



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

Protecting the Natural  
Environment from  
Lake to Escarpment

November 16, 2018

Steve Grace, C.E.T  
Program Manager, Water Resources  
Town of Halton Hills  
1 Halton Hills Drive  
Halton Hills, ON L7G 5G2

**BY EMAIL**

Dear Mr. Grace,

**Re: Supplemental Assessment of Stormwater Management Plan for Vision  
Georgetown Secondary Plan Area, Town of Halton Hills  
CH File: MPR 634**

Conservation Halton (CH) staff has reviewed the following assessment and offers comments below:

- *Supplemental Assessment of Stormwater Management Plan for Vision Georgetown Secondary Plan Area, Town of Halton Hills*, prepared by Wood Environment & Infrastructure Solutions, dated September 6, 2018.

The supplemental assessment recommends revised sizing criteria which would reduce the footprint of stormwater management (SWM) facilities by up to 58.8% for the 100 year event and 75.2% for the Regional storm event compared to the sizing criteria advanced in the May 2017 Subwatershed Study (SWS). This is based on the Tributary 'A' configuration and cross-sections from Wood's *Riparian Storage Assessment and Watercourse Corridor Planning* document (April 19, 2018).

While the April 2018 document was supported by CH, staff made clear that the ultimate watercourse corridor sizing is to be based on an analysis that comprehensively addresses the full range of channel and valley system functions, as detailed in Appendices R and V of the May 2017 SWS. Further, we noted that it may result in changes to channel configuration and that such changes would need to be incorporated into future hydrologic analysis.

While CH staff generally concurs with the supplemental assessment, there are a few items that warrant confirmation prior to CH staff supporting the sizing criteria. We acknowledge that some of the following comments may be beyond the scope of Wood's current work plan and are to be addressed as part of a future study. In those cases, we request that the Town/Wood confirm how and when those comments will be addressed, as well as identify the study lead (e.g. supplemental SWS Addendum Studies, community-wide Environmental Implementation

Reports (EIR) and Functional Servicing Studies (FSS) in support of future Planning Act applications, etc.).

1. Confirm that the model used as the "parent model" was the "Controlled" scenario model developed by AECOM as part of the May 2017 SWS for the purpose of setting SWM Targets.
2. Confirm that the post-development hydrologic analysis does not credit LIDs in development of SWM targets.
3. Clarify how the application of alternate rainfall distributions for the 1:2 year through 1:100 year storms would impact peak flows and storage targets. The impact of alternate rainfall distributions should be evaluated as part of this assessment and justification provided for the rainfall distribution recommended for use.
4. Note that the feasibility of the conceptual SWM facility locations will be confirmed in subsequent stages of the planning process. The *Future Drainage Plan (Drawing No. 1)* shows facility A5B outletting to the upstream end of AM-4 which is not a preferred location. Therefore, preliminary grading plans will need to support the SWM facility and outlet locations.
5. Confirm whether there will be a loss of channel routing function resulting from channel modifications outside of Tributary A. It is anticipated that some channel routing will be lost through modifications to Tributary C.
6. Provide additional analysis to determine the suitability of mitigating potential flood risk along Tributary A through adjacent grading. Confirmation is required that upstream areas not be impacted by increased water surface elevations along Tributary A. Furthermore, it is noted that any changes to the channel geometry in an effort to mitigate flood risk will need to be incorporated back into the hydrologic model. It is possible that this analysis will identify the need for increased channel corridor widths.
7. Provide analysis to demonstrate that flood conveyance is achieved under future conditions (with crossings included) for CH to support the proposed controlled future flows and watercourse corridors. Regional flows at internal nodes 1, 2, 4 and 5 are significantly increased from existing conditions.
8. Include the impacts on downstream flood risk and flood hazard within SWM targets. It is recommended that the analysis be extended downstream, preferably to the confluence of Tributary E and Tributary A. CH staff provided comments on a draft terms of reference for a downstream assessment in a letter dated March 28, 2017 and are available to meet with Town staff to discuss the study scope further.
9. Confirm that the erosion targets included in the design are sufficient to prevent increases to erosion along Tributary A where peak flow increases are proposed.
10. Provide supporting information or rationale for imperviousness calculations.
11. Provide a table comparing SWS existing updated existing peak flows at the reference nodes noted and revisit the percent changes noted, and that all flow reference nodes used in the

SWS be carried forward in this supplemental assessment (Section 3.1 Updated Existing Conditions Flow).

