CRAIGLEITH RIDGE - Comment Response Matrix

Comment #	Comment (1st Engineering Submission)	Response (1st Engineering Submission)
Town of The Blue Mountains (Comments dated January 25, 2019)		
A) Servicing and Stormwater Management Report		
1	Section 2.2 A) Please confirm the impact of the site on the Municipal Drains that Watercourses traversing the site connect too. B) Please Comment on the ongoing Master Drainage Anaylsis for 2 through regional storm event affecting Watercourses(6),7,8,9 and 10. C) Please Comment if any investigation has been completed to determine if Karst feature are present in the areas of the proposed stormwater system.	A) To clarify, there are no formal Municipal drains onsite, however the impact on the area drainage is discussed in the Regional Spill Management Letter submitted to the TOBM on February 8, 2019. B) The Master Drainage Analysis was completed and summarized in the Regional Spill Management Letter submitted to the TOBM on February 8, 2019. Further submissions of this material will be forthcoming. C) A Karst Conditions Investigation and Letter was completed by Peto MacCallum, and is available in the Appendix.
2	Section 4.0 Please discuss the operation of the Secondary/ Emergency Access and how it will be maintained and accessible for EMS but not the general public.	The emergency access will be regulated with knockdown bollards. This has been reflected on the site plan, engineering drawings, and mentioned in Section 4.0 of the Servicing & SWM Report.
3	Section 5.0 Please Comment on the adequacy of the existing infrastructure to account the proposed flows from the 211 units and the commercial building.	Please refer to the response to comment #5 (Water servicing) and comment #50 (sanitary servicing). The Regional Stormwater Management Report (Crozier, 2018) and Regional Spill Management Letter (February, 2019) outline the proposed infrastructure solutions for stormwater.
4	Section 6.1 To Clarify the Town has sufficient Capacity at the Water Treatment Plant. Water modeling is to clarify distribution system impacts.	Acknowledged.
5	Section 6.2 The Town requires watercad modeling to investigate potential offsite impacts from the design, particularly with respect to interferrence between PRV's, arrangments are being made to have JL Ricards undertake this work. Addtionally, outstanding issues remain pertaining to assuming the system, .	J.L. Richards completed preliminary water modelling following the first submission of the Servicing & SWM Implementation Report (Crozier, October 2018). The preliminary modelling results confirmed that the Town's water system has sufficient capacity to service the site's required flow. Subsequent to the completion of the preliminary water model, the fire flows for the site have been updated. Available water pressures and capacities will be confirmed through an update to the J.L. Richards/Town water model and will be submitted at a later date. The modelling results from this assessment have been included in Appendix B.
6	Section 7.0 A)Please provide comment from local utilities that connections are available. B) A CUP will be required in future submissions.	A) Local utilities have been contacted and utilities are available to service the site. B) A CUP will be included in future submissions.
7	Section 8.2 A) What's season is the underside of footing 0.5m above proposed ground water. And please confirm in relation to the season max groundwater elevation. B) the Towns Preference is to have a minimum of 1.5m cover or storm sewers.	A) Groundwater elevations were obtained in Winter (December 2015 and January 2018) and Spring (May 2018). The Spring groundwater elevations reflect higher seasonal groundwater levels. B) We are maintaining a minimum of 1.5m cover of storm sewers with the exception of the Lower Pond access road and Nipissing Trail to the east of the pond access road. Cover is lower in this area due to low slopes and the need to maintain drainage governed by the outlet to the lower pond.
8	Section 8.3 A) Please determine the extent of the site that is influenced by municipal drains. B) Please provide rational for peaks flow time assumptions and further calculation to support claim.	A) To clarify there are no Municipal drains onsite, however floodlines for onsite watercourses 7 and 9 have been illustrated in the Grading Plans (C102 A-D) and the Constraints Plan (Drawing C111). Please also refer to Regional Spill Management Letter submitted to the TOBM on February 8, 2019. B) Time of concentration calculations are completed based on establishing the length of the longest flow path, determining the change in slope and utilizing the Airport or Bransby Williams equation depending on the runoff coefficient of the catchment. Refer to hydrologic parameter sheets for detailed calculations.

