

MERTON TERTIARY PLANNING STUDY**TOWN OF OAKVILLE****PEER REVIEWS**

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RBS/II

1. WATER/WASTEWATER



January 8, 2014
Our File: TP113015-10

Town of Oakville
1225 Trafalgar Road
Oakville, ON L6H 0H3

ATTENTION: Mr. Kirk Biggar

Dear Sir:

RE: Peer Review of Merton Water and Wastewater ASP

Further to the second submission of the Water and Wastewater ASP submitted by David Schaeffer Engineering Ltd. (DSEL), December, 2013, AMEC has completed the review of the Area Servicing Plan (ASP) for Merton Tertiary Plan Area in the Town of Oakville.

This correspondence covers water and wastewater only, and the Stormwater Management peer review will be provided under separate cover.

As part of this review, AMEC has had discussions with Halton Region staff to confirm design parameters based on Sustainable Halton. Additional consultation will be required with the Region once the comments provided in this correspondence have been addressed.

The comments related to the Water and Wastewater ASP are as follows:

Water

- i. Figure 10 is offset from the left. Due to the offset there is less room on the right leading to a smaller and cramped Legend. Recommend correcting offset and adjusting the size of the Legend to be consistent with Figures 11, 12 & 13.
- ii. Section 5.2 Water Design Factors, used for calculating demands, is still consistent with the Halton Design Criteria and not the Sustainable Halton Water and Wastewater Master Plan demand criteria utilized by the Genivar Report attached to the David Schaeffer Engineering Ltd. Report, and dated November 16, 2013. Water design criteria need to be updated to reflect Sustainable Halton Water and Wastewater Master Plan for consistency and the DSEL should be revised to reflect this.

Water Design Factors	Sustainable Halton Water and Wastewater Master Plan demand criteria
Average Daily Demand – Residential	314 L/person/day
Average Daily Demand – Employment	213 L/person/day
Maximum Daily Demand Peaking Factor	1.9 times average day
Peak Hour Demand Peaking Factor	3.0 times average day

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- iii. Population Criteria provided in Section 5.2 (Water Design Criteria, page 12) was used to calculate population and capacity requirements for servicing options, as illustrated in Table 5-2: Land Use and Population for Servicing Options. The populations in Table 5-2 are inconsistent with the populations calculated in Appendix B (Demonstration Plan and Land Use Statistics). This inconsistency needs to be resolved. Due to the lack of a calculation spreadsheet provided with the updated Genivar Report, we are unable to comment on the consistency of Genivar's population calculations with respect to the rest of the report. This needs to be included in the ASP.
- iv. Population Assumptions (unit yields) are still inconsistent on Tertiary Planning Study drawings and land use statistics in Appendix B (Demonstration Plan and Land Use Statistics). The table below provides a comparison of the assumptions. This inconsistency needs to be resolved in order to calculate demand.

	Population Assumptions (unit yields)	
	<i>Appendix B: Demonstration Plan Option A, B and C Drawings</i>	<i>Appendix B: Demonstration Plan Calculation Sheet Assumptions</i>
Low Density Residential	29 upha	Low Density Res – large singles 15 upha Low Density Res – small singles 22 upha
Medium Density Residential	30-50 upha	Med Density Res – townhouses 35 upha
High Density Residential	51-185	High Density Res – Mid-rise apt 84 upha

- v. Due to the lack of a calculation sheet provided with the updated Genivar Report we are unable to determine if the Population Assumptions (person / unit ratios) are now consistent in Appendix B (Demonstration Plan) and Genivar Report (Appendix A).

Population Assumptions (persons/unit ratios) <i>Appendix B: Demonstration Plan Calculation Sheet Assumptions</i> (as per Development Charges Schedule 7)		<i>Genivar Report (Appendix A)</i> (as per 2012 Development Charges Background Study)	
Single-Detached	3.33 ppu	Low Density	3.47 ppu
Townhouse	2.37 ppu	Medium Density	2.46 ppu
Apartment	1.67 ppu	High Density	1.74 ppu

- vi. The Genivar Report used a person / unit ratio assumption in their original calculation sheet but the assumptions for the unit yield (upha) were not provided. This needs to be clarified in the updated calculation sheets.
- vii. The original calculation sheets in the Genivar report did not include the areas (in hectares) contributing to each node. The calculation sheets should be revised to include this information.

Wastewater

- i. Comments iii, iv, v in **Water Section** in this memo also apply on wastewater servicing analysis in respect to consistent population calculation throughout the process.
- ii. Consistent residential population and employment numbers for the fully built-out Merton Plan Area should be summarized in the Wastewater Servicing section of the ASP.
- iii. Items ii, v and vi in previous AMEC comments (September, 2013) remain outstanding. The preliminary design of the proposed wastewater system shall be consistent with the Halton Region Guidelines. Plan and Profile Drawings including pipe size, length, slope, invert and connection points shall be included in the ASP.
- iv. It is not recommended to send a portion of wastewater flow to Oakville Southwest WWTP considering incidents of pipe surcharging in the models. Flow should be directed to the Mid-Halton WWTP.
- v. In our discussions with the Region, we were advised that multiple connections to the 2400mm sewer trunk may not be permitted. Wastewater flow shall be collected locally and discharged to the 2400mm trunk via one connection point. Comment iv above and this comment shall be considered together.

Same comment applies on the servicing connections at the northeast and southeast corners of the Merton Plan Area.

In summary, the current submission of the Water and Wastewater ASP has not addressed all the water and wastewater servicing issues for the Merton Area. We would be pleased to discuss these comments at your convenience.

Yours truly,

AMEC ENVIRONMENT & INFRASTRUCTURE
a division of AMEC Americas Limited

Per: 
Paul Smeltzer, P. Eng.
Principal Consultant


Per: Tim Winterton, P. Eng.
Designer

CL/cc

bcc David Shen - AMEC Environment & Infrastructure

2. STORMWATER MANAGEMENT

January 24, 2014
Our File: TP113015-10

Town of Oakville
1225 Trafalgar Road
Oakville, ON L6H 0H3

ATTENTION: Kirk Biggar, MSc.PI, RPF, MCIP, RPP
Senior Planner, Long Range Planning Section

Dear Sir:

**RE: Peer Review of Area Servicing Plan for Merton Tertiary Plan Area
(David Schaeffer Engineering Ltd., December 2013), Second Submission
Stormwater Management Component**

AMEC Environment & Infrastructure (AMEC) has conducted a review of the stormwater management component of the second submission of the Area Servicing Plan for Merton Tertiary Plan Area (David Schaeffer Engineering Ltd., December 2013). Where related and appropriate to the Stormwater Management objectives, we have also reviewed the information presented in the Phase 2 Environmental Impact Study Merton (QEW/Bronte Road) Tertiary Planning Study (Beacon Environmental, December 2013). The following has been prepared to summarize the findings of our review.

Content and Study Requirements

We have compared the report content with the requirements outlined in the approved Terms of Reference (TOR) (February 2013), in order to identify any information which remains outstanding. The following have been noted based upon our review:

- i) Section 7.1.2 a) ii) of the (TOR) specifies that the existing hydrologic conditions are to be characterized within the EIS. The combined information presented in the Area Servicing Plan (ASP) and the Environmental Impact Study (EIS) partially addresses this requirement. Some key outstanding information includes the following:
 - Simulated peak flows for existing land use conditions at key locations within and downstream of the Merton area within both the Fourteen Mile Creek Watershed and the Bronte Creek Watershed. [NOTE: Currently, simulated peak flows for existing land use conditions are provided in Appendix F of the ASP for the Fourteen Mile Creek outlet at the QEW.]
 - Hydrologic characterization of the soils within the study area, comparing and contrasting the information presented in the surficial geology and surficial soils mapping; are the soil characteristics in the study area consistently characterized by each source?

- More discussion is required on the parameterization of the hydrologic models. What information was used to parameterize the land use and soils within the study area? What methodology was used to simulate the runoff response (i.e. SCS CN methodology, Green-Ampt method, etc.)?
 - Existing floodline mapping. [NOTE: Floodline mapping is also required in accordance with Sections 7.1.3 i) and 7.1.4 iii) b) of the TOR.]
- ii) Section 7.1.2 b) vi) of the TOR specifies that the existing surface water quality is to be characterized. Although a discussion and general characterization of the surface water quality is provided in Section 4.2.5.5 of the EIS, additional information is required regarding the methods used for sampling, sampling locations, the duration and frequency of sampling, and statistical summaries of the results for the representative contaminants outlined, as per the requirements of the Terms of Reference.
- iii) Section 7.1.2 c) i) a) of the TOR specifies that it is to be confirmed whether or not impacts from development within the Bronte Creek catchment area may be accommodated by the existing drainage outlet. [NOTE: The stormwater management strategy advanced in the ASP recommends that runoff from the catchment west of Bronte Road which currently drains toward the Bronte Creek be diverted toward the Fourteen Mile Creek. Additional information is required within the ASP to justify this diversion strategy, in accordance with the Terms of Reference.]
- iv) Section 7.1.3 iv) of the TOR specifies that features-based water balance analysis be conducted. The features-based water balance is presented in Section 4.2.8 of the EIS for the watercourse features; have any terrestrial features been identified for which a water balance should be completed (i.e. forests, wet woodlots, wetlands, etc.)? The features-based water balance presented in Section 4.2.8 of the EIS provides a summary of the surface water component of the water balance to the watercourse features, however groundwater recharge/discharge and evapotranspiration should be included in the water balance assessment. While it is suggested in the EIS that the PCSWMM model does not account for groundwater conditions, we note that groundwater recharge may be determined using the “aquifer” routines in PCSWMM, or else may be estimated based upon the simulated infiltration which is a direct output for each subcatchment in PCSWMM.
- v) Section 7.1.4 vi) d. of the TOR lists various water quality improvements to be considered to enhance the natural heritage features and functions within the Study Area. While the ASP acknowledges that low impact development (LID) measures may be implemented, the TOR specifies that opportunities to remove online ponds, restore in-stream cover, and direct treated urban storm runoff to the system (where beneficial) be investigated. These other opportunities are not discussed in the ASP and require consideration and evaluation.
- vi) Section 7.1.6 of the TOR specifies various requirements for the impact assessment. Key outstanding information requirements include the following:
- Item v) specifies that an erosion assessment be completed for the study area and “further downstream to a point where the catchment is a relatively small

contribution to the greater system". The erosion assessment provided in Appendix H of the ASP considered erosion sites within the limits of the Merton study area, but did not include analysis further downstream. Additional information is required in this regard as to how the approach advanced is compliant with the TOR.

- Item vi) specifies that downstream capacity constraints be identified. Section 6.5 of the ASP (page 40) states that it has been assumed that the downstream system is capable of accepting the pre-development Regional Storm peak flow rate of 4.147 m³/s, and recommends that a detailed assessment be completed as the detailed design of the Bronte Creek catchment advances. The ASP should clearly note the basis of this assessment, citing supporting background information as appropriate, or else include some preliminary analyses to determine whether or not a potential downstream capacity constraint exists. We further note that commentary regarding downstream capacity restrictions along the Fourteen Mile Creek have not been included within the ASP, and should be provided as appropriate.
- Item vii) specifies that stormwater management criteria for maintaining base flows are to be included in the ASP. We note that the requirement to maintain base flow is not included in the stormwater management criteria summarized in Section 6.2 of the ASP and should be incorporated into that section accordingly. Furthermore, Section 6.4 speaks to the need to maintain groundwater recharge, and discusses various LID techniques which could be implemented to address this requirement. Additional guidance should be included within the ASP regarding the volume and/or footprint required to achieve the required groundwater recharge. This can be completed using subcatchment-scale modelling techniques applied in other studies, or else through the surrogate use of the routines currently available within PCSWMM for specific LID practices. Finally, Section 6.11 of the ASP provides the water balance assessment to the watercourse features; similar to Comment iv) the features-based water balance should be completed for terrestrial features as appropriate, and should include the groundwater recharge/discharge and evapotranspiration components of the water balance assessment
- Item ix) specifies that continuous simulation is to be used for the hydrologic analysis of flooding impacts. The hydrologic analyses for flooding impacts have applied only the design event methodology (using the 24 hour Chicago storm distribution), hence continuous simulation remains outstanding. Additional information is also required regarding the application of the 24 hour Chicago design storm versus other durations (i.e. 4 hour, 6 hour, 12 hour) and/or distributions (i.e. SCS or AES). Furthermore, we note that the PCSWMM methodology has been used for the assessment of the Fourteen Mile Creek, however the information in Appendix G of the ASP indicates that the subcatchments within the Bronte Creek Watershed have been analyzed using the SWMHYMO methodology. Additional information is required in the ASP to justify the application of the two different hydrologic modelling methodologies. Please note as well that the SWMHYMO methodology is applicable to simulating design events, and is not capable of conducting continuous simulation as required in the TOR.

- Item xi) requires that details of proposed transportation crossing designs be included in the ASP, to ensure passage of aquatic and terrestrial wildlife, and continued natural fluvial geomorphological processes. While Section 6.3 of the ASP notes that these details will be provided for the proposed crossing toward the northwest limit of the Merton study area as part of the detailed design, this information is required within the ASP in accordance with the Terms of Reference. Due to the proximity of the proposed crossing to Bronte Road, appropriate hydraulic analyses should be included in the ASP to demonstrate that the proposed design of the crossing would not increase water surface elevations at Bronte Road, as well as to provide direction and preliminary sizing for the design of the proposed crossing to satisfy hydraulic criteria related to freeboard and overtopping, in addition to addressing the requirements outlined in the TOR related to passage of wildlife and fluvial geomorphologic criteria.
 - Item xiv) notes that an impact assessment is to be completed to identify, quantify, and describe cumulative impacts on water quality, water quantity, and hydrology. While it is recognized that a qualitative discussion (i.e. description) of anticipated impacts is provided in Table 24 of the EIS, a quantitative assessment has not been included in either the EIS or the ASP related to hydrology and surface water quality, and thus remains outstanding.
- vii) Section 7.1.7 specifies that terms of reference for a monitoring program is to be provided. We note that neither the EIS nor the ASP address this requirement.

Detailed Comments

The following detailed comments have been provided based upon our review of the recommended stormwater management plan provided in this submission of the ASP. Please note that further comments may be provided, upon receipt and review of the outstanding information requirements outlined above.

- i) Details regarding the hydrologic analyses are provided in Appendices F and G of the ASP, regarding the stormwater management facility sizing for development areas within the Fourteen Mile Creek and the Bronte Creek respectively. The following information should be included in the discussion surrounding the hydrologic analyses:
- Impervious coverages by land use and corresponding source/assumptions.
 - Impervious coverages for model subcatchments.
 - Adjustments to soil parameterization and supporting rationale as appropriate.

The information in Appendix F suggests that the hydrologic analyses for the stormwater management assessment were based upon servicing option A, however results are presented in Appendix F and within the main body of the ASP for servicing options A, B, and C. It should be confirmed whether separate hydrologic analyses were completed for each servicing option, and the above statement in Appendix F should be revised as appropriate.

- ii) Section 6.3 (page 23) notes that Regional Storm controls are not recommended on the basis that the hydrologic analyses indicate that the peak flow rates would be anticipated to increase insignificantly (i.e. 0.1 %) as a result of the proposed development. Additional discussion is required to support this modelling result. What is the physical reason for the marginal difference in peak flow rate (i.e. size of development area relative to total contributing drainage area, timing of peak flow rates, etc.)? It is anticipated that a hydrologic assessment of future land use conditions without stormwater management would provide some guidance and insight into the reasonableness of this conclusion. Furthermore, it should be confirmed that the hydrologic analysis for the Regional Storm event have been completed without the proposed stormwater management facilities in-place, in accordance with the current Provincial standards of practice.
- iii) Section 6.3 (page 24) notes that the APS has relied on the 1994 study completed by Philips Planning and Engineering Limited to establish the design targets for the portion of the Merton area within the Bronte Creek Watershed. The Philips study assessed the hydraulic capacity of the Speers Road trunk storm sewer. As such, the ASP should include additional information and discussion regarding any known or potential capacity constraints between the outlet of the Merton study area at the QEW and the Speers Road trunk storm sewer.
- iv) Section 6.4 (page 26) notes that oil/grit separators are recommended to provide stormwater quality control for areas identified for on-site stormwater management. Consideration should be given toward the use of other on-site stormwater quality techniques (i.e. grassed swales, buffer strips, etc.) as well as LID BMP's (i.e. bioswales) to provide the requisite stormwater quality control for areas with on-site stormwater management. These revisions should also be incorporated into the discussion in Section 6.5 on page 28. Additional discussion is also required to demonstrate that the recommended stormwater quality management strategy would address the current Provincial guidelines related to the protection of Redside Dace habitat.
- v) Section 6.4 (page 27) notes that LID measures to maintain groundwater recharge on residential lots are to include directing roof leaders to pervious areas, and increased topsoil depth. Additional information is required to support the exclusion of other LID infiltration BMP's which have been successfully implemented in residential developments in other areas (i.e. rain gardens, bioswales, bumpouts along the road right-of-way, etc.). Furthermore, this section notes that up to 85 % of the pre-development groundwater recharge may be maintained using the currently recommended approach; the analyses supporting this conclusion are not currently included in the ASP and are required for review.
- vi) Section 6.4 (page 27) identifies various LID infiltration BMP's which may be implemented in employment and commercial blocks, including the use of perforated pipes under parking lots. Please note that current practice of Conservation Halton requires pre-treatment of storm runoff prior to infiltration.
- vii) Section 6.4 (page 25) and Section 6.5 (page 29) recommend source controls in the form of rooftop storage, parking lot storage, rear yard storage, and storage within Municipal rights-of-way. Rear yards and Municipal rights-of-way are typically required to provide a conveyance rather than a storage function, hence it is



recommended these references be removed from the ASP. Similarly, the use of parking lot storage is generally less preferable due to potential nuisance flooding issues; this should be acknowledged within the ASP and used to establish a hierarchy of on-site storage alternatives accordingly.