12. Justify the extended detention volumes listed in Appendix B for Tributary D and E. CH staff note that the SWS specifies extended detention of 300 m<sup>3</sup>/ha for Tributaries A, C, D and E (Appendix B).
13. Provide sources for the volume and facility areas provided based on the May 2017 SWS are requested. Have these values been calculated based on the updated drainage areas provided as part of this assessment? (Appendix B).
14. Provide additional information to support estimates of SWM facility areas. The estimate should include additional lands required for freeboard, berming, maintenance, etc.

Please contact the undersigned at extension 2311 with any questions regarding the above comments or to arrange a teleconference call or meeting to discuss further.

Sincerely,



Matt Howatt  
Environmental Planner

CC (by email): Aaron Farrell, Wood Environment & Infrastructure Services  
Ron Scheckenberger, Wood Environment & Infrastructure Services  
Steve Burke, Town of Halton Hills  
Rick Reitmeier, Halton Region  
Barbara Veale, Conservation Halton  
Kellie McCormack, Conservation Halton  
Josh Campbell, Credit Valley Conservation

**Vision Georgetown Supplemental Assessment of Stormwater Management Plan, prepared by Wood**

Comment #	General Comment(s)	WOOD RESPONSE
1.	Confirm that the model used as the "parent model" was the "Controlled" scenario model developed by AECOM as part of the May 2017 SWS for the purpose of setting SWM Targets.	The model used as the "parent model" was "Controlled_Flows_(Culverts-Storages-Routing)-SWM_Targets" and was updated to remove the hydraulic structures (i.e. culverts) and their upstream storages at roadway crossing, consistent with conventional practice.
2.	Confirm that the post-development hydrologic analysis does not credit LIDs in development of SWM targets.	That is correct, the post-development hydrologic analysis does not credit LIDs in development of SWM targets.
3.	Clarify how the application of alternate rainfall distributions for the 1:2 year through 1:100 year storms would impact peak flows and storage targets. The impact of alternate rainfall distributions should be evaluated as part of this assessment and justification provided for the rainfall distribution recommended for use.	As described in the Vision Georgetown SWS prepared by AECOM in May 2017 pp 54, various design storm distributions were assessed including 24 hour-Chicago, 24-hour SCS type II and AES distribution. It was noted that "The 24-hour Chicago rainfall distribution was determined to be the critical distribution for the sub watershed providing the largest peak flows and has been applied for the design storm event analysis." To maintain consistency with the approach applied in the Subwatershed Study, and as discussed previously with Conservation Halton, the 24-hour Chicago rainfall distribution has been used for this assessment as well.
4.	Note that the feasibility of the conceptual SWM facility locations will be confirmed in subsequent stages of the planning process. The Future Drainage Plan (Drawing No. 1) shows facility A5B outletting to the upstream end of AM-4 which is not a preferred location. Therefore, preliminary grading plans will need to support the SWM facility and outlet locations.	Comment noted.
5.	Confirm whether there will be a loss of channel routing function resulting from channel modifications outside of Tributary A. It is anticipated that some channel routing will be lost through modifications to Tributary C.	All channel modifications will be required to comply with the recommendations of the Subwatershed Study or any amendments as approved by Conservation Halton and the Town of Halton Hills.
6.	Provide additional analysis to determine the suitability of mitigating potential flood risk along Tributary A through adjacent grading. Confirmation is required that upstream areas not be impacted by increased water surface elevations along Tributary A. Furthermore, it is noted that any changes to the channel geometry in an effort to mitigate flood risk will need to be incorporated back into the hydrologic model. It is possible that this analysis will identify the need for increased channel corridor widths.	The grading plan adjacent to Tributary A will be developed as part of future studies. Nevertheless, the analyses completed for the current study have demonstrated that the conceptual realignment and configuration for Tributary A would result in upstream water surface elevations at or below existing levels, hence would not increase the flood risk to upstream properties. Requirements to incorporate changes to the channel configuration into future hydrologic modelling are similarly noted.
7.	Provide analysis to demonstrate that flood conveyance is achieved under future conditions (with crossings included) for CH to support the proposed controlled future flows and watercourse corridors. Regional flows at internal nodes 1, 2, 4 and 5 are significantly increased from existing conditions.	The increased peak flows at nodes 1,2,4 and 5 for the Regional Storm (as well as for 2-100 year design storms) are considered attributable to the PCSWMM subcatchment parameter refinement; specifically, to the updated subcatchment slope and Manning's 'n' values of the external subcatchments. The results presented in the September 6, 2018 Technical Memorandum indicate that the updated stormwater management facility unitary sizing criteria and conceptual watercourse configuration and alignment would control post-development flows to pre-development levels for all events up to and including the Regional Storm event at the outlet of Tributary A. As part of the next stages of planning and design, the grading plan and sizing of hydraulic structures for future roadways would be established such that adjacent properties would be afforded the appropriate level of flood protection from Regulatory flood levels.
8.	Include the impacts on downstream flood risk and flood hazard within SWM targets. It is recommended that the analysis be extended downstream, preferably to the confluence of Tributary E and Tributary A. CH staff provided comments on a draft term of reference for a downstream assessment in a letter dated March 28, 2017 and are available to meet with Town staff to discuss the study scope further.	Comment noted. As previously discussed with Conservation Halton, the PCSWMM model developed by AECOM as part of SWS does not extend to include properties and reaches downstream of Eighth Line. Nevertheless, the model domain can be extended as part of subsequent studies, and the analyses undertaken accordingly to verify no impacts to downstream properties.
9.	Confirm that the erosion targets included in the design are sufficient to prevent increases to erosion along Tributary A where peak flow increases are proposed.	The scope of work for the addendum focused on verifying and refining the stormwater management facility sizing for flood protection, hence the sizing criteria for erosion control has not been revised from that advanced in the Subwatershed Study. It should be noted that the hydrologic analyses for the updated unitary storage and discharge criteria, as provided in the September 6, 2018 Technical Memorandum, have not included the extended detention storage and discharge for erosion control with the stormwater management facility rating curves incorporated into the hydrologic model, hence the unitary sizing criteria for flood control, as advanced in the September 6, 2018 Technical Memorandum, would not be affected by changes to the sizing criteria for erosion control.
10.	Provide supporting information or rationale for imperviousness calculations.	The imperviousness coverages for the area subcatchments have been developed based upon the current conceptual Land Use Plan (Ref. Figure 1, Farrell/Scheckenberger-Buonpensiero/Grace, May 4, 2018), and areally weighting the the imperviousness values listed in Table 1 of the May 4, 2018 Technical Memorandum. The intersect tool from ArcMap™ (ESRI) has been used to calculate the resulting percentage of each land use within a given future subcatchment boundary, and the overall subcatchment imperviousness was then calculated using "area-weighting" approach within a given subcatchment.

