnitude of the Glen Abbey redevelopment would provide the Town with an assessment on air quality impacts to the Oakville airshed in general and the adjacent community in particular, therefore allowing Council to make an informed decision on the application.
- **Growth Plan for the Greater Golden Horseshoe, 2017 S4.2 Policies for Protecting What is Valuable S4.2.9.19(c)** In the section of A Culture of Conservation, it is noted that *"municipalities will develop and implement official plan policies and other strategies in support of the following conservation objectives: air quality improvement and protection, including through reduction in emissions from municipal, commercial, industrial, and residential sources"*.



Additional references provided by the Town of Oakville related to air quality management and improvement include:

- *Ontario Provincial Policy Statement, 2014 S 1.1.1c* Notes that "Healthy, livable and safe communities are sustained by avoiding development and land use patterns which may cause environmental or public health and safety concerns"
- *OPPS S 1.1.3 Settlement Areas 1.1.3.2(a)3* "Land use patterns within settlement areas shall be based on densities and a mix of land uses which minimize negative impacts to air quality and climate change, and promote energy efficiency"
- *Livable Oakville Plan (2009 Town of Oakville Official Plan)S 10.11 Air Quality* "The Town will work to improve air quality through its land use and transportation decisions"
- *S 7.4.3 of the North Oakville East Secondary Plan and S 8.4.3 of the North Oakville West Secondary Plan* the plans shall work "to improve air quality and energy efficiency for development, such as, minimization of the amount of vehicular travel and emissions and the reduction of energy and residential combustion emissions"

There has been no attempt in the report to assess the impact of the development (e.g. space heating emissions, or vehicle traffic increase) on the surrounding area. The development is a change from a very permeable air quality environment to a 3000+ unit built-environment dominated by high density residential dwellings up to 12 storeys high.

## FUNDAMENTAL ISSUES

The fundamental issues here are twofold:

- Firstly that the proponent has not conducted any cumulative assessment of existing industrial or commercial development on the project area and has also not provided any assessment of the impact of vehicle emissions on the project. The only information that could have been an indicator of cumulative impact was the ambient air quality data for the Glenashton Road station 3.5 kilometres to the north and away from any industrial development. In addition, no information related to potential criteria emission frequency at this station was provided.
- Secondly, since the current development includes more than 3000 residential units up to 12 storeys in height, it is difficult to see why the facility definition in the 2010 Oakville bylaw would not apply. The town should therefore reasonably expect that a development of this scale would provide an assessment of the impact of the development including building emissions, as well as the emissions from the increased vehicular traffic, on air quality impacts to the community and therefore allow Council to make an informed decision on the application.

## OTHER ISSUES AND CONCERNS

Other comments on the consultant's report are provided in the table below.

Report Section	Comments
Section 3.3	<ul style="list-style-type: none"> <li>The choice of the Glenashton station as the background reference, is appropriate given the limited data set. It is however noted that the annual PM2.5 level is 71% of the 2020 criterion and that levels of PM/PM10 were calculated from PM2.5 which may be biased.</li> <li>Given PM2.5 is the likely limiting criterion – there is no information provided in the study regarding the potential frequency of exceedance of the 24-hour PM2.5 levels over the data period.</li> </ul>
Section 4	<ul style="list-style-type: none"> <li>This section only references those facilities that report to NPRI.</li> <li>There should be a map that combines the information from this section with the ECA references from Section 5.</li> <li>This should be accompanied by an appropriate wind rose for the area.</li> <li>The section notes that “<i>These sources are minor contributors of indicator compounds when compared to provincial totals</i>”. In the context of CAC contaminants this statement has no meaning.</li> <li>It is noted that many of the Table 4 facilities and all of the Table 4 facilities produce or might reasonably be expected to produce VOCs, however there is no discussion on potential odour or other VOC impact.</li> <li>Transportation sources, and the likely increase in emissions were not mentioned, and effects not included in the air quality assessment</li> <li>Given the presence of a trunk sewer along Dorval Drive west of the site, are there any locations where sewer gas is vented that could potentially impact the site.</li> </ul>
Section 5	<ul style="list-style-type: none"> <li>It is agreed that D-6 is an important, although dated, guidance document.</li> <li>While the D6 setbacks are met for each individual nearby facility the question of cumulative impact still remains</li> </ul>

Yours truly,

**Amec Foster Wheeler Environment & Infrastructure**  
a Division of Amec Foster Wheeler Americas Limited



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Principal Consultant, Air Quality



Alex Breido, Ph.D., P.Eng.  
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Town of Oakville  
July 28, 2017

### **Stormwater Ponds "A" and "C Outfalls**

According to the Functional Servicing and Stormwater Management Report, the redevelopment team proposes to pipe the outflows from the two ponds mentioned down the slope to an existing pond or swale respectively. It is not clear how this is going to be achieved, whether they intend to anchor the pipes to the surface, bury them in open-cut trenches or implement a trenchless installation or tunnelling method. Since a surface installation on an active slope is not recommended and an open-cut excavation is not feasible because of the inability to adequately restore the steep slope it is apparent that only a trenchless excavation or tunnelling method should be considered.

### **Excavations for Deep Service Installations**

It is indicated that some service installations may be as deep as 10 metres. The proposed excavation methods and controls are basically feasible. Future structure-specific investigations will be necessary to facilitate final design.

It is not clear what protective/support measures are being recommended for the deeper excavations which could be up to 5 m through overburden and 5 m through shale bedrock. Cutting back the slopes to 1H:1V or sheet piles or other shoring techniques in the overburden is standard but nothing is said about the side walls in bedrock which will be vertical or near vertical and will require some form of temporary stabilization to protect workers in the trenches.