In addition, the lot-level storage options provided (i.e. rooftop, parking lot, and underground) are not considered suitable candidates for providing erosion control, due to the longer drawdown times and functional issues related to nuisance flooding, rooftop leakage, and potential capacity issues with underground systems during short inter-event periods. As such, the ASP should distinguish between those lot-level quantity control measures which would address requirements for flood protection, and the lot-level controls which would address requirements to provide erosion control.

- viii) Section 6.5 (page 31) describes two storm servicing options for the development area west of Bronte Road: a) on-site, or b) off-site within the proposed stormwater management facility. A portion of these land is currently within the Bronte Creek Watershed, however both strategies recommend that runoff from these development areas be conveyed toward the Fourteen Mile Creek. As noted in our earlier comments, additional information is required in the ASP and EIS to support the proposed diversion of runoff from the Bronte Creek Catchment. Subject to confirmation that the proposed diversion is supportable, it is suggested that consideration be given toward the latter option of providing stormwater management within the off-site facility, since the urban drainage infrastructure required to convey the runoff from these lands would be designed and constructed as part of the Merton area development.
- ix) The information provided in Table 6-2 (page 33) has been compared with the information presented in Appendices F and G for the hydrologic analyses. We note that there are some minor differences between the drainage areas summarized in each table (i.e. generally 0.2 ha or less), hence the information in the appendices and in Table 6-2 need to be reconciled.

Furthermore, we note that the information provided in Appendices F and G indicate that the erosion analyses have assumed that erosion controls would be applicable to all areas recommended to implement on-site stormwater management by way of rooftop storage, parking lot storage, or underground storage. As noted in our previous comments, the currently recommended on-site stormwater quantity controls are not considered appropriate for providing erosion control; the erosion analyses should therefore be revised to assess the proposed condition in the absence of erosion controls for those areas receiving on-site stormwater management. It is suggested that these analyses also assess the erosion potential for the future land use conditions with stormwater management, with and without the included benefit of LID infiltration BMP's.

- x) Appendix G includes a preliminary capacity assessment of the QEW culvert for the Bronte Creek subcatchment, based upon the MTO nomograph for outlet control conditions. A tailwater condition corresponding to the obvert of the culvert has been assumed for the assessment to determine Regional Storm event capacity; additional information is required to support this assumption for the corresponding storm conditions. Furthermore, the capacity assessment has concluded that a head

- differential of 1.65 m; additional information is required within the ASP regarding the impacts of this head differential to the required grading within the ASP. Finally, the hydraulic analyses should also be completed based upon the inlet control condition for the culvert and the inlet structures, and the results included in the ASP.
- xi) Appendices F and G include preliminary stormwater management facility rating curves based upon the hydrologic analyses completed for the three servicing options. As noted in the ASP, the impervious coverage and size of the contributing drainage areas to the stormwater management facilities will need to be refined at detailed design, based upon refinements and revisions to the development area and drainage conditions. As such, the ASP should include adequate and appropriate guidance for the design of stormwater management facilities at the next phase of study. Furthermore, this information is more appropriately included within the main body of the ASP, as opposed to remaining within an appendix, since this information will be of importance to the practitioners at the detailed design stage.
 - xii) Section 6.7 recommends the use of inlet control devices (ICD's) to prevent surcharge conditions within the storm sewers. This is considered to be contrary to the general principles provided in the Town's Development Guidelines (2009) which specify that storm sewers should be designed for a free-flow condition. As such, it is recommended that consultation with Town staff be arranged to confirm the acceptance of this approach, or else this recommendation should be removed from the ASP.
 - xiii) Section 6.7 specifies that the minimum cover of storm sewers from centre line of road to pipe obvert is 2.5 m, which is consistent with Town standards. This section should also note that the Town suggests that storm sewers be designed to provide 3.0 m cover, and also allows for the use of sump pumps in areas where weeping tiles cannot drain by gravity.
 - xiv) The information presented in Appendix H for the erosion assessment indicates that the recommended erosion control strategy would nevertheless result in a residual erosion potential at one site (i.e. Site R-73). The average and maximum residual bed erosion potential at this location would be 3.32% and 4.17 % respectively, and the average and maximum residual bank erosion potential would be 4.87 % and 6.19 % respectively. The ASP should include recommendations for other methods to address this residual erosion impact.
 - xv) Section 6.9 (page 44) provides a discussion about the meteorological data used for the erosion assessment; additional information is included in Appendix F of the TOR for the datasets use. The based upon the information provided in Section 6.9 and Appendix F, it is understood that the erosion assessment was completed using meteorological data for the period from April 1 to October 31 for each of the six years simulated. The information further indicates that the average annual precipitation data for the full meteorological dataset was 467.1 mm. The average annual precipitation in Southern Ontario is typically in the range of 800 mm. As such, additional information is required to justify the utility and applicability of this scoped analytical approach for the erosion assessment, recognizing that it does not fully encompass the seasonal variations in hydrologic conditions and runoff response.

Furthermore, information provided in Appendix F indicates that the erosion assessment has been completed for only six (6) years selected from a forty-four (44) year period of record, due to the computational time required for a full continuous simulation. While it is recognized that a continuous simulation using 44 years of meteorological data would require a longer computational time than seven months of data from six years, it is nevertheless recommended that a full continuous simulation be completed in order to verify the performance of the recommended erosion controls.

The above comments also apply to the water balance assessment which is discussed in Section 6.11 of the ASP.

- xvi) Information provided in Section 6.9 (page 44) indicates that the erosion assessment was only completed for servicing option A since this was deemed to represent the “worst case” scenario in terms of required stormwater management controls and “impacts to the receiving watercourses”. Additional information is required to clarify how this option was deemed to represent the worst case scenario in terms of impacts to the receiving watercourse, particularly given that an assessment of the future uncontrolled land use conditions has not been included in the ASP. This comment also applied to Section 6.11 of the ASP regarding the water balance assessment.
- xvii) Section 6.9 (page 45) includes recommended erosion controls for the subcatchment within the Bronte Creek watershed by way of 40 m³/ha storage with a 24 hour drawdown, in order to provide “general erosion protection benefits”; it is further noted in this section that additional site specific work will be undertaken to identify any additional erosion controls required for the protection of the Bronte Creek. We trust that this additional work will be included with the next submission of the ASP.
- xviii) Section 6.10 cites a variety of stormwater management facility and landscaping design practices and features which would reduce the thermal enrichment from stormwater management facilities, including such practices as cooling towers. It is recommended that the Town of Oakville provide comment regarding acceptable thermal mitigation practices and features for Town-owned infrastructure. Please note as well that this section of the ASP extends the recommended thermal mitigation measures to include the recommended stormwater management facility within the Bronte Creek Watershed, as well as the Fourteen Mile Creek.
- xix) Table 6-9 in Section 6.11 of the report presents the results of the water balance assessment. As noted previously, the water balance assessment should include the impacts to the evapotranspiration and groundwater components of the water balance.
- xx) Section 6.11 (page 50) notes that the annual volume of water in the Saw Whet tributaries will increase with the removal of the ponds, however the erosion potential for the tributaries would not be anticipated to increase based upon the results of the erosion assessment. The erosion assessment was completed for the major reaches of the Fourteen Mile Creek, hence additional information is required within the ASP to discuss whether the erosion potential of the drainage features which connect to the Fourteen Mile Creek would increase, as well as what recommendations to mitigate.

Town of Oakville
January 24, 2014




- xxi) Section 7.0 discusses the various components of the stormwater management facilities. Additional information is required regarding the proposed stormwater management outlets to the Fourteen Mile Creek. Are drop structures recommended, or is it proposed to have the stormwater management facilities discharge to existing drainage features? If the latter, would the proposed stormwater management strategy increase the erosion potential of the receiving drainage feature?

We trust that the foregoing satisfies your current requirements. Feel free to contact our office should you have any questions or require anything further.

Yours truly,

AMEC ENVIRONMENT & INFRASTRUCTURE
A division of AMEC Americas Limited

Per: 
Aaron Farrell, M.Eng., P.Eng.
Associate

Per: 
Ron Scheckenberger, M.Eng., P.Eng.
Principal Consultant

AF/RBS/II

3. NATURAL HERITAGE SYSTEM

January 24, 2014

Town of Oakville
c/o Planning Services
1225 Trafalgar Road
Oakville, ON L6H 0H3

ATTENTION: Mr. Kirk Biggar MCIP, RPP, Senior Planner
Long Range Planning, Planning Services

Dear Sir:

Re: Review of the Aquatic Resources and Natural Heritage Resources Components of the PHASE 2 Environmental Impact Study, Merton Tertiary Planning Study, Town of Oakville, Ontario. (Beacon Environmental, December 2013).

Dougan & Associates hereby provides the Town of Oakville with a peer review of the Phase 2 Environmental Impact Study (EIS) for the Merton (QEW/Bronte Road) Tertiary Planning Study. The review has considered the following documents:

- Phase 2 Environmental Impact Study (EIS) for the Merton (QEW/Bronte Road) Tertiary Planning Study, prepared by Beacon Environmental, December 2013.
- 'Response Matrix' entitled Response to Town of Oakville, Region of Halton, and Conservation Halton Comments on Draft Phase 1 EIS for Merton Tertiary Plan (last revised 20 Dec 2013)
- Environmental Impact Study, Merton Tertiary Planning Study, Town of Oakville, Ontario, prepared by Beacon Environmental, May 2013.
- The Merton (QEW/Bronte Road) Tertiary Planning Study Terms of Reference dated February 15, 2013.

The Draft Phase 1 EIS was a 'work in progress', with study area characterization still incomplete, and with no description of the proposed development, impact assessment, monitoring program, etc. The Phase 2 EIS incorporates the results of the 2013 field investigations and subsequent analysis, expanding on the Study Methodology and Study Findings report sections, and adding sections: Description of the Proposed Development, Impact Assessment & Mitigation, Monitoring Program - Terms of Reference, Policy Compliance, and Conclusions.

The following review of the Phase 2 EIS is divided into two components. The first component is the Phase 1 EIS comments, annotated as to whether they were addressed in the Phase 2 EIS. For clarity, annotated text is shown in bold and is underlined. Response matrix numbering is also included to facilitate future reference or review. The second component is a set of additional comments on the new material incorporated into the Phase 2 EIS.

Phase 1 EIS Peer Review Letter with Annotated text reflecting Phase 2 EIS Content

General Comments

It is recognized that the Draft Phase 1 EIS is a 'work in progress' with study area characterization still incomplete, in terms of the Beacon work and other consultants whose work must be reported in the EIS. Our review has identified certain gaps in information, which may be addressed in a subsequent report version.

The Terms of Reference identify various levels of study for the EIS: a) Entire study area, generally from background information on specified biophysical resources, but with potential for supplementary fieldwork as required; b) Site-specific – Saw-Whet and Third Line lands, with detailed characterization of ground and surface water as well as geomorphic and natural heritage assessments; and c) Site-specific – Bronte Creek catchment, with similarly detailed studies under the environmental policy framework. We have concerns with the uneven biological monitoring coverage as evidenced on Figure 6 and as discussed in the comments. The Terms of Reference leave room for misinterpretation, so the EIS would benefit from a clearer discussion at the outset as to how the studies were planned and staged. The additional data contained in the December 2013 Phase 2 EIS does fill in many of the data gaps and 'even' out the coverage between the four main study sites within the TPA. (matrix comment #1)

The Phase 1 EIS sections on hydrogeology and hydrology apparently do not incorporate the most recent studies by other members of the TPS study team. Those documents are being peer reviewed separately by others, however our own scope does not extend to reviewing the additional supporting documents. The EIS will need to report on these other studies in order to meet the Terms of Reference. The Phase 2 report does discuss hydrogeology and hydrology in greater detail than in the Phase 1 report; our comments are based solely on the Phase 2 EIS content. (matrix comment #2)

The Beacon EIS references other Tertiary Plan Area consultant reports for further information on site-specific natural heritage studies. Given the comprehensive Terms of Reference for the EIS, all necessary content should be provided within the Beacon Phase 1 EIS, as the review of further studies is outside the scope of the Peer Review. Response accepted. (matrix comment #3)

The complexity of land parcels and ownerships, and the coverage of relevant data, is not clear in the EIS and could definitely be better referenced for clarity. Gaps in data, combined with some assumptions regarding interpretation of constraints, lead us to conclude that the current depiction of constraints to development in some areas is preliminary and subject to adjustment. The tables and figures have been updated to show more clearly the boundaries of the four main study areas (plus the 14 Mile Creek area), and also illustrate well the amount and nature of field work done in them. Consideration should be given to reorganizing Figure 16 into two or three figures as it contains a lot of information at this scale and can therefore be difficult to interpret. However, Figure 17, which shows the comprehensive constraints, is the main goal and is very clear. (matrix comment #4)

Aquatic Resources

The following are our comments on the aquatics resources components of the report.

2.1 Federal Fisheries Act (page 6).

- i. Under the new Fisheries Act the authorization of a HADD will not trigger a CEAA review. As of this writing, we still do not know how the revised Fisheries Act will treat the protection of fisheries resources within a development. [Has been updated in Phase 2 for new Fisheries Act](#) (matrix comment #5)

Figure 5

- i. "Water Temperature" locations should indicate that these are continuous temperature logger locations, and "Surface Water Flow" locations should indicate that spot water temperatures, and temperature loggers at W1, W2, S1, and S2, were also taken/deployed at these locations. [Addressed.](#) (matrix comment #6)

3.3.1 Background Review (page 24).

- i. A report apparently not included in this review of background information was "Fourteen Mile Creek Main and West Branches Subwatershed Plan. Philips Engineering, June 2000 (Revised January 2002)". [Has been added to Phase 2 report.](#) (matrix comment #7)

Figure 6

- i. Because all of the other location symbols had no specific labels, or were labelled within the symbol, it was not immediately apparent that the black number with the white background in the vicinity of the "Fisheries Survey" location symbol, was associated with the Fisheries Survey symbol. Perhaps including an example number label with the location symbol in the legend would make this clearer. Also, the superscript indicates that the information is referencing itself (this report), and likely should indicate that the information comes from Conservation Halton. [Recommendations have been implemented in this figure.](#) (matrix comment #8)

3.2.9.1 Aquatic Habitat Characterization (page 31)

- i. States that "Flow observations were also noted." Were flows estimated? Or simply recorded as present or absent, low or high, etc.? If there was no flow, were there permanent standing pools, or some indication that flow occurred for an extended time, or for a very short time? These are important observations with regard to fish habitat. [This detail was not added. No corresponding response in the circulated response matrix.](#)

3.2.9.4 Stream Temperature Monitoring (page 32)

- i. Table 3. - Can't find these stations, other than the above Stn 1 and Stn 2, easily on a map.
- ii. The points on the map that indicate flow monitoring should indicate that temperatures were also gathered at these locations (see Figure 5). [Addressed.](#) (matrix comment #9)

4.1 Tertiary Plan Setting (page 35)

- i. "Ontario Hydro Right-of-Way" is believed to be now "Hydro One Right-of-Way". [Corrected in Phase 2 report.](#) (matrix comment #10)

4.2.5 Hydrogeology (page 38) [Has been expanded and improved to address comments.](#)
(matrix comment #11)

- i. Given the importance in groundwater discharge and processes to the instream conditions of 14 Mile Creek, and the maintenance of essential habitats for Redside Dace in this area, a more detailed treatment of groundwater should be provided, e.g. greater integration of groundwater processes and the observed water flows and water temperatures in study area watercourses.
- ii. Even though it is offsite, discussion should deal with the major discharge point just north of Upper Middle Road that provides all the baseflow coming into the upstream end of the study area.

