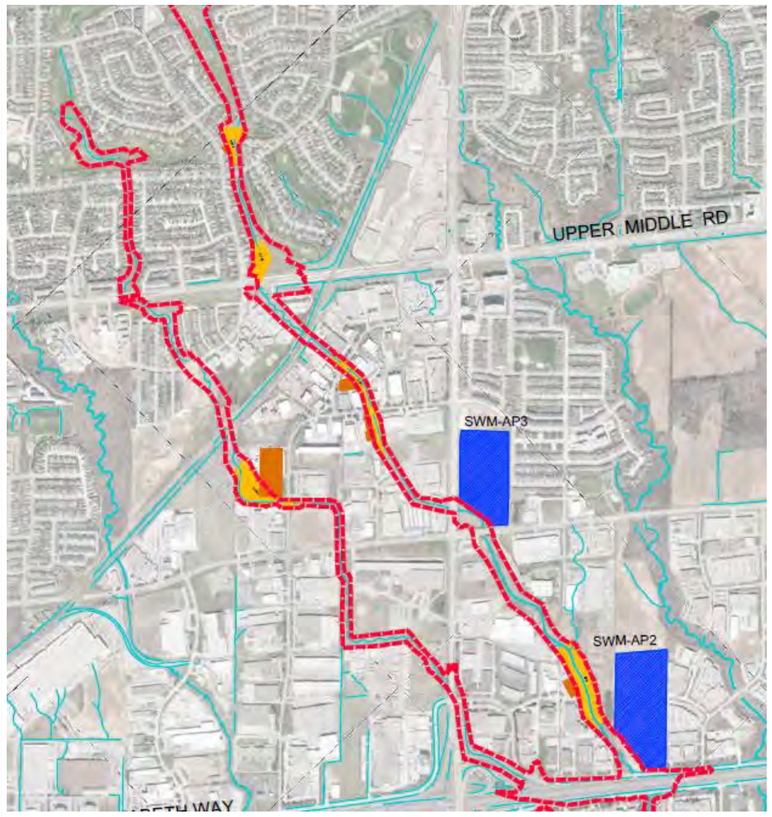
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	Wood Environment & Infrastructure Solutions - September 15, 2021	
1.	The Urban-Area Flood Vulnerability, Prioritization, and Mitigation Study (Wood, July 31, 2017) has been reviewed to identify the flood vulnerable areas (FVA)s within the Millcroft neighbourhood and the downstream receiving watercourses, and the associated mitigation alternatives. The mapping provided within the 2017 Report indicates that there are two (2) sites adjacent to Appleby Creek within the Millcroft neighbourhood which are susceptible to flooding during the Regional Storm event, one located immediately upstream of Millcroft Park Drive (FVA AP13) with one (1) building flood susceptible, and the second site located immediately upstream of Upper Middle Road (FVA AP12). In addition to the FVAs in Millcroft, there are two (2) FVAs upstream of the QEW highway. The sites will need to be considered by the applicant to confirm that there would be no impact as a result of the proposed development.	 Flows from newly developed areas will be controlled to less than or equal to the existing 100-year flows. It is not anticipated that the new development will result in increased flood flows in the watershed. The existing CH flows have been adopted for the purposes of this study as these represent the “best available information” as recommended by CH staff. The Regional flows for small catchments are considerably lower than the 100-year flows and it is anticipated that the Regional Storm flows will be attenuated in the proposed quantity storage tanks / superpipes. There will be local improvements resulting from removal of the weir upstream of Upper Middle Road. There are no negative impacts to the Regional water levels upstream or downstream of the development. Specifically, in the case of Riverine Flood Vulnerable Area No. AP13 per

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		Wood's Flood Vulnerability Prioritization and Mitigation Study (July, 2017), the FSR's existing & proposed hydraulic model Regional Storm water surface elevation (WSE) results for XS299 crossing AP13 are the same (WSE is 141.26m) with the floodplain contained within the valley. For AP12, overlapping Area A nearest to the pump house, the proposed Regional WSE of 138.10m at XS285 is less than the existing WSE of 138.14m. For detailed floodplain extents within Area A, refer to Area A-D FSR Drawing FP-2.
2.	The Applicant's reliance on guidance in the Tuck, Shoreacres, Appleby and Sheldon Creek Watershed Study (City of Burlington, June 1985) and a Draft Plan of Submission Letter addressed to the City of Burlington (Cosburn Patterson Wardman Limited, August 8, 1995) which predates the existing City of Burlington stormwater management criteria for new developments is a concern due to the lack of flood control criteria. Given the orientation of the proposed development runoff peaks may be affected by timing which requires a more comprehensive hydrologic impact assessment throughout the Millcroft community and immediately downstream of Upper Middle Road on Appleby Creek. In addition, the 1985 Watershed Study is considered out of date, and contemporary practices requiring water quality, water balance and erosion controls should be assessed and implemented for each development site.	This FSR Submission has removed references to the previous watershed study that was completed in 1985. Proposed drainage measures have been designed to comply with the latest MECP, City and CH SWM Standards. Refer to discussions in Area A-D FSR Section 4.6.2, 5.6.1, 6.6.1 for water quality details & erosion control, Sections 4.6.3, 5.6.2, 6..6.2 for quantity control and Sections 4.6.4, 5.6.3, 6..6.3 for water balance.
3.	As City staff is aware, the hydrology and hydraulics for Appleby Creek is in the process of being updated by Wood as part of the Burlington Creek Flood Hazard Mapping Study for Conservation Halton. The existing conditions results will be available 2021 Q4 and final modelling by March 2022. It may be beneficial to require validation of the proposed development impacts using the updated hydrologic and hydraulic Appleby Creek models throughout the Millcroft area and downstream of Upper Middle Road. Development impacts including the proposed 100 year and Regulatory (Regional Storm) floodlines should be mapped, along with the required setback to the Regulatory floodlines. Wood will require the hydraulic modelling to provide further commentary, including existing and proposed flood elevations and riparian and non-riparian flood storages.	Completion of this study is anticipated March-April, 2022. CH has indicated that the submission of the FSR can proceed prior to completion of the hydrology / hydraulics study.
4.	A stream morphological assessment should be conducted of the receiving watercourses to determine existing conditions and to provide recommendations for erosion controls for the proposed developments. As a minimum, in the absence of any other guidance, the erosion control requirements from the 2003 MOE SWM Guidelines should be used, however given cited concerns it is considered that a more comprehensive assessment is warranted.	The proposed area to be developed represents 2.7% of the watershed upstream of Upper Middle Road. The parcels range from 0.76 to 5.85 ha in size and the impacts on downstream erosion are immeasurable / would be considered as rounding error in terms of flows. Runoff of the 25mm event is typically discharge over ~48 hours for erosion control – this would correspond to a flow rate that is impractically small due to minimum orifice sizes. It is recommended that erosion control requirements be accomplished on "best efforts" basis. Measures include roof leaders to pervious areas, and bio- filtration where feasible.
5.	The hydrogeology report (R.J. Burnside & Associates Limited, October 2020) noted that the soils at the site predominantly consisted of low permeable till (silt and clay soils) and bedrock was encountered at depths as shallow as 1.5 mbgs. The hydrogeology report recommended the use of LID features to maintain the pre-development infiltration volumes. However, the report also notes that seasonal fluctuations in the groundwater level varies across the site (groundwater was recorded as high as 0.09 mbgs). This would suggest that the seasonal high	RJB has advised that infiltration trenches are not required to meet the site wide water balance objectives. Additionally, infiltration-based LIDs are not recommended due to high groundwater levels. However, opportunities to implement biofiltration cells in Areas A & B would be considered a best management practice as discussed in Area A-D FSR Section 4.6.2.