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9	Section 8.4 A)Please clarify with such a narrow cross section & semi mountable curb, does the road have enough capacity to convey large storm events. B) Please clarify the amount of hard surface runoff is uncontrolled in watercourse 9 drainage area.	A) Plater-Fleming Way has capacity to convey the 100-year storm event. We have provided FlowMaster calculations in Appendix E of the Servicing & SWM Report. B) Refer to the hydrologic parameter sheets
10	Section 8.5 Based on the Down Stream Constraints, Quantity control will be required for all drainage areas, based on the site's prorata share of downstream capacity.	The proposed stormwater management strategy is matching flows from pre development to post development at the outlets of the site. Drainage area 10A has reduced in size in post-development from pre-development and as such quantity control is not required. Drainage areas to Watercourse 9 upstream of drainage areas 9F and 9D are subject to overcontrol, and hence Drainage areas 9F and 9D do not require quantity control to maintain post to pre development flows at the site outlet for Watercourse 9. Refer to SWMHYMO Calculations. Further, spill between watercourses is an existing condition as described in the Regional Spill Management Letter submitted to the TOBM on February 8, 2019. Downstream improvements are proposed to address existing issues with deficient capacity.
11	Section 8.6 A) The Town used the Owen Sound IDF curve in our Engineering standards. B) A Pre- Post approach is only acceptable if the receiving water system has adequate conveyance capacity, as such is not the case, overcontrol is required.	A) SWMHYMO requires ABC values to complete hydrologic modelling, however the Owen Sound IDF curve only has AB values. The MTO IDF curve was used to identify a time-intensity curve with ABC values for input into SWMYHYMO to conduct SWM modelling. B) Overcontrol is achieved in the proposed SWM design. Spill between watercourses is an existing condition to convey water to the ultimate receiving body, Georgian Bay. To improve the local existing conditions, culvert upgrades have been proposed for watercourse 8, and diversion channels have been designed to direct flows to this upgraded culvert.
12	Section 8.8 Please comment on the velocity of flow for each culvert during each design storm, Please confirm if any culverts reach super critical.	The velocity of flow for culverts 1, 2 and 3 traversing Watercourse 9 for each design storm has been calculated. All three culverts in all design storms have a supercritical flow regime. The culverts were designed to match or improve upon the existing channel slope. Discussion on the flow regime has been added to the Servicing & SWM Report.
13	Sanitary Sewer Design Sheet Please check proposed drops and slopes to Town design standards.	Refer to Sanitary Sewer design sheet.
14	Hydrographs Please confirm if duration, volume and frequancy of inundation, has been increased in the flood centers downstream.	The hydrographs presented in Appendix C of the SWM Report show that peak flows in Watercourse 9 at Lakeshore Road are reduced in post-development conditions. The Regional Spill Management Letter (Crozier, February 2019) presents Regional hydrographs on Figures 1, 2 and 3 for Watercourses 7, 8, and 9, respectively. These graphs show the upstream storage volume and culvert capacity. The graphs demonstrate that the surplus volume that the culvert cannot convey under existing conditions is significantly larger than the storage volume upstream of the culvert. The comparison of pre- and post-development hydrographs shows that the duration, volume and frequency of inundation will not be increased in the flood centres downstream. Downstream flood center conditions will be improved through the Regional SWM works.
15	SWMF Design Please include 24hr SCS or Chicago Design Storm	Chicago design storm was assessed and the SWMHYMO modelling can be found in Appendix C. Tables summarizing the SWM Facility operating flows and storage volumes for the 6-hour Keifer Chu, and the 4-hour chicago storm has been included in Appendix D.
16	Storm Sewer Design Sheet A) Please confirm minimum slopes meet Town Standards B) Please confirm Flow Velocities don't exceeded flow standards. C) Town prefers pipe capacity does not exceed 90% capacity. D) Please verify there is no super critical flow.	A-D) Refer to storm sewer design sheet. All slopes, velocities and capacities are within Town Standards

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B) Drawings		
17	Please include an Overall Site Servicing & Grading plan, Similar to key plans, with details	This has not been provided due to the size of the site and notes required, as it will not fit on a standard drawing sheet at a useable scale. We have updated key plans to better illustrate areas of the site specific grading plans are referencing.