4.2.5.3 Recharge/Discharge Conditions (page 38).

- i. This is very important to understand, as the fish community, and the Redside Dace population in particular, relies on these groundwater sources. It must be thoroughly understood so that the existing groundwater and thermal regimes can be protected under any future development scenarios. More detail and integration of temperature information must be provided. For example: it is stated on page 39 that small gains in flow occur in reach 14W-W1, however, this has not been related to the separate observation in the Thermal Regime section that 14W-W1 is the coldest stream in the study area. Somewhere in the report groundwater and thermal regime must be linked to Redside Dace habitat, and discussed. [Appears to be addressed in Phase 2 report.](#)
(matrix comment #12)

4.2.5.4 Base Flows (page 38).

- i. During some fisheries field work undertaken in 1998/1999, the flow in the main channel of 14 Mile Creek started about 100 m upstream of Upper Middle Road. Within a small stretch of watercourse, flow went from nothing to about 10 L/s or more during those dry summers. This discharge point is an important feature of the aquatic habitats within the study area, and must be fully addressed (characterized, protected, monitored, etc.) to the extent possible given that it is outside of the study area, as it is critical to the downstream habitats, in particular Redside dace habitat, that occur in the study area. [More detail has been added.](#) (matrix comment #13)

4.2.7.3.1 Meander Belt Widths (page 47).

- i. The reaches in Table 9 are not shown on a map, but appear to be within Reaches 9b and 9c. This should be indicated somewhere to avoid confusion. [Now shown in Figure 5.](#) (matrix comment #14)

4.3.1 Background Review (page 50).

- i. Missing report "Fourteen Mile Creek Main and West Branches Subwatershed Plan, June 2000, revised January 2002." by Philips Engineering Ltd. This report should be included in the background review. [Addressed.](#) (matrix comment #15)

4.3.9 Aquatic Resources (page 72).

- i. Again, the report "Fourteen Mile Creek Main and West Branches Subwatershed Plan, June 2000, revised January 2002, Philips Engineering Ltd." is missing from this list. [Addressed.](#) (matrix comment #16)

4.3.9.1 Aquatic Habitat Characterization (page 73) (All addressed in matrix comment #17)

- i. Conspicuously lacking are photographs that show representative sections and important features of each habitat area. A few photos could be included in the text, or a larger set could be included in an appendix. Some photos have been added in an appendix.
- ii. In the third paragraph there is a reference to "aquatic habitat suitable for spawning". The information behind this statement needs to be presented, as these are critical habitats that may be **affected** by future development (e.g. SWMP discharge points). Apparently still unknown.
- iii. Figure 3 appears to be the incorrect figure referenced. Corrected.

4.3.9.2 Fish Community, second paragraph (page 74) (All addressed in matrix comment #18)

- i. The report states that since 1972, 22 species of fish have been collected from the stations within the Tertiary Planning Area, with over half of these species (14) still persisting in 2010 and 2012. As discussed at our first meeting, this does not necessarily mean there has been a reduction in species diversity, but may be more a factor of the number of different and varied times that the community has been sampled since 1972, compared to a smaller subset of sampling occasions in 2010 and 2012. Addressed in text.
- ii. In the fourth paragraph it is mentioned that MNR advised not to collect fish, however, if the concern was for the stress of sampling on Redside Dace, then MNR should have allowed sampling in the minor tributaries which likely do not contain Redside Dace, but not in the main west and east channels of 14 Mile Creek where Redside Dace are already known to occur. This would help in determining the fish community sensitivities required to plan watercourse treatment and protection. Not changed, but this is MNR's direction.
- iii. Table 13 (page 75) would have been better organized if the stations were along the top and the years were ranked in order within the cells, as it would be much more useful from the perspective of evaluating community assemblages associated with location and habitat. By ranking the years captured within each cell, the ability to discern trends over time on a species basis at a particular location is retained. Revised as suggested. Much better thank you.

4.3.9.2.1 Redside Dace (*Clinostomus elongatus*) (page 77)

- i. In the second paragraph, "open habitats" should be changed to "open terrestrial habitats" Corrected. (matrix comment #19)

4.3.9.4 Thermal Regimes (page 79)

- i. Thermal regimes in the different watercourses need to be integrated or related somehow to groundwater. This is very important to understand, as the fish community, and the Redside Dace population in particular, relies on these groundwater sources, and so a thorough understanding is needed so that the existing groundwater and thermal regimes can be protected. Other biophysical (e.g. shade) attributes should be discussed as well. Addressed in Phase 2 report. (matrix comment #20)
- ii. (page 80) - the nomenclature for the five thermal categories is somewhat different from that used in Figure 13. **This appears to still be the case. Thermal regime classes in the text are inconsistent with the Figures 12 and 13. (matrix comment #20 states that this is addressed in Phase 2 report, but there are still inconsistencies)**

4.3.11.2 Fourteen Mile Creek Valley ESA (ESA #12) (page 105)

- i. Table 20, primary criteria #9 (page 107) - If the proposed ESA boundary is adopted, which includes the short section of 14 mile Creek upstream of Upper Middle Road, then the ESA will include a significant groundwater discharge area. [Addressed. See same numbered section in the Phase 2 evaluation.](#) (matrix comment #21)

5.2 Natural Heritage Constraints to Development (page 112) (All addressed in matrix comment #22)

- i. In the third paragraph it mentions "The presence of a Redside Dace fishery will..." which should be changed to "The presence of a Redside Dace population will...". [Corrected.](#)
- ii. Table 22, second row entitled Habitat of Threatened and Endangered Species (page 113) - Table 22, third row entitled Fish Habitat (page 113) - The development setbacks for fish habitat are not specifically identified in Figure 16. However, could this be the same as the "setback to meander belt" that is defined in Figure 16? If this is the case, does there need to be an additional setback delineated between Bronte Road and the dripline of the existing ESA boundary, along watercourses 14W-W1, 14W-W1-2, and 14W-W1-3? [Addressed.](#)

Terrestrial Resources

Section 1 (Introduction) discusses the study area and Figure 1 shows property parcels, however in subsequent sections the discussion is organized under Saw-Whet Golf Course, Third Line Lands, and Enns Lands, however Figure 1 shows the properties under ownership names and parcels that are different from the boundaries shown on other EIS Figures, which lump some sub-areas and do not show distinctions such as Region of Halton lands or the Hydro Corridor. The clear distinction between any studies conducted on the Deerfield Golf Course and within the Fourteen Mile Creek ESA lands is important but not clear in the EIS. The text also mentions studies extending within Bronte Creek Provincial Park but the extent is not shown. Text discussion and data appendices are also ambiguous as to the extent of specific categories of study, and it is clear (and to a degree understandable) that data collection is uneven but the actual coverage and gaps are not readily transparent in the text and mapping. [The figures have been updated and are improved. However, there are still some inconsistencies. For example, Figure 1 lists "Saw-whet Lands" yet the text calls it "Saw-whet Property"; "Deerfield Property" is labeled as "Province of ON" in Figure 1, and "IO" \(Infrastructure Ontario\) is not defined on the map. Figure 1 does not show the 14 Mile Creek valley boundary. Figures have properties owned by "Bronte Green Corporation" while the text calls it "Bronte Creek Corporation". These are all minor discrepancies and don't change the overall conclusions of the report but are confusing nonetheless.](#) (matrix comment #23)

To better support interpretation of Table 2 (Recent Ecological Surveys), we would recommend a corresponding figure that summarizes the scope of the various seasonal studies listed in Table 2, and clarity elsewhere in the report and Appendices. Appendix B (ELC Data Cards) denotes the site as "Saw-Whet" but the data clearly covers lands mapped outside the Saw-Whet Golf Course, and data cards from NRSI and Dance are not included. Table 2 should be revised or supplemented with an integrated listing of all studies, cross-referenced to the properties shown on Figure 1, and indicating whether these studies are ongoing or otherwise incomplete/lacking. [Table 2, Figure 6, and Appendix H summarize the new and existing data collected in a clear and easy to read manner.](#) (matrix comment #24)

3.2.1 Background Review (page 24)

- i. Additional background documents that could be checked for records include: Birds of Hamilton (Curry 2006), Ontbirds listserv, South Peel Naturalists Club publications, Hamilton Noteworthy Bird records, and the Toronto Ornithological Club database; these encompass a lot of regional records. The butterfly, mammal and herpetological atlases for Ontario may also contain additional records. Agreed - a lot of the data in these sources is not vetted, and it is unlikely that any records exist as it is mostly private property and/or not covered by naturalists. (matrix comment #25)
- ii. Field notes reflecting the use of the protocols for OBBA and MMP should be included in the Appendices. Field notes are helpful for peer reviews as it allows the reviewer to check original field notes for accuracy and determine if the summary tables reflect the work appropriately. However, we understand that this was not in the scope of the Terms of Reference and, as such, was not required. (matrix comment #25)

3.2.3 Vegetation Surveys (page 26)

- i. Seasonal coverage for flora surveys is relatively even; Third Line, Saw-Whet and 14-Mile Creek ESA all have spring, summer and fall coverage. The Enns and Deerfield properties would benefit from May coverage for spring ephemerals. Response accepted - it is not likely that additional floral surveys in the Deerfield property would yield relevant information. The Enns property was covered adequately in 2013, and the 14 Mile Creek property is being protected in its entirety. (matrix comment #26)

3.2.4 Amphibian Surveys (page 27)

- i. We note that additional surveys are underway in 2013 for the Enns, Deerfield and Saw-whet G.C. properties, and therefore development constraint areas may need to be revised; Data cards for MMP monitoring stations should be provided, including time and weather conditions. Appendix H summarizes the 2013 surveys appropriately. See comment for 25ii regarding original field notes. (matrix comment #27)
- ii. The Saw-whet G.C. apparently only had amphibian surveys on May 8 and June 9 2012; an earlier survey in April should have been conducted according to MMP protocols. Table 2 should include dates and scope of additional 2013 surveys. April amphibian surveys were conducted in 2013. (matrix comment #27)
- iii. A Third Line amphibian survey was conducted on March 22 2012 and no April surveys were conducted; the text indicates that protocols were followed, but this date is outside the normal MMP protocol timing windows; we understand that 2012 was unseasonably warm in late March and that frogs began calling early, but there should be some acknowledgement stating that this was the reason why the protocols were not adhered to as well as a discussion of any potential gaps that resulted from lack of April surveys. Text has been updated accordingly regarding the early amphibian calling season in spring 2012. (matrix comment #27)
- iv. Figure 6 uses different levels of amphibian survey location detail on different properties; it would be helpful if the figure illustrated where all call stations were for amphibians. Figure 6 has been updated appropriately to show the location of all amphibian survey stations. (matrix comment #27)

- v. Figure 6 suggests that survey coverage is uneven across the TPA. The text suggests that Beacon did some of this survey work but the areas actually surveyed are unclear; see above for a recommended approach to indicate the status of surveys on all properties shown on Figure 1. Given the uneven nature of the sites regarding amphibian habitat, the additional surveys conducted in 2013 appear to adequately cover the habitats in the TPA, and Figure 6 illustrates this clearly. (matrix comment #27)

3.2.5 Reptile Surveys (page 28)

- i. We note that additional surveys are underway in 2013 for the Enns, Deerfield and Saw-whet G.C. properties, and therefore development constraint areas may need to be revised. The constraint analysis did consider the 2013 survey data, but did not result in the boundaries being changed. (matrix comment #28)
- ii. Field data for reptile monitoring should be provided, including time and weather conditions. Appendix H updates the reptile survey data accurately. (matrix comment #28)
- iii. The Third Line lands received more detailed snake surveys in locations mapped on Figure 6; Saw-whet G.C. and Enns property studies only recorded snakes on an incidental basis; no data points are shown on Deerfield or Region of Halton lands; this uneven coverage is inadequate given the species on record in the overall area. We understand that additional cover board studies are underway in 2013 and trust that these deficiencies will be addressed. Concerns regarding coverage were addressed. (matrix comment #28)
- iv. The text says that NRSI conducted turtle surveys; however Figure 6 does not indicate locations. Figure 6 has been updated accordingly regarding turtle surveys. (matrix comment #28)
- v. According to the dates listed, it appears that the cover boards were checked 6 times, not 5 times as indicated; this should be clarified. Text corrected. (matrix comment #28)
- vi. The text (page 29) refers the reader to the NRSI (2012) EIS for details on the turtle survey methodology; the methodology should be provided in the Phase 1 EIS, otherwise we cannot verify that the surveys were conducted appropriately. The Phase 2 EIS text now describes turtle survey methodology. (matrix comment #28)
- vii. Figure 6 indicates that survey coverage is uneven across the TPA; the text indicates that some additional surveys are underway in 2013. See above for a recommended approach to indicate the status of surveys on all properties shown on Figure 1. Figure 6 has been updated appropriately. (matrix comment #28)

3.2.6.1 - Breeding Bird Surveys (page 29)

- i. Field notes should be provided; survey coverage was apparently quite detailed on the Third Line site but very incomplete elsewhere. The time of day and weather conditions should be provided. Appendix summarizes the 2013 BBS adequately. See comment for 25ii. (matrix comment #29)
- ii. Figure 6 suggests that the lands to the immediate east of the Saw-Whet property were not surveyed; the avifauna on these lands will be affected by development and need to be fully documented. The breeding bird survey route appears to adequately cover

the 14 Mile Creek valley, and certainly any areas within 120 metres of lands proposed for development. As such, Species-at-Risk documented within the valley (e.g. Eastern Wood-Pewee) have been adequately documented. (matrix comment #29)

3.2.6.2 - Wintering Bird and Owl Surveys (page 29)

- i. Figure 6 indicates two locations where winter surveys were conducted. However, it should also indicate that winter surveys were conducted on the Enns property. Given the important historical records, winter bird and owl surveys on the Third Line property should have also been conducted. Figure 6 has been updated to show the owl surveys on the Enns property. It is agreed that the Third Line property has sub-optimal owl roosting habitat and no documented evidence of past usage in winter; therefore, owl surveys there would not likely yield useful data. (matrix comment #30)

3.2.8 - Lepidoptera and Odonate Surveys (page 30)

- i. Field data for butterfly monitoring should be provided, including time and weather conditions. Cloud cover significantly reduces butterfly and odonate activity. The appendix is helpful, however, for five of the eight survey dates it still does not show cloud cover, only that the conditions were "suitable". (matrix comment #31)
- ii. For the Saw-whet G.C., the first two surveys (May 30 and June 23) were done concurrently with the breeding bird surveys, which are recorded as occurring between 05:30 and 11:00. The text states the weather was warm (above 17 °C) doesn't specify if this was the case throughout the survey (05:30). In our experience, most butterfly species do not begin to fly until at least 10:00 (especially in May) so surveys which finished by 11:00 would not adequately detect all butterfly species present. Also, the text doesn't mention cloud cover, which is important as sunny conditions are especially important for butterfly activity earlier in the day. This may explain why very few butterflies were recorded on the spring and summer dates. It appears that the first two surveys were likely deficient and should be repeated so that the time of day and weather conditions are optimum. See response to v. below.
- iii. The third Saw-whet butterfly survey was conducted on September 10, which is late for detecting most breeding species (it would mostly detect vagrants) as most species will have finished their flight period by then. This third survey should have been conducted in July. See response to v. below.
- iv. The Third Line lands EIS also covered Odonates and Lepidoptera concurrently with breeding bird surveys on May 29, which would be too early in the day. The June 22 survey was a dedicated survey, however, there were no later surveys so species flying in July and August would be missed. See response to v. below.
- v. The Enns property had two surveys conducted, on August 22 and 30, which would have missed the majority of species present, typically in June and July. While we agree that not all species present would be recorded by the surveys, the number and dates/times of the surveys are still fairly weak. For example, for the Saw-whet property, the May 30 and June 23 surveys were too early in the day, and the two surveys in September (2012 and 2013) would miss most species (except for

Monarch and other late migrants). Third Line still only has two surveys (May 29 and June 22) and Enns two surveys in August only. The Terms of Reference (page 10 (b) vii) item g) asks for targeted surveys for butterflies and odonates in suitable habitat. We do agree, however, that these targeted habitats do not need to be completed on the Deerfield lands as most of this is fairways and greens which would not constitute suitable habitat for either group. (All addressed in matrix comment #31 ii. - v.)