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	groundwater levels may impact the function of the proposed LID features. As an example, it is indicated within the Geotechnical Report (DS Consultants Ltd, November 12, 2020) that borehole BH19-102 had a groundwater elevation 144.3 m; an infiltration trench has been proposed at this location with a ground surface elevation of 145.09 m. Based on a review of this information, the Geotechnical Consultant should confirm that the proposed LID BMP features are feasible to maintain the water balance for the study area.	
6.	Overall, there is a general lack of detail for the implementation of the LID BMPs and there is no discussion of potential groundwater interaction, who will maintain the infiltration trenches within the rear yards of the properties, how reliant the LID BMPs are for the development, and if there is any redundancy should the LID BMPs fail or are removed. Additionally, it appears select LID features will be located within the private rear yards of the proposed properties; this is not favorable as the City will want to inspect the LID features to ensure the long-term functionality and perform maintenance if necessary. As such, the LID features should be located on public property which are accessible by City Staff and where they cannot be removed or altered by private property owners. Another possible consideration for the location of LID features would be common elements within the condominium properties; requiring the condominium corporation to operate and maintain the LID features.	The proposed developments are private site plans. There are limited opportunities to introduce LIDs in existing public property, particularly since the soils are not suitable for infiltration and the water balance can be addressed with enhanced topsoil depths and roof leader discharge to pervious areas as per RJB's recommendations. For quality control, O/GS units in conjunction with CB shields are proposed. With the exception of enhanced topsoil depths, roof leader discharge to grade and biofiltration 'islands' in Areas A and B, LID BMPS have been eliminated from the design. The biofiltration 'islands' will be common elements within the condo properties, thereby requiring the condo corporation to operate and maintain the features.
7.	While the LID features may be considered to maintain water balance and may offer water quality treatment, please note that they will not be recognized to provide water quantity benefit.	Acknowledged.
8.	Based on a review of the Functional Servicing Report, it does not appear that extended detention has been considered for sites B-E.	From a fluvial geomorphological perspective, Beacon anticipates that the additional runoff from the proposed developments would likely fall within the tolerances of the stormwater erosion analysis modelling (i.e., negligible / immeasurable changes in erosive flows). Urbantech has confirmed that, as the proposed developments approximate 12ha size represents 2.7% of the total watershed area of 450 ha, the relative influence of the additional runoff from the proposed developments would be immeasurable from a modelling perspective.
9.	Stormwater quantity control criteria should consider the City's Stormwater Management (SWM) Design Guidelines, requiring 100 year post development to 5 year pre-development quantity control for areas with only a minor system outlet, and post development to pre-development controls for areas with both minor and major drainage outlets. SWM quantity controls should also consider the capacity of the receiving drainage systems and potential capacity constraints.	As a conservative measure, control of the 100-year Type II SCS 24-hour post development flows to existing 5-year flows is proposed for all connections to the existing minor system. To avoid impacts to the major system, all site flows will be captured into the proposed storage / super-pipes and released at the lower 5-year existing flow targets. The existing target flows are based on the original / 1999 City IDF parameters, whereas the proposed flows are based on the 2020 City IDF parameters. This is a conservative approach. Note that Parcel E will have 100-year post development flows control to the pre-development 2-year flows instead of the 5-year flow as this block drains ultimately to the watercourse.
10.	SWM quantity controls will have to be located with either public lands and/or common elements within the condominium properties.	Acknowledged. All SWM quantity controls are proposed within common elements of the condo properties.

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11.	The Millcroft online pond which is proposed to be converted to an offline pond has also been proposed to be used for golf course irrigation. Irrigation ponds which are drawn down (especially in the summer) are unlikely to function well to provide water quality treatment. To that end, the Permit to Take Water (PTTW) (MECP, March 22, 2021) indicates a max flow rate of 1,112,300 l/day (1,112 m3/day) while the proposed permanent pool volume for enhanced water quality treatment (80 % TSS removal) is 9,274 m3. It is anticipated that the PTTW is for the existing Millcroft Golf Course and not for the proposed condition, which would likely require less water for irrigation. The FSR has not discussed how the pond will provide water quality treatment should the volume be drawn down due to irrigation. It is noted that average day irrigation requirements in July and August are 465 m3/ day 465 (5%) of the proposed permanent pool, as such the water quality level may be reduced during periods of no precipitation. Further to this comment, possible alternatives to mitigating the concern of using the proposed Millcroft pond for SWM and irrigation would be to increase the permanent pool of the pond. An increased permanent pool volume could ensure that the water quality function of the pond would not be compromised during high irrigation periods with low recharge from precipitation. The potential impacts to the receiving aquatic habitat due to low oxygenated water and potential temperature impacts would need to be reviewed should a deeper pond be proposed. In addition to the foregoing, it is understood that both the City and Conservation Halton have concerns related to the pond's function, operation and maintenance, ownership, and location within regulatory limits, which will need to be addressed.	The pond is still proposed to be taken completely offline but the applicant is no longer proposing to use it for SWM purposes. The pond, along with the valley system south of Millcroft Park Drive, will be conveyed to the City as part of Block 91 but will have a private use agreement with the Millcroft Golf Club for the golf course's irrigation use. Under post development conditions, the golf course will have reduced irrigation requirements due to the reduction in golf course length. The offline pond will continue to receive flows from existing Parklane Crescent to provide for some of the course's irrigation needs. The irrigation needs that cannot be achieved from the offline pond will be supplemented with municipal water. This approach ensures that the irrigation pond only receives drainage from public property (i.e., Parklane Crescent). Accordingly, there are no permanent pool storage requirements for proposed development Areas A or B since stormwater management will be addressed through the use superpipes & underground storage tanks. As such, the offline irrigation pond is not proposed to provide SWM functions.
12.	Additional detail for the Millcroft Pond modifications should be provided, based on dimensions and the stage/storage relationship being only approximated; it is recommended that a full topographic survey and bathymetric survey of the pond and outlet structure be conducted. As per City comments sediment removal should be considered, based on the results of the bathymetric survey.	Drawing **GR-A2** illustrates the proposed grades for the irrigation pond. The corresponding stage storage relationship which has been provided to RJB for the irrigation analysis. Since the existing pond will be re-graded as part of the proposed channel works, a bathymetric survey may be unwarranted as all sediments will be removed when the pond is set to the ultimate design elevations At the agency meeting of October 22. 2021, City staff advised that the City is agreeable to making the bathymetric survey of the pond a condition of draft plan approval but that all bathymetric investigations must be completed, and the maintenance requirements identified by the survey implemented before commencing any work on the site for servicing.
13.	It is unclear how the riparian storage has been calculated for the proposed conditions scenario for Appleby Creek and whether the freeboard for the proposed offline SWM pond will be used for riparian storage. These calculations will need to be verified to confirm the approach suggested by Urbantech.	The riparian storage has been calculated assuming no "artificial" structures are in place, including the pond berm and weir and culverts. This approach was used to define both the existing and proposed storage volumes. A second scenario, assuming all infrastructure is in place "i.e., floodplain storage" has also been completed. The volume within the offline pond is not considered to be a part of this riparian storage scenario. Both scenarios results are included in Area A-D FSR Section 4.5.5.
14.	It needs to be demonstrated how the proposed offline SWM pond, will provide a level of erosion control that incorporates the stream morphologist erosion control recommendations (ref. Comment No. 4), including erosive critical flows downstream of the pond, applying the pending	As referenced in Comment Response No. 11, the offline irrigation pond is no longer proposed to provide a SWM function for the subject development areas. Please refer to the response to Comment 8 related to erosion control.