18	C101.A A) Please provide typical Parking space detail in clubhouse parking area. B) Please provide snow storage area C) Please provide any hard surface area around club house on drawings. D) Please label all amenities in club house area, as they will affect storm water. E) Please comment on the Need for guardrails at the water course crossing. F) Please comment on garbage and fire access at the end of Streets, B, C, D and F. G) Please comment on the proximity of services to buildings H) Please comment on the water and storm crossing and the separation provided on Street D	A) Typical Parking space detail has been provided for the site. B) Snow Storage Areas are indicated on the Site Plan and drawings. C) Hard surface areas around the club house are shown on the drawings. D) Amenities in the club house area are labelled in the drawings. E) Guiderails have been added at watercourse crossings. F) These streets have been looped such that garbage and firetruck access is available. G) Typical unit servicing detail has been provided. H) Additional labelling and notes have been added to the profile, and the at-grade inlet to the storm sewer has been upsized to accommodate flows.
19	C101.B A) Please comment on the Need for guardrails at the water course crossing. B) Please comment on garbage and fire access at the end of Streets, E, F, and J C) Please comment on the proximity of services to buildings D) Please comment on the height and potential set back requirements of the proposed retaining wall. E) What is the surface treatment on the access road around SWMF. F) How will STM DICB # 2 be maintained and is it designed for 50% blockage? G) Please note Conservation Authority will need to comments on set backs from retained butter nut trees.	A) Guiderails have been added at water crossings. B) Garbage and firetruck access have been provided at the end of Streets E, F and J. Truck turning movements have been provided at hammerheads. C) Typical unit servicing detail has been provided. D) Retaining walls within setbacks have been kept to a height of <1m, so as not to be defined as 'structures'. E) Refer to DWG C108.C for access road details F) We have assumed this is referencing DCB#12, the inlet from Drainage Area 37. This DCB has been assessed for 50% blockage and has sufficient capacity to capture the 100-year flow. A capture curve has been included in Appendix E of the SWM Report. G) Acknowledged.
20	C101.C A) Please comment on garbage and fire access at the end of Street H, and length of hammerhead. B) Please comment on the proximity of services to buildings C) Confirm how Emergency access culverts were sized D) Confirm traffic control measure at EMS access G) Need Details on sanitary connection, including pre-condition survey of structure. H) will require full width reconstruction to current standards on Old Lakeshore I) Will need comment from GSCA on Rip rap of watercourse, J) please confirm why Storm water from OGS (MH 52) does not have quantity control. K) Please note size of vehicles assumed for hammerhead turn around?	A) Garbage and firetruck access have been provided at the end of Street F. Truck turning movements have been provided at hammerheads. B) Typical unit servicing detail has been provided. C) Emergency access culverts were sized with a 500mm dia. culverts per typical driveway design and convey the Regional flow. Culvert Master calculations are appended to the SWM report. D) The emergency access will be regulated with knockdown bollards. This has been reflected on the site plan, engineering drawings, and mentioned in Section 4.0 of the Servicing & SWM Report. G) See Plan & Profile C104.B for existing condition and details for sanitary connection. H) Plans have been revised to show full width reconstruction on Old Lakeshore Road at service connections complete with details. I) Acknowledged. J) The proposed stormwater management strategy is matching flows from pre development to post development at the outlets of the site. Drainage area 10A has reduced in size in post-development from pre-development and as such quantity control is not required. Drainage areas to watercourse 9 upstream of drainage areas 9F and 9D are subject to overcontrol, and hence Drainage areas 9F and 9D do not require quantity control to maintain post to pre development flows at the site outlet for watercourse 9. Refer to SWMHYMO Calculations. Further, spill between watercourses is an existing condition as described in the Regional Spill Management Letter submitted to the TOBM on February 8, 2019. K) The hammerheads were sized for a rear-load garbage truck, using AutoTurn software.