Prepared by:



Michael A. Patterson, M.A.Sc., P.Eng.  
Amec Foster Wheeler, Environment and Infrastructure.  
A division of Amec Foster Wheeler Americas Limited

## Noise Matters – Peer Review

### Memo

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To: Charles McConnell and Philip Kelly, Town of Oakville

From: Frank Babic

Date: July 14, 2017

File: TBP178089

cc: Ron Scheckenberger, Amec Foster Wheeler

Re: Preliminary Draft Comments  
Peer Review of Noise Matters Related to  
Proposed Development of Glen Abbey Golf Club, Town of Oakville

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#### Introduction

Amec Foster Wheeler Environment & Infrastructure, was retained by the Town of Oakville to conduct a technical peer review of the acoustic report completed by HGC Engineering Inc (HGC) for the proposed redevelopment of Glen Abby Golf Club located in the south-east quadrant of Dorval Drive and Upper Middle Road in the Town of Oakville.

As part of the above requirement, the acoustic review team has participated in the following meetings:

Date	Organization(s)	Description
July 05, 2017	Development Group, Town of Oakville, Peer Review Team	Development Group presentation of technical reports
July 12, 2017	Town of Oakville, Peer Review Team	General discussion of issues

The acoustic review team has reviewed the following documents as part of this assessment:

- i. "Noise Feasibility Study Proposed Redevelopment of Glen Abbey Golf Club Oakville, Ontario", October 13, 2016

In addition, the following regulatory and guideline documents have been referenced, where relevant:

- i. Ministry of the Environment and Climate Change (MOECC) Guideline NPC-300 "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", October 21, 2013
- ii. Town of Oakville Noise Bylaw 2008-098 and amendments 2009-081, 2011-100, 2013-028, 2016-016

- iii. Town of Oakville "Development Engineering Procedures and Guidelines Manual"
- iv. Region of Halton "Noise Abatement Policy for Regional Roads (Retrofit Locations) and New Developments"
- v. Region of Halton "Draft Noise Abatement Guidelines" April 2013

An acoustic review for this development should consider the following:

- Traffic Noise to the residential development;
- Industrial Noise to the residential development; and
- Noise to and from the community amenity areas.

#### Traffic Noise Impacts of the Project on the Residential Development

HGC completed a review of the traffic noise impacts to the proposed residential community. They identified the applicable NPC-300 MOECC guideline for traffic noise criteria and assessment, and from that determined warning clauses and building façade construction upgrades to the townhouse developments.

The HGC report applied NPC-300 noise guidelines to the outdoor living areas for both daytime and nighttime noise impacts from traffic from Upper Middle Road West, Dorval Drive and Street A (new road). We did not confirm the traffic data provided in the HGC Report with any associated traffic studies, as it was taken as per the referenced AADT traffic information noted in the appendix of the report. However, we note that the AADT traffic volumes are for 4 lanes on Dorval (30,600 AADT) and 6 lanes for Upper Middle Road (45,900 AADT) to the ultimate year 2031. Street A (new road) is expected to have a total of 10,950 AADT for the 2031 ultimate year. Volume percentages between medium and heavy trucks were assumed but provided through supporting email correspondence provided in the appendix.

Based on the provided AADT traffic volumes, noise predictions using STAMSON were completed for noise sensitive receptor locations A through W, also shown on Figure 3 in the report. We note that there is no sensitive locations identified for the community park area. Based on these predicted sound levels and associate noise sensitive locations, some noise levels were noted to be in excess of MOECC criteria or reduce noise levels to MOECC criteria with a 2.4m noise barrier<sup>1</sup> (location O) provided MOECC recommended Warning Clauses (provided in the report) are included in the property and tenancy agreements for all units with anticipated road traffic sound level impacts.

Predictions of daytime indoor noise levels are provided in the HGC report for Dorval Drive (locations D and I), Street A (location M) and Upper Middle Road West (location Q to W). As

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<sup>1</sup> A 2.4m high noise barrier was deemed the maximum height based on a review of Region of Haltons minimum noise barrier heights, Draft Noise Abatement Guidelines and Town of Oakville Development Engineering Procedures and Guidelines Manual



these are predicted to be in excess of MOECC guidelines, all apartments with exposure to these roads are to be equipped with central air conditioning systems to allow for closed windows. Predictions of daytime indoor noise levels for Dorval Drive (locations A, B, E, G), Street A (locations H, J, K) and Upper Middle Road West (location N and O) are in excess of MOECC guidelines, but will only require provision for future installation of central air conditioning systems. All remaining units do not require specific ventilation requirements.

As building facades with exposure to Upper Middle Road West are greater than 65 dBA, the windows, walls and doors were reviewed for these facades for upgraded constructions to meet MOECC indoor criteria. These upgraded constructions were based on a 'typical' window-to-floor area of 70% assumed by HGC, as they did not have detailed layouts at the time their report was prepared (2016). They do note in the report that detailed floor plans and building elevations for those buildings closest to Upper Middle Road West be reviewed when they are available. However, from this assumption, the HGC report proposes the glazing along the north façade facing Upper Middle Road must achieve an STC-30. Other windows that meet OBC requirements are considered acceptable.

The HGC report does identify that a detailed noise study is required to revise acoustic recommendations on a phase by phase basis, or when more detailed lotting information is available.

#### Industrial Noise Impacts of the Project on the surrounding environment or community

Industrial noise impacts were not identified in the HGC report. A review of local industrial facilities shows that there are none within 1km of the site that are likely to impact the proposed development based on stationary noise impacts.

#### Noise Impact of the Community Amenity Area

The HGC Report does not identify the community park area as a sensitive noise receptor. Therefore, there has been no assessment of traffic noise to this area, as a communal outdoor amenity area, or whether traffic noise impacts meet MOECC noise criteria at this location.