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	Burlington Creek Flood Hazard Mapping Study hydrologic and hydraulic modelling.	
15.	An integrated hydraulic assessment of the minor and major drainage systems within Areas A and B and adjacent existing development should consider the proposed off-line SWM pond operation.	The proposed major & minor storm for both Areas A & B are designed to bypass the pond and discharge directly to the channel. A PCSWMM and HGL analysis has been prepared for the entire Area A & B storm system, which demonstrates no hydraulic impacts on the existing developments upstream of Parcels A and B (Hadfield Court). Note Parklane Crescent is proposed to bypass the Hadfield/A/B system in a 100 year pipe and outlet to the irrigation pond.
16	Grading for overland drainage routes including required drainage easements, within Areas A and B should be provided with adequate details and sections to understand overland drainage system performance.	Refer to Master Comment Response Matrix (City) 1.3.h.
17.	It is noted that both minor and major drainage systems for Areas A and B have been located within the CNR 30 m setback, as such approvals from CNR would be required for the proposed drainage works. Furthermore, the grading for this area is unclear as there is a proposed berm within the 30 m setback. The impacts of the proposed berm on the proposed major system flow route should be reviewed	It is proposed that any major system 100-year flows originating from Parklane Crescent as well as various rear yards will be captured in the proposed storm sewer. Minor impacts to the proposed CNR berm are demonstrated in the applicable grading drawings and will be coordinated with CNR for comments.
18.	The FSR indicates that the major system from Area B will be captured and conveyed to the storm sewer system, as such, the inlet capacity within Area B needs to demonstrate capture of the 100 year event.	We propose that precise calculations for 100-year capture (including allowance for blockage) be provided with the detailed design. Anticipated 100-year flows to be captured are called out on the various drainage plans.
19.	As per CH's comments, it is understood that a separate report will be prepared to demonstrate upstream and downstream improvements on Appleby Creek based on the proposed creek works; Wood will need to review this report as part of the drainage and stormwater management assessment review.	The understanding expressed in Wood's comment is not accurate. To clarify, CH Policy 2.19.1 requires that, when flood plain alterations are proposed, in the absence of a SWS or EA, a comprehensive study is required to support the proposed alterations. According to the definition of 'comprehensive study' in CH's policy document, this requires the submission of a detailed study that fully assesses existing conditions and the potential impacts of proposed development with respect to, at a minimum, hydrology, hydraulics, hydrogeology, fluvial processes, erosion, slope stability and the natural environment (including, but not limited to, ecological functions). There is no requirement to demonstrate upstream or downstream improvements on Appleby Creek as part of those flood plain alterations but rather, it must be demonstrated that the proposed flood plain alterations will not have a negative impact on the items as listed above. A Benefits Analysis Report, as prepared by Jennifer Lawrence & Associates Inc. and included in this submission, reflects an amalgamation of existing information presented in the FSR and EER and specifically addresses CH's regulatory policy requirements. As such, the study team respectfully disagrees with Wood's suggestion that they will need to review the report as part of their peer review.
20.	In review of the Appleby Creek hydraulic model, the existing conditions Cross-section 284 incorporates ineffective flow, while the proposed cross-section has not; this difference needs to be verified.	The model has been updated to address this.
21.	The proposed pedestrian bridge should be added to the hydraulic modelling.	This comment is no longer applicable as the bridge has been removed from the plan.

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22.	Stormwater quality calculations are required for each development area, including LID BMPs, oil/ grit separators and CB Shields.	Oil/grit separators and CB shields are proposed on Areas A, B, C, and D as discussed in Area A-D FSR Sections 4.6.2, 5.6.1 and 6.6.1. Areas A and B have biofiltration "islands" as part of the treatment train for best management practices. Area E will have an O/GS and tank for water for storage / sump storage and water reuse. Area E will discharge to an enhanced swale for additional control. Areas C and D discharge attenuated flows via an OG/S unit prior to discharging to the existing minor system on Millcroft Park Drive & Country Club Drive, respectively. Note, Area A-D FSR Sections 4.6.2, 5.6.1 and 6.6.1 refer to OGS sizing calculations in accordance with included in Area A-D FSR Appendix G. All sizing reports adhered to a particle size distribution (PSD) that accounts for finer fractions of pollutants, and lower specific gravities relative to CA ETV & NJDEP PSD(s) which provides more protections for natural water resources as per PCSWMM for Stormceptor Sizing Tool by Imbrium Systems Inc.
23.	The superpipe storage provided for Area C is proposed to control the minor system peak flow rates. However, it is unclear how the major system peak flow rates will be controlled. It is indicated within Section 5.5.1 that the minor system will intercept some of the major system runoff, while in Section 5.5.2 it is indicated that the catch basins have been sized to capture the 100-year storm event. These statements are contradictory and will need to be further investigated to understand the impact to Country Club Drive major system.	The minor system will capture all of the major system flow for control in the tank (i.e., 100-year flows will be fully captured in the pipe). Area C has been modelled in PCSWMM during the 100-year storm event with a fixed outlet to reflect existing conditions along Country Club Drive.
24.	For Area C, Existing Storm Outlet #2C, the 100-year constant flow is above the allowable release rate (Ref. Dwg. STM. C).	This has been corrected – all proposed release rates to the existing outlets have been reduced below pre-development targets based on the original / 1999 IDF parameters.
25.	For Area C, Outlet #4C, the 100 year constant flow is above the release rate (Appendix H, SWM Calculations).	This has been corrected – all proposed release rates to the existing outlets have been reduced below pre-development targets based on the original / 1999 IDF parameters.
26.	For Area C, will the rear yard catchbasins be able to capture the 100 year peak flows?	The number, size, and resulting ponding depth above the rear-yard catchbasins will be determined at detailed design to confirm 100-year capture is possible. If required, more / larger inlets can be added.
27.	For Area C, the location of Outlet #2C is unclear, as the label on Drawing STM.C appears to not match the quantity control calculations in Appendix H, and the drainage area requiring control needs to be confirmed to the control MH.	The Area C outlets have been clarified on the drawings and calculations. Descriptions of the location of each outlet are noted in the calculations.
28.	The orifice size for Area C control manhole needs to be confirmed, as it is indicated as 100 mm and 110 mm diameter in different locations.	This has been addressed – the orifice sizes are now consistent in the drawings, calculations (model) and report.
29.	For Area C is the proposed foundation drain collector system to connect downstream of the control MH?	Foundation drain collector pipes are not proposed. Weeping tiles will be pumped to surface or storm sewers. Refer to Area A-D FSR Sections 4.1.4, 5.1.4 & 6.1.4.
30.	For Area C, no extended detention has been proposed for erosion control, it needs to be verified how this would meet erosion control targets (MOE or other)?	This would be difficult to achieve for underground storage tanks / superpipes – the release rates and corresponding orifice sizes would be too low if 24-hour detention is proposed.