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21	C101.D A) Please comment on the proximity of services to buildings B) Please comment on outlet that avoids pond off of street I C) Please note the location of the watermain is not easily maintainable D) Please note the servicing lot 186 on old lake shore will exceed planning approvals E) Please comment on need for random retaining walls F) Town road connection will require full width reconstruction. G) Verify size of sanitary outlet and capacity	A) Typical unit servicing detail has been provided. B) This outlet accepts stormwater from EXT-8A and 8A, bypassed beneath the development (catchment Area 2D) and outlets to Watercourse 8 downstream of the development. These catchment areas consist of natural pervious areas only, and as mentioned previously the proposed stormwater management strategy is matching flows from pre development to post development at the site outlet, and as such EXT-8A and 8A catchment areas do not require treatment from a stormwater management pond. C) This watermain has been removed. D) 186 Lakeshore Road is not part of the development. If referring to 208 Lakeshore Road, (Keith Residence), this residence will be removed and not contribute to the 211 unit count. E) Retaining walls were included in the last submission for protection of the archaeological area to ensure adequate stormwater drainage of the surrounding areas without grading or intrusion on the archaeological zones identified. Retaining walls have since been refined through revised grading. F) Plans have been revised to show full width reconstruction complete with details at connection points. G) The sanitary outlet pipe size is 525 mm. The outlet is 36% full flow after our site connects to the existing external sanitary systems.
22	C102.A A) Please confirm where Club House roof water will discharge B) Please comment on quality and quantity comments of stormwater management.	A)The Club House roof water is discharging to the southeast. Half will sheet off uncontrolled towards Watercourse 9, and half will be captured in the storm system and conveyed to stormwater management facility #1. B) There are no quality and quantity comments of stormwater management on DWG C102.A. Please refer to the Report for stormwater management details.
23	C102.B A) Please provide cross section for pond overflow B) Please include tactile plates C) Please comments on the potential risk of a flood damage center below the water crossing street A D) Please include discussed trail.	A) Refer to DWG C108.C & C109.C for the emergency spillway cross section. B) Tactile Plates have been included. C) Assuming this question refers to the northern-most watercourse crossing, the Regional Floodline has been included in the grading and constraint plans. More details on floodline and spill are discussed in the Servicing and SWM Report and addressed in response to comments from the GSCA. D) The Trail has been added to the site plan. The trail alignment will be refined and provided in more detail in the landscape drawings.
24	C102.C Please include grades on end of hammerhead on Street H	Additional grades have been included on end of hammerhead in this location.
25	C102.D Please confirm details on the swale to the east of the Storm Pond.	Detailed grading has been added to the swale to the east of SWMF#2
26	C103.A A) Please confirm Hydrant spacing. B) Please confirm separation under the first water course crossing.	A) Fire coverage has been provided for every unit. Units are all within 50m of a fire hydrant. B) Assuming comment is with respect to vertical separation between sanitary and watermain to box culvert, the drawing indicates both sanitary and watermain are to be installed within steel casing, and casing to be installed a minimum 0.5m below underside of box culvert complete with insulation.
27	C103.C A) Is a drop structure required at 0+455 B) Please confirm slope and max velocity on first section of sanitary pipe.	A) Assuming comment is with respect to sanitary sewer. Sanitary sewer has been designed to TOBM design standards. B) Refer to Sanitary Design Sheets
28	C103.D A) Please verify why greater depth can not be applied to the watermain and insulation is used? B) Please provide greater detail on boundary swales.	A) Watermain has been revised and insulation removed. B) Detailed grading of boundary swales has been provided on grading drawings.

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29	C103.E A) Please verify why greater depth can not be applied to the watermain and insulation is used? B) Please confirm pipe and structure on profile drawings from 0+100 to 0+120	A) Watermain has been revised and insulation removed. B) This pipe captures the external flows from the south, and passes on an angle through the profile, hence why there are no structures shown on the profile. It connects to a CBMH12 on C.103.F
30	C103.F Our understanding is retaining walls are subject to set backs, to be further determined by planning after a LPAT decision.	Retaining walls within setbacks have been kept to a height of <1m, so as not to be defined as designated structures.