Further, there has been no discussion on the community use of this area, specifically with amplified noise impacts to surrounding residences, in accordance with the Town of Oakville Noise Bylaw.

Lastly, there has been no comment on potential sound scaping opportunities with the planning of the outdoor park area, that could enhance the enjoyment of the space for the residents.



**Fundamental Issues**

The fundamental issues here are as noted:

- The proponent has not identified the communal park area as a noise sensitive receptor with respect to traffic noise impacts, nor considered community use of the communal part with respect to noise intrusion to surrounding residences in accordance with the Town of Oakville noise bylaw
- The proponent did not provide all supporting calculations for either their traffic noise impacts nor building façade analysis (only a sample road noise calculation was provided). Therefore, we cannot review or comment on the results presented in the report, nor assess the recommendations based on those predictions.
- A base assumption in the building façade analysis is a 70% window-to-floor area. However, since the report was completed in 2016, we expect that detailed floor layouts and building elevations may now be available to validate this assumption, as this may change construction requirements for the building facades facing Upper Middle Road West

**Other Issues and Concerns**

Other comments on the report are provided in the table below.

Report Section	Comments
Section 5.1	<ul style="list-style-type: none"> <li>• Page 8 paragraph 2 identifies the prediction location N with a noise level of 64 dBA. Table IV identifies an outdoor living area level of 63 dBA at this location.</li> <li>• Page 8 paragraph 3 identifies the prediction location O with a noise level of 57 dBA. Table IV identifies an outdoor living area level of 58 dBA at this location.</li> </ul>
Section 5.2	<ul style="list-style-type: none"> <li>• Statement "will be greater than 56 dBA and greater than 60 dBA during nighttime" seems incomplete. Suggest missing the word 'daytime' after 56 dBA</li> </ul>
Section 6.1	<ul style="list-style-type: none"> <li>• Recommendation #3 states that "certify that the noise control measures for the dwelling units have been properly incorporate, installed and constructed". We suggest this go further that as a condition of Building Permit that a detailed noise study be submitted and approved.</li> </ul>

5  
Town of Oakville  
July 14, 2017

Yours truly,  
**Amec Foster Wheeler Environment & Infrastructure**  
**a Division of Amec Foster Wheeler Americas Limited**

A handwritten signature in dark ink, appearing to read 'Frank Babic', with a stylized flourish at the end.

Frank Babic, P.Eng INCE  
Acoustic Practice Lead

6716876

## Stormwater Drainage Matters – Peer Review

### Memo

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**To:** Charles McConnell, Town of Oakville  
**From:** Ron Scheckenberger, Aaron Farrell, Matt Britton, Amec Foster Wheeler  
**Date:** July 27, 2017  
**File:** TPB178089  
**cc:** Philip Kelly, Town of Oakville  
**Re:** Peer Review of Stormwater Drainage Matters Related to  
Proposed Development of Glen Abbey Golf Club, Town of Oakville

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#### Introduction

Based on direction from the Town of Oakville, Amec Foster Wheeler has conducted a peer review of the stormwater drainage system related to the Glen Abbey golf course and its proposed development. The primary reporting prepared by the proponent in this regard is the "Functional Servicing and Stormwater Management Report", October 2016 by SCS Consulting Group Ltd. (SCS) which provides details of the proposed Glen Abbey development storm servicing approach. The focus of the review summarized in this memorandum relates to stormwater drainage matters.

The parties to this review have included the following:

Ron Scheckenberger, Senior Water Resources Engineer, Principal Consultant  
Aaron Farrell, Senior Water Resources Engineer, Associate Engineer  
Matthew Britton, Engineering Intern, Design Analyst

The Town of Oakville has retained Amec Foster Wheeler to conduct this review; the scope of this retainer has included:

- ▶ Meetings with the Town of Oakville, Region of Halton and Conservation Halton (multiple dates)
- ▶ Attendance at a presentation of the project by the proponent (July 5, 2017)
- ▶ Review of available background material from the proponent, including:
  - "Functional Servicing and Stormwater Management Report" October, 2016, SCS Consulting Group
  - "Environmental Impact Assessment" October, 2016, Beacon Environmental Ltd.
  - Official Plan Amendment, Draft Plan and Zoning By-Law Amendment

Furthermore, Amec Foster Wheeler has also consulted with other Peer Reviewers specific to related disciplines to stormwater drainage, including: hydrogeology, natural environment (terrestrial and aquatic), stream morphology, and geotechnical engineering.



Town of Oakville  
July 27, 2017

Based on this review and consultation, Amec Foster Wheeler has assembled the following outline of issues and concerns, specific to storm drainage and related disciplines. These issues and concerns have been subdivided into those which are considered "fundamental" and "formative" to the specifics of the proposed land use and associated configuration, along with "other" issues and concerns, which while important, may not have a direct impact on land use and associated principles of use.

#### **Proponent's Proposal for Stormwater Management**

Using a locally-based assessment (local catchments only), SCS conducted a simplified analysis of development impacts which led to the proposed management strategy development. In short, the management strategy to mitigate the storm drainage impacts of urbanizing the site calls for post- to pre-development peak flow control at 3 drainage outlets (2 to Sixteen Mile Creek and 1 to Glen Oak Creek).

Furthermore, erosion impacts are proposed to be managed by SCS through the use of generic standard storage detention values (25 mm retained for over 48 hours), in the absence of detailed study or direct consideration of impacts to the receivers.

Water budget/balance for the overall development site is proposed to be managed per a suite of source controls, to be applied in both the public and private realm.