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		Furthermore, as noted in the response to comment #4, the potential for the total development area of approximately 12 ha (Areas A, B,C, D, and E) to cause an increase in erosion relative to the total 450 ha (approx.) catchment area to Upper Middle Road is negligible. As referenced in Area A-D FSR Section 5.6.1, only a small measure of extended detention can be achieved for the 25mm storm event based on the minimum practical orifice size of 50mm. As such, it is recommended that ED requirements be waived due to small catchment sizes and in consideration that Area C drains to a municipal sewer.
31.	The FSR has not provided an assessment of the existing condition receiving storm sewer system hydraulic performance, particularly for Area C. It is unknown if there is a backwater condition due to the downstream storm sewer system which could impact the proposed Area C storm sewer system. This should be confirmed with a holistic evaluation using a hydrologic/hydraulic model to ensure the drainage system is meeting post to pre-development conditions. Furthermore, it should be confirmed that there no downstream basement flooding concerns with laterally connected properties.	A capacity analysis is not deemed to be required – as-constructed / design drawings have been obtained from the City to confirm existing pipe information and the pre-development A x C and corresponding flow based on the 1999 IDF parameters will be matched by overcontrolling the 100-year post-development flow based on the 2020 IDF parameters. There will be no net increase in flows at any outlet into the existing system and therefore no impacts to existing infrastructure. It is assumed that the existing storm sewer system was designed for the existing drainage areas and land use. Although not deemed required as above mentioned, a capacity analysis can be considered as a condition of draft plan approval.
32.	As noted earlier, detailed hydrologic/ hydraulic assessments should be conducted for the proposed minor and major drainage systems.	Hydrologic / hydraulic modelling has been completed for all development areas.
33.	Extended detention has not been proposed for Area D, which discharges to both Appleby Creek and Sheldon Creek. For the section of Area D that drains to Sheldon Creek, the stormwater management requirements as per the Sheldon Creek Watershed Study (Philips, 1993) should be referenced and incorporated into the stormwater management assessment. The Sheldon Creek Erosion Control Study Class EA (TSH, October 2003) focused on the section of Sheldon Creek between New Street and Spruce Avenue, 5 km (+/-) downstream of the Millcroft Golf Course site, hence does not provide any specific guidance for the development.	Area D is longer proposed to drain to Sheldon Creek.
34.	For Area D, the proposed lot grading does not match the proposed area to the infiltration trench.	Refer to Wood Comment Response 6 as infiltration trenches are no longer proposed.
35.	In areas where infiltration trenches and rear yard catchbasins (RYCBs) are proposed, will the RYCBs not capture overland drainage prior to entering the infiltration trenches?	Refer to Wood Comment Response 34 and RYCBs will be designed to capture the 100-year storm.
36.	For Area D, will the RYCBs be able to capture the 100 year peak flows?	RYCBs leads will be appropriately sized at the design stage to capture the 100-year storm.
37.	For Area D, the area for drainage catchment EO1-D does not match the area used in the stormwater management calculations.	The calculations and report now match the drawings.
38.	The Area D Storm Drainage Plan should provide additional detail as to how the 0.32 ha is to be captured for the 5-year storm event.	Area D will now be directed to the Millcroft Park Drive storm sewer system via 100-year capture on site.
39.	For Area D it is indicated in FSR that the 100 year release rate is overcontrolled to compensate for the uncontrolled discharge to West Sheldon Creek, except the controlled discharge is to Appleby Creek, therefore the stormwater quantity control strategy for each creek system needs	Refer to Wood Comment Response No. 33.

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	to be verified. For the portion of the site draining to Sheldon Creek, based on the relatively small area conveyed to the creek and that drainage will only be conveyed above the 5-year storm event, a localized peak flow assessment will be considered adequate.	
40.	For Area D the superpipe has been sized based on no consideration of the receiving storm sewer system hydraulics, which may impact the sizing and hydraulics of the proposed storm sewer.	Sizing an orifice for onsite control generally assumes free flow in the receiving pipe. Adjusting orifice sizes to account for tail water increases orifice sizes and may defeat the purpose of the orifice. In accordance with comments received to date, all orifice sizing for Areas A through D has been determined considering 100-year tailwater conditions.
41.	For Area D is the proposed foundation drain collector system to connect downstream of the control MH?	Refer to Wood Comment Response No. 29.
42.	For the Area D Storm Outlet # 2D, the proposed swale alignment and connection to Sheldon Creek should be refined to minimize stream bank erosion within Sheldon Creek. Support for the proposed drainage swale should also be provided by the pipeline company.	Refer to Wood Comment Response No. 33.
43.	The drainage conveyed to the wetland and Hydro corridor from Area E will need to be reviewed; it appears that the existing area is conveyed to the Hydro corridor via sheet flow, while the proposed conditions would convert the drainage to a point flow. This may require energy dissipation prior to discharging. Wood will secure plans for the existing works yard and review the design assumptions for the maintenance yard.	To date, additional comments have not been received from Wood, as was suggested in their comment. The proposal is to connect the outlet for Area E to a swale, and ultimately to the existing overland flow spillway from Dundas Street, which is an existing point-source contribution to the Hydro Corridor. The frequent flows from Area E (i.e., 5mm storm or less) will likely be retained/re-used on site. The proposed swale will mitigate erosive forces as well.
44.	For Area E as the Hydro corridor would be the proposed drainage outlet, confirmation that Hydro is supportive of Area E drainage through Hydro lands should be provided.	Agreed – this will be coordinated with HONI lands.
45.	The proposed 450 mm diameter storm sewer for Area E has been designed to convey the 5-year storm event and is located at the edge of a retaining wall. How does the overland drainage system work, with the flow path to the proposed DCB and retaining wall?	The proposed Area E outlet has been revised – please refer to Area E FSR Drawing STM-E for the outfall location. All flows will be captured into the internal building drainage system for control to the 2-year pre-development flow. Refer to Area E FSR Section 9.3.
46.	No quantity controls have been proposed for Area E, as such, it needs to be verified that there would not be any impacts to the receiving drainage system.	Quantity controls are discussed in Area A-D FSR Sections 4.6.3, 5.6.2, 6.6.2 and Area E FSR Section 9.3.
47.	The trapezoidal channel west of Area E has been sized based on the 100 year – 5-year peak flow, should it not be sized for the 100 year peak flow as the 5 year will be discharged to the channel?	The 5-year flow from Dundas Street will be piped in the proposed Dundas Street storm drainage system. However, the spillway channel has been conservatively sized for the anticipated 100-year flow from Dundas Street. Refer to Area E FSR Appendix G for Visual OTTHYMO 6.2 modelling.
48.	Detailed calculations should be provided for the channel at Area E, to indicate the available freeboard along the length of the channel.	Cross-section 322.1, nearest to Area E, has a Regional Storm water surface elevation of 151.02m as modelled in HECRAS referenced in Area A-D FSR Appendix I. This Regional WSE elevation is approximately 0.9m below the downstream “Dundas Street” swale invert elevation of 151.90m (i.e. downstream of Area E storm outlet) delivered to HONI lands as illustrated on Area E FSR Drawing GR-E. Note, 151.90m is the lowest design grade on Area E FSR Drawing GR-E.

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49.	The Area E channel is proposed to act as an enhanced swale, as such, calculations should be provided to demonstrate this water quality function. The same comment applies for all proposed enhanced swales for Areas A-E.	Calculations will be provided at detailed design. This comment does not affect block sizing and the swale is provided as "polishing" only and is not being relied upon to achieve water quality targets. The majority of Area E is clean roof area and the entire parcel will be treated by an oil/grit separator and through water re-use/retention.
	Key Comments	
A	As per CH's regulatory Policy 2.19, to consider major floodplain or watercourse alterations, a comprehensive study assessing existing conditions and potential impacts of proposed development is required. A comprehensive study includes an integrated assessment of components such as hydrology, hydraulics, hydrogeology, fluvial processes, erosion, slope stability and the natural environment (see further requirements below). Staff understands a summary/comprehensive report will be included with the next submission. The report needs to provide rationale for proposed creek and hazard alterations that go beyond the extent of works necessary to meet PTTW requirements by demonstrating how those works will provide an overall benefit (i.e., minimize risk to life or property) and/or how they are in the public interest. Benefits tied to taking the pond offline in accordance with existing PTTW/CH Permit requirements should not be used as justification for any additional works to support proposed development.	A comprehensive analysis has been provided in the form of the FSR and EER. These findings have been amalgamated into a Benefit Analysis Report for ease of reference and to address CH's request for a comprehensive report. To clarify something that is stated in CH's comment, there is no requirement within CH's policy document to demonstrate an overall benefit as a result of the proposed flood plain alterations but rather, a demonstration that there will be no negative impact on various processes including hydrology, hydraulics, fluvial, erosion, flooding and the natural environment. There is also no requirement in CH's policy document to demonstrate that the proposed flood plain alterations are in the public interest. These two requirements (demonstration of overall benefit and/or how the works are in the public interest) are CH staff's interpretation of the policy requirements however, there are no specific policy requirements that address these items. At the October 22, 2021 agency meeting, CH staff advised that the only benefit that cannot be considered in the benefit analysis is the removal of the downstream weir (as a result of taking the pond offline) since, in their opinion, this weir would have been required to be removed as part of the PTTW process.
B	The plans within the current development application are inconsistent with those previously submitted through the CH Permit and PTTW processes. Given the Mill Pond is now proposed to be used for SWM for the proposed development and the pond reconfiguration may impact floodplain and developable limits, the PTTW-related works are interconnected with the planning application. The proposed development cannot rely on works tied to the CH Permit and PTTW applications until those works are approved and will be implemented to the satisfaction of CH and other applicable agencies. Therefore, the applicant should confirm how those works will be coordinated with the planning process and ensure the development application plans and reports appropriately integrate the designs associated with the PTTW.	The plans that were previously submitted were never approved through CH's Permit process or the PTTW process. The pond is now proposed to be an entirely offline pond and is no longer proposed to serve as a SWM facility for the proposed development. The offline pond will be used to retain stormwater from public lands (i.e. Parklane Crescent), to be used for irrigation purposes. The offline pond will require the use of municipal water to supplement irrigation needs and, as such, is entirely contingent upon the approval of the development application. If the development application is not approved, the golf course would revert back to the by-pass pond design and proceed through the PTTW process with the previous approach to supplying the golf course's irrigation needs. These channel / pond related works will be coordinated with City and CH staff upon approval of detailed design, CH Permit and site alteration applications.
C	Proposed conditions coded into the hydraulic model do not match subdivision drawings. Works proposed within the regulated area must be clearly and consistently shown in modelling, reports, and detailed drawings.	. The existing HECRAS floodplain model was obtained from CH and updated with more accurate topographic information for reach to create an existing condition floodplain as indicated in Drawing FP-1. These floodplain limits are reasonably consistent with the original CH model upstream of Upper Middle Road. As such, proposed conditions are relative to the

