Submission #1 Peer Review Comment Matrix

168 County Road 49, Part Lot 19, Concession 19
Biddle Job Number: 122169
Planscape File Number: 146800

	Comment	Consultant	Response
#	**Preliminary Stormwater Management Report - Jeffery Homes Development - Project No. 21-1-6814 by Greer Galloway and Sanchez Engineers**	**Commenter: Harmanpreet Kaur, Resources Planner, KRCA – Received April 11, 2023**	
1	Section 4 – Soil Data We recommend referencing the results from the geotechnical investigation by Terraspec Engineering Inc, as the test pit data completed as part of the geotechnical investigation would be more accurate that a desktop review.	DGB	Comment noted. The previous submission included a Preliminary SWM Report completed by another consultant. The SWM report included in this submission has been completed by this office, DG Biddle & Associates, therefore the material presented for SWM management in this submission are new.
2	Section 5 – Approval Requirements Stormwater Quantity Controls, Runoff Volume Control, Stream Erosion and Water Balance apply to the proposed development and must be addressed and discussed in the report.	DGB	The proposed stormwater Quantity Controls are clearly addressed and discussed within the SWM report. Runoff Volume Control and Stream Erosion will be discussed in the next submission. It should be noted that the proposed infiltration galleries will likely fulfill their respective requirements as substantial runoff is directed to the galleries for infiltration. The Water Balance will also be discussed in the next submission.
3	Section 6 – Pre-Development Drainage Conditions Please address all external drainage conveyed towards the subject property. Based on Figure 2, there appears to be some external drainage areas to the northwest. Delineate all external drainage areas and present them on Figure 2.	DGB	Refer to response to comment 1. All pre-development areas are shown in the Engineering Drawings Set: 1) 122169 20240315 Pre-Development Storm Drainage Plan (East Parcel) -SD-2 2) 122169 20240315 Pre-Development Storm Drainage Plan (West Parcel) -SD-1.

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4	Please confirm the correct runoff coefficients and areas, as there are discrepancies as indicated in the redlined figures.	DGB	All runoff coefficients are assumed to be below 0.20, therefore Nashyd nodes were used to simulate flow volumes in the Visual Otthymo program. The Curve Number (CN) for each area was calculated to simulate the flow volumes. Calculations are shown in Appendix 1. The corresponding CN number for each drainage area in pre, and post development conditions are shown on Drawing SD-1, SD-2, SD-3 and SD-4.
5	Section 7 – Post-Development Drainage Conditions Please describe how runoff from each area is going to be services. For example, swales, storm sewers… etc.	DGB	A majority of runoff will drain towards rural side ditches. No storm sewers are proposed except at the headwalls.
6	Please describe minor and major flows and how they are being conveyed.	DGB	All flows will be conveyed to rural side ditches to low points in the road where flows will first be infiltrated via infiltration galleries then attenuated above the galleries in the roadside ditches in conjunction with orifices(s) to meet pre-development targets. All remaining flows throughout the subdivision will continue to flow to the rear of the proposed lots as in pre-development conditions.
7	Please provide a storm sewer design sheet if storm sewers are proposed	DGB	No storm sewers are proposed for conveyance.
8	Please provide swale capacity calculations if swales are proposed	DGB	This can be shown at detailed design.
9	Please provide overland flow capacity calculations	DGB	Not required as a new SWM strategy is proposed. All flows are being attenuated within the roadside ditch and being directed through orifices.

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10	Please address all external drainage conveyed towards the subject property and how it is going to be accounted for under post-development conditions	DGB	All external drainage areas conveyed towards subject property will drain through the subdivision via swales at the property lines which discharge to the rural side ditches.
11	Section 8 – Hydrologic Modelling Please provide a reference for the assigned runoff coefficients	DGB	No runoff coefficient will exceed 0.20 for each drainage area. Nashyd nodes only were used in the Visual Otthymo Program.
12	The pre-development drainage areas reported in Figure 8-1 does not correspond with the areas reported in Figure 2	DGB	Refer to response to comment 1.
13	Please provide the rationale for why the SCS 60hour storm was the governing rainfall distribution. Evaluate other rainfall distributions such as the 4-hour Chicago, 12-hour SCS, and 24-hour SCS. The most conservative rainfall distribution should be utilized for water quantity control design	DGB	The 4-hour Chicago Distribution rainfall was used. Additional rainfall distributions will be assessed next submission, and the most conservative distribution will be used.
14	The post-development drainage areas reported in Figures 8-2 and 8-3 do not correspond with those reported in Figure 3.	DGB	Refer to response to comment 1.
15	The post-development VO schematic provided in Figures 8-2 and 8-3 features culverts. Please provide a description and design details of the proposed culverts in the main body of the report. Please provide culvert sizing calculations to ensure that the culvert has sufficient capacity to convey the 100-year flows	DGB	Refer to response to comment 1. A new SWM strategy is proposed.
16	Please report the impervious Manning's roughness and the previous depression storage applied to the VO modelling in Tables 8-4 and 8-5.	DGB	Refer to response to comment 1.
17	Table 8-5 incorrectly reports a pervious Manning's roughness of 0.6. The VO modelling inputs apply a pervious manning's roughness of 0.25. Please Revise	DGB	Refer to response to comment 1.
18	The Table 8-5 header for the XIMP and TIMP columns appear to be swapped. Please revise	DGB	Refer to response to comment 1.
19	Stand HYDs should only be proposed for catchments with impervious ratios larger than 20%. East Basin B, West Basin C, D, and E would be more appropriately modelled with a NasHYD. Please revise	DGB	Comment noted and agreed. Refer to response to comment 1.
20	Section 9 – Stormwater Management	DGB	Refer to response to comments 1. Visual Otthymo version 6.0 was used.

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	The report references VO2 throughout the report. This implies that version 2.0 was used, however, version 6.2 was used as per the modelling output. Please revise to just VO to avoid confusion		
21	The proposed West Pond outlets to the roadside ditches servicing County Road 49, and the proposed East Pond outlets to the roadside ditches servicing Moon Line North. Please evaluate how much flow drains towards these ditches under pre-development conditions and demonstrate that flows directed to the roadside ditches does not increase under post-development conditions	DGB	Refer to response to comment 1.
22	Please describe the proposed quantity control measures: SWM pond active storage, orifice, weir, etc.	DGB	Refer to response to comment 6.
23	Please include discussions on groundwater and if the East and West Pond need to be wrapped with an impermeable liner	DGB	Refer to response to comment 1. A new SWM strategy is proposed. The infiltration galleries must be 1.0m above the seasonally high groundwater. Based on the Borehole data and the additional fill where the proposed infiltration galleries are proposed, this requirement is achieved. This is also discussed in infiltration gallery sizing calculations in Appendix 1 of the SWM Report
24	Please summarize the water quantity volume requirement in comparison to the active storage provided	DGB	Refer to response to comment 1. A new SWM strategy is proposed.
25	The peak storage volumes reported in Table 9-1, reports a peak storage of 3747m3. Please ensure that the numbers reported in the tables correspond to the VO outputs. The Vo outputs indicate that the east active storage provided needs to be significantly increased. Please clarify or revise	DGB	Refer to response to comment 1. A new SWM strategy is proposed.
26	The peak storage volumes reported in Table 9-2 does not correspond with the VO outputs appended. For example, during the 100-year event, the VO outputs report a maximum west pond storage used of 5491m3. However, Table 9-2, reports a peak storage of 5145m3. Please ensure that the numbers reported in the tables correspond to the VO outputs. The VO outputs indicate that the west active storage provided needs to be increased. Please clarify or revise	DGB	Refer to response to comment 1. A new SWM strategy is proposed.