#### **Fundamental Issues**

1. A fundamental gap in the assessment documented in SCS's report relates to the lack of a holistic, system-based assessment of the respective drainage areas [as part of the whole of the Sixteen Mile Creek and McCraney Creek (Glen Oak)], in order to define the potential impacts related to converting the subject lands from golf use to fully urban.
2. Given the location of the Glen Abbey development within the Sixteen Mile Creek Watershed and in the absence of a more holistic system-based analysis, it is unclear as to whether any flood control storage would be required for the areas discharging directly to the Sixteen Mile Creek. It has been our experience that the provision of flood control storage and the associated attenuation (as proposed by SCS) can in fact exacerbate the flood peaks in the larger system. As such, it would seem reasonable to confirm the need for 2 to 100 year flood controls for this site.
3. The lack of a Regional Storm impact assessment and management strategy is considered a gap. There must be some form of acknowledgement of the potential for Regulatory impacts related to flood risk downstream; this should include both public and private lands and infrastructure. The recent document "Approaches to Manage Regulatory Event Flow increases resulting from Urban Development", June 2016, TRCA and Regional Storm Committee, should be considered in developing an appropriate management plan in the event of any predicted adverse impacts.
4. The portion of the site draining to the Glen Oak Creek system (headwaters of McCraney system) should be assessed on a subwatershed basis to ensure that the downstream impacts of urbanization of Glen Abbey lands is appropriately addressed. There are currently documented areas at risk of flooding in the downstream lands, and as such there is a need to consider the potential for impacts more holistically. There may in fact be some



Town of Oakville  
July 27, 2017

benefit (to the Town) of possible oversizing the proposed on-site controls. The Town of Oakville is in the midst of a Class EA for the Fourteen Mile and McCraney Creek system, hence there may be some value in considering this opportunity concurrently.

5. The rationalization for establishing the specific locations of the drainage outlets for the proposed Glen Abbey development needs to be more robust and integrated to consider other disciplines such as ecology and geotechnical stability, as certain aspects of the decision-making have not been fully documented. The explanation provided by SCS representatives at the July 5, 2017 Proponent's presentation proved helpful but needs to be better supported and documented.
6. The specific design details provided in the reporting for the Low Impact Development Best Management Practices (LID BMPs) are limited. It is understood that the proponent proposes a system of LID BMPs as follows:

*Private Realm*

- ▶ Soakaway pits (Rooftop capture)
- ▶ Water re-use (mid-rise)

*Public Realm*

- ▶ Infiltration Trenches

Long-term operations implications, loss of effectiveness over time, redundancy planning, and other considerations such as lack of control on private lands should all be reviewed in greater detail as part of an integrated water management strategy. Furthermore, the assignment should include commentary as to whether the groundwater levels noted in the Preliminary Hydrogeological Assessment would preclude implementation of certain LID BMP's. Given that groundwater depths (as low as 1.02 m) have been noted in the report, it is anticipated that some LID infiltration BMP's may intercept groundwater levels and should be screened from consideration.

In the absence of more detailed plans which depict the application and the spatial coverage of proposed LID BMPs, within the proposed land use fabric, it is unclear as to whether the land uses plans can suitably support the mitigation strategy.

Finally, Section 2.5.2 of the SCS report notes that retention/reuse of rainfall on 50% of all mid-rise blocks is proposed. It is unclear as to why this practice is proposed for only 50% of the mid-rise blocks, and cannot be implemented for all areas.

7. Stormwater Management Pond A appears to be proposed to be built up by way of berming along the east and south sides of the proposed facility. For infrastructure of this size, constructing a facility in this manner is considered an unnecessary risk for the Town to assume, particularly where depth to outlet is not an issue. From the reporting, it is unclear why the facility would not be entirely depressed, thereby not rely on any man-made berming which would obviously have some potential for failure in the event of prolonged and extreme water levels.

Furthermore, the siting of Stormwater Management Pond A, immediately adjacent to the development limit, adjacent to the steep valley is concerning; given its proposed siting, it is suggested that there be a geotechnical review of this proposed orientation. It is

Town of Oakville  
July 27, 2017

noteworthy that the Geotechnical Peer Review (ref. Patterson-Kelly) has raised similar concerns.

8. At the July 5, 2017 Proponent's meeting, SCS staff noted that under current site conditions, there are a number of locations along the Sixteen Mile Creek Valley edge (west side) where local surface flow discharges over the valley wall. No details are provided for these existing points of surface discharge, nor has there been any consideration, in either the SCS reporting or the Beacon reporting, of the possible reliance of water from these sources to support natural features in the valley; further assessment is warranted. Similar concerns have been raised by North South in its Peer Review of the Beacon EIS.

#### Other Issues and Concerns

1. The proposed stormwater management facilities draining to the Sixteen Mile Creek have been designed for the 100 year event; there need to be details provided in the proposed design(s) to address safe conveyance of floodwaters to the valley floor in the event of larger storms or blockages of the outlets.
2. The post-development impervious coverage for the urban areas, as documented in the SCS report, ranges from 65% to 69%. SCS confirmed these figures as representative of the actual proposed form by SGL Planning at the Proponent's presentation. These values nonetheless appear to be on the low-side for contemporary built form. Further details and precedent drawings and calculations are required to support these assumptions for hydrologic modelling.
3. It is unclear as to how the existing condition (as a basis of comparison) for flood, erosion, and water balance, has considered (or not) the Golf Course's current irrigation system. While it would generally not be expected for the development to mimic the operation of the man-made irrigation system, having some understanding of how this irrigation network currently operates (and its possible influence on the local ecosystem over the past 40 years) seems warranted, in the context of better understanding the current setting and establishing a future land use management system.
4. The hydrologic analyses have assumed that the portion of the golf course draining to the existing pond south of the clubhouse (ref. Catchment 101) drains toward Dorval Road, whereas the characterization provided in Section 2.2 indicates that a portion of the runoff from this area would drain toward the Sixteen Mile Creek. It would be anticipated that the existing ponds on the golf course would provide some attenuation of peak flow, hence the hydrologic analyses completed by SCS consulting are considered to potentially over-estimate the current pre-development peak flows at the catchbasin along Dorval Road. While it is acknowledged that the on-site ponds do not constitute formal flood control, there needs to be some consideration in practical terms of the existing operations to ensure no potential for off-site impacts.
5. The infiltration trenches proposed in the SCS report are recommended to be sized to fully capture runoff from a 15 mm storm event. Additional technical justification and analysis is required for this capture rate, since capturing an excessive amount of runoff for infiltration may result in higher groundwater levels, potentially impacting public infrastructure and utilities.