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		existing HECRAS floodplain model prepared by Urbantech for this FSR submission rather than the HECRAS floodplain model obtained from CH or any other model that predates the same. Area A-D FSR Figure 1 – Constraints illustrates various constraints and proposed development limits as supported by the EER included in this submission.
D	An update to the hydrologic model for Appleby Creek (existing and proposed conditions) is required to assess the proposed land use intensification. The applicant will need to discuss these requirements with CH and City staff prior to resubmission.	Discussions with CH staff and Wood have taken place prior to re-submission, as requested. We note that the hydrology study is underway by CH/Wood but is not yet available for our use. As directed by CH staff, the best available information has been used for the channel design in the absence of this updated hydrology study.
E	The proposed development should meet current SWM standards and design guidelines, including quality, quantity, and erosion controls.	Acknowledged. Refer to Area A-D FSR Section 3.4 regarding the City & CH standards / design guidelines that has been adhered as it relates to SWM criteria.
F	SWM facilities are not permitted within the 1:100 year floodplain. Facilities situated within CH's regulated area are only permitted when it is demonstrated that no other viable option exists (i.e. appropriately justified), and the facility will function as intended under the full range of flood conditions. Please address this policy in the next submission.	It is important to acknowledge that there is already a pond within the flood plain and the proposal is to take this pond offline (a benefit from an ecological and fluvial perspective) while still maintaining use of the pond for irrigation purposes. The flood plain that this pond is located within is a manicured golf course and is not in a natural state. The proposed development would remove the manicured golf course from the entire valley system from Millcroft Park Drive to Upper Middle Road and naturalize it with native vegetation and habitat creation. The proposal has been revised such that the offline pond is no longer proposed to be used for SWM purposes to treat the new development within Areas A and B. It will continue to receive public drainage, as it does under existing conditions.
	Appendix A	
	ALL AREAS	
4	**Section 3.4: Stormwater Management Design Criteria (Page 7)** The Tuck, Shoreacres, Appleby and Sheldon Creeks Watershed Study (SWS) prepared by the City of Burlington in June 1985 does not take precedence over the City of Burlington's current design guidelines or MECP's current SWM design guidelines. This is because: a) The referenced study is not current (i.e., more than 5 years old) and its recommendations are no longer relied upon. b) The referenced study did not assess the land use changes being proposed and the proposed intensification exceeds what was previously studied and approved. Therefore, the referenced study does not support the proposed changes. c) Hydrologic modelling used for the referenced study is no longer current; current hydrologic modelling must be used. Coordination with the City of Burlington and CH is required in this regard.	Quality and quantity control are now provided on every development area. The quantity control will be achieved via a combination of superpipe and/or underground tank storage for Areas A through E. Quality control will be provided on a best management practices basis with the use of CB shields, OGS and water re-use/retention where feasible. We note that the hydrology study is underway by CH/Wood. As directed by CH staff, the best available information has been used for the channel design in the absence of this updated information.

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	Quantity controls, erosion controls and quality controls are required. Revise the current application as required.	
5	**Section 6.6.1 Design, (Page 53)** Updates to the FSR are needed to address the following: a. Stormwater drainage proposed to outlet to a regulated watercourse or wetland requires quality and quantity control to maintain ecological functions, characteristics and hydrologic functions under post development conditions. b. The report should discuss potential impacts associated with flow or volume increases, and additional mitigation measures (i.e. bioengineering, vegetated swale).	The FSR has been updated as requested.
6	**Section 7.6.1 Design, (Page 67)** All new development should follow the most current SWM requirements and regulations to minimize impacts both on site and to downstream receiving watercourses	Acknowledged, see response to CH Comment Response No. 4; a significant level of over control is provided and all outlets from each development area are matched to the Existing AxC.
	AREAS A AND B	
7	**Section 1.3: Storm Servicing and Stormwater Management (Page 1)** Areas A, D and E, which discharge to the adjacent watercourse, require stormwater management. Revise report text accordingly.	Please refer to the responses to CH Comment Responses 4 and 6. Quality and quantity control area provided for all proposed development areas.
8	**Section 1.3: Storm Servicing and Stormwater Management (Page 1)** Plans within the current development application are inconsistent with those previously submitted through the CH Permit and PTTW processes. The Mill Pond is now proposed to be used for SWM for the proposed development and the pond reconfiguration may impact floodplain and developable limits. Therefore, the PTTW-related works are interconnected with the planning application. Given the change in scope, the applicant should confirm which works will be reviewed through the PTTW process versus the development application and how the two will be integrated, through discussion with all applicable agencies (CH, MECP, City, etc.) prior to resubmission. The proposed development cannot rely on works tied to the CH Permit and PTTW applications until those works are approved and will be implemented to the satisfaction of CH and other applicable agencies. It is therefore recommended that both projects be advanced simultaneously, and the applicant should confirm how PTTW and CH Permit works will be coordinated with the planning process and integrated into the development plans and reports. We recommend meeting with agency staff to discuss the integration of these elements. Staff provided comments on the CH permit application on February 1, 2019 and have not received a subsequent submission. As the current proposal is not within the same scope as the prior CH permit application, a new application and fees may apply.	Acknowledged; see CH Comment Responses B & F related to the revised offline pond proposal. If the development application is approved, the Golf Club will proceed with a revised PTTW application utilizing an entirely offline irrigation pond. If the development application is not approved, the Golf Club will revert to the bypass pond option, due to the increased costs associated with the offline pond and the need to supplement irrigation needs with municipal water if an offline pond is used.