11.	Provide a table comparing SWS existing updated existing peak flows at the reference nodes noted and revisit the percent changes noted, and that all flow reference nodes used in the SWS be carried forward in this supplemental assessment (Section 3.1 Updated Existing Conditions Flow).	The objective of the supplemental assessment has been to verify the performance of the unitary stormwater management facility sizing criteria presented in the May 2017 Subwatershed Study, and refine as appropriate based upon the conceptual land use plan and configuration for Tributary A. Recognizing that the stormwater management facility locations and watercourse alignment used for this assessment differ from those applied for the Subwatershed Study, the reference nodes used for comparison would necessarily differ from those applied for the Subwatershed Study. Nevertheless, the nodes at the study area outlet, as well as the nodes at key watercourse confluences, have been retained as appropriate for this assessment.
12.	Justify the extended detention volumes listed in Appendix B for Tributary D and E. CH staff note that the SWS specifies extended detention of 300 m <sup>3</sup> /ha for Tributaries A, C, D and E (Appendix B).	As noted, the erosion control criteria advanced in the May 2017 Subwatershed Study by AECOM has not been re-evaluated as part of this assessment, and further have not been included in the storage-discharge relationships modelled to establish flood control criteria. The information in the May 2017 Subwatershed Study completed by AECOM (ref. pp 402) indicates that no erosion analysis was conducted for tributary D and E and erosion control target has been assumed to be the same as that for Tributary A (i.e. 300 m <sup>3</sup> /ha). As noted previously, the supplemental assessment has not included the extended detention storage in the simulated facility rating curves or the updated unitary storage volumes advanced for flood control, hence changes to the erosion control requirements would not affect the sizing criteria for flood control.
13.	Provide sources for the volume and facility areas provided based on the May 2017 SWS are requested. Have these values been calculated based on the updated drainage areas provided as part of this assessment? (Appendix B).	The SWM facility footprint calculations have been based on the revised drainage areas and unitary sizing criteria provided within the supplementary assessment for flood control, and the unitary sizing criteria for erosion control as advanced in the May 2017 Subwatershed Study by AECOM.
14.	Provide additional information to support estimates of SWM facility areas. The estimate should include additional lands required for freeboard, berming, maintenance, etc.	The sizing calculations provided in the supplemental assessment have been completed to inform land budget calculations for planning purposes. The calculations have assumed 5:1 side slopes, 4:1 length:width ratios, maximum 2.5 m detention storage, maximum 3 m permanent pool volume, and an additional 20% sizing to account for maintenance access and other appurtenances. The additional considerations noted by the Authority are more appropriately included in the sizing calculations as part of the next stages of planning and design, at which time the grading plan would be established for the watercourse and development area.