4.3.2.1 Vegetation Communities (page 51)

- i. Page 52 states that none of the vegetation communities are considered rare, however two communities listed have rarity status as per Appendix M of the Significant Wildlife Habitat Technical Guide (MNR 2000): Fresh-Moist Black Walnut Deciduous Forest (FOD7-4) is ranked S2S3, and Dry-Fresh Hickory Deciduous Forest (FOD2-3) is ranked S3S4. This should be clarified in the text. Responses Accepted. (matrix comment #32)
- ii. The Saw-Whet land vegetation communities are described in some detail whereas Third Line Lands and Enns Property are just briefly summarized. Given the comprehensive Terms of Reference for the EIS, content should be provided at a uniform level of detail within the Phase 1 EIS. Vegetation community descriptions have been updated. (matrix comment #32)

4.3.2.2 Flora (Page 59)

- i. Flora findings (native status, species ranks etc.) are discussed in detail for the Saw-Whet Lands, 14-Mile Creek, and Third Line, however this detail is lacking for the Enns property. However, the actual distribution of botanical surveys is unclear based on the locations as shown on Figure 6. Section 4.3.2.2 and Figure 6 have both been updated accordingly. (matrix comment #33)

4.3.2.3 Significant Flora (page 60)

- i. The text states that Sharp-leaved Goldenrod and Slender Sedge have been historically reported but that there are no recent sightings. Given that these species form part of a complement of species attributed to specialized habitats that also occur in Bronte Provincial Park, did surveyors specifically search for these species? These species were specifically searched for - response accepted. (matrix comment #34)
- ii. Figure 6 is vague as to the extent of botanical sampling. Figure 6 has been appropriately updated. (matrix comment #34)

4.3.4 Breeding Birds (page 63)

- i. Apparently Beacon did not conduct breeding bird surveys within the 14 Mile Creek valley, rather only along the edges from the Saw-whet G.C. (an exception was made to search the valley for wintering Northern Saw-whet Owls). Therefore, the EIS relied on data from the Halton NAI and the OBBA (2001 – 2005) (Axon et al (1987) would be considered historic). The report was adequately updated to reflect 2013 breeding bird surveys conducted in the 14 Mile Creek valley. (matrix comment #35)
- ii. On page 65, the text notes that one of the eight species heard calling from the 14 Mile Creek valley was Eastern Wood-Pewee, which has been nominated by COSEWIC and

will therefore likely be added to the provincial ESA list; therefore, the EIS should discuss the implications of this. [The report was adequately updated with a discussion of Eastern Wood-Pewee in the 14 Mile Creek valley.](#) (matrix comment #35)

- iii. We note that two Savannah Sparrows were documented but the location is not referenced; the area(s) are of interest as they could also support Eastern Meadowlark and/or Bobolink, which are provincially Threatened. [The report adequately discusses the Savannah Sparrows found during the breeding bird surveys as well as the potential for Bobolink and Eastern Meadowlark.](#) (matrix comment #35)
- iv. 1st paragraph on page 66 – While no Eastern Meadowlarks were detected as breeding on the Saw-Whet property in 2012, the text should consider if there is any suitable habitat for the species on or adjacent to the Saw-Whet property, or in the overall study area. [Text on Eastern Meadowlark acceptable.](#) (matrix comment #35)
- v. 3rd paragraph on page 66 – Why was the Yellow-bellied Sapsucker thought to be a late migrant? [The habitat at Third Line does appear to be unsuitable for Yellow-bellied Sapsucker \(from NSRI 2012\); the record from Axon et al. \(1987\) is historic and it is unclear whether it was a breeder or late migrant with no further details.](#) (matrix comment #35)
- vi. 4th paragraph on page 66 – All species observed within or adjacent to (*i.e.* within 120 m minimum as per the Natural Heritage Reference Manual) the TPA should be listed. Those that were documented outside the TPA can be identified and discussed separately. The fact that a Species at Risk was documented adjacent to the TPA study area is relevant and the potential impacts of the proposed development should be appropriately considered. [Appendix E has been updated to show birds found in the adjacent 14 Mile Creek valley.](#) (matrix comment #35)

4.3.5.1 Migratory Birds (page 66)

- i. Re 1st paragraph (page 67): fall surveys on Enns property, the text states “some of which were probably recorded in the adjacent woodland”; a more definitive discussion of species and locations should be provided as this is apparently within adjacent lands. [Appendix F1 adequately shows the Dance Environmental data for the Enns property.](#) (matrix comment #36)
- ii. The text states on page 67 that “Winter bird surveys of the Enns property are scheduled for winter 2012/2013”; however the results were not included in the EIS (May 2013). [The EIS adequately documents the winter bird surveys for the Enns property from 2012/2013.](#) (matrix comment #36)

4.3.5.2 Wintering Owls (page 67)

- i. Christmas Bird Count (CBC) data (reviewed by Beacon) should be listed in the documents utilized in the Background Review section. [CBC data is listed in Background Review.](#) (matrix comment #37)
- ii. Bird records from local field naturalists clubs could be reviewed to better understand historical usage of the area. [See 25ii.](#) (matrix comment #37)
- iii. The attempts to gain information are commendable. Nevertheless, local CBC data should be available to indicate what sub route the Tertiary Planning Area falls within.

Data for those sub routes should be available. It is not likely that the CBC data, even if tracked down, would provide much useful information for these mostly private land holdings. (matrix comment #37)

- iv. Although Long-eared Owls may flush when approached but they don't always do so; Saw-Whet Owls don't flush readily. Given the fact that owls are not always easy to detect, that no owls were observed during the 3 survey visits does not eliminate the possibility that they may be utilizing the habitat. The number of owls that overwinter fluctuates annually depending on food availability and snow depth locally and further to the north. Therefore, it may not be accurate to characterize local usage based on a single season of observations. More surveys may be warranted given the important historical records. We contend that it would still be more accurate to base the current usage of owls in the 14 Mile Creek valley on more than one winter of surveys. However, even surveys over five or more winters may not show the usage of the valley in a peak winter (i.e. during a high influx year for irruptive species). Given that the valley is not being directly affected, and that there has been no recent documentation of significant owl usage found in the background review, conducting multi-winter surveys may not provide much additional information. (matrix comment #37)

4.3.6 Herpetofauna (page 68)

- i. This section lists records of Snapping Turtle and Milksnake for the Deerfield G.C., which lies between the Saw-whet G.C. and the Third Line lands; given the records and recent observation of Milksnake on Third Line lands, specific surveys should be conducted for these two species on the Deerfield G.C. and Region of Halton lands. Nine and four reptile surveys were conducted for the Saw-whet property and Deerfield lands, respectively, which seems adequate considering their size and cover; all surveys seemed to have appropriate times and dates, and the EIS has been updated accordingly. (matrix comment #38)
- ii. The text (page 69 4th para) states that there were nine (9) herptile species confirmed on the Third Line lands; however, the subsequent text only lists seven (four anuran, three snakes, no turtles); Appendix F only lists six for the Third Line lands. Are there other species, or is this statement in error? This typo has been corrected in the Phase 2 report. (matrix comment #38)

4.3.8.1 Odonates (page 70)

- i. Re: Beacon fieldwork and (page 71) Re: NRSI fieldwork – Were these incidental observations or results of the dedicated surveys (data should include survey dates of observations)? As noted earlier, odonate surveys conducted in 2012 and 2013 could have been more comprehensive. (matrix comment #39)
- ii. Re: last paragraph - The concentration of uncommon and rare species could suggest that this habitat is locally important and needs to be considered for protection. Until odonate species status is reviewed and updated (at least provincially), status information should not be discounted without credible evidence that species are more common. Table 16 shows that pond 4e was considered as SWH based on the occurrence of the Swamp Spreadwing (S3); it was subsequently rejected as candidate SWH

based on the fact that the species is not confirmed as breeding and that the pond is constructed. Given that this species can wander and that a constructed pond of limited size does not represent high quality habitat overall, this analysis seems reasonable. (matrix comment #39)

4.3.10.5 Significant Valleylands (page 87)

- i. Re: "Conservation Halton considers the Bronte Creek Valley a major valley system and the Fourteen Mile Creek a minor valley system." Please provide reference. Reference accepted. (matrix comment #40)
- ii. Where criteria have not been developed by a planning authority, the Natural Heritage Reference Manual (2010) provides biophysical criteria that can be applied. Response accepted. (matrix comment #40)

4.3.10.6 Significant Wildlife Habitat (page 87)

- i. Re: Table 15 (page 87) states that criteria are organized according to the four general categories that they belong to. However, a number of criteria have been incorrectly placed, and titles of the criteria do not always match those used in the SWHTG (2000), although the EIS states that it was followed. Some of the criteria categories used are confusing and some criteria overlap in the table. Although organization remains confusing, all SWH categories are considered; response acceptable. (matrix comment #41)
- ii. Re: "Landbird/shorebird/butterfly migratory stopover area" (page 89) – The study area and valley of 14 Mile Creek is within 5 kilometres of the Lake Ontario shoreline, and should qualify as a significant landbird migratory stopover area. Table 16 indicates that the 14 Mile Creek valley is considered as candidate SWH for landbird stopover habitat - therefore, response accepted. (matrix comment #41)
- iii. Re: "Bat/reptile hibernacula" (page 90) –The corresponding criterion in the SWHTG is "Bat maternal roosts and hibernacula". Is the provincially Endangered Little Brown Myotis (*Myotis lucifugus*) present? Response acceptable, that is, Little Brown Myotis could be present in the 14 Mile Creek valley and that no suitable habitat for hibernacula exist on the sites. (matrix comment #41)
- iv. Re: "Rare vegetation" (page 90) – See comments above on Sect. 4.3.2; two communities may have status. Was the Great Lakes Conservation Blueprint for Terrestrial Biodiversity also reviewed? Response acceptable. (matrix comment #41)
- v. Re: "Mink and otter feeding /denning sites" (page 91) – Clarify why the habitat along 14 Mile Creek is not favourable for Mink. Mink could occasionally occur along 14 Mile Creek but given the lack of records and isolated nature of the valley, along with its deciduous cover, they likely do not occur on the frequency level to trigger SWH. (matrix comment #41)
- vi. Re: "Waterfowl nesting habitat" (page 91) – This criterion belongs under the "Seasonal Concentration Areas" group, not the "Rare Vegetation Communities or Specialized Habitats for Wildlife" Group. Response acceptable. (matrix comment #41)
- vii. Re: "Waterfowl staging areas" (page 91) – This criterion belongs under the "Seasonal Concentration Areas" group, not the "Rare Vegetation Communities or Specialized Habitats for Wildlife" Group. Response acceptable. (matrix comment #41)

- viii. Re: "Raptor hunting areas" (page 92) – "Raptor Wintering Areas" is already discussed on page 89. We note there is a SWHTG criterion "Raptor Nesting Habitat" under the "Rare Vegetation Communities or Specialized Habitats for Wildlife" group. There were no nest records since 1983 but apparently no additional surveys were conducted. Nesting Long-eared owls are not easy to find. According to the ROM's Breeding Birds of Ontario (1983) only 73 nests had been documented in the province (as of 1983). The Cooper's Hawk nest, outside of the TPA, does likely not constitute SWH. We do stand behind our comment that species such as Long-eared Owl are very hard to find nesting, so the level of nest searching in portions of the TPA were likely not detailed enough to find this species if it were nesting. (matrix comment #41)
- ix. Re: "Sites supporting area-sensitive forest species" (page 92) Given the status of larger forested sites features in Oakville, we would agree this is SWH. Suitable buffers are required to protect this habitat. Note: a similar criterion is discussed on page 95 but not considered SWH? Response acceptable. (matrix comment #41)
- x. Re: "Woodland amphibian breeding ponds" (page 93) – Non-forested breeding ponds should be considered as there are at least nine ponds present outside the valleylands. Agreed that the number and diversity of amphibians detected in the dug out ponds in the golf course would not constitute SWH. (matrix comment #41)
- xi. Re: "Turtle nesting areas" (page 93) – This should include turtle nesting habitat and overwintering areas; in the Oakville planning area (which would be the area for which SWH is evaluated) most turtle habitat (away from the rivers and creeks) is likely related to dug ponds. Turtle populations, especially near urban areas, are declining due to the cumulative impacts of habitat loss and increased road mortality. We are not convinced that adequate surveys have been conducted to date to identify turtle nesting areas. Given the habitats surrounding these dug out ponds, it is not likely that turtles are breeding in significant numbers. Turtle surveys in 2013 did search for evidence of nesting. (matrix comment #41)
- xii. Re: "Seeps and springs" (page 94) – What criteria were used to evaluate whether they would support SWH conditions? Seeps and springs - response acceptable. (matrix comment #41)
- xiii. Re: "10-1-3 Habitat of Species of Conservation Concern" (page 94) – The criteria contained within this group do not correspond with those in the Significant Wildlife Habitat Technical Guide. As a result, the information is confusing and possibly misleading. The group should have included the following criteria levels:
- o Species identified as Nationally Endangered or Threatened by COSEWIC which are not listed as Endangered or Threatened under Ontario's ESA. This would include Eastern Wood-Pewee and possibly Wood Thrush.
 - o Species identified as Special Concern or historical in Ontario. Monarch should be discussed.
 - o Species that are listed as rare (S1 - S3) or historical in Ontario
 - o Species whose populations appear to be experiencing substantial declines in Ontario.
 - o Species that have a high percentage of their global population in Ontario and are rare or uncommon in The Regional Municipality of Halton

- Species that are rare within the Regional Municipality of Halton, even though they may not be provincially rare
 - Species that are subjects of recovery programs
 - Species considered important to The Regional Municipality of Halton, based on recommendations from the Conservation Advisory Committee (e.g. EEAC, ESA studies). Out of sequence - these all respond to our comment 41 xiii (with multiple bullets). xiv. Response acceptable; xv. Response acceptable; xvi. No Wood Thrush were detected within TPA - response acceptable; xvii. Response acceptable (matrix comment 41 xiii. – xvii.) (matrix comment #41)
- xiv. Mis-assigned or repetitive/redundant categories listed under Species of Conservation Concern include: include: Raptors, Area-Sensitive Birds, Grassland Birds, Other Birds, Amphibians, Reptiles, Mammals and Insects; content should be reorganized according to status levels of conservation concern. Listing does cover all categories but alignment with references with regard to order would assist readers. (matrix comment #41)
- xv. Re: “Grassland birds” (page 95) – This criterion is covered as "Habitat for open country and early successional breeding bird species" and should be discussed in the "Rare Vegetation Communities or Specialized Habitats for Wildlife" group. While we agree with the determination, we do not agree that no significant grassland species were recorded; Savannah Sparrow is listed by OMNR as a species that would potentially qualify an area as significant wildlife habitat according to the Ecoregion 7E Criteria Schedule (OMNR, 2012). Although Savannah Sparrow is listed by MNR as a species that could potentially qualify and area as SWH, it must be observed with at least one other listed species. No other listed species have been recorded to date. (matrix comment #41)
- xvi. Re: “Other birds” (page 95) – Although listed as rare in Halton NAI (which would trigger SWH as per page 87 last paragraph), Beacon state that they don’t consider Orchard Oriole to qualify as triggering SWH designation. This exception should be further qualified. Response re: Orchard Oriole - Species is increasing and not dependent on rare or undisturbed habitat, response acceptable. (matrix comment #41)
- xvii. Swamp Spreadwing should be discussed under the S1 - S3 criterion. Swamp Spreadwing is discussed accordingly in report. (matrix comment #41)
- xviii. The rationalization that there are better examples of Snapping Turtle Habitat would imply that the current study area has been fully documented for this species, and that no habitat outside of the major and minor river valleys should be considered. According to John Boos (Peterborough OMNR), all Snapping Turtle nests are considered SWH by OMNR. Agreed that MNR recommends that non-natural sites not be considered SWH and that final SWH determination rests with the planning authority. However, turtle populations, which are under considerable threat and continue to decline, remain poorly protected in urban areas. Turtles don’t have many ‘natural’ sites available and simply select what is most suitable, regardless of its artificial status. A better strategy to protect turtle populations is necessary. The MNR Ecoregion 7E Criterion Schedule considers a single Snapping Turtle nest SWH. (matrix comment #41)

- xix. Milksnake is considered a secondary target species in the Great Lakes Conservation Blueprint for Terrestrial Biodiversity for Ecodistrict 7E-4 (Henson & Brodribb, 2005). A secondary target is defined as an element of biodiversity (species or vegetation community) that is of some conservation concern in the Ontario portion of the Great Lakes. Occurrences of secondary biodiversity targets were included in the Conservation Blueprint portfolio where their occurrence coincided with a primary target occurrence, a protected area, or conservation lands. [Response acceptable \(comment noted\).](#) (matrix comment #41)
- xx. Re: Animal Movement Corridors – Although this criterion is listed on page 87, it is not discussed in Table 15. Existing Animal Movement Corridors should be mapped and described. [Table 16 has been updated with a response regarding SWH for animal movement corridors. Agreed that 14 Mile Creek valley is currently cut off at both ends by Upper Middle Road and the QEW and is likely limited as an animal movement corridor.](#) (matrix comment #41)
- xxi. Re: Table 16 (page 98) – “Turtle nesting habitat and overwintering areas” may warrant SWH status in Table 16. Fourteen Mile Creek and associated tributaries likely merit designation as SWH as Animal Movement Corridors. [In a context such as the TPA, identifying potential animal corridors using aerial photography is appropriate. The generalized movement corridors indicated on Figure 15 seem appropriate. More work would need to be undertaken to establish if SWH for animal movement corridors exist; however, given the nature of the site, with barriers to movement at many areas, it may not exceed thresholds \(that don't currently exist\) for SWH.](#) (matrix comment #41)
- 4.3.11 Environmentally Sensitive Areas Assessment (page 99)
- i. Re: last paragraph on page 100 and Figure 14 – It is not clear why some features were included in the proposed ESA boundary and others were excluded. Each area where the existing ESA boundary differs from the proposed boundary should be discussed, perhaps in a corresponding table. For example it is not clear why vegetation polygons 2q, 2r, parts of 2u, 12, 37, 39b, and 39c were excluded. [Update in report regarding delineation of ESA seems reasonable and acceptable.](#) (matrix comment #42)
- 4.3.11.1 Bronte Creek Valley ESA (ESA #10) (page 104)
- i. Table 19 – The table heading is incorrect; it speaks to Bronte Creek Valley ESA #10, not Fourteen Mile Creek ESA #12. [Item corrected in Phase 2 report - response accepted.](#) (matrix comment #43)
- ii. Re: Primary Criteria 6 in Table 19 (pg. 104) – Why isn't Swamp Spreadwing (S3) mentioned? [Swamp Spreadwing did not occur within the ESA, so not captured in Table 19 - response acceptable.](#) (matrix comment #43)
- 4.3.11.2 Fourteen Mile Creek Valley ESA (ESA #12) (page 105)
- i. Primary Criterion 6 in Table 20 (pg. 107) – Given the information available, the ESA likely provides habitat for Snapping Turtle (Special Concern) and possibly Milksnake (Special Concern and S3). The proposed boundary on Fig. 14 does not reflect the Redside Dace habitat as mapped on Figure 16. [Item corrected in Phase 2 report - response accepted.](#) (matrix comment #44)