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27	Please ensure the first line of the Route Reservoirs is set to zero. Review all warnings/errors in VO output and revise as needed.	DGB	Refer to response to comment 3. A new SWM strategy is proposed.
28	Please adjust pervious and impervious depression storage for all StandHYDs appropriately (Impervious = 2.0mm, pervious = 5.0mm – representative of asphalt and lawns, respectively), rather than 1.0mm and 1.5mm	DGB	Refer to response to comment 1. A new SWM strategy is proposed.
29	Please provide an emergency outlet sized for the 100-year uncontrolled flow for the proposed SMW ponds	DGB	Refer to response to comment 1. A new SWM strategy is proposed.
30	Please provide the controlled release rates from the SWM ponds from the 2-years to 100-year storm events	DGB	Refer to response to comment 1. A new SWM strategy is proposed.
31	please provide detailed descriptions on how Runoff Volume Control, Stream Erosion and Water Balance are addressed for the proposed development and provide detailed calculations	DGB	Refer to response to comment 2.
32	Please see redlined drawings and calculations attached. We understand that this is a preliminary design submission. As such please provide more detailed engineering drawings (servicing, grading, erosion and sediment control, stormwater management plans., etc) in the next submission. Upon review of the detailed submission, additional SWM comments will be issued as necessary	DGB	Refer to response to comment 1. A new SWM strategy is proposed.
33	The proposed development appears to reduce flows going towards Wetlands 1. A feature-based water balance assessment for Wetlands 1 should be conducted by a qualified professional to ensure that the proposed development will have no negative impacts to Wetlands 1	DGB	All post development flows have been attenuated to below pre-development levels. Therefore, no adverse impact to the wetlands is anticipated.
34	Please provide a description on the proposed erosion and sediment control measure on site	DGB	Refer to section 8.0 of the SWM report.
35	Please provide a description on the operation and maintenance of the proposed stormwater management pond	DGB	Refer to response to comment 1. A new SWM strategy is proposed. Any Operations and Maintenances manuals should not be requested at the preliminary stage of approvals. This can be completed at detailed design.

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	Hydrogeological Investigation and Terrain Analysis Proposed Residential Development, February 2019, Re-issue October 2021 by Jp2g Consultants Inc.	**Commenter: Stantec Consulting Ltd. (Peer Review on behalf of the County of Peterborough)**	
1	Section 3.3 - Hydrogeology There is little to no discussion with respect to the shallow groundwater table in Jp2g (2021). The only reference to the shallow groundwater table was found in the Geotechnical Report (Terraspec, 2021) where it states that groundwater was encountered at the west end of the project at depths of 1.0 m to 1.5 m below existing ground surface based on information collected from 10 test holes. The Terraspec (2021) report refers to this subsurface water as groundwater, whereas the test hole logs indicate the water to be perched.	Cambium	An Updated Hydrogeological Assessment report dated April 19, 2024, was prepared by Cambium to address peer review comments on Jp2g Consultants report dated Oct. 2021.
2	The high groundwater table and shallow groundwater flow direction needs to be defined using a shallow groundwater monitoring well network to assist with: • setting basement elevations • assessing the suitability of various infiltration deficit mitigation measures • the placement of supply wells and sewage system envelopes on each lot (i.e., what direction(s) is groundwater flowing to assist with the placement of this infrastructure) • assessing the relationship between the shallow groundwater table and the wetland (i.e., does the wetland depend on shallow groundwater inputs to maintain its form and function) • septic system design (i.e., will raised beds be required because of a shallow groundwater table or low permeability soils) • assessing the need for construction dewatering.	Cambium	See Sections 4.4 to 4.6 of Updated Hydrogeological Assessment report.
3	The function of the wetland needs to be evaluated to determine if the wetland is a groundwater recharge or discharge feature. If the wetland is a groundwater discharge feature then Jp2g must discuss how groundwater flow to the wetland will be maintained under the post-development condition.	Cambium	See Sections 4.5 of Updated Hydrogeological Assessment report.
4	A pre- and post-development water balance must be completed to assess the infiltration deficit and identify appropriate mitigation measures to maintain pre-development infiltration	Cambium	See Sections 6.0 of Updated Hydrogeological Assessment report

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	rates. This exercise is important to establish whether sufficient infiltration will be available for nitrate dilution to occur under the post-development condition.		
5	The report needs to comment on whether the Site is situated within a Source Protection Vulnerable Area and if there are any Source Protection Policies that may impact the proposed development.	Cambium	See Sections 8.0 of Updated Hydrogeological Assessment report
6	Section 4.0 – Terrain Suitability For Septic Systems Stantec concurs that the septic system density is appropriate for the proposed lot development area. However, as stated above, a pre- and post-development water balance needs to be completed to demonstrate that infiltration rates are maintained under the post-development condition.	Cambium	See Sections 7.0 of Updated Hydrogeological Assessment report
7	Section 7.0 – Groundwater Supply Stantec concurs that the bedrock aquifer beneath the Site is capable of providing potable water for the proposed development.	Cambium	Noted
8	SUMMARY As detailed above, there is information missing in Jp2g (2021) that is required to support the conclusions of the report. This information is as follows: 1. The high groundwater table and shallow groundwater flow direction needs to be defined using a shallow groundwater monitoring well network to assist with: • setting basement elevations • assessing the suitability of various infiltration deficit mitigation measures • the placement of supply wells and sewage system envelopes on each lot (i.e., what direction(s) is groundwater flowing to assist with the placement of this	Cambium	An Updated Hydrogeological Assessment report dated April 19, 2024, was prepared by Cambium to address all peer review comments.

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	infrastructure) • assessing the relationship between the shallow groundwater table and the wetland (i.e., does the wetland depend on shallow groundwater inputs to maintain its form and function) • septic system design (i.e., will raised beds be required because of a shallow groundwater table or low permeability soils) • assessing the need for construction dewatering. 2. The function of the wetland needs to be evaluated to determine if the wetland is a groundwater recharge or discharge feature. If the wetland is a groundwater discharge		

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1	Section 5.0 of the SWM Report summarizes the approval requirements. These requirements do not include the City of Peterborough Water Balance requirement as stated in Section D.2.5.C of the City Engineering Standards, which states that a water balance analysis is required for subdivision applications in order to estimate impacts on the hydrologic cycle in terms of infiltration and runoff. Methodologies such as Thornwaite and Mather based upon location, monthly rainfall and temperature records, vegetation, and soils may be used to complete the water balance in lieu of detailed groundwater modeling. Please include this requirement and provide details to show how it is satisfied, or otherwise provide supporting argument to show why it is not required.	DGB	The previous submission included a Preliminary SWM Report completed by another consultant. The SWM report included in this submission has been completed by this office, DG Biddle & Associates, therefore the material presented for SWM management in this submission are new. A water balance study can be completed and discussed in the next submission. It should be noted that the proposed infiltration galleries will likely fulfill their respective requirements as substantial runoff is directed to the galleries for infiltration.