DRAFT

**Conservation Halton (CH) comments to Wood Response Matrix for the Supplemental Assessment of SWM Plan for Vision Georgetown Secondary Plan Area**

#	CH Comment from November 16, 2018	Wood Response received November 5, 2019	CH Comment from January 20, 2020	When to Address
1.	Confirm that the model used as the “parent model” was the “Controlled” scenario model developed by AECOM as part of the May 2017 SWS for the purpose of setting SWM Targets.	The model used as the “parent model” was “Controlled_Flows_(Culverts-Storages-Routing)-SWM_Targets” and was updated to remove the hydraulic structures (i.e. culverts) and their upstream storages at roadway crossing, consistent with conventional practice.	Comment addressed.	Addressed
2.	Confirm that the post-development hydrologic analysis does not credit LIDs in development of SWM targets.	That is correct, the post-development hydrologic analysis does not credit LIDs in development of SWM targets.	Comment addressed.	Addressed
3.	Clarify how the application of alternate rainfall distributions for the 1:2 year through 1:100 year storms would impact peak flows and storage targets. The impact of alternate rainfall distributions should be evaluated as part of this assessment and justification provided for the rainfall distribution recommended for use.	As described in the Vision Georgetown SWS prepared by AECOM in May 2017 pp 54, various design storm distributions were assessed including 24 hour-Chicago, 24-hour SCS type II and AES distribution. It was noted that “The 24-hour Chicago rainfall distribution was determined to be the critical distribution for the sub watershed providing the largest peak flows and has been applied for the design storm event analysis.” To maintain consistency with the approach applied in the Subwatershed Study, and as discussed previously with Conservation Halton, the 24-hour Chicago rainfall distribution has been used for this assessment as well.	The requested analysis was outside of the scope of SWS work, but was to be completed in future studies. Larger Corridor/SWM Blocks may be necessary once the analysis is completed. If the Town wants to confirm the proposed SWM Block sizes are conservative, the recommended analysis must be incorporated into an integrated supplemental assessment.	Integrated Supplemental Assessment or EIR/FSS

4.	<p>Note that the feasibility of the conceptual SWM facility locations will be confirmed in subsequent stages of the planning process. The <i>Future Drainage Plan (Drawing No. 1)</i> shows facility A5B outletting to the upstream end of AM-4 which is not a preferred location. Therefore, preliminary grading plans will need to support the SWM facility and outlet locations.</p>	<p>Comment noted.</p>		<p>Future planning stages – EIR/FSS</p>
5.	<p>Confirm whether there will be a loss of channel routing function resulting from channel modifications outside of Tributary A. It is anticipated that some channel routing will be lost through modifications to Tributary C.</p>	<p>All channel modifications will be required to comply with the recommendations of the Subwatershed Study or any amendments as approved by Conservation Halton and the Town of Halton Hills.</p>	<p>This analysis is deferred to a future study. Larger SWM/Corridor Blocks may be necessary once the analysis is completed. If the Town wants to confirm the proposed SWM Block sizes are conservative, the recommended analysis must be incorporated into an integrated supplemental assessment.</p>	<p>Integrated Supplemental Assessment or EIR/FSS</p>