- ii. Primary Criterion 9 (significant groundwater discharge) and 10 (groundwater quality) may apply given the presence of cool/coldwater reaches and habitat for Endangered Redside Dace, a species reliant on these conditions. Swamp Spreadwing did not occur within the ESA, so not captured in Table 19 - response acceptable. (matrix comment #44)
- 4.3.12 Natural Heritage System (page 108)
- i. Restoration/Enhancement Areas (pg. 109) – Vegetation unit 12 (i.e. field surrounded by forest) is not identified as a possible restoration/enhancement area, yet if reforested it would result in a significant increase in forest interior habitat, contributing to habitat for area-sensitive forest breeding birds which is was one of the SWH criteria applicable to the 14 Mile Creek valley. Restoration/enhancement areas 1, 2 and 3 are located very close to vegetation unit 12, and areas 2 and 3 would be negatively impacted if vegetation unit 12 was developed. Response inadequate. Section 4.3.12.3 continues to exclude vegetation unit 12 as a key restoration or enhancement area. The value this unit could provide, if restored, is not acknowledged or addressed. The EIS should provide rationale for why it (and any others) were not considered. (matrix comment #45)
 - ii. Figure 15 – Vegetation polygons 2q, 2r, 2u, 2v, 37, 39b and 39c should be discussed re: potential restoration/enhancement areas. Areas outside of proposed NHS; response acceptable. (matrix comment #45)
- 5.2 Natural Heritage Constraints to Development (page 112)
- i. Figure 16 - The buffers and setbacks applied to derive Constraints to Development are exclusively feature-based. 7.1.4 of the Terms of Reference do advocate a feature-based identification of constraints, however Section 4.3.12 of new report says “This EIS has adopted as systems based approach to establish an NHS for the TPA.” Clarification is requested. (matrix comment #46)
 - ii. The section does not discuss 120 m Adjacent Lands where future development may interfere with the natural heritage system and its functions, such as functions represented by Significant Wildlife Habitat. Examples of broader functions would include:
 - o The relationship between potential owl roosting sites and adjacent open lands as foraging habitat should be addressed in the development constraints.
 - o Protection of locally occurring turtle species, including Snapping Turtle, needs to address overwintering/foraging habitat, as well as nesting habitat and the overland connections that exist between them. Without this consideration there is no realistic expectation that these species will persist in the local landscape in the future.
 - o Local frog populations (especially Spring Peeper) are reliant on upland forest as well as pools/ponds; need to consider how the necessary connections that exist will be protected as constraints. 7.1.4 of the Terms of Reference do advocate a feature-based identification of constraints. Therefore, response acceptable. (matrix comment #46)
 - iii. Given two Milksnake observations, more cover board surveys and a more comprehensive evaluation of critical habitat is warranted. Hibernacula are sometimes very difficult to identify. In recognition of this limitation, it would be appropriate to discuss

how the constraint approach addresses this and similar species reliant on a range of cover conditions. [More snake surveys were conducted in 2013, and no potential hibernacula were found. Response acceptable.](#) (matrix comment #46)

- iv. Animal Movement Corridor is another criterion that merits consideration under SWH and constraints. Ecological functions need to be considered and appropriately reflected on constraint mapping. [NHS does cover potential animal movement corridors, and it is discussed in Table 16 \(SWH\). Response acceptable.](#) (matrix comment #46)

Appendix C – Vascular Plant List

- i. Are S-ranks current? We note that this list uses the old S-rank system (e.g. non-native species are SE# instead of SNA). [Appendix C was updated accordingly.](#) (matrix comment #47)

Appendix D – List of Rare and Uncommon Plants Recorded in the Tertiary Planning Area

- i. Note typo in the Scientific Name for Slender Sedge [Typo corrected.](#) (matrix comment #48)

Appendix E – List of breeding birds recorded in TPA

- i. This appendix requires a legend to define all of the codes used, and a reference list to match with the superscripts (1 through 10). [Appropriate legend added to Appendix E.](#) (matrix comment #49)
- ii. For column 12, “B” and “NB” are not defined. [Ibid.](#) (matrix comment #49)
- iii. Do the numbers indicated for various species for the three properties refer to the total number of birds seen, or pairs? There should be some indication of whether it refers to singing males, fledged young, etc., as well as the level of breeding evidence recorded (i.e. possible, probable, confirmed). [Ibid.](#) (matrix comment #49)
- iv. For the Third Line lands, Yellow-bellied Sapsucker is listed as “B”, which presumably means breeding. However, the text on page 66 says that it is likely a late migrant; please clarify. [Explanation re: Yellow-bellied Sapsucker acceptable.](#) (matrix comment #49)
- v. It would be helpful to include the field notes in an appendix to add detail (e.g. timing, weather conditions etc.) regarding the site visits. Also, it would be helpful to know where the species were observed (i.e. referenced according to ELC polygon). [See response to comment #25.](#) (matrix comment #49)
- vi. Eastern Wood-Pewee should be listed as Special Concern in Canada, and Wood Thrush should be listed as Threatened in Canada. [Table updated appropriately regarding Eastern Wood-Pewee and Wood Thrush.](#) (matrix comment #49)

Appendix G – List of non-avian wildlife recorded in TPA

- i. On page 69, Dekay’s Brownsnake is listed for the Third Line lands (NRSI 2012), yet it does not appear in this appendix (only for Geomatics 1993). [Appendix G updated to show Dekay’s Brownsnake.](#) (matrix comment #50)
- ii. It would be helpful to include field notes in an appendix to confirm the details (e.g. timing, weather conditions etc.) regarding the site visits. Also, it would be helpful to know where the species were observed (i.e. on a map or referenced according to ELC polygon). The

ELC data cards were provided in the appendix. [Appendix G updated; see response to comment #25.](#) (matrix comment #50)

Phase 2 EIS Comments on New or Revised Material

Aquatic Resources

4.3.9.4 Thermal Regimes

- i. Page 114, Figure 12b - The points in the legend appear to be all the same colour. Also, the figure caption should stipulate that this is dealing with the east and west forks of the east branch of Fourteen Mile Creek.

4.3.9.4.1 2013 Water Temperature Data

- i. The temperature regime classifications in the text are not consistent with those used in Figures 13a-13c. However, it is generally understood what is meant with the figures, as the inconsistency appears to be a simple naming error that has been repeated.
- ii. Page 116, last paragraph - Again, there seems to be some confusion with the temperature class nomenclature.

4.3.10.1 Significant Habitat of Endangered Species and Threatened Species

- i. Page 122, watercourses falling into the habitat regulations - 14W should be added to the list attached to 3. West Branch of Fourteen Mile Creek (14W, 14W-E1, 14W-M1, 14W-W1).

4.3.11.2 Fourteen Mile Creek Valley ESA (ESA #12) (page 105)

- i. Table 21, primary criteria #9 (page 146) - If the proposed ESA boundary is adopted, which includes the short section of 14 mile Creek upstream of Upper Middle Road, then the ESA will include a significant groundwater discharge area. I strongly support this inclusion, as it would capture in the ESA the most important source of baseflow to this portion of Fourteen Mile Creek, which is critical in maintaining the Redside Dace habitat in this area.

5.1 Physical Constraints to Development

- ii. Page 155, Table 22 - Agree that first item in the table is essential in reducing the potential disruption to adjacent Redside Dace habitat.

6.4 Servicing

Page 169, treatment train approach to SWM. Noted.

6.5 Water Supply

Page 170, watercourse crossing done with trenchless methods. Crossing at road crossing of 14W-W1. Noted.

6.6 Sanitary Collection System

Page 170, no crossings of the NHS proposed. Noted.

6.7 Stormwater Management

Pages 171 and 172 - No increases in flows up to the regional storm event, 80% suspended

solids removal, and bottom draw pipes and other measures will be implemented to mitigate thermal impacts to protect Redside Dace. Noted.

7.0 Impact Assessment and Mitigation - Table 24 starting on page 176. Lots of good plans in place to minimize impacts to Fourteen Mile Creek. The following are concerns/clarifications.

- i. Page 183. My understanding of the road crossing of 14W-W1 is that it will be upstream of direct fish habitat and Redside Dace habitat. Please confirm and modify text to indicate that this is the case.
- ii. Page 184. Last bullet under the "Recommended Mitigation" column in the "Redside Dace" row, suggests that restoration and naturalization is planned for Tributary 14W-W1. Please confirm that this will be for the upstream sections considered contributing fish habitat, and not the downstream sections (Reaches SW1 and SW2) considered Redside Dace recovery habitat.
- iii. Page 185. Under the "Recommended Mitigation" column in the "SWM Facility and Storm Outfalls" row, it is suggested that there are requirements of maximum temperature and dissolved oxygen for discharge to Redside Dace habitat. While I agree with the importance of constructing SWM facilities to mitigate thermal impacts to Redside Dace habitat, how is it possible to ensure, given that these are passive cooling systems, that these temperature limits will never be exceeded?

7.1 Evaluation of Preferred Land Use Options - Agree with Option B as preferred. This option will provide a greater separation between Fourteen Mile Creek and urban development on the east side of the creek in the Brey's Lane area.

8.0 Monitoring Program - Terms of Reference.

- i. Table 25, Page 190 - Under Aquatic Resources (can also be related to Groundwater Resources on page 189) there should be a requirement for the mapping of groundwater seeps and springs, watercress, skunk cabbage, and other observations/indicators of groundwater inputs to Fourteen Mile Creek and its tributaries within the study area. This mapping should be undertaken at similar periods over two years prior to construction. This will indicate the actual pattern of groundwater inputs to the creek system. Potential changes to this pattern will help connect the results of groundwater monitoring to potential impacts to aquatic habitat.

9.0 Policy Compliance

- i. Page 192, Table 26, Endangered Species Act - It should be noted that the proposed road crossing will be in contributing Redside Dace habitat.

Terrestrial Resources

6.1 Description of the Proposed Development (page 162)

- i. It is unclear how these three options were developed, other than the statement that they were developed to offer a balanced mix of employment and residential uses at varying densities to serve the needs of the local populations. Why were only 3 options considered in the evaluation? Placement of SWM ponds could benefit from a more strategic assessment based on benefits to NHS (e.g. linkages and buffers).
- ii. Although the farm field on the Saw-Whet property may not be environmentally constrained in its own right, it's an obvious restoration and enhancement area given its local context (i.e. it is almost entirely surrounded by core areas of the proposed Natural

Heritage System). In fact, it should have been considered for inclusion in the NHS. Its omission is confusing. Why is this area “yet to be determined”? We recommend a long list of restoration and enhancement areas be prepared (including the farm field), showing how they were screened for restoration and enhancement opportunities. Restoration of the farm field could significantly increase available habitat for area-sensitive birds. Please refer to the Great Lakes Factsheet: *Forest Birds in Urban Areas: Habitat Needs of Area-Sensitive Species* http://publications.gc.ca/collections/collection_2009/ec/CW66-260-2006E.pdf.

- iii. Figures – Option A, B & C: NHS boundary should be included on mapping.

6.3 Preliminary Grading Requirements (page 168)

- i. Earthworks and the corresponding removal of vegetative cover need to be compliant with the federal Migratory Birds Convention Act (MBCA). Section 6 of the Migratory Birds Regulations (MBRs) made under the 1994 MBCA makes it an offence to “disturb, destroy or take a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird.” Environment Canada normally recommends restrictions on vegetation clearing during the core breeding period, which generally correspond to the beginning of May through to the end of July. The EIS should provide direction on avoiding conflict with the MBCA. It is noted that this issue was raised in the Impact Assessment Matrix (page 183).

7.0 Impact Assessment and Mitigation - Table 24 starting on page 176.

- i. Water Balance – it would be desirable that monthly modeling of water balance be provided to assess potential changes that may affect key biota and wetlands.
- ii. Woodlands (page 180) – Discussion of potential impacts and recommended mitigation is good, however there is no mention of the property marked TBD on mapping. Due to the location of this property within the wooded feature there should be discussion of impacts and mitigation in relation to future uses of this area. Restoring this area as part of the larger wooded block could contribute to the quality of the larger natural feature and avoid negative impacts that could occur from development in this area. Also see comment 6.1ii.
- iii. Birds (page 183) – Text suggest that forest species will be unaffected. However, we are concerned that the 10 m minimum buffers recommended for woodlands may not be sufficient to protect forest breeding birds? Also see comment 6.1ii.
- iv. Birds (page 183) – We support the recommendation to undertake vegetation clearing outside the breeding season.
- v. Reptiles (page 183) – A more definitive commitment to compensate for lost turtle foraging and overwintering habitat should be made, not just recommendations. Suggested approach in EIS may not result in an overall neutral impact. It is acknowledged that SWM ponds can provide additional habitat but they are also known to pass along contaminants. Turtle nesting habitat is not mentioned.
- vi. Reptiles (page 183) – Concerns remain that despite recommending pond removal take place in late summer/early fall that turtles will be negatively impacted. Construction plans should ensure that all turtles discovered during the draining of the ponds are rescued and transported to suitable alternative ponds. Permits will be required to handle turtles.
- vii. Amphibians (page 183) – Concerns remain that despite recommending pond removal take place between late summer and early February that frogs and toads will be negatively impacted. Construction plans should ensure that all amphibians discovered

- during the draining of the ponds are rescued and transported to suitable alternative ponds. Permits will be required to handle amphibians.
- viii. Species at Risk (page 184) – If possible, replacement nest structures for Barn Swallows should be located within the TPA.
- 7.1 Evaluation of Preferred Land Use Options (page 187)
- i. It would be useful if a matrix was provided that reviewed how each of the options address or don't address key NHS protection issues.
 - ii. It appears that Option B does result in the most area being retained in Open Space.
- 8.0 Monitoring Program – Terms of Reference (page 188)
- i. Breeding Bird Species (Table 25, Page 190) – Unless previous bird survey work was specifically conducted in such a way that point count stations can be integrated in a monitoring program, new stations will need to be surveyed pre-development.
 - ii. Breeding Bird Species (Table 25, Page 190) – the reference to the *Amphibian and Reptile Protection Plan* is confusing.
 - iii. Amphibians/Turtles and condition of created habitats (Table 25, Page 190) – Assuming newly created ponds are constructed prior to the initiation of development (requires to support any rescued amphibians or turtles), it is unclear why baseline conditions should not be established.
 - iv. Amphibians/Turtles and condition of created habitats (Table 25, Page 190) – Clarification is requested as to what the *Amphibian and Reptile Protection Plan* is.
 - v. Wildlife Movement (Table 25, Page 190) – It is unclear how long cameras will be collecting data during each of the monitoring periods (i.e. pre-, during and post-development). Will the cameras be functional for one night, one month or other length of time?

Conclusions

Overall, the Phase 2 EIS represents a significant improvement in content and clarity. The vast majority of issues raised in the Phase 1 EIS have been adequately addressed. Nevertheless, a few minor issues remain and a few others have been added. The consideration of Restoration & Enhancement Areas, as well as Land Use Options, is not as transparent as would be desirable.

Sincerely,



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4. HYDROGEOLOGY



January 20, 2014
Ref No. TP113015.4000

Town of Oakville
c/o Planning Services
1225 Trafalgar Road
Oakville, ON L6H 0H3

Attn: Mr. Kirk Biggar MCIP, RPP, Senior Planner, Long Planning, Planning Services

Dear Sir,

Re: Peer Review of Hydrogeological Study, Merton Tertiary Planning Area, R.J. Burnside & Associates

AMEC Environment & Infrastructure, a division of AMEC Americas Limited (AMEC), is pleased to provide the Town of Oakville with a follow-up peer review of the hydrogeological study for the Merton (QEW/Bronte Road) Tertiary Planning Study. The review has considered the following documents:

- The Merton (QEW/Bronte Road) Tertiary Planning Study Terms of Reference dated February 15, 2013;
- Preliminary hydrogeology report prepared by R.J. Burnside & Associates Limited titled "Hydrogeological Study, Merton Tertiary Planning Area, Town of Oakville, Ontario" dated March, 2013;
- A review of the preliminary Burnside report by AMEC dated April 16, 2013;
- A review of the preliminary Burnside report by Conservation Halton (CH) dated 28 July, 2013, CH File MPR 640;
- A revised hydrogeology report prepared by R.J. Burnside & Associates Limited titled "Hydrogeological Study, Merton Tertiary Planning Area, Town of Oakville, Ontario" dated December, 2013;

With reference to our review of 16th April, 2013, we have indicated where the additional work/information has answered our queries regarding the preliminary hydrogeology report in the following table. For information, we have also indicated in this table where Conservation Halton has made similar comments.

We note that the revised hydrogeology report has included additional data collected from the Merton Tertiary Planning Area (further referred to as the Study Area) provided, which includes additional water level measurements and stream flow gauging up to the end 2013.

We would welcome Burnside's further comments on items raised in the review dated April 16, 2013 that have not been further considered in the revised hydrogeology report.