31	C103.G A) Please verify why greater depth can not be applied to the watermain and insulation is used? B) Our understanding is retaining walls are subject to set backs, to be further determined by planning after a LPAT decision.	A) Watermain has been revised and insulation removed. B) Retaining walls within setbacks have been kept to a height of <1m, so as not to be defined as designated structures.
32	C104.A A)Please verify why greater depth can not be applied to the watermain and insulation is used?	A) Watermain has been revised and insulation removed.
33	C104.B/C A) Please verify why greater depth can not be applied to the watermain and insulation is used? B) Confirm separation at station 0+315	A) Watermain has been revised and insulation removed. B) Adequate separation has been provided at this location.
34	C105.A A) Confirm separation and conflicts at 0+000 B) confirm depth of storm sewer and cover between stations 0+220 &0+260	A) Adequate separation has been provided at this location, and there are no conflicts. B) We are maintaining a minimum of 1.5m cover of storm sewers with the exception of the Lower Pond access road and to the east of the intersection along Street I. Cover is lower in this area due to low slopes and the need to maintain drainage governed by the outlet to the lower pond.
35	C105.D A) Please verify where existing and proposed grade meet. B) Please verify if the drainage of all disturbed areas is being accounted for.	A) The pond berm profile has been included in the Profile, and grading updated in this area. Refer to grading drawings. B) Refer to Storm Drainage Area plans.
36	C106.A Please confirm extents of area around clubhouse and if any future capacity is required.	The Clubhouse area and parking lot area have been incorporated into the drainage area.
37	C107.A Please note why club house and tennis courts do not appear to be in accounted drainage areas.	Flows from the Tennis Court are considered clean and sheet to watercourse 10. Half of the Club House is controlled and has been included in the drainage area. The other half of the Roof Water will sheet to watercourse 9.
38	C107.B Please confirm volume / flow rate of roof water not being directed to or controlled by the storm system.	The entirety of the roof area is included in our stormwater modelling. We're controlling half the flows and directing them to SWM Facility #1. All roof water flows are conveyed through watercourse 9 at the downstream outlet, where we are matching pre-development flows.
39	C107.C A) Please confirm overland flow to watercourse 10. B) Please confirm is a swale will be necessary to convey water around existing hydro sub station C) Please confirm culverts sizes, and provide calculations	A) The post-development overland flow route will remain the same as the pre-development overland flow route, with less flow being conveyed to Watercourse 10 under proposed post-development conditions. Overland flow arrows have been added where applicable to indicate drainage to Watercourse 10. B) Current drainage design on drawing C102.C indicates drainage will be conveyed around substation to ditch on Old Lakeshore Drive. Refer to grading plan DWG C102.C C) Emergency access culvert calculations have been provided in Appendix E of the SWM Report and sizing has been summarized within the body of the report.

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40	C107.D A) Please confirm if the entire North East corner including approx. 18 lots drains via rear yard swale. B) Please comment on how drainage if affected by proposed retaining walls	A) 12 lots in the North East corner drain via rear yard swale. The remaining 4 lots to the southeast drain to the road. Refer to DWG C102.D B) Retaining walls around the archaeological protection area have been removed.
41	C108.A Please confirm with GSCA & MNRF that work can be completed in butternut set back area.	Acknowledged. Environmental Consultant Azimuth is in discussion with MNRF regarding the Butternut setback areas to confirm that works can occur as per the detailed design drawings. This submission was also provided to the GSCA for their review and comment.
42	C108.B Please include side slopes on section.	Acknowledged. Side slopes have been added to the section.
43	C109.A A) Please comments on side slope stability, 3:1 below permeant pool may not be maintainable, or allow egress, and is not compatible with MOE recomemndations. B) Additionally please have the Geotech comment on the slope stability in areas of the storm water pond that intersect the water table, and potential groundwater inflow into the Pond and PTTW implications.	Based on previous geotechnical data it was recommended that the base of the SWM pond be set at about elevation 180.2 in order to achieve a 0.5 m buffer from the closest highest ground water level. Based on the latest drawings provided for our review the base of the pond has been re-established at elevation 180.2, as recommended. Based on this revised pond base, it is anticipated that ground water should not impact side slopes or pond capacity. Where interior pond side slopes are steeper than 5H:1V, rip rap is recommended to line the slopes to aid with stability.