Town of Oakville  
July 27, 2017

6. The water budget calculation for the significant woodlot, south central on the site, has been based upon a simplified Rational Method calculation. This methodology does not consider potential seasonal considerations for managing the water budget to this feature, and depending on the ultimate approach may adversely affect the sustainability of the local hydrology supporting the woodlot. The water budget methodology should be based upon the characterization of that feature, and should thus be integrated with the terrestrial assessment of the feature.
7. Further explanation is required for the outlet conditions of the existing tableland pond located immediately south of Upper Middle Road. There is a concern that the current modelling over-estimates the pre-development release rate from Catchment 101. Consideration should be given to discretizing the drainage to this pond and modelling the pumped outlet.
8. The woodlot area located within Catchments 103 and 104 should be accounted for in the pre-development modelling.
9. The capacity of the existing 1500 mm diameter storm sewer under Dorval Drive should be stated within the report, and compared to the pre-development release rates from Catchment 103.
10. It is not clear how the east boundary of Catchment 102 on Figure 2.1 and Catchments 202, 205 and 208 on Figure 2.2 was determined. Figure 2.2 shows proposed impervious surfaces outside of the boundary that should be incorporated in the modelling.
11. The southeast corner of Catchment 103 needs to be reviewed. The report text and Figure 2.1 indicate this area of the site drains to the existing 1500 mm storm sewer under Dorval Drive, whereas Figure 2.2 indicates the drainage is directed to surface of Dorval Drive.

We trust the foregoing adequately captures the Town's needs with respect to the review of Storm Drainage matters related to the proposed development of the Glen Abbey Golf Course.

# Fluvial Geomorphology Matters – Peer Review



## MEMORANDUM

**TO:** Charles McConnell and Phil Kelly, P.Eng., Town of Oakville

**CC:** Ron Scheckenberger, Amec Foster Wheeler

**FROM:** John Parish, P.Geo., Matrix Solutions Inc.

**SUBJECT:** Peer Review of Fluvial Geomorphology Matters Related to Proposed Development of Glen Abbey Golf Club, Town of Oakville

**DATE:** September 13, 2017

### 1 INTRODUCTION

This summary memo provides the initial findings of the technical peer review of the Fluvial Geomorphology work that has been completed in support of the proposed development of the Glen Abbey Golf Club. I have been retained by AMEC Foster Wheeler, through the Town of Oakville as a member of the peer review team, specifically as it pertains to fluvial geomorphology. This discipline, in the context of the proposed development, would include the assessment and characterization of the drainage features and watercourses in and around the golf course. The geomorphology component provides insight on potential hazards from channel migration; which may influence the overall slope stability. The geomorphology component also ensures the proposed drainage and stormwater management will not have any detrimental effect of the features on site and the overall stability of receiving watercourses. In this study area, this would involve Headwater Drainage Features (HDF's) within the golf course and the receiving watercourses of Sixteen Mile Creek and Glen Oak Creek.

To date, I have participated in meetings with the Town, Halton Region, and Conservation Halton (June 29 and July 12); a meeting that involved a presentation from ClubLink and their consultants (July 5), and a site meeting on July 19. In addition to these meetings, background information on the watercourses in study area was also completed, including the Town-Wide Erosion Inventory, and recently completed work in support of the Enbridge pipeline crossing of Sixteen Mile Creek, south of Upper Middle Road.

In support of the proposed development, numerous technical reports had been prepared and submitted. From these, the following were studied as part of the fluvial geomorphology peer review.

- Geomorphic Assessment (Beacon Environmental; October 2016)
- Preliminary Geotechnical Investigation (Golder Associates; October 2016)
- Environmental Impact Assessment (Beacon Environmental; October 2016)
- Functional Servicing and Stormwater Management Report (SCS Consulting Group; October 2016)



Given the nature and size of the proposed development, a broader characterization of Sixteen Mile Creek, any tributaries, valley form, and active processes would typically need to be assessed. Generally this work would have including the following tasks such as those listed below:

- background review of any relevant reports and studies on the creeks in the broader study area
- desktop characterization, which would include reach delineation and quantification of channel migration/channel adjustments through historic aerial photographic interpretation
- field characterization, including synoptic level assessments (RGA/RSAT) and detailed field survey to quantify channel characteristics
- determination of erosion thresholds using standard approaches and compare results to background values
- support of natural hazards delineation (stable slope lines) through Provincial Policy Statement (PPS) approach and/or meander belt width delineation
- establishment of monitoring stations for long-term impact assessment

Based on an initial review of the provided reports, it is apparent that the level of assessment and characterization has been very limited in scope. While some of tasks described above have been completed, the spatial scale and overall rigour of the characterization has been minimal. As such, based on the review completed thus far, the concerns and issues could be divided into 'Fundamental Issues,' which may have a direct influence on the nature and feasibility of the proposed development; and 'Other Issues,' which should be considered, but likely would not have a direct bearing on the nature of the proposed development.

## 2 FUNDAMENTAL ISSUES

Fundamental Issues are those that may affect the principle of land use, the specific land uses as shown on the OPA, ZBA, and/or Draft Plan, or otherwise significantly impact the configuration/layout of the OPA, ZBA, and/or Draft Plan. Given this definition, there are several from a fluvial geomorphology perspective that merit further consideration.