6.	<p>Provide additional analysis to determine the suitability of mitigating potential flood risk along Tributary A through adjacent grading. Confirmation is required that upstream areas not be impacted by increased water surface elevations along Tributary A. Furthermore, it is noted that any changes to the channel geometry in an effort to mitigate flood risk will need to be incorporated back into the hydrologic model. It is possible that this analysis will identify the need for increased channel corridor widths.</p>	<p>The grading plan adjacent to Tributary A will be developed as part of future studies. Nevertheless, the analyses completed for the current study have demonstrated that the conceptual realignment and configuration for Tributary A would result in upstream water surface elevations at or below existing levels, hence would not increase the flood risk to upstream properties. Requirements to incorporate changes to the channel configuration into future hydrologic modelling are similarly noted.</p>	<p>The current study does not demonstrate that upstream water surface elevations will be maintained at or below existing levels. Further analysis has been deferred to future study. Increased corridor block widths may be necessary once the analysis is completed.</p>	<p>Integrated Supplemental Assessment or EIR/FSS</p>
----	---	---	---	--

DRAFT

7.	<p>Provide analysis to demonstrate that flood conveyance is achieved under future conditions (with crossings included) for CH to support the proposed controlled future flows and watercourse corridors. Regional flows at internal nodes 1, 2, 4 and 5 are significantly increased from existing conditions.</p>	<p>The increased peak flows at nodes 1,2,4 and 5 for the Regional Storm (as well as for 2-100 year design storms) are considered attributable to the PCSWMM subcatchment parameter refinement; specifically, to the updated subcatchment slope and Manning's 'n' values of the external subcatchments. The results presented in the September 6, 2018 Technical Memorandum indicate that the updated stormwater management facility unitary sizing criteria and conceptual watercourse configuration and alignment would control post-development flows to pre-development levels for all events up to and including the Regional Storm event at the outlet of Tributary A. As part of the next stages of planning and design, the grading plan and sizing of hydraulic structures for future roadways would be established such that adjacent properties would be afforded the appropriate level of flood protection from Regulatory flood levels.</p>	<p>This analysis is deferred to a future study. Larger SWM/Corridor Blocks may be necessary once the analysis is completed. If the Town wants to confirm the proposed SWM Block sizes are conservative, the recommended analysis must be incorporated into an integrated supplemental assessment.</p>	<p>Integrated Supplemental Assessment or EIR/FSS</p>
----	---	---	---	--

8.	<p>Include the impacts on downstream flood risk and flood hazard within SWM targets. It is recommended that the analysis be extended downstream, preferably to the confluence of Tributary E and Tributary A. CH staff provided comments on a draft terms of reference for a downstream assessment in a letter dated March 28, 2017 and are available to meet with Town staff to discuss the study scope further.</p>	<p>Comment noted. As previously discussed with Conservation Halton, the PCSWMM model developed by AECOM as part of SWS does not extend to include properties and reaches downstream of Eighth Line. Nevertheless, the model domain can be extended as part of subsequent studies, and the analyses undertaken accordingly to verify no impacts to downstream properties.</p>	<p>This analysis is deferred to a future study. Larger SWM Blocks may be necessary once the analysis is completed. If the Town wants to confirm the proposed SWM Block sizes are conservative, the recommended analysis must be incorporated into an integrated supplemental assessment.</p>	<p>Integrated Supplemental Assessment or EIR/FSS</p>
9.	<p>Confirm that the erosion targets included in the design are sufficient to prevent increases to erosion along Tributary A where peak flow increases are proposed.</p>	<p>The scope of work for the addendum focused on verifying and refining the stormwater management facility sizing for flood protection, hence the sizing criteria for erosion control has not been revised from that advanced in the Subwatershed Study. It should be noted that the hydrologic analyses for the updated unitary storage and discharge criteria, as provided in the September 6, 2018 Technical Memorandum, have not included the extended detention storage and discharge for erosion control with the stormwater management facility rating curves incorporated into the hydrologic model, hence the unitary sizing criteria for flood control, as advanced in the September 6, 2018 Technical Memorandum, would not be affected by changes to the sizing criteria for erosion control.</p>	<p>This analysis is deferred to a future study. Larger SWM Blocks may be necessary once the analysis is completed. If the Town wants to confirm the proposed SWM Block sizes are conservative, the recommended analysis must be incorporated into an integrated supplemental assessment.</p>	<p>Integrated Supplemental Assessment or EIR/FSS</p>