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2	Section 6 states that basin A and basin B flow ultimately into the adjacent property to the south. Please identify the pre-development flow routes in the drawings and provide further information about the receiving system to ensure that the post development flow will be directed to the same system.	DGB	Refer to response to comment 1. All pre-development areas and discharge points represented as Hydraulic Points A to D are shown in the Engineering Drawings Set: 1) 122169 20240315 Pre-Development Storm Drainage Plan (East Parcel) -SD-2 2) 122169 20240315 Pre-Development Storm Drainage Plan (West Parcel) -SD-1.
3	Section 6 states that a portion of the lower part of basin D flows towards the adjacent property to its south, please identify the pre-development flow routes in the drawings to show this flow pattern. Since there are two outlets to the same basin, it is not clear why was it not divided into two separate basins.	DGB	Refer to response to comment 2. The pre-development drainage boundaries were delineated based on the most up to date contour information and to match the post development hydraulic points for a reasonable pre and post comparison.
4	Section 8.2 states that flow from basins A and B drain into the existing outlet to the west of the lot. This statement contradicts the statement in section 6 (predevelopment drainage conditions) which states that basin A and B flow through the wetlands 5 and 6 and ultimately into the adjacent property to its south. Please update the model accordingly or otherwise provide clarification to remove the contradiction.	DGB	Refer to response to comment 1.
5	Section 8 states that each scenario was analyzed considering the SCS Type II distributions of 6 hours duration for the 2, 5, 10, 25, 50, and 100-year storm events. This is not in line with the requirements stated in Section D.2.5.A (Stormwater Management Quantity Control) of the City of Peterborough Standards, which require analysis using more rainfall distributions. Please update analysis accordingly.	DGB	Additional rainfall distributions will be assessed in the next submission.
6	The pre-development hydrologic model, as presented in Figure 8-1, doesn't include any of the existing wetlands. This will result in over-estimated release rates, as the model doesn't	DGB	Refer to response to comment 1.

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	include the attenuation of flows caused by wetlands. Please revise accordingly.		
7	The report states that the time of concentration (Tc) was calculated using two methods. For C values less than 0.4, the Tc was calculated using the Airport formula, and for C values greater than 0.4, the Bransby Williams formula was used. However, for the post development model, the Bransby Williams formula was used in most cases although the C values are < 0.4. Please revise and update the analysis, or otherwise provide supporting argument for using the Bransby Williams formula.	DGB	Refer to response to comment 1. The time of concentration calculations are shown in Appendix 1 of the SWM report and the time of concentration route and associated inverts are shown in Drawings SD-1 and SD-2 in the Engineering Set. The Upland Method was used to calculate Tc.
8	The detailed calculations of the imperviousness in Appendix A show very small ratios when compared to the values used in Visual Otthymo model, or in tables 8-4 and 8-5 of the report. Please revise to remove inconsistency.	DGB	Refer to response to comment 1.
9	**Figure 2 Predevelopment and Figure 3 Post Development**: As required by the City of Peterborough standards, please provide identification of the pre-Development flow routes. Please show on the drawing the existing and proposed outlet for each basin.	DGB	Refer to response to comment 1.
10	**Figures 1** and **2** have the same title (Predevelopment), please provide further description to the titles to identify the drawings.	DGB	Refer to response to comment 1.
11	**Figure 3 Post Development:** The parameters of basin A are missing in the drawing, please add these parameters.	DGB	Refer to response to comment 1.
12	**Figure 3 Post Development:** There are slight difference in the parameters of the basin between the model and the drawing, please revise for consistency.	DGB	Refer to response to comment 1.
13	**Figure 3 Post Development:** Please show the proposed culverts in the drawing.	DGB	Refer to response to comment 1.

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#	**Phase 1 Assessment of Potential Karst Proposed Residential Development by Greer Galloway Consulting Engineers, 2021**	**Commenter: Stantec Consulting Ltd. (Peer Review on behalf of the County of Peterborough)**	
1	Greer Galloway (2021) provides a good description of the bedrock geology beneath the Site, noting that the eastern half of the Site is underlain by the Bobcaygen Formation, with the western half of the Site underlain by the Verulam Formation. No areas of known karst are mapped as occurring on the property. Greer Galloway (2021) indicated that a small area of inferred karst is mapped in the extreme northeastern portion of the Site and the eastern half of the property is mapped as an area of potential karst. Potential karst areas are basically defined as areas where the type of bedrock is susceptible to karstification but where there have been no direct observations of karst features. The site reconnaissance identified two bedrock outcrops in the eastern part of the property and neither showed evidence of karstification. Also, the driller logs for the four test wells completed in the bedrock did not identify any major fractures or voids that might suggest the presence of karstification.		N/A (including for tracking purposes only)
2	Stantec agrees with the summary provided in Greer Galloway (2021) that there is a low risk of karst features posing a hazard and/or constraint to the proposed development.		N/A (including for tracking purposes only)

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#	**Environmental Impact Assessment for the 1919 Estates Subdivision by Jp2g Consultants Inc. in association with the Greer Galloway Group Inc., June 11, 2018, revised November 3, 2021 and November 28, 2022**	**Commenter: Stantec Consulting Ltd. (Peer Review on behalf of the County of Peterborough)** Note: Wetland delineation should be sent to KRCA too when done.	
1	PURPOSE AND SCOPE OF THE EIA The EIA is in support of a proposed 22 hamlet residential estate lots, two stormwater blocks and one environmental protection block. The stated purposed and scope include:	Cambium	Acknowledged.

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	"The purpose of this report is to provide details regarding the site conditions of Phase 1 of a subdivision proposal located at 168 County Road 49 in the geographic Township of Harvey. This report also provides details on the existence and extent of Bobolink (Threatened), Eastern Meadowlark (Threatened) and Northern Myotis (Endangered) as well as other Species at Risk (SAR) habitat, which were indicated to potentially exist on the subject lands by the Ministry of Natural Resources and Forestry in an email dated May 26, 2017, attached as Appendix C." It was not clear in the EIA if the scope of the EIA was reviewed by Peterborough County including the field program. It's Stantec's opinion that due to the size of the proposed development and the potential for impacting key hydraulic features (KHF) via infilling and crossing, the scope of the EIA did not appear to be adequate to identify KHF and/or key natural heritage features (KNHF) that could be impacted as a result of the proposed development and/or apply appropriate mitigation measures to limit potential impacts. Additional discussion is noted below.		
2	CONFORMITY TO THE PROVINCIAL POLICY STATEMENT (PPS), THE GROWTH PLAN FOR THE GREATER GOLDEN HORSESHOE (GPGGH) AND OTHER PROVINCIAL AND FEDERAL POLICIES AND REGULATIONS It was noted that the proposed development is located within a settlement area; therefore, was not assessed against the policies in the GPGGH. The EIA does not include policy context on how the regulations, policies, acts may impact the proposed development and did not provide information on how the EIA demonstrated conformity to the County or Township OP, the PPS, *Migratory Birds Convention Act* (MBCA), *Fisheries Act* or the *Endangered Species Act* (ESA).	Cambium	Acknowledged. Please note that, as outlined in Section 1.0, the Phase 1 lands are within a settlement area, while the Phase 2 lands currently outside. However, it is intent of the application to pursue a settlement boundary expansion for the Phase 2 lands, which has been presented as such in the EIS.
3	DATABASE COLLECTION The data collection in support of the EIA was limited to correspondence with the Ministry of		See Section 3.1 for background sources reviewed.