44	C109.B A) Please comments if the Ground water table will intersect the pond B) Confirm orifice invert elevation	A) The bottom of the pond was raised to avoid conflict with the groundwater table. B) The orifice invert elevation is 181.00
45	C110.A-D A) Provide greater detail of erosion control and dewatering activities around water crossings B) Provide greater detail of erosion control on ridge slopes	A) We have included watercourse crossing drawings which have more details of the crossing design. Erosion and sediment controls are shown on the ESC Plans. GEO Morphix has assessed watercourse 9 and is reviewing the proposed watercourse crossings and proposed inwater structures to provide recommendations. B) The road crossing of the Nipissing ridge is through an area that is already disturbed, and the rest of the ridge is remaining relatively untouched. Erosion and sediment controls are proposed around the construction of the roadway and the boundaries of the ridge.
C) Additional Comments		
46	Please note, Road Geometry and layout is not supportive of Curbside Solid Waste collection, Please revise or provide an alternative means of waste collection.	Roads have been looped where required and hammerheads have been adequately sized for Curbside Solid Waste collection turnarounds.
47	Please provide a greater level of detail and disscusion on the secondary access and how it is proposed to be maintained to be usable by EMS regulary without allowing pedestrial or residential vehicler access.	The emergency access will be regulated with knockdown bollards. This has been reflected on the site plan, engineering drawings, and noted in Section 4.0 of the Servicing & SWM Report.
48	Please include and provide details for the trails that were discussed with the Town, The Town understood that an easement would be provided and the Town will maintain an East West trail.	Trail alignment has been included on the Site Plan. The landscape submission will include the details of the trail.
49	Please confirm use for 186 Old Lakeshore, Keeping it will exceed premited units of 211.	186 Lakeshore Road is not part of the development. If referring to 208 Lakeshore Road, (Keith Residence), the existing unit at 208 Lakeshore Road is being removed prior to final approval.
50	Wastewater would like to see some calculations or modeling supporting the exisitng sanitary sewer has capacity from the site, to the Criagleith pumping station.	The sanitary sewer system between the proposed connection points to the Lakeshore Road Sewage Pumping Station has residual capacity to accept proposed flows from the Development as confirmed through update of the TOBM sanitary sewer model.
51	Please complete firetruck turning radius anaylsis on all radii and hammerheads	Firetruck turning radius analysis has been completed and is shown at all Hammerhead locations. Note that firetrucks can back up a max of 90m on Private Roads.
52	Please indicate areas of snow storage and stockpile locations.	Areas of snow storage and stockpile locations have been added to the Site Plan.

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Grey Sauble Conservation (Comments Dated July 31, 2019)		
A) Natural Hazards		
53	Several natural hazards were identified on the property and were zoned in the Town of the Blue Mountains Zoning By-law. These include the flood and erosion hazards associated with watercourses 7, 8, 9 and 10 as identified in the Craigleith-Camperdown Subwatershed Study by Gore and Storrie Limited in 1993. There are also erosion and slope hazards associated with the Glacial Lake Nipissing Ridge that runs through the subject lands.	Acknowledged. The Site consists of hazard areas pertaining to the watercourses and the Nipissing Ridge that are zoned hazard per the Town of The Blue Mountains Zoning By-law. The constraints related to these hazard areas are identified in the compiled constraints plan included in the Servicing and Stormwater Management Report. Further, additional studies have been completed by Peto MacCallum and GEO Morphix with respect to the Nipissing Ridge slope hazard, and Watercourse 9 erosion hazard, and the results of these studies has been incorporated into the compiled constraints plan and included in this submission.