These include the presence of HDFs and how their potential management strategy would be reflected in the proposed land use plan. Based on the completed reports, there were two identified, plus three large draws down the Sixteen Mile Creek valley. The proponents have initiated the TRCA/CVC protocol, but the reporting is incomplete. During the Landowner's presentation on July 5, it is mentioned that they had made several more visits to these features, which had not been reported. Ultimately, the HDF procedure will recommend a management strategy that may identify that the features may need to be maintained in place.

The next fundamental issue is the toe erosion allowance and implications on the stable slope delineation. The proponent has followed the PPS Guidelines for natural hazards and has used the maximum table value of 5 m (5 cm/yr). There is a concern that this value may under-estimate the actual migration rate and potential influence on the overall slope. There are locations within the general reach of Sixteen Mile Creek where channel erosion, incision, and migration have resulted in slope instabilities placing structures at risk. It is felt, that given the degree of channel hardening, additional efforts should have been completed to verify the appropriateness of the PPS Guideline value.

A similar issue is the potential slope stability for properties that currently exist on the eastern side of the golf course. As this was an existing development, no risk assessment was undertaken. However, if the existing channel migration and erosion rate potentially jeopardizes these properties, additional work needs to be completed to understand the risk and potential mitigation.

The Glen Oak Creek (also referred to as Glen Oak Tributary) has not been characterized. A stormwater management facility is proposed to discharge to this channel, yet an assessment on its stability and function has not been completed. Based on the Oakville Erosion Inventory, there are sensitive sites in the downstream area. An erosion threshold analyses should be completed and used to properly size the stormwater management facility, as additional storage and control for erosion may be necessary. This may result in a larger stormwater management facility than shown in the land use plan.

### 3 OTHER ISSUES AND CONCERNS

The technical geomorphic work completed thus far has been ad-hoc has resulted in a very site specific assessment and characterization. This poses challenges as there is uncertainty on the potential downstream impacts on the watercourses and slope stability. Thus, it is the general lack of thoroughness of the technical work that produces these concerns.

Specifically, the following is list of examples where additional assessment and characterization would be beneficial.

- Channel reach delineation doesn't seem appropriate and reach breaks have been added at the property limits.
- No assessment/consideration of downstream channel conditions has been completed; thereby there has been no evaluation of potential impacts.
- Discussion on the implications of the bank stabilization work on Sixteen Mile Creek. The concrete wall is leaning into the creek suggesting a loss of basal support and numerous gabions have failed or are failing due to channel migration and enlargement. These processes should be quantified in order to better understand and predict future channel form as well as the implications on future restoration.
- Erosion thresholds (especially for the banks of Sixteen Mile Creek) should be provided and applied for the stormwater management. This would include the need for continuous simulation.
- Based on the presentation to the Town, monitoring stations have been installed within the study area. Results/findings from repeated measurements (if completed) should be provided.

## 4 SUMMARY

To date, the technical review of the fluvial geomorphology work has involved meetings, a site visit, background review, and a review of the completed supporting studies. Based on this work, there have been several fundamental issues that pertain to fluvial geomorphology that may have a direct influence on the proposed land use plan. These include the HDF recommendations, erosion thresholds on Glen Oak Creek and verification of the toe erosion rates used in the delineation of the stable slope line. In addition to these, other issues and concerns were discussed that were the result of the supporting studies being focused solely on the proposed development site.

I trust you'll find this initial summary of the provided technical information to be helpful. I looking forward to providing further assistance as this project moves forward.

## School Board Comments



# Halton District School Board

Planning Department

July 24, 2017

Charles McConnell  
Planning Services Department  
Town of Oakville  
PO Box 310  
Oakville ON L6J 5A6

Dear Charles:

Subject: ClubLink Corporation ULC and ClubLink Holdings Ltd.  
Official Plan Amendment, Zoning By-law Amendment and Draft Plan of Subdivision Application  
Our File No.: 24T-17003/O  
Your File Nos.: OPA 1519.09, Z.1519.09, 24T-17003/1519

Thank you for the opportunity to review the application dated June 22, 2017. Based on the circulated application, the Halton District School Board believes that an elementary school site is warranted at this point in time. This is based on the proposed number of 3222 residential units initially proposed in this plan (141 detached, 299 townhouses and 2782 apartments) and the unknown student yield that this new development will yield. If this development proceeded today, public elementary students generated from this proposal would be directed to Abbey Lane PS (1160 Old Abbey Lane) and Pilgrim Wood PS (1551 Pilgrims Way). Public secondary students would be directed to Abbey Park HS (1455 Glen Abbey Gate) and Thomas A. Blakelock HS (1160 Rebecca Street).

On November 18, 2016 a Pre-Consultation Technical Review meeting was held at the Town of Oakville to review the preliminary Glen Abbey Golf Course redevelopment proposal. Included in the proposal was the *Glen Abbey Heritage Landscape and Master Planning Strategy, September 2015* document. In the document a Concept Master Plan was shared and a Community Hub/New School was shown on the plan. This was described as "a Community Hub or a new school located on the existing clubhouse site is envisioned as an important community amenity space". It has been noted that the draft plan of subdivision dated November 1, 2016 that was submitted with this application does not show a Community Hub/New School.

In the *Glen Abbey Heritage Landscape and Master Planning Strategy, September 2015*, the Glen Abbey Master Plan is proposed to be a brand new complete community. One of the key components of the community includes "a pedestrian friendly and transit supportive community". A proposed mix of residential, retail and office uses should also include a potential elementary school site in order to develop a complete community.