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	Natural Resources and Forestry (MNRF), a search of MNRF Make-a-Map: Natural Heritage Areas database and a review of applicable Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status reports. No other provincial databases, wildlife atlases or background resources appear to be assessed to determine potential natural heritage features which could potentially be impacted as a result of the proposed development. Also, the correspondence with the MNRF occurred in 2017.		Please note that recent guidance from MECP have advised that they will no longer be doing background information request reviews, due to a lack of capacity.
4	FIELD STUDIES Site visits were carried out on the following dates: May 23, May 24, June 7, June 8, June 13, June 20, June 27 and June 28 of 2017 to assess site conditions and conduct SAR Surveys. The studies included the following: 1. Three Bobolink/Eastern Meadowlark surveys 2. Five Blanding's turtle surveys 3. Butternut surveys Survey protocols for Bobolink/Eastern Meadowlark and Blanding's turtle was included in the EIA. However, several field methods were not included in the EIA including wetland delineation, ecological land classification (ELC), etc., and/or if the surveyors were qualified to completed wetland delineation. It is also recommended that survey protocols be included in the reference list for the EIA and be referenced in the text for each survey. Although the time of day for some surveys were provided, the field survey program descriptions did not provide the time of day and/or conditions during each site visit. A table with dates, times of day and conditions for the field program is recommended to determine the suitability of the program. SAR screening was conducted as part of the site visit. Additional recommended surveys to be completed for a development of this size include the following: 1. Wetland delineation using protocols in the Ontario Wetland Evaluation Systems (OWES).	Cambium	See Section 4.0 and Table 5 for a list of surveys, timing and conditions. Below are comments intended to address the additional survey recommendations component of this comment. 1. Wetlands were delineated by OWES certified staff using methods outlined in 3.2.1. 2. Noted. ELC mapping completed as per methodology outlined in 3.2.1. Details are provided in Section 4.3 and shown on Figure 2 and 3. 3. Bat maternity roost surveys as well as acoustics monitoring was completed, as outlined in Sections 4.7.4.1 and 4.7.4.2. 4. Noted. Both standard Breeding Bird surveys as well as Grassland Bird surveys were completed as outlined in Sections 3.2.4 and

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	2. Vegetation mapping consistent with Ecological Land Classification (ELC) for Southern Ontario: first approximation and its application. 3. Bat acoustic surveys. 4. Breeding bird surveys (as only 9 bird species were included in the report), Stantec assumes a full breeding bird survey was not completed during Bobolink and Eastern Meadowlark surveys), including crepuscular surveys for Eastern Whip-poor-will and Common Nighthawk. 5. Evening breeding amphibian call surveys. 6. Fish and fish habitat assessment. It is Stantec's opinion that there is not enough background information included in the EIA to determine which natural heritage features may be impacted as the result of the proposed developments. Findings during the desktop review and field program included:		3.2.5. See Section 4.7 and Appendix E for Breeding Bird results, as well as applicable results sections for Eastern Meadowlark (4.10.1.2) and Eastern Whip-poor-will (4.10.1.3) 5. Amphibian breeding call surveys were completed at 10 stations as outlined in Sections 3.2.7 and 4.7.2. We note that the first survey could not be completed given the timing of retention. Further discussion is provided in 5.2.2. Aquatic and Fish Habitat Assessment completed. See Sections 3.2.2, 3.2.3, 4.2, 4.9, and 5.3.
5	VEGETATION Vegetation communities were mapped in Map 3 (Bobolink & Eastern Meadowlark Survey Stations & Vegetation Communities); however, ELC codes were note provided to allow the reviewed to determine potential SWH features which may be on-site. Map 3 did not provide the vegetation communities within the buffer to Wetland 1. It was also noted on Map 3, that a bedrock outcrop occurs on site.	Cambium	See comment above and Figure 2 and Figure 3.
6	WETLANDS AND WATERBODIES Several wetlands and a watercourse were mapped. However, the watercourse was not delineated, and the location was identified as approximate. It is also unclear of wetlands	Cambium	See response to Comment #4, above. See Section 5.1 and 5.2.2 regarding the proposed impacts to Wetlands 2 and 3.

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	were mapped consistent with OWES protocols. Several wetlands were noted to be on the subject property which were determined to potentially be impacted (infilled) as the result of development. It was noted that Wetland 1 was mapped differently on Map 1 and 3 than it was presented on Map 2. Some discussion on this discrepancy is recommended.		Please note that naming conventions and delineation of wetlands on Site differ from original EIA, as they did not appear to be field verified in the original submission.
7	SPECIES AT RISK ASSESSMENT The EIA included a list of potential SARs which was provided via email correspondence from the Ministry of Natural Resources and Forestry. However, no other resources, provincial databases, etc., appears to be referenced in support of the EIA. Stantec recommends that a review of the *Draft Client's Guide to Preliminary Screening for Species at Risk* (MECP 2019) be considered in support of the EIA. The report's justification for concluding no suitable habitat for SAR bats does not appear to be consistent with current guidance from MECP (Treed Habitats – Maternity Roost Surveys, MECP Undated), which required targeted surveys if trees are present with a diameter at breast height of 10 cm or greater. The EIA discounts the presence of Eastern Hog-nosed Snakes, as they were not observed during site visits. However, for a species with a large home range and that occurs in low densities in the landscape, lack of detection should not be used to conclude absence. Stantec recommends using habitat suitability to assess potential presence / absence. Stantec recommends referring to the *Blanding's Turtle General Habitat Description*, when assessing the presence/absence of habitat for that species. While Stantec notes Blanding's Turtles were not observed on site during targeted surveys, protected habitat may still be present if the species has been recorded within 2 km. The rationale for discounting suitable Eastern Whip-poor-will habitat is not clear. The species	Cambium	See Section 4.10 and Appendix B for Species of Conservation Concern (including SAR) Screening. Targeted SAR surveys were completed for SAR Bats, Eastern Whip-poor-will, Bobolink/Eastern Meadowlark, and Blanding's Turtles.

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	often nests in habitats with a mosaic of fields and woodlands, which appear to occur on site.		
8	FISH HABITAT No fish or fish habitat assessment was completed in support of the EIA. On Page 3 of 16, the EIA provided the following: *"No fish were observed during visual searches in the watercourse on the subdivision lands during the site visits to the property."* It is noted that visual searches are not an appropriate method to assess the presence of fish habitat. Identification of fish habitat should refer to definitions and guidance in the PPS and the *Natural Heritage Reference Manual*.	Cambium	Noted and agree. A License to Collect Fish for Scientific Purpose (LCFSP) was acquired with the intention to survey the on-site watercourse (Watercourse 1), however, the feature was dry during the sampling period. Given the poor connectivity to downstream habitat, and lack of overwintering habitat, the watercourse was not characterized as fish habitat. Further discussion is provided in Section 4.2 and 4.9
9	SIGNIFICANT WILDLIFE HABITAT Stantec was unsure if the *Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E* (MNRF 2015) was referenced while conducting the review of SWH. The was no reference to the Schedules provided in the reference list so Stantec assumes that the *Schedules* were not referenced. Also, the ELC codes were not provided in the EIA and it was unclear if the ELC codes were cross referenced with the schedules. The EIS indicated the following regarding SWH: *"Based on the field studies carried out at the subdivision lands, the potential for other species of special concern and their habitat to be present on the subdivision lands is minimal. Similarly, significant features such as other seasonal concentration areas of animals and rare vegetation communities are not anticipated to occur on the site. Amphibian breeding habitat (specialized habitat for wildlife) potentially exists on and adjacent to the subject lands. Only one wood frog was noted during the site visits to the property, however in order to protect potential amphibian breeding*	Cambium	A SWH screening is provided Appendix F with supporting discussion in Section 4.8. Mitigation and recommendations as it relates to SWH is provided in Section 5.2.1 and summarized in Section 7.0.