10.	Provide supporting information or rationale for imperviousness calculations.	The imperviousness coverages for the area subcatchments have been developed based upon the current conceptual Land Use Plan (Ref. Figure 1, Farrell/Scheckenberger-Buonpensiero/Grace, May 4, 2018), and areally weighting the imperviousness values listed in Table 1 of the May 4, 2018 Technical Memorandum. The intersect tool from ArcMap™ (ESRI) has been used to calculate the resulting percentage of each land use within a given future subcatchment boundary, and the overall subcatchment imperviousness was then calculated using “area-weighting” approach within a given subcatchment.	Comment addressed.	Addressed
-----	--	---	--------------------	-----------

DRAFT

11.	Provide a table comparing SWS existing updated existing peak flows at the reference nodes noted and revisit the percent changes noted, and that all flow reference nodes used in the SWS be carried forward in this supplemental assessment (Section 3.1 Updated Existing Conditions Flow).	The objective of the supplemental assessment has been to verify the performance of the unitary stormwater management facility sizing criteria presented in the May 2017 Subwatershed Study, and refine as appropriate based upon the conceptual land use plan and configuration for Tributary A. Recognizing that the stormwater management facility locations and watercourse alignment used for this assessment differ from those applied for the Subwatershed Study, the reference nodes used for comparison would necessarily differ from those applied for the Subwatershed Study. Nevertheless, the nodes at the study area outlet, as well as the nodes at key watercourse confluences, have been retained as appropriate for this assessment.	<b>Comment not addressed – for discussion.</b> It appears that existing peak flows (2-year to 100-year) have increased by 8% to 44% along Tributary A and at its outlet. A comparison between existing peak flows from the SWS and the supplemental assessment would aid in confirming whether or not this is the case. It would be helpful to gain a better understanding as to why this change occurred and justification for the modelling approach used. Dependent on this conversation it would also be beneficial for some of this detail to be included in the Supplemental Assessment to support the proposed SWM criteria.	Integrated Supplemental Assessment or EIR/FSS
-----	---	---	---	---

12.	Justify the extended detention volumes listed in Appendix B for Tributary D and E. CH staff note that the SWS specifies extended detention of 300 m <sup>3</sup> /ha for Tributaries A, C, D and E (Appendix B).	As noted, the erosion control criteria advanced in the May 2017 Subwatershed Study by AECOM has not been reevaluated as part of this assessment, and further have not been included in the storage-discharge relationships modelled to establish flood control criteria. The information in the May 2017 Subwatershed Study completed by AECOM (ref. pp 402) indicates that no erosion analysis was conducted for tributary D and E and erosion control target has been assumed to be the same as that for Tributary A (i.e. 300 m <sup>3</sup> /ha). As noted previously, the supplemental assessment has not included the extended detention storage in the simulated facility rating curves or the updated unitary storage volumes advanced for flood control, hence changes to the erosion control requirements would not affect the sizing criteria for flood control.	If the Supplemental Assessment is updated, the extended detention values provided for Tributaries D and E should be corrected in the Appendix B Table. If outstanding issues are deferred to the next level of study, it should be ensured that the correct values are used at that time. As noted under Comment #9, larger SWM Block sizes may be necessary once the erosion control criteria are incorporated into the SWM Pond design.	Integrated Supplemental Assessment or EIR/FSS
13.	Provide sources for the volume and facility areas provided based on the May 2017 SWS are requested. Have these values been calculated based on the updated drainage areas provided as part of this assessment? (Appendix B).	The SWM facility footprint calculations have been based on the revised drainage areas and unitary sizing criteria provided within the supplementary assessment for flood control, and the unitary sizing criteria for erosion control as advanced in the May 2017 Subwatershed Study by AECOM.	Comment addressed.	Addressed

14.	Provide additional information to support estimates of SWM facility areas. The estimate should include additional lands required for freeboard, berming, maintenance, etc.	The sizing calculations provided in the supplemental assessment have been completed to inform land budget calculations for planning purposes. The calculations have assumed 5:1 side slopes, 4:1 length:width ratios, maximum 2.5 m detention storage, maximum 3 m permanent pool volume, and an additional 20% sizing to account for maintenance access and other appurtenances. The additional considerations noted by the Authority are more appropriately included in the sizing calculations as part of the next stages of planning and design, at which time the grading plan would be established for the watercourse and development area.	Defer to Municipality to confirm additional 20% sizing adequately accounts for maintenance access and other requirements for current planning purposes.	N/A
-----	--	--	---	-----

DRAFT