In our letter dated February 10, 2017 in response to the November 1, 2016 draft plan of subdivision, it was stated that the Halton District School Board supports the need for an elementary school site to be reserved in the Glen Abbey Master Plan. It was also noted that it is unknown whether this will be a

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Mail: J.W. Singleton Education Centre • P.O. Box 5005, Stn. LCD 1, Burlington, Ontario L7R 3Z2

Deliveries: JW Singleton Education Centre • 2050 Guelph Line, Burlington, Ontario L7P 5A8

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Website: [www.hdsb.ca](http://www.hdsb.ca)

Email: [choil@hdsb.ca](mailto:choil@hdsb.ca)



Public or Catholic school site but that the Halton Catholic District School Board also supports this request for a school site.

On July 5, 2017 a Technical Review meeting was held at the Town of Oakville to review the submitted development application (dated June 22, 2017) and to allow the developer's consulting team to provide an overview of the submission materials and to respond to any questions or points of clarification. It has been noted that the draft plan of subdivision submitted with the June 22, 2017 development application does not show a Community Hub/New School. Block 167 has been identified as a "Community Amenity" but at 0.50 ha (1.24 ac) the site is too small to accommodate an elementary school and is designed to be more for retail uses including a village market (*Planning Justification Report, November 2016*).

**Please note that both the Halton District School Board and the Halton Catholic District School Board supports the need for an elementary school site to be reserved in the Glen Abbey Master Plan.** Ownership of the elementary school site will be determined at a later time and will be based on the total accommodation needs in the area. Both school boards support this approach.

For your convenience, below are our standard conditions of development that may be applied to the development proposal:

1. The owner agrees to place the following notification in all offers of purchase and sale for all lots/units and in the Town's subdivision agreement, to be registered on title:
  - a. Prospective purchasers are advised that schools on sites designated for the Halton District School Board in the community are not guaranteed. Attendance at schools in the area yet to be constructed is also not guaranteed. Pupils may be accommodated in temporary facilities and/or be directed to schools outside of the area.
  - b. Prospective purchasers are advised that school busses will not enter cul-de-sacs and pick up points will be generally located on through streets convenient to the Halton Student Transportation Services. Additional pick up points will not be located within the subdivision until major construction activity has been completed.
  - c. Prospective purchasers of lots/units abutting, fronting and adjacent to the school site designated for the Halton District School Board are advised that temporary facilities/portables may be sited on the school site in order to accommodate pupils in excess of the school building capacity.
2. That in cases where offers of purchase and sale have already been executed, the owner sends a letter to all purchasers which include the above statement.
3. That the Owner agrees in accordance with the Plan of Subdivision, that the Halton District School Board requires an elementary school site as identified as **Block \_\_\_\_** of the draft plan of subdivision. Prior to final approval, satisfactory arrangements have been made with the Halton District School Board to transfer title to the subject lands, identified as **Block \_\_\_\_** for public elementary school purposes in a condition acceptable to the Board.
4. That the Owner agrees to submit to the satisfaction of the Halton District School Board appropriate soil and environmental investigations, site grading plans, storm water management plans, site servicing plans (sanitary, water and utilities) and archaeological investigations. In the event of an identified

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Mail: J.W. Singleton Education Centre • P.O. Box 5005, Stn. LCD 1, Burlington, Ontario L7R 3Z2

Deliveries: JW Singleton Education Centre • 2050 Guelph Line, Burlington, Ontario L7P 5A8

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Email: [choil@hdsb.ca](mailto:choil@hdsb.ca)

concern, the Board may commission its own studies at the cost of the landowners. Prior to registration of the plan, the Owner shall certify that all properties to be conveyed to the Halton District School Board are free of contamination.

5. That the Owner agrees to the satisfaction of the Halton District School Board to erect chain link fence, in accordance with the Board's standards. The fence shall be located along the school block boundaries as determined by the Board and shall be erected at such time as the adjacent development proceeds.
6. That the Owner agrees to insert a restrictive covenant in every Transfer/Deed of Land of lots adjoining the sites intended for use or actually used for a school, prohibiting the installation or use for any purposes of a gate in any boundary line fence on such school property.
7. That the Owner obtain written permission from the Halton District School Board prior to placing any fill on the school **Block \_\_\_\_**.
8. That the developer agrees that, should the development be phased, a copy of the phasing plan must be submitted prior to final approval to the Halton District School Board. The phasing plan will indicate the sequence of development, the land area, the number of lots and blocks and units for each phase.
9. That the Owner shall supply, erect and maintain signs at all major entrances into the new development advising prospective purchasers that pupils may be directed to schools outside of the area. The Owner will make these signs to the specifications of the Halton District School Board and erect them prior to the issuance of building permits.
10. That the Owner take responsibility for all required signage on the various blocks which are part of this plan of subdivision and further, that in the event that the Town installs any signs on the Owner's behalf, the Owner agrees to reimburse the Town for the supply, erection, and relocation of appropriate signs which depict land uses and other information on the subject and adjacent lands including notices relating to the bussing of children until the school sites are available and developed, that portables and/or portapaks may be required for student accommodation and that construction of a school is not guaranteed.
11. That a copy of the approved sidewalk plan, prepared to the satisfaction of the Town of Oakville be submitted to the Halton District School Board.
12. The Owner shall provide Halton District School Board a geo-referenced AutoCAD file of the Draft M-plan once all Lot and Block numbering has been finalized. Should any changes occur after the initial submission to Lot and Block configuration or numbering on the draft M-plan the Owner shall provide a new AutoCAD file and a memo outlining the changes.

In addition the following note should be included in the conditions:

Educational Development Charges are payable in accordance with the applicable Education Development Charge By-law and are required at the issuance of a building permit. Any building permits which are additional to the maximum unit yield which is specified by the Subdivision Agreement are subject to Education Development Charges prior to the issuance of a building permit, at the rate in effect at the date of issuance.

Should you have any questions regarding our comments, please contact the undersigned.