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	habitat on and adjacent to the subject lands, the mitigation measures in this report should be properly implemented. The site also provides some animal movement corridors for species along the fencerows on the subdivision lands. Therefore significant wildlife habitat potentially occurs on the subdivision lands and adjacent lands." However, typically for a development of this scope a table is recommended to be provided in the EIA which demonstrates compliance with the PPS in Policy 2.1.5: *"Development and site alteration shall not be permitted in:…* *d) significant wildlife habitat;…* *unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions."*		
10	SIGNIFICANT WOODLANDS Regarding Significant Woodlands, Stantec acknowledges the following statement in the EIA and has not residual concerns: *"Based on the characteristics and size of these woodlands and the lack of suitable interior habitat, the woodlands on the subdivision lands themselves are not considered to be significant woodlands."*	Cambium	Noted and agreed. No significant woodlands were identified on Site, as discussed in Section 4.5
11	IMPACT ASSESSMENT AND MITIGATION MEASURES WETLANDS, WATERBODIES AND FISH HABITAT The PPS states the following:	Cambium	See above Comment #8. No fish habitat was identified in Watercourse 1 or in the on-site wetlands. We note that farm ponds hydrologically isolated from

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	"2.1.6 – Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements." The EIA states the following: *Potential fish habitat is present in the ponds, watercourse and wetlands on the subject lands, however, no fish were noted during visual searches in these surface water features during the site visits to the property. All development will occur at least 30 metres from Wetland 1 located through the middle portion of the subject lands as well as 15 metres from the smaller wetlands and ponds on the subject lands, with the exception of Wetlands 4, 5 and 6 as well as the watercourse. Wetlands 4, 5 & 6 and the watercourse will be directly impacted as a result of the development of the subdivision lands. However, provided the mitigation measures outlined in the next section are implemented, no adverse impacts on fish or potential fish habitat will occur within the watercourse, wetlands or ponds on the subject lands.* There was no discussion within the EIA about the types of fish or fish habitat which was on-site, potential fish which could be impacted and there was no sampling conducted, no background search completed and no correspondence with Fisheries and Oceans Canada (DFO) provided. Stantec recommends further discussion is provided to determine how the proposed infilling of ponds and wetlands addresses the provisions in 2.1.6 of the PPS. Without a proper understanding of the fish and fish habitat on-site, an appropriate impact analysis and supporting mitigation measures cannot be completed. In addition, consultation with the Conservation Authority (CA) and DFO is recommended to receive government input to address provision 2.1.6 of the PPS.		downgradient habitat are not subject to protective provisions under the *Fisheries Act.*

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12	IMPACT ASSESSMENT AND MITIGATION MEASURES As indicated, in the previous section, ELC codes are recommended to be included in the EIA and SWH should be reviewed against the *Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E* (MNRF 2015). Additional field surveys are likely required to be able to assess the presence of SWH. In addition, it was noted that several wetlands and ponds were recommended to be infilled. Stantec recommends that the EIA address potential animal movement corridors and how that may affect amphibian's ability to carry out life functions as well as isolating breeding habitat to Wetland 1 from the other wetlands, etc.	Cambium	See response to Comment #4 and #9, above.
13	In paragraph 1 of Section 4.2 of the EIA, the following was stated: *"As Wetland 1 is larger and contains more features and functions, a 30 metre wide buffer area from the edge of the wetland boundary of Wetland 1 on Block 25 should be maintained in a natural vegetated state, with an exception for a meandering pathway to the wetland."* However, in Maps 1 and 3, it appears that the 30 m buffer will not be able to be maintained as the location of the delineated wetland is different on Map 2 compared to Maps 1 and 2. Some further discussion is recommended as to whether the 30 m buffer from the wetland will be maintained.	Cambium	Notwithstanding a small area in the northeast of the Site (Figure 3), a 30 m buffer has been provided to the central Wetland 1. Further, enhancement areas outside the lotting fabric, as well as within the buffer itself, have been identified for enhancement initiatives to mitigate impacts from the proposed removals on Site.
14	Several timing windows were provided in Section 4.2; however, there were no references in the report from where the timing windows were determined. There were no in-water timing window provided to avoid impacts to potentially spawning fish except recommendations to complete the work during the summer.	Cambium	See response to Comment #11

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15	There were no mitigation measures provided to reduce potential impacts to amphibians should the wetlands be considered significant wildlife habitat.	Cambium	See response to Comment #2 and Comment #9. Wetland 3 is not considered SWH. Recommendations are provided to further characterize Wetland 2 and/or inform impact evaluation. See Section 5.2.2
16	Erosion and sediment control (ESC) measures were not included in the report except for the installation of the culvert. Stantec recommends that and ESC plan is prepared prior to construction.	Cambium	Noted and agree. See recommendations in Section 7.0
17	The EIA indicates the following: "*No building envelopes will be in proximity to the watercourse on the property however, the access road will be constructed over this watercourse. In order to mitigate potential impacts on the potential fish habitat within the watercourse and surrounding wetland the following mitigation measures should be implemented for any culverts to be installed under the access roads on the subdivision lands*." Stantec is unable to identify where the watercourse is except for an estimate location on Maps 1, 2 or 3, and if correspondence has occurred with DFO and/or the local CA regarding the watercourse crossing. It's also unclear from the background information provided, what could potentially be impacted and if the changes and/or infilling of wetlands, establishment of stormwater management ponds will have impacts upon the potential fisheries resources within the channel and/or if it shall permanently affect the flow within the channel. Stantec recommends that the watercourse be appropriately delineated and a water balance model be considered to determine potential impacts. Without a clear understanding of the fish and fish habitat which is located on-site, a proper impact analysis cannot be completed.	Cambium	See response to Comment #11.

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18	Regarding the mitigations for the watercourse, Stantec has the following concerns: • No thermal regime has been provided in the report and specific in-water work timing windows is provided. • It's unclear if a geomorphological study was completed to determine culvert sizing. • Stantec assumes that a CA permit and/or a DFO review will be completed as part of the proposed project. This letter shall not be considered a full review of the mitigations as it's Stantec's opinion that CA and DFO review shall be completed and a design of the culvert and mitigation measures is required to determine potential impacts.	Cambium	See response to Comment #11 regarding fish habitat. As such, a request for review is not recommended. However, it is acknowledged that a permit will be required by Kawartha Conservation Authority (KCA) for the proposed culvert crossing.
19	It was noted in the EIA that: *"The pond on Lot 6 is also a small, isolated feature which contains limited features and functions. However, as this feature contains standing water, a 15 metre wide buffer area from the pond on Lot 6 should be maintained in a natural vegetated state, with an exception for a meandering pathway constructed of permeable surface materials. No impermeable surfaces should be located within 15 metres of this feature."* Some discussion regarding why a 15 m is appropriate for this feature is recommended. VPZ for KHF in the GPGGH is 30 m.	Cambium	Please note that the proposed culvert is within the settlement boundary, and therefore the GPGGH does not apply.
20	It was noted in the EIA that: *"At the time that a portion of Wetland 4 and Wetland 6 will be filled in order to construct access roads to the property and if Wetland 5 will be removed, if there is standing water present, defishing, if applicable will need to occur prior to filling it in.*	Cambium	See response to Comment #11 regarding fish habitat.

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	A sampling permit will be required from the Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF) for the defishing." However, there was no discussion on where the fish would be placed after in-filling would occur and if DFO has reviewed these considerations for their input moving fish from one wetland to another and/or what potential impacts this may have on resident amphibian and fish of the receiving wetlands.		
21	SUMMARY It is Stantec's opinion that additional information is recommended to be provided to both identify natural heritage base-line conditions within the subject property, development of appropriate mitigation measures and an assessment of the potential impacts the proposed development may have on the natural features on-site as outlined in this letter.	Cambium	Acknowledged.