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9	**Section 4.1.7: Existing Mill Pond (Page 12)** Drainage area upstream of the Mill pond is approximately 430 ha not 43.91 ha. Revise report text accordingly.	This has been corrected.
10	**Section 4.1.8: Existing Major System Drainage (Page 13)** a. Clarify within report text intent of separating internal and external drainage areas contributing to Area B (Table 4-3). b. Define how runoff coefficients for external developed areas were determined. Runoff coefficients for these areas should be determined via direct measurement of aerial imagery or a more conservative assumption.	The report has been amended as requested to explain the routing of the existing / external drainage areas. Runoff coefficients, particularly those for external golf course lands, are consistent with the City's approved drawings.
11	**Section 4.5.3: Channel Realignment / Pond Retrofit (Page 20)** Update this section as per comment #8 above.	Section has been updated.
12	**Section 4.5.3: Channel Realignment / Pond Retrofit (Page 20)** Staff will review justification (i.e. separate summary report) for the proposed channel re- alignment and associated floodplain alterations once provided with the next submission.	Acknowledged.
13	**Section 4.5.4: Existing and Proposed Flood Elevations – Table 4-8 (Page 21)** a. Hydraulic modelling requires update; update table(s) accordingly. b. Identify source(s) for topographic data used to prepare hydraulic modelling. c. Identify source of base hydraulic modelling and flow data: **Title**: Appleby Creek Floodline Mapping Update **Dated**: July 1997 **Prepared by**: Environmental Water Resources Group Ltd. **Prepared for**: The City of Burlington d. Clarify which works are tied to the subdivision process versus the CH permit and PTTW applications. Analysis of interim conditions may be required. e. Provide drawings for the proposed channel reconfiguration and associated floodplain alteration, etc.	a. Tables have been updated based on revised model b. The model geometry is based on a combination of detailed ground survey near Area A (RPE, 2018) and MNR LIO topography (2002) c. The model flows are from the CH HEC-RAS model provided to the study team d. See response to Comment 8. We do not anticipate any interim conditions. e. The proposed grading plan (GR-A1 & GR-A2) illustrates the proposed channel grades and Figure 2 illustrates the corresponding cross-sections included in Area A-D FSR.
14	**Section 4.5.5: Riparian Storage Analysis – Table 4-9 (Page 22)** a. Hydraulic modelling requires update; update table(s) and text accordingly. b. Include separate analysis of manmade flood storage. Losses of manmade flood storage may be permissible however confirmation from CH staff is required.	Area A-D FSR Section 4.5.5 reflects updates to the riparian storage Table 4-9A. Storage within culverts, etc. in place has also been evaluated.
15	**Section 4.6.2: Quality Control (Page 24)** a. Revise report text: quality control is required as detailed by above comments. b. The SWM facility, at minimum, must be located outside of the 1:100 year floodplain and meet all requirements under CH Policy 2.24.5.1.	a) Quality control will be provided by a combination of O/GS units and CB shields. Areas A and B will also have biofiltration "islands" within the ROW. b) The pond is no longer proposed to be used as a SWM facility

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	c. Revise report text: existing flows discharge directly to the online Mill Pond which was not specifically designed as a quality control facility.	c) The pond is no longer proposed to be used as a SWM facility. The text has been revised.
16	**Section 4.6.2 Quantity Control (Page 25)** Unless the PTTW-related works are advanced before or alongside the subdivision process, interim design scenarios must be evaluated whereby reconfiguration of Mill Pond has not been completed.	The subdivision works cannot proceed until the channel / pond works are completed. Refer to CH Comment Responses 8 and 13d.
17	**Section 4.6.2: Quantity Control (Page 25)** a. Revise report text: quantity control is required as detailed in above comments. b. Quantity controls provided by the proposed SWM facilities cannot be relied upon during the less frequent events if the pond is inundated by events exceeding the 2-year storm. For facility storage to receive full credit, the facility must be situated outside the regulatory floodplain. Further consultation with CH and City staff is required in this regard. c. Clarify the master drainage plan being referenced. d. Clarify method used to calculate peak flow rates within Table 4-11 (e.g., rationale method). Additionally, confirm if discharge from Outlet 1A includes Outlet 2B's drainage area as well.	a. Quantity control is now proposed via a combination of superpipe & underground tank storage as discussed in Area A-D FSR Section 4.6.3. b. The pond is no longer proposed to be used as a SWM facility. c. References to the previous master drainage plan are no longer relevant. d. Peak flow targets are based on the rational method. Note, Area B 100-year proposed flow is controlled to the 5-year flow originating from Parklane Crescent and is below Area B existing 100-year existing flows. Area B controlled flows are combined with existing Hadfield Court flows and further combined with Area A controlled flows downstream prior to discharging into Appleby Creek.
18	**Section 7.1.1 Land Use & Topography** The FSR notes that the golf course maintenance building, currently located in Area E, will be relocated to Country Club Drive beside the Club House. Provide details to confirm the building and any associated development (including grading) will be outside CH's regulated area.	This building will be located outside of the regulated area and designed to ensure approvals can be secured. This is not part of the current application and does not need to be provided at this time.
19	**Appendix H – SWM Calculations (VO Modelling)** a. Provide digital copies of the VO hydrologic models (files). b. VO SWM Calculations must be consistent with catchments shown on existing and proposed drawings. Use of a single catchment is not supported under these circumstances. Calculations supporting catchment parameterization must be included with the modelling. c. Include hyetographs used for the frequency design storms and confirm rationale for using an SCS Type II distribution and 24-hour duration.	a. VO model files have been provided for Area E as referenced in Area E FSR Appendix H. PCSWMM models have been used for Areas A, B, C and D as referenced in Area A-D FSR Appendix G. b. The models, drawings, and report text are now consistent. Parameter tables are included in the appendices. c. The SCS Type II storm (24 hours) has been used as this storm generates the largest runoff / storage volumes based on sensitivity analysis.
20	**Appendix J – PTTW Application** As per comment #8, the subdivision should incorporate plans associated with the PTTW and CH Permit application to take Mill Pond offline. An understanding of the phasing approach for both the permit and subdivision application is needed to ensure all aspects of the applications are being considered for the proposed SWM strategy, refinements to hazards and natural heritage features. Ensure the most recent PTTW documentation is included in the resubmission.	Please refer to the response to CH Comment 8. The previous PTTW documentation (which is no longer applicable) and phasing approach has been included in the updated FSR. The latest PTTW permit issued by MECP is included for reference in Area A-D FSR Appendix J.

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21	**General** Unless review from CH is requested, staff defers detailed review of SWM for Area C to the City of Burlington.	Acknowledged.
	AREA D	
22	**General** Unless review from CH is requested, staff defers detailed review of SWM for Area D to the City of Burlington.	Acknowledged.
23	**General: Flood Hazard Mapping** Delineate existing flood hazards associated with Sheldon Creek on a detailed topographic map. Include regulatory water surface elevations as well as relevant hydraulic cross sections.	Flood hazards informed the Draft Plan of Subdivision development limits and are illustrated on the grading plan. No modelling updates were completed for Sheldon Creek – the most recent CH hazard mapping was applied; therefore, no hydraulic cross-sections were shown.
24	**General – Golf Course Re- design** Provide conceptual design for golf course re-design and proposed swale to confirm feasibility of grading adjacent to the proposed subdivision and within CH's regulated area.	The design of the golf course is outside the Area D development limits and not a part of this submission. Further, Area D no longer discharges to Sheldon Creek and thus no grading is required outside of the development limits.
	AREA E	
25	**General** Unless review from CH is requested, staff defers detailed review of SWM for Area E to the City of Burlington.	Acknowledged.
	HECRAS Modelling	
	AREAS A AND B	
26	**Appendix I - Hydraulic Modelling** **Existing and Proposed Conditions Hydraulic Modelling**: a. Include a description of each model and plan scenario. Description must include: • Date prepared, • Modeler, • Reviewer, • Description of the model, model updates, and plan files, • Intended use for each plan file, • Source(s) of topographic data and applicable vertical datum, • Source(s) of model data (i.e., flow data, bridges, etc.), • Version the model was run, and • Anything pertinent for future users to be aware of.	A) Existing and Proposed Conditions Hydraulic Modelling: **Date prepared** - 2022-February-03 **Modeler** - Urbantech Consulting / Danny Lee, Water Resources Analyst **Reviewer** - Urbantech Consulting/ Andrew Fata, Senior Associate, Water Resources **Description of the model, model updates, and plan files** - The model geometry data updated between Upper Middle Road and Dundas Street and the flow used in the original CH model for the existing and proposed condition. **Intended use for each plan file:** Existing condition model file - Ex.Update3 Existing riparian model file – Ex.Update3 Rip