AMEC Environment & Infrastructure
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Page	Sect.	Para	Comment/Note	Page	Sect.	Comment/Note
1	1.0	2 nd	Indicate in last sentence of this paragraph that the study addresses the Tertiary Planning Area Terms of Reference only.	1	1.0	Addressed
8	4	5 th	The stream gain for the Study Area (SS10 – (SS1+SS2+SS3+SS4+SS9) equals -10 L/s (i.e. a loss) for the measurement most representative of dry weather conditions. The loss is equal to 6% of the flow at SS10. Could Burnside comment on the significance of this in relation to the results of the water balance.			Not addressed – the new data further show that there is no/very limited groundwater discharge during dry conditions and that the Fourteen Mile Creek loses water over the bedrock shale. We would further comment that the stream flow data (i.e. very limited groundwater discharge in Fourteen Mile Creek across the Study Area) indicates infiltration rates derived from the water balance are simply too high unless there is under drainage from the buried valley to the Bronte Creek.
9	5.1	last	The sand layers in the buried valley ‘do not appear to be laterally extensive as illustrated by Figures 6 through 9’. Actually these figures do show them to be laterally extensive. These also rely on the MOE wells for confirming there is silty clay at depth. One record (2807144) appears to have a large thickness of sand and is not consistent with the drawn cross-sections. Could Burnside please comment on the likely accuracy of the cross-sections as they cross the	10	5.1	Partly addressed – we would add that there is limited data on the overburden at depth within the buried valley and that the interpretation of the bottom half of this feature being filled by low permeability clay/silt till (Figure 6 & 7) is not uniformly proven by the available data.

Page	Sect.	Para	Comment/Note	Page	Sect.	Comment/Note
			buried valley? It would also be useful to confirm the extent of the bedrock valley shown in Figure 4 based on bedrock outcropping along Bronte Creek.			
12	5.4	Table 1	The obtained values of hydraulic conductivity, although not particularly high, are not particularly low either. The Hazen method is not reliable for low hydraulic conductivity, and the slug tests have been carried out in relatively permeable sandy till (~1E-06 m/s). Could Burnside please comment in more detail on how representative these measurements are? (CH File MPR 640, point 6)	12	5.4	Addressed
13	6.0	General	There is no indication of where the golf courses draw water from or how much water they use. Do they use their onsite ponds for irrigation water? If so what effect do the ponds and water use have on the groundwater system? Would this effect the water balance calculations in section 7.4? (CH File MPR 640, point 2)	19	6.4	It has been confirmed that the ponds are clay lined and likely have limited interaction with the groundwater system.
14	6.2 to 6.3	General	Comments should be made on how representative data collected in late 2012 is of more typical climate conditions. For instance would the inferred groundwater gradients and estimated groundwater discharge conditions be significantly different in other years? (CH File MPR 640, point 9)			Further data collected, so query now less relevant

Page	Sect.	Para	Comment/Note	Page	Sect.	Comment/Note
15	6.4	1 st	It may be useful to map the areas of thin overburden cover that provide areas of potentially higher recharge.			Not addressed
17	6.4	2 nd	0.02 is a high horizontal hydraulic gradient; equivalent to a head loss of 20m over 1km. Given the groundwater contours shown on Figure 10 (head loss of ~15m over ~2km), could Burnside comment on the derivation of the gradient? It would also be useful to provide an upper and lower limit on the groundwater discharge calculation of 0.25 L/s as the method used has considerable uncertainty.			Not addressed
17	6.5	1 st	The water chemistry data in Appendix G is not tabulated, neither are conclusions on groundwater quality compared to the ODWQS provided other than to state the water is hard. First paragraph should indicate that results are from shallow wells and may not be applicable to water quality in deeper wells used for water supply. Is there any variation between recharge and discharge zones? Should additional samples be collected from deeper wells completed in the bedrock valley aquifers that are used for water supply? (CH File MPR 640, point 7)	20	6.5	Partly addressed – Tables added comparing water to ODWQS, PWQO and sewer by-laws in Appendix G
22	7.4	2 nd	The infiltration calculated for the Fourteen Mile Creek watershed in the Study Area (239,000 m ³ /year) equates to			Not addressed – we would add that the infiltration calculated in the water balance is not consistent with the stream

Page	Sect.	Para	Comment/Note	Page	Sect.	Comment/Note
			7.5 L/s. Can Burnside reconcile this with the other information on groundwater discharge (noted above in comments), specifically commenting on the buried valley and if this has any potential to under-drain and discharge to the Bronte Creek, considering the uncertainties in the estimates of flow.			flow gauging data and the calculations for baseflow contributions. Estimated infiltration is too high when compared to the stream flow gauging data and are likely to be conservative (i.e. over-estimate groundwater infiltration and impacts of the development) unless the Study Area is underdrained by the buried valley (i.e. towards Bronte Creek).
25	8.5	2 nd	Monitoring of private wells recommended is the absolute minimum. Could Burnside comment on the perception of risk to these wells and if the recommended program is consistent with this?			Not addressed
General			It would be useful to include a description of the proponents conceptual model for groundwater system, which would tie together the individual observations and conclusions scattered throughout the report			Sections added, but in essence not addressed – we have highlighted the discrepancy between the water balance and stream flow gauging data.
General			Study should include recommendations for future site specific studies in a single section	32	9	Addressed – we endorse the requirement for further investigations at Deerfield Golf Course.
General			Identify high water table areas where basement flooding would be a concern.			Not addressed
Main Issue 1			We would agree that shallow groundwater in the Study Area may support baseflow to the Fourteen Mile Creek, but that this is a very small proportion of the total flow due to the low			Not addressed; new stream flow data suggest there is very little groundwater discharge to the Fourteen Mile Creek.

Page	Sect.	Para	Comment/Note	Page	Sect.	Comment/Note
			hydraulic conductivity of the shallow geology. However, we would suggest that there be some more consideration of the potential role of the buried valley in limiting discharge to the Fourteen Mile Creek			
Main Issue 2			We would also agree that low impact development (LID) infiltration measures are appropriate for the Study Area. However, given the buried valley, its more permeable deposits and possible discharge to Bronte Creek, this requires some more consideration with respect to measures within and outside the footprint of the buried valley.			Not addressed

Closure

If you have any questions, please contact either of the undersigned at (905) 312-0700.

Yours truly,

AMEC Environment & Infrastructure
A division of AMEC Americas Limited

Prepared by:

A stylized signature of Martin Shepley, where the letters are formed by a grid of small squares, giving it a digital or pixelated appearance.

Martin Shepley, D.Phil., M.Sc., P.Geo.
Associate Hydrogeologist

A handwritten signature in black ink, appearing to read "Simon Gautrey".

Reviewed by:
Simon Gautrey, M.Sc., MBA, P.Geo.
Senior Associate Hydrogeologist

5. STREAM MORPHOLOGY



January 24, 2014

Mr. Ron Scheckenberger
AMEC Environment and Infrastructure
3215 North Service Road
Burlington, ON
L7N 3G2

**RE: Technical Review #2 - Merton Tertiary Planning Study
Fluvial Geomorphology Component
Oakville, ON
Project No. 13081**

This memo provides a review of the *Merton Tertiary Planning Study: Geomorphic Assessment – Fourteen Mile Creek and Associated Tributaries* (PARISH Geomorphic Ltd., December 2013), in addition to fluvial geomorphology sections of the Merton Tertiary Plan Area Technical Reports (December 2013). The Geomorphic Assessment and its appendices were reviewed in their entirety. No other materials related to other technical disciplines were reviewed.

The Merton Tertiary Planning Study Area is identified as an area for potential future development in the Town of Oakville, Ontario. On October 16, 2012, the Town approved the development of a Tertiary Plan that will identify land use designations and policies for the entire study area. In support of the Tertiary Planning Study, PARISH Geomorphic undertook a geomorphic assessment of Fourteen Mile Creek and its associated tributaries (PARISH Geomorphic Ltd., February 2013). The draft report (V-4) provided a fluvial geomorphic assessment of the watercourses within the study area, including a review of background information, reach delineation, rapid field assessment, detailed data collection and the quantification of erosion thresholds. Meander belt widths and 100-year migration rates were also determined on a reach basis; 30 m setback limits were established for those reaches classified as Redside Dace habitat. The assessment of Fourteen Mile Creek and associated tributaries extended from Upper Middle Road south to the Queen Elizabeth Way (QEW). On behalf of the Town of Oakville, GHD was retained to provide a technical review of the submission. Finalized comments were submitted to the Town in April 2013. This Technical Report #1 indicated that the PARISH report generally conformed to previously accepted methods in identifying existing geomorphic conditions; however, it specified that additional materials were required in order to consider the submission to be complete.

The purpose of Technical Report #2 is to provide a review of the finalized *Merton Tertiary Planning Study: Geomorphic Assessment – Fourteen Mile Creek and Associated Tributaries* (PARISH Geomorphic Ltd., December 2013). To provide context for this technical review, original comments regarding the draft PARISH (February 2013) report as provided in Technical Report #1 and are provided below in *italicized* text. Additional comments related to the final (December 2013) report are summarized in standard text.



2.0 Background Review

As an overview, the background information presented in the report provided the following context for reaches along Fourteen Mile Creek (Oakville Erosion Assessment Studies, 2008):

Reach R-74

- RGA score: 0.47 (In adjustment)
- Dominant mode of adjustment: widening

Reach R-75

- RGA score: 0.48 (in adjustment)
- Dominant mode of adjustment: widening

Reach R-76

- RGA score: 0.33 (transitional/stressed)
- Dominant mode of adjustment: widening

In the finalized geomorphic assessment (PARISH, December 2013), additional background information, including an overview of physical channel conditions and an historic assessment using aerial photographs of the study area from 1954, 1978 and 2012 were provided. While an attempt was made to provide an historic overlay of channel planform over the available records, it is recognized that issues relating to georeferencing of historic imagery and the resolution of these images did not support a detailed analysis of channel planform adjustment over time. It did, however, facilitate a general qualitative assessment of land use change. No additional clarification or information regarding this section of the report is required.

3.1 Reach Delineation

Reach delineation followed the previous Oakville Creek Erosion studies (2008, PARISH Geomorphic Ltd.; 2010, AECOM); however, reaches R-74 and R-75 were subdivided through the 2013 geomorphic assessment based on changes in sinuosity and tributary junctions. This approach generally follows previously accepted methods. Similarly, rapid field assessments were undertaken using the RGA (Rapid Geomorphic Assessment) and RSAT (Rapid Stream Assessment Tool) techniques. Reach delineation and rapid assessment work included the main branch of Fourteen Mile Creek, as well as western tributaries. Information pertaining to eastern tributaries of Fourteen Mile Creek previously reported by UEM (2012) was also summarized in the report.

Information presented in the finalized geomorphic assessment remains consistent with the February 2013 draft report.

3.3 Rapid Assessment Results

Rapid assessment results generally identified the main branch of Fourteen Mile Creek as being in a transitional/stressed state, with widening identified as the dominant mode of adjustment. Conditions reported along the downstream extent of the western tributary were consistent with rapid assessment results for the main branch, while the upstream reaches were characterized as stable (in regime).

While it is presumed that the two eastern tributaries not included in the study were excluded because they are not internal to the development area or are protected by the natural heritage system, the report should include an overlay of the Tertiary Plan (once developed) on the reach mapping, as well as text to address this exclusion. If the tributaries were accessible, reach characteristics and rapid assessment results should be provided.

It is noted that many of the RGA scores are high. Please provide confirmation that the reach extents as presented are appropriate. The inclusion of more than one reach within an identified extent can result in the identification of additional active geomorphic processes during the field assessment and result in



artificially high RGA scores. Additionally, bankfull channel dimensions and relevant channel characteristics (e.g., riffle/pool substrate composition, riparian community, channel modifiers or controls) should be summarized on a reach basis.

It is noted that the finalized geomorphic assessment does provide revised figures which differentiate the eastern tributaries as not assessed (Figure 1.2), as well as the Study Area (Figure 1.1). While the text of the report does differentiate between the Study Area and Subject lands, the Subject Lands are not clearly identified on the supporting figures. Further, it is recommended that the Study Area and Subject Lands be overlain on all of the report figures in order to provide additional context for the geomorphic information. Lastly, the report should provide justification for the exclusion of the eastern tributaries from the geomorphic assessment. Based on the land ownership mapping provided, it is anticipated that the tributaries were accessible; as such, reach characteristics and rapid assessment results should be provided. Mapped watercourse layers for the tributaries do not correlate to the detailed contour information. These mapping discrepancies should be resolved.

It is noted that no additional information regarding justification of the elevated RGA scores has been provided. Further, a comparison of the rapid assessment results from the 2008 Town of Oakville study and the 2013 PARISH report was not provided. The inclusion of more than one reach within an identified extent can result in the identification of additional active geomorphic processes during the field assessment and result in artificially high RGA scores. Additionally, general descriptions of the active channel, including bankfull channel dimensions and relevant channel characteristics (e.g., riffle/pool substrate composition, riparian community, channel modifiers or controls) remain outstanding. This information should, at a minimum, be included in the main body of the report. While it is recognized that information regarding bankfull dimensions has been provided through the detailed field investigation results, it is recommended general channel characteristics as documented through the rapid assessment work also be summarized on a reach basis in tabular format.

4.0 Meander Belt Width Assessment

Provincial Policy regarding erosion hazards for river systems stipulates the differentiation between slopes (or valley land systems) and floodplains. The report provides hazard limits based on meander belt width delineation on a reach basis within the study limits. These meander belt widths were based on the existing channel planform. However, a description of the degree of valley confinement and topographic (contour) mapping information for the study area was not provided. This information should be provided in order to facilitate a complete review of the geomorphic assessment.

Further, it is important to differentiate between meander belt widths delineated for the purpose of establishing proposed Redside Dace regulated habitat limits, as opposed to those delineating erosion hazard limits. In accordance with Provincial Policy, the meander belt width is considered relevant in determining erosion hazard limits for unconfined valley systems. Geotechnical considerations govern erosion hazard limits for confined valley systems (valley wall heights greater than or equal to 2 meters). At a minimum, the development area limit should be overlain on the meander belt width mapping. Ideally, a proposed development fabric would also be included and governing meander amplitudes upon which meander belt widths were based, should be identified with an associated dimension.

Given the size of the study area, the meander belt width mapping should be provided at a larger, legible scale. Contour information should be provided to define confined and unconfined reaches and to ensure that the figure clearly illustrates how the meander belt width captures the active channel. The report indicates that a 10% factor of safety was not required for those reaches classified as Redside Dace habitat. Given that the report does not clarify through mapping or text as to whether the meander belt width dimensions, at a minimum, accommodate the existing active channel, it is difficult to determine whether this statement is accurate. It is likely more appropriate to reference inclusion of the existing toe of valley slope within the belt width limit along governing meander bends as justification for the lack of



erosion setback. A toe erosion allowance should be provided for confined reaches, referencing the local soil conditions and the MNR technical manual.

Discussion of the application of the 7.5 m regulated setback (minor valley system) per Conservation Halton requirements was not included in the report; please revise. Please also provide documentation of the historic aerial photos reviewed through the assessment in the form of an aerial photo appendix.

A description of the degree of valley confinement on a reach basis for the study area remains outstanding. This information should be provided in order to facilitate a complete review of the geomorphic component of the hazard assessment.

Additional clarification regarding the information provided in the second paragraph on page 20 is requested. It is our understanding that the authors only applied geotechnical requirements for erosion hazard delineation (referred to in the final report as the stable slope allowance method) to Reach 73. The long-term stable top of slope plus access allowance was then compared to the meander belt width plus 30 m Redside Dace riparian setback for this one reach (specifically, one meander bend as illustrated in Figure 4.1). As the lateral extent of the meander belt width plus Redside Dace setback was the greater (more conservative) setback, this setback was identified as the erosion hazard limit. While it is recognized that this exercise was likely undertaken for all reaches within the study area, based on the data summarized in Table 4.1, this methodology does not conform to the Provincial Policy Statement for the delineation of erosion hazards. The meander belt width plus 30 m setback establishes the limit of regulated Habitat for Redside Dace and is not related to erosion hazards. The finalized report should be clarified and revised to be consistent with the Provincial Policy Statement and integrated constraint information (Figure 16 of the Phase 2 Environmental Impact Study – Beacon, 2013).

Geotechnical considerations govern erosion hazard limits for confined valley systems (valley wall heights greater than or equal to 2 meters). It is understood that the meander belt width plus 30 m would be provided in order to delineate the limit of regulated Redside Dace Habitat. This information should not be identified in association with an erosion hazard limit for confined systems. Furthermore, at a minimum, the development limit should be overlain on the meander belt width mapping. Ideally, this mapping would include and governing meander amplitudes upon which meander belt widths were based, along with an associated dimension.

5.0 Detailed Geomorphological Analysis

While the location of detailed geomorphic field data collection was presumably driven by the proposed outlet location of stormwater facilities, this justification should be included in the report. Without this information, it is difficult to understand why Reach 74a was not selected for detailed data collection, as it was identified as the most unstable reach along the main branch of Fourteen Mile Creek, based on rapid assessment results. Additionally, it would be beneficial to provide a table summarizing the channel geometry on a reach basis.

Per the comments provided in Technical Report #1 (above), additional justification regarding the selection of detailed field site locations remains outstanding. It is noted that Figure 17 of the Area Servicing Plan (DSEL, 2013) indicates that the only two stormwater management ponds outletting to Fourteen Mile Creek outlet to Reach 74a. Further, while it is noted that bankfull grades are reported in Table 5.7 (Average Bankfull Dimensions and Erosion Thresholds) of the PARISH report, the inclusion of this gradient information in Tables 5.1-5.3 and 5.4-5.6 would facilitate review of this report.