	Comment	Consultant	Response
#	**Traffic Impact Assessment, Greer Galloway Consulting Engineers, December 15, 2022**	**Commenter: Stantec Consulting Ltd. (Peer Review on behalf of the County of Peterborough)**	
1	**Comment 1 –** Under Section 2.0, the TIA states that "The approach for this Traffic Impact Assessment was to follow the guidelines of the MTO General Guidelines for the Preparation of Traffic Impact Studies". It is not clarified why the MTO TIS Guideline was selected for this study. The study shall follow the County of Peterborough Traffic Impact Assessment Guidelines.	Nextrans	Acknowledged
2	**Comment 2 –** Under Section 2.0, the TIA states that "… utilizing Highway Capacity Software (HCS7) to determine if the existing road network has the ability to service the proposed development at an acceptable level of service". As per the County of Peterborough TIA	Nextrans	Acknowledged. Synchro 10 software was used to conduct the traffic analysis

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	Guidelines "The analyses should be done using Trafficware's, Synchro software". Please revise the analysis by utilizing Synchro.		enclosed in the revised Transportation Impact Study.
3	**Comment 3 –** Under Section 2.0, the TIA states that traffic volumes "The traffic volumes generated by the proposed development were estimated using the Institute of Transportation Engineers (ITE) Trip Generation, 10th Edition, Code 210". The study shall utilize the latest ITE TG Manual (11^{th}) version.	Nextrans	The revised Transportation Impact Study utilizes information contained in the ITE Trip Generation Manual 11^{th} Edition to generate site trips.
4	**Comment 4 –** Under Section 3.2, excerpts of the proposed development plan are shown as illustrated below. Both Street A and Street B seems to be planned to provide access to the future phases of the site and serve traffic volumes more than the traffic generated by the site discussed in this study. While the report states both roads will terminate in cul-de-sacs, Street A is extended north-east and Street B is divided to two roads and has an extension to north-west, west of Moon Line Road North, east of Block 23. The study shall be revised and include an estimation of the future phases of the development to consider the traffic expected to the future phases.	Nextrans	The analysis has been updated in the revised Transportation Impact Study, in accordance with the latest development plans, and the site traffic generated by the entire site has been considered in this analysis.
5	**Comment 5 –** Under Section 3.3.1, TIA states that "County Road 49 is a main road that conveys traffic to and from the Town of Bobcaygeon and is under the jurisdiction of the City of Kawartha Lakes." County Road 49 is under the jurisdiction of the County of Peterborough.	Nextrans	Acknowledged. Mention of County Road 49 being under the jurisdiction of the City of Kawartha Lakes has been removed in the revised Transportation Impact Study.
6	**Comment 6 –** Under Section 4.0, TIA provides traffic counts in the study area. There are several concerns about this information as follows: • Traffic count for the intersection of CR49 and CR 36 is from 2009 (14 years old). Any data collected older than 3 years usually being considered as obsolete. • Traffic counts in Section 4.2 are collected along County Road 36 approximately 4.8km east if its intersection with CR49. It is not clear what is the purpose of presenting this information.	Nextrans	New traffic data was collected and used in the revised Transportation Impact Study.

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	• Manual traffic count presented in Section 4.3 does not provide information on the time span the data was collected (start and end time, AM peak, or PM peak). It is not clear when the data is collected or what exactly included in the SB, NB, EB, and WB volumes presented. • There is no data available for Moon Line Road North. It is recommended that new traffic counts at locations representing the future proposed site future access road locations at CR49 and Moon Line Road North to be conducted to be utilized for assessment of the access intersections.		
7	**Comment 7 –** Under Section 5.1, the methodology used for trip generation calculation is not accurate, the analysis does not use the ITE average rate or fitted curve and only includes directional distribution percentages with the assumption of 1 trip per unit. Please update trip generation forecast to include the ITE 11th trip generation rate in the calculation.	Nextrans	Trip rates and site generated trips were derived from the information contained in ITE Trip Generation Manual 11th Edition. The average rate was used to calculate the number of trips the subject site will generate.
8	**Comment 8 –** Please provide trip generation estimation for the future phases of the site. The access analysis shall include the full development traffic.	Nextrans	The analysis has been updated in accordance with the latest development plans, and the site traffic generated by the entire site has been considered in this analysis.
9	**Comment 9 –** Under Section 6.1, the traffic volumes presented in Table 6-1 by "applying a general 2% annual growth rate to the 2009 traffic volumes presented in the 2012 City of Kawartha Lakes Master Plan, future traffic conditions for the year 2032" seems to be redundant. There are discrepancies between the data in this table and Table 6-2. As an example, while CR 40 SB in 2009 is reported as 440 veh/hr, it is reduced to 270 veh/hr in 2017. It is not clear what is the use of this information. We recommend new counts to be conducted at CR 49 and Moon Line Road North and to be utilized in the study.	Nextrans	New traffic data was collected and used in the revised Transportation Impact Study.
10	**Comment 10 –** It is not clear why CR 39 data is presented in the study as it is not being used in the future sections.	Nextrans	Acknowledged. The study area intersections and associated traffic data

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#	**Traffic Impact Assessment, Greer Galloway Consulting Engineers, December 15, 2022**	**Commenter: Stantec Consulting Ltd. (Peer Review on behalf of the County of Peterborough)**	
			reviewed in the revised Transportation Impact Study have been updated.
11	**Comment 11 –** Please provide figures for the traffic volumes forecasted at the intersection of CR 49 and Street A and the intersection of Moon Line Road North and Street B for both AM and PM peak hours. It shall include trips to the future phases on the development as well.	Nextrans	Traffic figures have been included in the enclosed study.
12	**Comment 12 –** Under Section 6.2, the study shall provide operations analysis for both access intersections including the intersection of CR 49 and Street A and the intersection of Moon Line Road North and Street B using Synchro software and based on updated traffic volumes considering the comment provided in this peer review.	Nextrans	Acknowledged. Access operations are included in the future total section of the revised Transportation Impact Study.
13	**Comment 13 –** The study shall provide auxiliary lane warrant analysis for left and right turns at the access intersections as per the County TIA Guidelines.	Nextrans	Left turn lane warrant analysis is discussed in the future total section of the revised Transportation Impact Study, and excerpts of left turn lane warrants from the TAC-2017 Guidelines are enclosed in Appendix F of the revised TIS.
14	**Comment 14 –** Site internal circulation shall be reviewed. The site entrances and internal circulation including proposed cul-de-sacs must be designed to meet County and local municipal standards for the land use that is being developed. The internal roads must have a cross-section that will provide for good internal site traffic circulation as well as, access by municipal service vehicles and EMS vehicles.	Nextrans	AutoTURN analysis in the revised TIS demonstrates that a P TAC-2017 vehicle and fire truck are able to enter and exit the subject site unencumbered as well as maneuver throughout the proposed cul-de-sac without issue.
15	Based on the above, this TIA report prepared in support of the proposed residential development was found to contain undocumented assumptions and missing calculations, which may have an impact on the results of the access intersection layouts and operations analysis and future transportation requirements. As a result, the impact of the proposed residential development on the adjacent road network may not have been satisfactorily assessed. It is recommended for the Peterborough County to request a detailed comment response or an update to the TIA report from the applicant to address the issues brought to light in this Peer Review.	Nextrans	Acknowledged.

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	Comment	Consultant	Response
#	**Geotechnical Report by Terraspec Engineering Inc., December 6, 2021**	**Commenter: Stantec Consulting Ltd. (Peer Review on behalf of the County of Peterborough)**	
1	The comments regarding the geotechnical investigation report are provided in two forms: Recommendation and For Consideration. Recommendation comments are considered fundamental to providing the necessary information in the report for purposes of design and construction. For Consideration comments are offered as suggestions for clarifications or additions that may assist the designers, regulatory authorities, and other readers in understanding specific aspects of the report. The comments provided are referenced to the section headings provided in the report. Section numbers were not included in the document.		
2	**Introductory Comments** **Recommendation 1** – The section includes general reference to the scope of development (number of building lots). It is presumed that there was no information available at the time of the investigation with respect to the type or size of residences or to the presence of basements or garages. If available at this time, it is recommended that this information be included in the report to assist in providing appropriate geotechnical parameters and recommendations for use in design and construction.		Cambium report includes development details known to date, including the use of the latest site plan with new borehole locations in the same figure.
3	**General Site Data** **Recommendation 2** – The text states that the site consists "mainly" of undeveloped land. It is recommended that clarification be provided with respect to use of the word "mainly". If there is historic or existing development, comment should be provided on any required demolition, decommissioning, or similar undertaking.		Cambium report outlines site description details and acknowledgement of an existing dwelling.