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	b. Review coding for the Upper Middle Road culvert crossing (RS 279.48). Earlier reports and model identify the culverts as being 1.7 m in height with a 0.3 metre gravel bottom. Adjust coding and Manning's n as required for the crossing structure or otherwise justify current coding. c. Code the Upper Middle Road crossing structure using HEC-RAS's bridge routine (i.e., Bridge deck low cord data) with a central pier. This approach will better account for hydraulics of flows contacting the blocked area between the two openings. Revise hydraulic modelling accordingly. d. Review appropriateness of using the Energy Only method versus the Pressure and Weir flow method for the Upper Middle Road crossing structure under high flow conditions.	Proposed condition model file – PR.Update4A_V2 Proposed riparian model file – PR.Update4A_V2 Rip **Source(s) of topographic data and applicable vertical datum** - Geometry files were generated by GeoHEC-RAS 3.1.0.1028 using a 2018 survey data provided by R.P.E. Vertical datum is UTM ZONE 17. NAD 83 for between Upper Middle Road to Millcroft Park drive and MNR LIO 2002 mass points and breaklines between Millcroft Park Drive to Dundas Street **Source(s) of model data (i.e., flow data, bridges, etc.)** - The existing condition model was provided by CH. and Urbantech updated the existing condition Geometry data and culvert information at Upper Middle Road and Millcroft Park Drive based on 2018 survey data and site inspection. **Version the model was run** - The model computed by HEC-RAS 5.0.7 analysis engine B) CH's previous model has been reviewed and updated with both topographic survey information and additional field verification for existing & proposed model conditions. As discussed in Area A-D FSR Section 4.5.4, the culvert dimensions at Upper Middle Road have been adjusted accordingly. C) The Area A-D FSR Section 4.5.4. lists several reasons in support of modelling the Upper Middle Road crossing with twin box culverts. D) With respect to CH Comment Response 26c above, consideration for an alternative methodology is deemed not to be necessary.
27	**Appendix I - Hydraulic Modelling** **Existing Conditions Hydraulic Modelling**: A. Review Reach Lengths coded for hydraulic cross section 285. LOB reach length appears to be an overestimate. B. Review Manning's n coded for hydraulic cross section 288. A Manning's n value of 0.08 should be used for the right overbank adjacent the channel (suggested between 83.86 m to 97.75 m). C. Review left levee coding for hydraulic cross section 281; confirm levee is appropriate for this location. D. Review left levee coding for hydraulic cross sections 285 and 286; considering upstream inundation and topography the levee should be changed to an ineffective flow area.	a. The existing section 285 has been adjusted - the LOB reach length is now updated. b. The Manning's N value is updated c. The levee has been removed d. The levee has been removed
28	**Appendix I - Hydraulic Modelling**	a. The proposed model is consistent with the grading plan / proposed channel works.

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	Proposed Conditions Hydraulic Modelling: a. Modelling must be in accordance with the relevant drawings. Revise proposed conditions hydraulic modelling to match the proposed conditions grading plan or vice versa. The extent of works proposed in the regulated area is unclear. b. Clarify what is proposed as part of the subdivision process and what will be completed as part of the PTTW process. An analysis of interim conditions may be required if the processes are advanced separately. c. Cross section alignment may require adjustment from the existing conditions model. Cross sections should be situated perpendicular to the flow path, which is generally perpendicular to slope contours. Additionally, cross sections must capture areas of flow restriction and expansion as appropriate. d. Confirm the proposed pedestrian crossing structure is coded as intended; specifically, that, a 45 metre length single span bridge would be constructed in this location. Alternatively revise modelling to capture design intent.	b. Please refer to response to Comment 8. An analysis of interim conditions is not considered necessary at this time as it is anticipated that there will be no interim condition however, if through a future CH Permit process it is deemed necessary, it can be provided at that time. c. Cross-sections have been adjusted to be perpendicular to the slope contours where required along Area A. Additional sections have been added where necessary to capture the flow restriction and expansion areas. Note that the model results upstream of Upper Middle Road are less relevant to the plan since a) no proposed developments are backing on this area and b) no increases to the existing water levels upstream of Millcroft Park Drive are permitted. d. The pedestrian bridge is no longer proposed.
37	**Section 6. Proposed Development, Preliminary Development Concept, (Page 55)** Clarify why the 'proposed refined CH ARL' extends beyond the limits of Area A.	Refer to the EER included in this submission for discussion on the latest constraint mapping.
38	**Section 6.1.5 Stormwater Servicing and Management, (Page 56)** As the existing PTTW and CH Permit applications do not include components related to the SWM strategy, separate CH permit(s) may be required to ensure all appropriate measures are incorporated to mitigate impacts to Appleby Creek on site and to the downstream receiving watercourse.	Acknowledged however, as detailed above, the pond is no longer proposed to be used for stormwater management purposes.
39	**Section 6.1.5 Stormwater Servicing and Management, (Page 56)** CH recommends additional discussion and coordination with the PTTW application regarding flora and fauna salvage plan for the disconnection of Mill pond. Further discussion with all agencies is recommended.	Agreed; this will be dealt with through the detailed channel design / CH Permit process and can be included as a condition of draft plan approval if necessary.
40	**Section 6.3.4 Grading, (Page 58)** Update the report to include grading activities, impacts and appropriate mitigation measures associated with the 2D outlet that is proposed within the regulated area of Sheldon creek.	This outlet has been removed. All Area D flows are now directed to the Millcroft Park Drive storm sewer.
41	**Section 7. Impact and Mitigation: Table 17. Impact Assessment and Matrix – Areas** **a. Area A – General:** Any proposed alterations to the creek and/or hazard lands should be included in the impact assessment. b. **Area A Regulated Watercourse/Site Grading Potential Impacts:** Once hazard limits are established, all site grading must be outside of the hazards and associated regulatory allowances for Appleby Creek. Update this section to include suitable mitigation measures to minimize any impacts to the watercourse form and function.	a. Agreed. Please refer to the EER (Beacon) and Benefit Analysis Report (Jennifer Lawrence & Associates Inc.) included in this submission, for analysis in relation to proposed alterations within hazard lands. b. Flood plain alterations are proposed, thereby necessitating grading within the hazards and associated regulatory allowance. CH has policies that contemplate grading within the flood plain as well as within some regulatory allowances. As such, we recommend that this comment is not an accurate representation of CH regulatory requirements or