5.4 Erosion Threshold Analysis

While extensive information is presented for each detailed site with respect to bankfull channel dimensions and associated hydraulic parameters, it is difficult to determine the value of this information in the body of the report when the erosion threshold analysis was based on average channel dimensions. It would be beneficial to present average channel dimensions and hydraulics, along with sediment characteristics in a single summary table to facilitate review of the report. The erosion threshold summary



table does not provide critical velocities, shear stresses are critical depths associated with the critical discharge. The table also lacks a critical shear stress or velocity associated with the median grain size for the channel bed material.

Given that widening was identified as the dominant mode of adjustment along the entire system, the report should include a description of bank materials and an associated critical shear stress for bank materials. Critical flows identified for R-75a and R-73 exceed the bankfull flow. Additional justification for these thresholds must be provided, as both of these reaches were identified as being sensitive to alterations in land use/flow regime through the rapid assessment phase. The predominant role of widening along each reach indicates that the erosion threshold is governed by the inherent strength of bank materials. The report does not reflect this condition. Field confirmation of thresholds for sediment entrainment or observations during the time of detailed assessment is also recommended.

We note that a section in the report has not been provided to consolidate the bankfull dimensions, hydraulic parameters and erosion threshold analysis in a single summary table. While a critical shear stress and velocity have been provided in association with the median grain size for the channel bed material (Table 5.7), the report did not provide an explanation for the application of different critical shear stress values for the bank materials. Based on the qualitative description of the bank materials in Table 5.7, the reader is left to assume that the bank material critical shear stress for all three sites should be the same.

We note that a comparison of maximum shear stress values under bankfull flow conditions exceeds the critical shear stress for all three reaches. This information should be noted in Table 5.7 and addressed in the report. While the report indicates that nine separate erosion threshold models that were reviewed in support of erosion threshold analyses, only one model is identified in Table 5.7 for bed and bank materials. Additional justification for the selection of sediment entrainment models should be provided. Additional clarification should be provided to explain why a sediment entrainment model based on shear stress was not evaluated, or presented in the report, for the channel bed. It is noted that thresholds associated with the bank materials have been provided and have been identified as the governing thresholds for the system. However, the main body of the report does not clearly define these bank parameters as the governing erosion thresholds for any future servicing of the site.

Overall, the erosion threshold section of the report lacks clarity and completeness in the presentation of information, as well as in the provision of a strong, formal recommendation. In order to fully evaluate whether the critical flow associated with bank materials is appropriate for each field site, the critical depth must be provided. This depth must then be compared to bank materials and water levels documented at the site at the time of survey. Field confirmation of erosion thresholds over a range of flow events is also recommended. Justification of recommended threshold values and how they relate to bed materials, flow depth, and bank materials/thresholds should be provided. The report text lacks detailed analysis, conclusions and recommendations.

Summary

This memo provides a review of the *Merton Tertiary Planning Study: Geomorphic Assessment – Fourteen Mile Creek and Associated Tributaries* (Final Report V-1) date December 2013. The report provided a fluvial geomorphic assessment of the watercourses within the study area, including a review of background information, reach delineation, rapid field assessment, detailed data collection and the quantification of erosion thresholds for 3 reaches. Meander belt widths and 100-year migration rates were also determined on a reach basis; 30 m setback limits were established for those reaches classified as Redside Dace habitat. Based on our review of the available documentation, the following additional information (at a minimum) is required in order to facilitate a complete technical review of the geomorphic assessment:

1. Additional justification for the exclusion of the eastern tributaries from the geomorphic assessment;



2. Identification of confined and unconfined reaches;
3. Clarification that the lateral extent of the meander belt width plus Redside Dace setback does not represent the erosion hazard limit;
4. Rationale for the location of detailed geomorphic field sites;
5. Tablature summary of relevant bankfull channel characteristics from the rapid assessment work on a reach basis;
6. Justification for the exclusion of Reach 74a in the selection of detailed data collection sites;
7. Provision of critical depths associated with the critical flows identified for detailed field sites;
8. Provision of detailed erosion threshold analyses and a clear recommendation with respect to the governing erosion threshold for each detailed field site; and
9. Field confirmation of erosion thresholds is recommended.

We trust that the information provided in this letter meets your requirements at this time. Should you require further clarification regarding this review, please do not hesitate to contact the undersigned.

Respectfully submitted,

Imran Khan, M.Sc., P.Geo.
Services Group Manager, Environment, Canada

Shelley Gorenc, M.Sc., P.Geo.
Fluvial Geomorphologist

DRAFT

6. TRANSPORTATION

January 16, 2014

Ref No. TP113015.4000

Town of Oakville
c/o Planning Services
1225 Trafalgar Road
Oakville, ON L6H 0H3

ATTENTION: Mr. Kirk Biggar MCIP, RPP, Senior Planner Long Planning, Planning Services

Dear Sir,

RE: Peer Review of Transportation Study, Merton Tertiary Planning Area, Read, Voorhees & Associates (RVA) Toronto, Ontario – Second Review

CIMA as part of the AMEC Peer Review Team hereby provides the Town of Oakville (Town), the second review of the Transportation Study for the Merton (QEW/Bronte Road) Tertiary Planning Area prepared by Read, Voorhees & Associates (RVA).

In the first review, the report entitled "Traffic Impact Study Merton Tertiary Plan Oakville" dated May, 2013 prepared by RVA was reviewed by the CIMA team and a detailed list of comments was provided. In response to CIMA's comments, RVA has provided an updated version of the report, dated December 2013, for the second review.

CIMA undertook a detailed review of the updated report in light of our previous comments. Overall, RVA has done an excellent job in addressing our comments, and it is our opinion that the current document is comprehensive enough for providing traffic related input to identifying a preferred land use option for the Merton Tertiary Planning Area, subject to the following modifications.

We suggest completing the following modifications before finalizing the report.

- There are two more signalized intersections on Third Line between Upper Middle Road and QEW (Greenridge Circle and Glen Abbey Gate) similar to the intersection of Third Line and Abbeywood/Kings College. Please highlight them within the report with some general comments. We do not see the necessity for any SYNCHRO™ analysis of these intersections, as the results are expected to be similar to the intersection of Third Line and Abbeywood/Kings College. Additionally, the review of the traffic impact on QEW and Third Line ramps as highlighted in Halton Region's comments should be included in the report.
- In the fifth paragraph of Section 4.1, modify "1.6 northbound and 1.8 southbound" to "1.6 for the peak directional volume and 1.8 for the off-peak directional volume"

- In Table 1, for Neighbourhood Centre, it appears the unit should be 1000 sq. ft. We could not validate the factors used for this item from ITE manual. However, they are within the range of similar land uses.
- There are still some minor issues with background traffic volume calculations. Please apply growth factors consistently as suggested in the following examples:

Intersection of Bronte Road and QEW EB On-Ramp			
Movement	Factor	Existing Volume	2031 Volume
NBL/NBT/NBR	1.8	4/664/245	7/1195/441
EBL/EBT/EBR	1.4	4/3/4	6/4/6
SBL/SBT/SBR	1.6	400/932/7	640/1491/11
WBL/WBT/WBR	1.4	430/4/430	602/6/602
Grand Oak Trail and Upper Middle Road			
EBL/EBT	1.4	30/572	42/801
SBL/SBR	1.4	203/96	284/134
WBT/WBR	1.4	492/77	689/108

The rectification of the above discrepancies would also require some modifications to other parts of the report, such as traffic volumes figures (Figure 5 to Figure 13), Synchro results, etc.

- Please note that in the current SYNCHRO™ tables (Table 4, 5, and 6), some numbers do not match with SYNCHRO™ reports. It is a very minor issue; however, we suggest modifying it to maintain consistency. In addition we observed that the provided document missed two SYNCHRO™ reports (NSR & Bronte 2031 Total PM and NSR-EW & NSR-Halton 2031 Total PM).
- In the fifth paragraph on page 29 (Section 8), please revise two lane roadways for internal roadway system according to Section 5.2 of the report (three lane cross section).

The status of some additional comments provided by the Town of Oakville is as follows:

- Traffic counts have been revised as required. Please note that the counts are within 2 years of the date of the first version of the report (i.e., May 2013). For example some counts are dated June 2011.
- Background figures have been included in the document as requested. However, there are still some issues with the background traffic as indicated above in the requested modifications.
- The revised document has included some relevant details of the Traffic Impact Study prepared for the Third Line parcel.
- Mitigation measures and recommendations are included for all the intersections with the exception of intersections of Third Line with Greenridge Circle and Glen Abbey Gate (please see our comments under suggested modifications).
- The report has included the intersection spacing of new intersections between Upper Middle Road and Woodlands Operations Access.

- With respect to the preliminary design details of Bronte Road at North and South Streets, the report has included the information on lane configurations in the traffic operations section. We suggest including similar details in Section 2.
- The intersections of Upper Middle Road with Third Line and Grand Oak Trail are included in the analyses.
- A separate figure (Figure 7) has been added to identify the traffic volumes generated from the proposed development in the southeast quadrant of the Bronte Road and North Service Road as requested by the Town.
- The report does not include a comment on the impact on extending North Service Road through Halton's existing overflow parking lot.
- Development Staging has been included as requested by the Town.
- The report does not include a review of the impacts on QEW ramps on Third Line. We are not aware whether or not MTO undertook a review of the report due to potential impacts of the development on QEW ramps at Bronte Road and at Third Line.

It should be noted that the objective of the current study does not cover detailed analyses in some areas, which are otherwise required according to North Oakville Terms of Reference for Transportation Impact Studies and Transportation Functional Design Studies (North Oakville Guidelines). These areas include transit impacts including transit market potential estimation, cycling and pedestrian facilities analyses, access geometrics, safety analysis, etc. We are assuming that this level of analysis will be undertaken as part of each specific development plans within the Merton Tertiary Planning Study Area.

Closure

If you have any questions, please contact either of the undersigned at 289-288-0287

Yours truly,
CIMA Canada Inc.
3027 Harvester Road, Suite 400
Burlington, ON

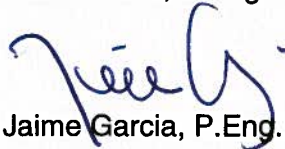
Prepared by:



Sheetal Thukral, P.Eng. M.Eng.

CIMA

Reviewed by:



Dr. Jaime Garcia, P.Eng., PTP, Ph.D

CIMA

7. ARCHAEOLOGY/CULTURAL HERITAGE

January 13, 2014

AMEC Ref No. TP113015.5000

Town of Oakville
c/o Planning Services
1225 Trafalgar Road
Oakville, ON L6H 0H3
Attn: Mr. Kirk Biggar MCIP, RPP, Senior Planner, Long Planning, Planning Services

Dear Mr. Biggar

Re: Peer Review of Stage 1 Archaeological Background Study, Merton Tertiary Plan, Part of Lots 26, 27, 28, 29, 30 & 31, Concession 2 South of Dundas Street (Geographic Township of Trafalgar South, County of Halton), Town of Oakville, Regional Municipality of Halton (AMICK Consultants Limited)

AMEC Environment & Infrastructure, a division of AMEC Americas Limited (AMEC), hereby provides the Town of Oakville with a peer review of the archaeological assessment report entitled: *Stage 1 Archaeological Background Study, Merton Tertiary Plan Part of Lots 26, 27, 28, 29, 30 & 31, Concession 2 South of Dundas Street (Geographic Township of Trafalgar South, County of Halton), Town of Oakville, Regional Municipality of Halton (AMICK Consultants Limited [AMICK], December 17, 2013).*

In the preparation of this review, the following municipal guidance documents were consulted:

- The Merton (QEW/Bronte Road) Tertiary Planning Study Terms of Reference dated February 15, 2013;
- The minutes of the Town of Oakville Planning and Development Council Meeting of November 12, 2012; and,
- The Disposition for the Town of Oakville Planning and Development Council Meeting of November 12, 2012.

The purpose of this review is to determine if the consultant's report was carried out in accordance with the provisions of the Ontario Heritage Act, R.S.O. 1990 by a qualified archaeologist licensed by the Ontario Ministry of Tourism, Culture and Sport (MTCS) and is in compliance with the technical guidelines for archaeological resource assessment prepared by the Province of Ontario. More specifically, we will consider whether the consultant's report: 1) takes into account all conventional features of archaeological potential and thereby provides an accurate reflection of the archaeological potential of the study area; 2) makes appropriate recommendations with regard to any additional archaeological assessments that may be required; and 3) is compliant with the Ministry of Tourism, Culture and Sport's (MTCS) 2011

Standards and Guideline for Consultant Archaeologists (2011 S&G). The detailed review presented below is structured so as to evaluate how well the report addresses each of the requisite components of a Stage 1 archaeological assessment as defined in the 2011 S&G. In accordance with these standards, certain sensitive information, namely archaeological site location mapping, was included in a separate supplementary report. This supplementary report was not made available for review.

DETAILED REVIEW

Cover Page, Executive Summary, Table of Contents and Project Personnel

As required under the 2011 S&G, the report contains the following introductory components: Project Report Cover Page; Executive Summary; Table of Contents; and Project Personnel.

Comments:

The introductory components of the report and their contents are in conformity with the requirements of the 2011 S&G. The cover page (Section 1.0) includes all required information. A concise summary of the assessment is provided in the Executive Summary (Section 2.0). The Table of Contents (Section 3.0) includes all of the requisite headings for a Stage 1 report. The Project Personnel section (Section 4.0) lists all of the necessary information concerning who conducted the assessment.

The Project Personnel page indicates that all work was undertaken under an MTCS Project Information Form issued to a Professionally licensed archaeologist. Moreover, Professionally licensed archaeologists conducted the fieldwork and prepared the report.

Project Context: Development Context, Historical Context, Archaeological Context

As required under the 2011 S&G, the report contains information on Project Context (including Development, Historical and Archaeological Context).

Comments:

The information contained in each of the Project Context sections (Sections 5.0, 5.1., 5.2, 5.3) meets or exceeds MTCS standards. It is stated that this work was carried under the Planning Act (RSO 1990b) in order to support proposed Official Plan Amendments for the Town of Oakville and was conducted in conformity with the 2011 S&G, the Ontario Heritage Act (RSO 1990a) and the Ontario Heritage Amendment Act (SO 2005).

The Development Context discussion provides all of the information required under the 2011 S&G.

The Historical Context discussion is thorough, drawing useful information on the original Township Lots from both secondary sources and primary sources, including Land Registry Abstract Indices, Tax Assessment Rolls, Census Records, Wilmot's Survey Map of 1806, Tremaine's Map of 1858, the Historical Atlas Map of 1877, and the National Topographic Survey

Maps of 1935 and 1988. AMICK also consulted the Town of Oakville Heritage Register for information on registered and listed heritage properties on the property, which include: 2031 North Service Road West (“Hilton House,” c. 1858), 2363 North Service Road West (“George Langtree House,” c. 1850), 1326 Bronte Road (Edwardian and Queen Anne style house and barn, c. 1911), and the Merton Cemetery (c. 1880).

The Archaeological Context discussion is equally thorough and brings to light not only the previously registered archaeological sites both within the study area and within a radius of one kilometer, but also the spatial limits of past archaeological assessments on the Merton lands dating from 1975, 1976, 2007 and 2012. It is stated (page 49) that the 1970s work was so meticulous that the site location information—which was then acquired with compasses and tape measures—would be comparable to results that could be achieved today with a GPS or Total Station. Moreover, the overall quality of the 1975 and 1976 research is said to be consistent with expectations articulated in the 2011 S&G (page 70).

A total of 53 Aboriginal and Euro-Canadian sites have been registered to date within one-kilometer of the study area. Within the study area limits have been found 20 Aboriginal sites and one Euro-Canadian site. Further, the report provides detailed descriptions of these sites and notes that outstanding archaeological concerns exist for six of them, all pre-contact Aboriginal components.

Also under the heading Archaeological Context, the report outlines the general physiography of the study area and the current conditions of each of its constituent property in terms of soil integrity, drainage patterns, topography and vegetative cover. Current conditions are important considerations for the following reasons: previous deep disturbance will have removed archaeological potential, obviating the need for Stage 2 assessment; low, wet or excessively sloping (>20°) terrain is deemed to have low archaeological potential and not to warrant Stage 2 assessment; and the vegetative cover of an area will determine if a Stage 2 assessment must be completed by means of pedestrian survey or hand shovel test pitting. It is concluded that the study area contains: no significant recent disturbances that would have removed archaeological potential; no extensive low-lying and wet areas; and generally flat terrain despite a few spatially limited steep slopes.

In short, with the exception of those portions of the Merton Tertiary Plan that have already been subjected to Stage 2 assessment, any proposed development-related disturbance must be preceded by additional archaeological assessment.

This section of the report also discusses each property in terms of the distribution of open fields, woodlots or orchards/vineyards, and thus whether Stage 2 assessment in each location must be carried out by means of pedestrian survey or test pitting.

Field Methods

As required under the 2011 S&G, a section—here entitled “Property Inspection” (Section 6.0)—describes the manner in which the field inspection was carried out. AMICK did not have permission to enter all of the properties within the Merton Tertiary Plan. Consequently, they confirmed current conditions by means of photo-documentation from roadways and public property as well as through the analysis of satellite imagery and modern maps.

Comments:

The field methods used for the property inspection and the weather conditions during the inspection were in conformity with the requirements of the 2011 S&G.