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#	**Geotechnical Report by Terraspec Engineering Inc., December 6, 2021**	**Commenter: Stantec Consulting Ltd. (Peer Review on behalf of the County of Peterborough)**	
4	**Investigation** **Recommendation 3** – The investigation did not include a survey to establish the ground surface elevations at the investigation hole locations. The profile shown on the Test Hole Log Data page attached to the report uses the ground surface as the datum. Further to this, Section 1, Cut and Fill Operation, in the Recommendations section of the report refers to the relevance of the existing grades in the context of any planned cut and fill and in the context of possible garages in the residences. In the absence of a field survey, it is recommended that the ground surface elevations at the investigation hole locations be inferred from the topography shown on Drawing DP-1 in the Planning Justification Report to assist the designers in further evaluating the site conditions and possible approaches to development. The profile on the Test Hole Log Data should be adjusted accordingly. Appropriate caveats can be included in the report with respect to the interpretation and accuracy of the elevations inferred from the Topography plan used for that purpose. **For Consideration** – It would be of value to provide a general summary of the overall topography on the property (referring to visual observations at the time of the investigation and referring to the topographic plan included in the Planning Justification Report). **For Consideration** - Comment regarding the presence/type of vegetation on the property is included in the Recommendations section of the report (e.g. Section 3. Permeability and Erosion). The Authors may wish to consider moving that description to this section to provide the designers/readers with a more complete description of the property in this section. **For Consideration** – The investigation consisted of a series of test pits undertaken with a tracked excavator. It would be of benefit to provide a brief description of the backfilling procedures adopted on completion of the test pits.		Cambium report includes geodetic borehole elevations.

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#	**Geotechnical Report by Terraspec Engineering Inc., December 6, 2021**	**Commenter: Stantec Consulting Ltd. (Peer Review on behalf of the County of Peterborough)**	
5	**Soil Conditions** **For Consideration** – The Authors may wish to consider revising the section heading to include reference to the bedrock and Groundwater that was encountered in the test pits. **For Consideration** – Additional information concerning the presence/absence of caving and condition of the side-slopes would be of benefit, particularly in the context of the seepage conditions referenced on the test hole summaries in the attachment. **Recommendation 4** – The section references the presence of cobbles in the native glacial till soil. The test hole summaries provided in the attachment to the report also reference the presence of boulders. It is recommended that the text include reference to the presence of boulders and that comment be provided with respect to the quantity/volume of cobbles and boulders observed as this could have an impact on excavation, reuse and backfill. **For Consideration** – It is inferred from the test hole summaries that the excavator could not penetrate the bedrock. Confirmation in the form of an explicit statement in this respect would be of benefit, particularly if the scope of development should require excavation into the underlying bedrock for any purpose. **Recommendation 5** – It is recommended that additional comment regarding the groundwater conditions be provided. Reference to the range in depth that the perched water was encountered in the test holes on the west side of the property would be of value. In addition, confirmation that there was no accumulation observed in TH2 and TH3 would be of benefit. The report refers to the presence of 'perched water' but a statement should be included identifying if the perched condition observed is considered to be the 'static groundwater table' in the west portion of the property. **For Consideration** – The laboratory test results included with the report indicate the predominant soil type encountered in the test pits can be classified as GM. Can the Authors confirm the group naming convention consistent with the MTO (MTC) Soil Classification System as referenced in the report (e.g. silty sand versus silty gravel).		Bedrock and groundwater sections are provided separately in the Cambium report (Sections 4.4 and 4.5). The presence of cobbles/boulders is outlined in the text and in the borehole logs of the Cambium report. Groundwater conditions is discussed further in the Cambium report, with groundwater level measurements from the installed monitoring wells.

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#	**Geotechnical Report by Terraspec Engineering Inc., December 6, 2021**	**Commenter: Stantec Consulting Ltd. (Peer Review on behalf of the County of Peterborough)**	
6	**Laboratory Analysis** **For Consideration** – This section includes a paragraph describing the regional physiography and geology. It is suggested that this may be better included in the Introductory Comments section or the Investigation section above.		n/a
7	**Cut and Fill Operations** **Recommendation 6** – Paragraph 1 discusses the possibility of cutting the existing grade. It is recommended that discussion/clarification be provided given the conditions encountered in the test holes (e.g. groundwater was only encountered on the extreme west portion of the site). The discussion should also address the presence of the wetland in the central portion of the site and the potential implications in this respect as warranted. The Authors may wish to specify a limiting depth of cut in consideration of the potential presence of the groundwater table but also in consideration of the presence of the bedrock that was encountered in 2 of the test holes on the west portion of the site.		Excavations and water/dewatering is discussed further in the Cambium report, Section 5.3 and 5.4.
8	**Cut and Fill Operations** **Recommendation 7** – Paragraph 2 discusses the possibility to raise the existing grade by up to 2 m. For purposes of clarity, it is recommended that the Authors state if the existing silty sand with trace gravel soil can remain in place under this scenario, or if it should be removed with the topsoil.		Cambium report addresses the backfill recommendations including the ability to reuse existing soil (Section 5.5). Discussion of the grade being raised, with recommendations, is also provided in Section 5.6. As mentioned in the Cambium report, it should be noted that at the time of the report, the actual finished floor elevations (FFE) were not available.
9	**Cut and Fill Operations** **Recommendation 8** – Paragraph 2, Line 2 states in part that the existing topsoil layer would require complete removal prior to raising the site. It is acknowledged that this		This is discussed in Cambium's Section 5.5.

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	section refers specifically to cut and fill operations. However, consistent with industry practice, removal of the topsoil will also be required in all areas of planned construction including residences, roads, and SWM infrastructure. It is recommended that this requirement be added to the report.		
10	**Cut and Fill Operations** **Recommendation 9** In addition, commentary regarding the presence of cobbles and boulders in the native soils should be addressed in the context of possible reuse of the existing soils.		Cambium report, Section 5.5 includes commentary on this.
11	**Permeability and Erosion** **For Consideration** – Paragraph 3 provides an estimate of the Wischmeier K value. The value is described as "in the range of" though only a single value is provided. The Authors may wish to consider clarifying the value as an estimated or approximate value. **For Consideration** – Paragraph 5 provides a recommendation for a Type 2 Geosynthetic where rip rap is considered for erosion protection. It is inferred that the recommendation considers the geosynthetic classification provided in ASTM D8364. The authors may wish to include this reference or provide an alternative classification and referenced such as that in OPSS 1860.		N/A
12	**New House Foundations** **For Consideration** – The Authors may wish to consider including the reference for the recommended depth of frost cover for foundations, whether based on OPSD 3090.101, the table of values for Ontario towns/cities/locations provided by MTO, or regional familiarity/knowledge. **Recommendation 10** – The section includes recommendations for bearing reactions and resistances. It is recommended that guidance be provided with respect to any applicable minimum/maximum dimensions for conventional spread and/or strip footing foundations.		See Cambium's Section 5.6

	Comment	Consultant	Response
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13	**New House Foundations** **Recommendation 11** – Paragraph 2 provides the recommended bearing reaction and resistance for design of foundations for the residences if placed on the prevailing native silty sand and gravel till (silty gravel and sand). In consideration of the potential to raise the grade, the Authors should provide recommended bearing reactions and resistances for foundations placed in the surficial silty sand with trace gravel (if the Authors recommend that this soil can remain in place) or on engineered fill as described in Section 1. Cut and Fill Operations.		See Cambium's Section 5.6.
14	**New House Foundations** **Recommendation 12** – Paragraph 3, Line 2 states that a reduced bearing reaction/resistance would be applicable for 'wet' subgrade conditions. Clarification should be provided with respect to this statement. Should wet conditions be encountered at the time of excavation and construction, a reduced bearing would necessitate re-design of the foundations, potentially resulting in delays. The Authors may wish to consider making recommendations to remedy the field conditions to permit the use of the recommended values in the report; this could include localized sub-excavation and replacement or improved/supplementary drainage.		N/A. See Cambium's groundwater, dewatering and foundation sections.
15	**New House Foundations** **For Consideration** – It is suggested that guidance be provided with respect to any applicable minimum/maximum dimensions for conventional spread and/or strip footing foundations placed on the native soils or on engineered fill used to raise the existing grades to the design grades. **For Consideration** – It is suggested that additional clarification be provided with respect to Paragraph 4 and the requirement to have a P.Eng. set the basement floor elevations. The context and specific intent of that statement is not clear.		N/A (and see above regarding dimensions).