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	c. **Area D Surface Water/Water Quality Potential Impacts:** CH requires more information regarding the potential impacts associated with the proposed Outlet 2D draining towards Sheldon Creek. To ensure no negative impact on watercourse form and function, appropriate mitigation measures should be proposed based on further characterization through the requested SWH assessment. To minimize impacts, the outlet must be pulled back outside the regulated allowances and where feasible, only sources of clean water should be used. If this is unmanageable, a softer approach (i.e. vegetated swale, bioengineering) is needed. d. **Area E Other Wetlands, Potential Impacts:** As per the EER, please revise the conceptual open space plan to include the creation of additional wetland habitats through the buffer plantings and wildlife habitat features to help enhance habitat and ecological functions	permissions. Please refer to the Benefit Analysis Report for a detailed policy analysis as it relates to grading within CH's regulated area. c. As previously noted, this outlet is no longer proposed. d. Additional wetland habitat is proposed (see Area A-D FSR Figure 3 Riparian Wetland Catchment Area). Note that the potential opportunities for wetland creation are hampered by CH's requirement to incorporate a 30m regulated allowance adjacent to these newly created features. The team has shown the creation of a 475 m^2 wetland adjacent to the downstream section of Appleby Creek (Area A). This approach was discussed with and agreed to by CH in June 2021.
42	**Section 7. Impact and Mitigation: Table 17. Impact Assessment and Matrix - Areas A-E** a. **General:** CH recommends including a Linkages section for Area A/B, D and E to discuss any potential impacts associated with the development and mitigation measures to help maintain the ecological functions long-term. b. **Area A: Reptile and Amphibian Potential Impacts:** The Mill pond is not a suitable location for reptiles and amphibians post development as it will be converted into a formal SWM pond. The water quality condition of the pond will degrade and threaten the existing health of wildlife and ecological functions. CH recommends including alternate mitigation measures and enhancement opportunities to ensure wildlife habitat will be maintained or improved under post development conditions. c. **Area D Reptiles and Amphibians Potential Impacts:** As amphibians/reptiles were not surveyed in this area, associated impacts are unknown. This section should demonstrate that the proposed development will not impact the health and ecological function, as only sources of clean water (e.g. roof drainage, rain collection systems, etc.) should be located here with the intent to maintain ecological and hydrologic functions under post development conditions.	a. The Impact Assessment Table has been updated to include linkages as applicable. b. The proposed revised design includes provision of a created wetland within a portion of the former footprint of the online pond, adding to available habitats for herpetofauna. Furthermore, appropriate permits for wildlife collection and relocation will be sought from the MNRF for works related to taking the existing pond offline. As noted earlier in this response table, the offline pond is no longer proposed for SWM treatment and will be used solely for irrigation purposes. c. Please note that as per CH's request, additional surveys were completed in Area D. It is understood that the request was prompted by the proposed SWM outfall, which is no longer proposed. Nevertheless, the Impact Assessment Table has been updated accordingly. No water from the proposed development Area D will be directed to the pond.
48	**Section 9.4 Water Quality Monitoring, (Page 89)** Staff recommends that water quality monitoring be extended to include the following: a. Continuous measurement of outflow water temperature to help monitor impacts of SWM facility discharge on temperature within the receiving watercourses. b. Additional water quality stations for the proposed outlet draining towards Sheldon creek (Area D)	General: Please note that the methodology for the water quality monitoring was approved by CH prior to its inclusion in the EER. CH did not request any additional monitoring beyond what was included in the EER. a) As noted above, the pond will only be used for irrigation purposes. As such, we respectfully recommend that outflow water temperature monitoring should not be required as there will be no formal outfall from the pond.

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	c. Fisheries community surveys within Appleby creek d. All restoration plantings/habitat features within watercourse corridors to ensure restoration establishes as designed e. All materials related to construction are removed when appropriate (e.g. sediment and erosion controls)	b) This comment is no longer applicable as the plan has been revised to remove any stormwater discharge to Sheldon Creek. c) We respectfully disagree with including fish community monitoring. Following the removal of the weir at Upper Middle Road, fish within the urbanized downstream reaches will be able to move upstream to the next nearest fish barrier located immediately downstream of the online pond upstream of Area A. In addition, the proposed channel reinstatement will not provide critical habitat for aquatic species of concern. As such, we do not think that additional fish community information will bring value to the monitoring program. If CH staff disagree, they can make this a condition of draft plan approval. d) Development of a vegetation monitoring program for the Area A corridor can be included as a condition of draft plan approval. e) This relates to ES&C controls and is not relevant to the monitoring section of the EER. ES&C controls will be confirmed as part of CH & City permitting applications.
56	**GR-AB, Draft Grading Plan** a. Remove or grey out existing contours where grading is proposed. b. Show grading for Proposed SWM Pond 'F'. c. Proposed grading will confine the watercourse and create a new top of bank in the left overbank area. CH policy requires a 7.5-metre setback between the long-term stable top of bank and new development/lots. d. Proposed grading used to confine the floodplain/valley should not encroach within the watercourse's meander belt width. e. Proposed SWM outfall appears to block flows from entering the Upper Middle Road Culvert and should be adjusted. f. Identify grading within proposed bioretention cells.	a) The grading plans have been revised for clarity and contours have been adjusted as recommended. b) Grading for the proposed irrigation pond is shown. This pond is no longer proposed to be a SWM pond. c) In an email dated January 28, 2022, CH staff confirmed that they no longer consider there to be a top of bank created in the left overbank area. As such, this comment is no longer relevant. d) The proposed grading has been revised such that no filling is proposed within the meander belt where possible. A minor encroachment is proposed close to Millcroft Park Drive, which is typical when channels "taper" towards the culvert entrance even though the calculated meander belt is larger. A cut is proposed within the meander belt however, this cut is associated with changes to artificial grading that was created when the golf course was built and does not represent natural topography within the meander belt. It is the Study Team's opinion that the cut within the meander belt will not have a negative impact on the fluvial processes of the creek. e) The pond is no longer proposed to be a SWM facility. The storm outfall from Parcel A will discharge directly into the channel. The outfall from the existing Parklane Crescent lands will discharge into the pond to supply runoff for irrigation purposes. The Upper Middle Road culvert is not blocked.

Comment #	Comment	Response
		f) Conceptual grades (functional level of detail) have been shown in the biofiltration areas for Areas A and B as referenced in Area A-D FSR Section 4.6.2 and reflected in cross-section view in Area A-D FSR Drawing SEC-A4.
57	**GR-AB, Draft Grading Plan** a. It is challenging to distinguish existing versus proposed limits on the drawings. Please submit a drawing showing all existing feature and hazard limits and another drawing showing all proposed limits, overlayed on the proposed development. b. All proposed development and related activities must be outside regulated limits for Appleby Creek. Update drawing to include all applicable setbacks and modify lot limits accordingly. c. The pedestrian bridge must be cited and designed in a way which minimizes footprint and impact within CH's regulated area(s). At the CH Permit stage, more detail regarding the bridge span will be needed to ensure the crossing will allow the natural fluvial geomorphic process to continue. CH recommends the span to be at least 3 times bankfull width.	a. The grading plans have been revised to clearly define the development limits / constraints and hazard mapping. An existing constraints plan has been prepared for Area A as referenced in Area A-D FSR Figure 1. b. Acknowledged, these are shown on the constraint mapping figure discussed in a. above. Note that the regulated limits are proposed to be redefined through adjustment to the floodplain grading. c. The pedestrian bridge is no longer proposed.
58	**GP-AB, General Plan** 1. Relocate the outlet structure for the SWM pond away from the culvert to minimize impacts to newly aligned channel and downstream receiving watercourse. 2. A SWM landscape plan is also required, please see CH Landscape guidelines and City of Burlington SWM guidelines updated 2020.	a. The pond is no longer proposed to be a SWM facility. The storm outfall from Parcel A will discharge directly into the channel, north of the pond. The outfall from the existing Parklane Crescent lands will discharge into the pond to supply runoff for irrigation purposes. The Upper Middle Road culvert is not blocked. b. The pond is no longer proposed to be used for SWM purposes. As such, CH's Landscape Guidelines would not necessarily be applicable for an irrigation pond. The applicant is prepared to discuss landscaping requirements for the pond, provided they do not impact the irrigation needs. This can be addressed as a condition of draft plan approval.
60	**EX-AB, Existing Drainage Plan** a. Ex. Culvert at Upper Middle Road is labelled 1.84 x 1.84 @ 2. Revise label as required. b. Review and revise contour layer as required; the drawing may contain more than one contour layer as various contour lines cross. c. Identify source of existing topographic data on the drawing	a. We have field verified the dimension of the culvert as a twin 4.7m x 1.92m box which is generally consistent with the CH model provided to Urbantech (twin 4.7m x 1.7m box culverts as discussed in Area A-D FSR Section 4.5.4). The HECRAS model reflects these verified dimensions The culvert survey is incorrect. b. The contours have been adjusted / revised on this plan. c. The source of the topographic mapping is the existing survey by RPE (2018). This has been combined with the MNR LIO data for the surrounding area (dated 2002)
	AREA D	
61	**GRD-D, Grading Plan**	Refer to Wood Comment Response No. 33.

Comment #	Comment	Response
	Details for STM Outlet #2D must be provided. Calculations and proposed surface treatments must be specified. A CH Permit will be required for works within the regulated area.	