Sincerely,



Laureen Choi  
Senior Planner

Cc: F. Thibeault, Halton Catholic District School Board

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## Transit Strategy – Peer Review

# Memo

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**To:** Charles McConnell and Lin Rogers, Town of Oakville

**From:** Gene Chartier, Vice-President, Paradigm Transportation Solutions Limited

**Date:** September 8, 2017

**File:** 170179

**cc:** Jill Stephen, Senior Manager, Transportation Strategy, Town of Oakville

**Re:** **Peer Review of Transit Strategy for Proposed Redevelopment of Glen Abbey Golf Club, Town of Oakville**

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### Introduction

Paradigm Transportation Solutions Limited (Paradigm) has been retained by the Town of Oakville to complete a technical review of the Transportation Considerations Report (TCR) submitted by BA Group (consultant) and the draft plan of subdivision for the proposed redevelopment of the Glen Abbey Golf Club lands. A memorandum was submitted to the town on July 24, 2017 outlining initial findings.

Subsequently, Paradigm was requested to complete a more detailed review of the transit strategy for the proposed redevelopment. The following summarizes the comments.

### Commentary

The proposed Glen Abbey Golf Club development is not consistent with the transit planning principles articulated in the Livable Oakville Plan. Section 8.12.2 of the Plan states that:

*Development plans shall be designed with specific regard to the safe, convenient and efficient provision of public transit as well as pedestrian and cycling facilities. In particular, to facilitate the development of a transit-supportive urban structure, the following measures will be reflected in all development proposals:*

- a) densities supportive of transit, which are commensurate with the type and frequency of transit service planned for the area and/or corridor, particularly near transit stops and stations;*

The Ministry of Transportation (MTO) **Transit-Supportive Guidelines** provide guidance on creating a pattern of development within existing communities and new development capable of promoting and supporting increased transit ridership in existing systems, such as Oakville Transit. The guidelines



recommend an urban structure based on transit nodes and corridors to best achieve transit-supportive development:

*Identify higher-density, mixed-use nodes (Guideline 1.1.2) and corridors (Guideline 1.1.3) within each settlement area. Tie these areas into existing and planned transit investments and vary their size and intensity according to the level of planned transit service. (Section 1.1.1 (13))*

Unlike the planned Growth Areas within the town (including Midtown Oakville, Uptown Core, Palermo West and Palermo Village), the Glen Abbey Golf Club lands are not located at a planned transit node or along one of the town's Busway Corridors – Trafalgar Road and Dundas Street – which are envisioned to enjoy higher frequency transit service. As such, the level and quality of transit service needed to facilitate transit-supportive development is unlikely to occur without diverting resources from existing and already planned services, or inducing additional cost for the town.

With the Glen Abbey Golf Club not being located in or near an existing or planned transit node or corridor, the "Glen Abbey Golf Club Proposed Redevelopment Transportation Considerations Report" (October 2016) prepared by BA Group (the Transportation Considerations Report) recommends a new primary transit route to serve the lands. The proposed route connects the Oakville GO Station to the Uptown Core (at the Oak Walk Drive/Taunton Road intersection) via Cross Avenue, Spears Road, Kerr Street, Dorval Drive, Upper Middle Road, Sixth Line and Dundas Street. The service is proposed to operate at 12-minute headways during both the morning and afternoon peak hours, and serve existing stops located on roads outside the development lands and new stops along Street "A", a major collector road, within the Glen Abbey Golf Club area.

The proposed transit strategy does not consider the orientation and design of the town's current transit system and how this new route would integrate with, duplicate and/or impact other existing and planned services. Decisions concerning transit service delivery like this lie solely within the town's purview as the system operator. Regardless, it is unlikely that any transit strategy would result in the level and quality of service needed to facilitate transit-supportive development, since:

- ▶ The route would be somewhat circuitous and lengthy given the relative location of the subject lands and the already planned transit nodes within the town. Orientations of this nature are not consistent with the alignments of the Bus Corridors designated in the Livable Oakville Plan. These corridors provide direct, linear connections along major arterial roads between identified transit nodes, thereby reducing travel times and minimizing both capital and operating costs of service delivery. It is also possible that the route would traverse existing residential communities, where this transit service frequency is atypical and could be a concern to local residents;
- ▶ It would be difficult to provide sufficiently frequent service needed to foster higher ridership. The proposed Glen Abbey Golf Club development would consist of 3,222 units, which equates to an average density of approximately 53 units per hectare. According to Section 1.1.7 of the MTO Transit-Supportive Guidelines, the proposed density exceeds the minimum 45 units per hectare suggested for "very frequent bus service", which is defined as 1 bus every 5 minutes (5-minute headway) with potential for bus rapid transit or light rail transit. Further, the **Growth Plan for the Greater Golden Horseshoe (2017)** defines "frequent transit" as service that runs at least

every 15 minutes in both directions throughout the day and into the evening every day of the week. The potential ridership is highly unlikely to warrant service levels this high ; and

- The route would primarily serve to connect the Glen Abbey Golf Club lands to existing transit nodes, more like a feeder service than a typical transit corridor. The service is unlikely to generate much additional transit ridership or foster transit-supportive development outside the development area, in part because the route would be within the catchment area of existing services operating in somewhat built-up locations. It would also duplicate the linear service connecting Mid-Town Oakville to the Uptown Core via the Busway Corridor designated on Trafalgar Road.

Overall, the proposed development is unlikely to foster a transit mode share beyond existing trends, at least not to the level contemplated in the Livable Oakville Plan and overarching Provincial and Regional planning policies for transit-supportive development. To achieve a mode share of this magnitude would require further intervention and investment by the town to provide more frequent transit service between the Glen Abbey Golf Club lands and already identified nodes, which is not likely justified or consistent with the town's transit planning principles.