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	Dewatering **For Consideration** – In consideration of the focus of this section, the Authors may wish to revise the section heading to "Construction Dewatering". **For Consideration** – Paragraph 5 pertains to construction traffic and disturbance of the exposed sub- grade. It is suggested that this paragraph be moved to another section.		N/A to Cambium's report
	Seismic Parameters **For Consideration** – Consistent with the OBC and NBC, the selection of the Seismic Site Class is based on the subsurface conditions to a depth of 30 m below foundation level. It is suggested that the report include reference to this specific requirement and include a description of the shallow overburden conditions and inferred contact with the underlying bedrock (assuming the Authors used the N-value method for assessment) consistent with determining that Site Class C applies for the site.		See Section 5.11 in the Cambium report
	Geotechnical Parameters **Recommendation 13** – Geotechnical parameters are included for the predominant native till soil and for Granular B Type I (differentiating between a more granular material and a more sandy material). It is recommended that parameters for the OPSS SSM be provided as well (given the cut and fill section includes a recommendation for this material to be used in any proposed grade raise). It would also be of benefit to confirm if different parameters should be used for the surficial silty sand with trace gravel (recognizing that this soil was of limited thickness). **For Consideration** – In accordance with good industry practice, it is suggested that comment be provided with respect to the minimum dimension (width or wedge) of granular required adjacent the wall (for purposes of drainage and with respect to the use of the appropriate lateral earth pressure parameters).		N/A
	Subdrains		See Section 5.7 in Cambium's report.

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	Recommendation 14 – The Authors may wish to consider revising the section heading to Permanent Drainage for clarity. It is recommended that specific comment and recommendation be provided in the context of any residence that includes a basement, particularly with consideration for the groundwater conditions observed in the west portion of the site.		
	Concrete No comments		
	Reuse of Subsoils **Recommendation 15** - Confusion may arise given Section 1 states that OPSS SSM can be used to raise the grade on the site whereas Section 9 states that fill used beneath "structures" should consist of OPSS Granular B Type I. It is recommended that the two sections be reviewed and edited as required for consistency and clarity.		N/A, Cambium addresses requirements for raising the grade.
	Reuse of Subsoils **Recommendation 16** – Clarification should be provided as to whether the predominant native till soil encountered in the test holes can be used as service trench backfill (in conjunction with Section 11. Pipe Installation below).		Reuse of subsoils is mentioned in Cambium's Section 5.5.
	Floor Slabs **For Consideration** – The recommended thickness of the concrete floor slab should be reviewed and confirmed as 127 mm is a somewhat unusual recommendation. **For Consideration** – The recommended granular under the floor slab consists of 2 materials. It is suggested that this be reviewed and confirmed as typical residential construction uses only one type of material.		

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	Floor Slabs **Recommendation 17** – The top layer of granular recommended for under the concrete floor slab is described as "Base". It is recommended that an OPSS designation be provided for this material.		See Section 5.6.1 of Cambium's report.
	Floor Slabs **Recommendation 18** – The existing subgrade preparation addresses proof-rolling and the presence of deleterious soils or organics. It is recommended that an additional comment be provided referencing the required removal of cobbles and boulders, where exposed, to permit proof-rolling and subsequent placement and compaction of the granular materials.		See Section 5.3, 5.5, and 5.6.1 for encountered cobbles/boulders
	Floor Slabs **For Consideration** – The report states that required areas of sub-excavation should be backfilled using an acceptable subgrade material or OPSS SSM. It is suggested that this recommendation be revised to indicate that the backfill should consist of OPSS SSM or similar material, or Granular B Type I (or better).		N/A
	Floor Slabs **Recommendation 19**– Designers often require a modulus of sub-grade reaction for design of concrete slabs. It is recommended that a value be provided for this purpose in consideration of the anticipated sub- grade conditions and the granular base/sub-base materials recommended in the report.		See Cambium's Section 5.6.1
	Pipe Installation **Recommendation 20** – With reference to Section 9. Reuse of Subsoils above, comment should be provided regarding whether the predominant native till soil encountered in the test holes can be used as service trench backfill. Should the use of the existing subsoils be recommended, comment should be provided regarding the removal of any cobbles and boulders encountered at the time of excavation.		It is understood that the development/homes will be on septic with water supplied from the town/municipality – See Cambium's section 5.9 for recommendations. Cambium's Section 5.5 discusses the reuse of the native soils.

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			Cambium's Section 5.3, 5.5, and 5.6.1 discuss encountered cobbles/boulders.
	Pipe Installation **Recommendation 21** – It is recommended that this section also reference the City of Peterborough Engineering Design Standards (December 2022) and Peterborough Utilities Commission Construction Specifications (January 2022) and confirm that the recommendations in the report meet the City of Peterborough Standards and Specifications.		N/A
	Pavement Design **Recommendation 22** – The report references OPSS 1150 in the context of the recommended pavement design. OPSS 1150 addresses the asphalt material requirements for roads. It is recommended that reference be provided to the pavement designs in Table C.1 Geometric Standards for Road Design in the City of Peterborough - Engineering Design Standards. If the right-of-way width and pavement width are known (or can be assumed), the report should confirm that the proposed design meets or exceeds the requirements in the Standards. If the details of the proposed roads are not known or cannot be assumed, it is recommended that general reference be made to the Standards, such that the appropriate pavement design can be adopted for the project when the required design details are available. The report should also reference Clause B.1.9.12 and the Drawings in Appendix A of the Standards for specific requirements associated with drainage of roadways.		Development is not within City of Peterborough limits
	Compaction Requirements **For Consideration** – The section includes a blanket statement regarding the lift thickness and compaction requirement for fill materials placed on the site. The Authors may wish to review the recommended compaction requirement with respect to material placed as backfill adjacent basement walls or similar. The Authors may also wish to include a comment regarding moisture conditioning of the native soils, if and as required.		See Cambium's Section 5.5.
	Test Hole Log Data Sheet		N/A

	Comment	Consultant	Response
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	For Consideration – The legend in the top right of the sheet indicates that "s" refers to sample. However, in the table, it appears that the samples are indicated only by a number, except for a single "s" that appears above the inferred ground surface line for the stratigraphy associated with Test Hole 1.		
	SUPPLEMENTARY COMMENTS The following comment pertains to an item not specifically addressed in the preceding section of this review. **Recommendation 23** - The scope of development described in the Planning Report includes Storm Water Management (SWM) infrastructure. The report does not include any comments or recommendations in this respect. If information is now available in this respect, it is recommended that the report be amended to include recommendations for design and construction of the infrastructure. This may include a discussion regarding depth of excavation, construction of earth berms, pond liners for containment, erosion protection for slopes, and piping/inlet/outlet structures. If information is not currently available in this respect, it is recommended that the report include a specific statement in this regard.		It is understood that there are currently no more SWM ponds being proposed