Analysis and Conclusions

As required under the 2011 S&G, Analysis and Conclusions have been presented (Section 7.0).

Comments:

All properties within the study area are deemed to have archaeological potential on the basis of presence of, or proximity to: streams flowing into Fourteen Mile Creek and Bronte Creek; previously registered archaeological sites—53 within a one-kilometre radius and 21 within the Merton Tertiary Plan itself; early transportation routes, including Bronte Road, Upper Middle Road, Lower Middle Road (now largely under the QEW), Third Line and an unnamed roadway that ran north-south through Lot 27 as depicted in the Historic Atlas Map of 1877 and the 1935 topographic map; and listed and registered properties that may also be associated with nearby archaeological deposits.

The report further asserts that no significant portions of the study area have had archaeological potential removed as a result of deep modern disturbances. On this basis it is correctly concluded that, with the exception of lands that have previously been subjected to Stage 2 assessment, each individual property within the Merton lands must be assumed to contain archaeological potential and to warrant Stage 2 assessment. In addition, outstanding archaeological concerns exist for six previously registered archaeological sites within the Merton Tertiary Plan.

Recommendations

As required under the 2011 S&G, recommendations have been made with regard to the need for further archaeological assessment.

Comments:

This section (Section 8.0) makes recommendations arising from the Stage 1 assessment.

This section also contains a “suggestion” that a more detailed standalone Stage 1 assessment be considered for the larger properties in order to address their complexities and reduce the level of work required in Stage 2. It is stated that such an assessment is currently underway for

the Saw Whet Golf Course lands and should also be considered for Deerfield Golf Course property. AMEC concurs with this strategy but maintains that, rather than being couched as a “suggestion,” it should appear as the first of three enumerated recommendations, thus:

- 1) Given that the Deerfield Golf Course is a large and complex property and not all portions of it could be physically inspected due to access restrictions, it is recommended that this property be subjected to a detailed standalone Stage 1 assessment in order to address its complexities and thereby refine the scope of work required in Stage 2.
- 2) Prior to any development disturbance, Stage 2 assessment by means of either pedestrian or test pit survey, as appropriate to the location and conditions, should be undertaken for all lands with archaeological potential that have not previously been subjected to Stage 2 assessment.
- 3) Prior to any development disturbance, all outstanding archaeological concerns for any previously registered archaeological sites within the subject lands should be addressed by means of Stage 3 assessment. This includes Sites AiGw-23, 26, 33, 36, 50 and Cluster B of AiGw-56. Such assessment may lead to recommendations for Stage 4 mitigation, either by means of avoidance and protection or by means of comprehensive salvage excavation.

Advice on Compliance with Legislation, Bibliography and Sources, Maps and Images

As required under the 2011 S&G, the report provides customary advice from the MTCS regarding the legal responsibilities of the proponent(s) (Section 9.0), and lists the literature, photographs and maps that were consulted in the preparation of the report (Sections 10.0, 11.0 and 12.0, respectively).

Comments:

These sections are properly presented and their contents meet or exceed MTCS standards.

Adequacy

Overall, this report is well prepared and meets or exceeds the requirements of the MTCS *Standards and Guidelines for Consultant Archaeologists* (2011).

Conclusion

Based on our detailed review of the data and property characteristics presented in this report, AMEC would have reached the same conclusions and recommendations as AMICK Consultants Limited. The only changes AMEC would make pertain to the wording of the Recommendations section as noted above.

Sources Consulted

Ontario Ministry of Tourism, Culture and Sport
2011 *Standards and Guidelines for Consultant Archaeologists*

Closure

If you have any questions, please contact either of the undersigned at (905) 312-0700.

Yours truly,

AMEC Environment & Infrastructure
A division of AMEC Americas Limited

Prepared by:

A handwritten signature in cursive script that reads "Shaun Austin".

Shaun Austin, Ph.D.
Associate Archaeologist

Reviewed by:

A handwritten signature in cursive script that reads "Linda Axford".

Linda Axford, MLA, CAHP
Senior Heritage Specialist

8. NOISE

February 24, 2014

TP113015

The Corporation of the Town of Oakville
1225 Trafalgar Road
Oakville, Ontario
L6H 0H3

Attention: Mr. Kirk Biggar, MCIP, RPP
Senior Planner
Long Range Planning, Planning Services

Dear Mr. Biggar:

Re: Peer Review of Preliminary Noise Study (Rev. 3) for the Merton Tertiary Planning Study Area in Oakville, Ontario

AMEC Environment & Infrastructure, a division of AMEC Americas Limited (AMEC), was retained by the Corporation of the Town of Oakville to conduct a technical peer review of the preliminary noise study completed by SS Wilson Associates Consulting Engineers (SS Wilson) for the proposed Merton Tertiary Planning Study Area in Oakville, Ontario. The site is located north of the Queen Elizabeth Way (QEW) - north of the North Service Road, east of Bronte Road (includes some parcels of land located west of Bronte Road), south of Upper Middle Road West and west of the existing residentially developed lands west of Third Line.

The first round of comments was provided on March 25, 2013 and was revised on September 27, 2013 based on the Town's letter dated July 15, 2013 and our subsequent meeting with Town representatives on September 18, 2013. The second round of comments was provided on January 14, 2014 after review of the SS Wilson's Preliminary Noise Study dated December 16, 2013 for Merton Tertiary Planning Study Area, Oakville, Ontario. This peer review report updates our second round of comments based on our meeting with the Town and the Region of Halton's comments on the reports on February, 21, 2014.

The following documents have been reviewed as part of our study:

- "Preliminary Noise Study for Merton Tertiary Planning Study Area, Oakville, Ontario," dated 1 March 2013, prepared by SS Wilson Associates Consulting Engineers (Report No.WA12-032-A REV.1).

- “Preliminary Noise Study for Merton Tertiary Planning Study Area, Oakville, Ontario,” dated 16 December 2013, prepared by SS Wilson Associates Consulting Engineers (Report No. WA12-032-A REV.2).
- “Merton Tertiary Planning Area, Odour and Noise Study Comments” dated February 21, 2014 by the Region of Halton.

In addition, the following regulatory and guideline documents have also been reviewed as part of this peer review:

- i. MOE Environmental Noise Guideline NPC-300, “Noise Assessment Criteria for Stationary Sources and for Land Use Planning”, August 2013;
- ii. MOE Guideline D-6, ‘Land Use Compatibility’, July 1995;
- iii. Ontario Ministry of Transportation (MTO) Environmental Guideline for Noise;
- iv. Oakville Town Noise By-law (2008-098); and
- v. The Region of Halton Noise Abatement Policy for Regional Roads and New Developments.

Most of the first round peer review comments were addressed in the updated report. However, there are few items yet to be addressed in the updated report and they are listed below along with our additional comments:

1. Sample sound calculation for Upper Middle Road does not match the sound level reported in the report for night-time. Predicted sound level per sample calculation is 61.48 dBA and the reported level is 57 dBA.
2. It is stated in the SS Wilson report that for stationary sources, the sound level objectives must be met at the face of the windows at all dwelling levels and that the use of central air conditioning is not an acceptable solution for noise control. This is true of Class 1 or Class 2 areas, but if the area is approved as Class 4, then the use of air conditioning is acceptable per NPC-300 for Class 4 Areas, which subject to approval by the Land-Use Planning authority of the Municipality may be a consideration for this project.
3. We disagree with the comment on page 7 that “the Class 4 classification is not sought after the study area as this may lead to putting undue pressure on the Region in the form of future complaints from future residence subject to the noise from the Public Works Yard”. The Class 4 considers a closed window at the dwelling, compared to open windows for Class 1, which allows for higher plane of window criteria to achieve the same indoor noise level.

NPC-300 also identifies the need to incorporate purchase agreements to notify any potential residents of the Class 4 area designation, with registration on title of the noise mitigation and warning clauses that Class 4 areas sound limits for the dwellings are protective of indoor areas and are based on the assumption of closed windows. A sample clause would include:

“Purchasers/tenants are advised that sound levels due to the adjacent industry (facility) (utility) are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with ventilation/air condition system which will allow windows and exterior doors to remain closed.”

It is our opinion that an assessment of stationary noise sources at the Region Office Buildings, Public Works Yard, Waste Water Treatment Plant and Third Line Waste Water Pumping Station (as identified by the Region) on the proposed development land be conducted and predicts sound levels at the closest sensitive land uses for the classification. The Class 4 Area allows for less stringent noise criteria requirements on the Public Works Yard (and other existing municipal activities), and allows the option for the Municipality and the developer to consider receptor-based mitigations (e.g. upgraded windows) that will not impact their existing operations in order to meet those Class 4 criteria. This is in anticipation of the Land-Use Planning authority granting approval for the Class 4 area designation.

4. Footnote 6 on Page 9 of the report notes “the noise wall will be amplified.” This is ambiguous statement with respect to the performance of the noise wall. The report should provide clarification what is specifically meant by ‘amplified’.
5. The new MOE noise guidelines NPC-300 applicable to the project is considered for the assessment. The report also agrees that noise study is required at various stages of the development. However, it simply classifies the development as Class 1 Area without a detailed noise assessment to justify the Class 1, or consideration for the potential of a Class 4 designation. Further justification of the Class 1 area designation should be provided. In addition, consideration for the area as Class 4 should be provided, as the development may meet this upon approval by the Land-Use Planning authority approval of the Municipality, and Class 4 areas are subject to different criteria than Class 1 areas.
6. The SS Wilson report identifies some of the equipment for the Region Office building, Public Works Yard and Waste Water Treatment Plant, and provides typical sound levels. But it fails to identify Third Line Waste Water Pumping Station. Also, it identifies emergency generators at Region’s Main building and EMS Service building without their ratings. The ratings provided in the report are the MOE criteria (e.g., 700 kW with sound level 75 dBA at 7 m) to qualify for registering under the Environmental Activity and Sector Registry (EASR). A stationary noise impact assessment is required to help the Town with the classification of the Merton Development area. The assessment must include actual noise sources and measured sound levels at the Region Office Buildings, Public Works Yard, Third Line Waste Water Pumping Station (as identified by the

Region) Waste and Water Treatment Plant, and predict sound levels at the closest proposed sensitive land uses.

7. The SS Wilson report provides mitigation options for Concept Options A through C for the Public Works Yard only, not for the line sources (such as transportation corridors).
8. The minimum required barrier height provided in the report for Option B is 5 m and that for Option C is 4 m. Comparing the layouts for both options, it is not clear what makes this difference.

MOE Land Use Compatibility Guideline D-6 is referenced in this report as requested by the Region. It should be noted that the minimum separation distance as provided in the Guideline does not guarantee the sound level at the developing properties; a detailed noise assessment is necessary.

Based on the comments from the Region, it is clear that the Region does not support a Class 4 Area designation for the development, as there is a concern for future complaints. However, consideration for some Class 4 Area designations may be appropriate as part of a broader mitigation strategy. It should be noted that the new classification (i.e., Class 4 Area) as proposed in the new guideline NPC-300 by the MOE was to address these type of issues.

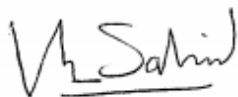
It is our opinion that a detailed stationary noise assessment be completed prior to the classification and the assessment should include all existing facilities surrounding the development area. As the current WWTP is about 21% of the design capacity, the WWTP stationary noise assessment should be completed for both the current and future WWTP capacity.

We hope that this review meets with your present requirements. Should you have any questions or if we can be of further assistance please contact the undersigned at your convenience.

Sincerely yours,

AMEC Environment & Infrastructure
a Division of AMEC Americas Limited

Prepared by:



Mohammed Salim, P.Eng.
Senior Acoustics Engineer

Reviewed by:



Frank Babic, P.Eng., INCE
Acoustics Practice Lead – Eastern Canada

9. ODOUR

February 21st 2014

TP113015

The Corporation of the Town of Oakville
1225 Trafalgar Road
Oakville, Ontario
Canada, L6H 0H3

Attention: Mr. Kirk Biggar MCIP, RPP – Senior Planner
Long Range Planning, Planning Services

Dear Sir:

Re: PEER REVIEW OF THE ODOUR STUDY FOR THE MERTON TERTIARY PLANNING STUDY AREA IN OAKVILLE, ONTARIO

Introduction

AMEC Environment & Infrastructure, a division of AMEC Americas Limited (AMEC), was retained by the Corporation of the Town of Oakville to conduct a technical peer review of the odour study completed by Pollutech Environmental Limited (PEL) for the proposed Merton Tertiary Planning Study Area in Oakville, Ontario. The PEL report provides an assessment of the potential impacts of the expanded Mid-Halton Wastewater Treatment Plant on the Merton Tertiary Planning Area. The peer review was provided on September 6th 2013.

The following additional document provided by the Region has now been reviewed::

- Memorandum Re: "Merton Tertiary Planning Area Odour Study," dated December 12th , 2013, prepared by Pollutech Environmental Limited (PEL).

Comments

In our previous peer review of the Merton Tertiary Area Odour Study AMEC had a number of comments. These have been provided in italics below to provide context to the current document.

- *The objectives of the study are broad in scope and not well defined and this has made it difficult to follow and to link specific conclusions and recommendations to the body of the report or other referenced technical documents.*
 - No further comment required.
- *The report notes that the MHWTP is approximately 280m from the residential development to the NE of the plant site. This exclusion distance does not appear to include Langtry Park to the NE or the Golf Club to the W and SW as part of the sensitive areas under the "recreational area" provision of the Halton Region definition, either of which would expect to reduce this value.*

- The current document continues to reference a distance to nearest residential of 280m. However Figure 10.1 clearly shows the park/diamond closer to the primary clarifiers. If this facility is to be retained then the above “recreational area” provision would apply. This may create a constraint and should be clarified.
- *The 2011 total odour emission rate of 17,262 ou/s specifically excludes the emissions from the biosolids truck loading vent and assumes that the fans at the North Pumping Station Exhaust Stack No. 1 and Exhaust Stack No. 2 were both operating. The total odour emission rate from the plant increases very significantly up to a total of 72,309 ou/s during the approximately 15-minute biosolids truck loading operations each day. It was also noted that during the odour sampling period, the fan at Exhaust Stack No. 2 was operated manually and it was not known if there will be a difference in the odour emissions when the fans are operating automatically versus manually.*
 - We agree with PEL that it would be prudent to conduct dispersion modelling of impacts from the Biosolids truck loading operations. All odour impact tends to be of short term duration and should therefore be included in any maximum impact scenario as this could materially affect any current or future separation distance allocation.
 - We would also recommend that any future test reports and associated modelling be consistent in their reporting of all significant odour emissions including high impact, short term emissions such as the biosolids loadout.
 - Test conditions related to process and operating fan conditions should be clarified.
- *The Zorix assessment also used in the study and referenced a 2007 baseline maximum off property impact (percentile basis) of 5.5 ou based on a total facility emission of 14,675 ou/sec (Zorix Table C25) and a point of impingement at 160m NE of the plant property line (PEL).*
 - Any reference to projected offsite impact should reference dispersion modelling based on all facility sources
- *Modelling the future emissions following the expansion resulted in 5.6 ou at the same receptor distance (Zorix Table C28).*
 - No additional comment
- *Neither case appears to include the short term impacts from the biosolids truck loading operations in the modelling. While one may conclude that this source would fall under the final percentile reduction we believe that this level of source is significant and should have been modelled to assess maximum impact and any potential requirements for operational or process mitigation, and also any impact on current or future separation distance allocation.*
 - Further to our earlier comment and given the inherent nature of odour related complaints we would strongly recommend that facility odour impact assessment include the biosolids loadout and that consideration be given to odour mitigation

- from this source. Failing this we agree with PEL that an increased separation distance may be mandated.
- We note however that the 300m separation line shown on the PEL option A,B & C drawings appears to include park and open space neighbourhood parkette areas to the NE and SE and that odour impacts to such areas could potentially cause complaint.
 - *We agree with Zorix/PEL that there remain opportunities for odour mitigation from some sources (eg clarifier/detritor tanks). However the primary odour source (although short term only) still remains the biosolids truck vent. If this is managed then we would agree with the general conclusions of the PEL study.*
 - No additional comment
 - *The PEL report concludes by a discussion of the separation distance in the context of the Phase IV & V expansion. It notes that the application of a 1.5 safety factor to the modelling result (160m) would result in a separation distance (presumably at the 5.6 ou level) of 240m to minimize odour impacts. No rationale is given for the use of such a multiplier or for the value used.*
 - No explanation provided

In conclusion, given that the currently modelled scenarios do not include all odour sources, and in particular the biosolids loading area, the uncertainty in the modelled odour impacts would in our opinion justify the use of a minimum setback reserve of 300 metres extending from the facility property line. In addition, we would recommend that all odour sources be modelled in the build out scenario to determine whether or not any additional mitigation measures may be required at a 300m setback.

We trust that this review meets with your present requirements. Should you have any questions or if we can be of further assistance please contact the undersigned at your convenience.

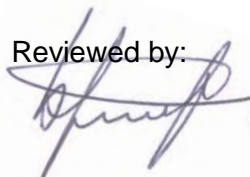
Sincerely yours,
AMEC Environment & Infrastructure
a Division of AMEC Americas Limited

Prepared by:



Steve Lamming PhD EP.
Principal, Air Quality

Reviewed by:



Alex Breido PhD P.Eng
Senior Environmental Engineer