54	Fill is being proposed to be placed in hazard lands along the banks of watercourse 9. This was not previously included in the plans and under GSCA policy 8.1.29 e) flood protection works and bank stabilization works to allow for future/proposed development is prohibited. We request clarification as to why floodproofing is being considered for development if appropriate setbacks are being met from the watercourses across the site.	Fill placement within the hazard lands associated with watercourse 9 is required at the locations identified for crossings, the stormwater management pond outlets, and in some areas to manage the existing spill conditions associated with watercourse 9. Fill placement associated with spill management is to ensure that spill flow is contained within the watercourse, consistent with the recommendations of the Regional Stormwater Management Report to formalize flow routes for existing spill flows and upgrade existing conveyance channels and culverts to the Regional Storm standard. These recommendations effectively improve conveyance to Georgian Bay and eliminate flood risk to a number of existing flood susceptible properties downstream of the subject lands. The MNRF Technical Guide - River & Stream Systems: Flooding Hazard Limit (MNR, 2002) provides direction on flood hazard identification and implementation of PPS policies. Unlike a floodway, the preferred floodplain management approach in spill areas, such as those identified on the Subject Lands, is to eliminate spill flooding risk where feasible. This is commonly achieved by placing fill in the spill area to create a height of land that contains spill flows within the Regulatory Floodplain or by re-channelization of the offending watercourse. This is consistent with the approach recommended in the Regional SWM Report to deal with spill flows across Parkbridge Craigleith. Additionally, GEO Morphix completed a Geomorphological Assessment and Stabilization Recommendations Report dated September 11, 2020, that prepared recommendations for erosion protection and bank stability associated with the proposed watercourse crossings and SWM outfalls to ensure that natural hazards are addressed from a fluvial geomorphological perspective. Furthermore, Section 3.1.4 of the PPS further goes on to note that development and site alteration may be permitted in certain areas associated with the flooding hazard along the river where development is limited to uses which by their nature must locate within the floodway, including flood and / or erosion control works. Likewise, GSCA Policies Section 8.1.15 provides an exception to one zone policy for a variety of infrastructure uses. Finally, Section 3.1.7 of the PPS notes that development and site alteration may be permitted in those portions of hazardous lands where the effect and risk to public safety are minor and could be mitigated in accordance with the Provincial standard. Likewise, Section 7.1.2 of the GSCA Policies list a series of technical requirements associated with permitted development, interference or alteration within a regulated area.
55	The maintenance road for the upper stormwater management pond is also proposed in the hazard lands associated with watercourse 9, again requiring alterations within the hazard lands that were to act as the buffer between the development and the watercourse.	As mentioned in response to your previous comment, Section 3.1.7 of the PPS notes that development and site alteration may be permitted in those portions of hazardous lands where the effect and risk to public safety are minor and could be mitigated in accordance with the Provincial standard. Likewise, Section 7.1.2 of the GSCA Policies list a series of technical requirements associated with permitted development, interference or alteration within a regulated area. The existing pond berm has been relocated away from Watercourse 9. The proposed pond berm is outside the flooding / meander hazards identified in this section of Watercourse 9.

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56	If there is no additional information on the erosion potential of watercourse 9, additional setbacks from the bank may be required given that a consistent setback from the top of the bank has not been consistently met through this development proposal. As noted above, bank stabilization work for future development is not in line with GSCA policies.	GEO Morphix prepared a Geomorphological Assessment and Stabilization Recommendations report, dated September 11, 2020, investigating the meander belt widths and erosion potential of Watercourse 9 through the site. The lower reaches (below the Nipissing Ridge) were identified as an unconfined system, and a meander belt width of 17m was applied. The upper reaches (above Nipissing Ridge) were identified as a confined system, and for Reaches WC9-4 and WC905, a 5m erosion setback is applied. For Reach WC9-4, a toe erosion allowance is not required as the watercourse is greater than 15m from the valley toe of slope, and for Reach W9-6, a 1m erosion setback is applied. The erosion setback from stable top of slope is indicated in representative cross-sections in the GEO Morphix report and the Engineering grading drawings and Constraints Plan.
57	In our previous comments we also noted that in the PML slope stability assessment, others were looking into the required setbacks from the sloped area along the southern section of the Nipissing Ridge, roughly between watercourse 8 and watercourse 9. It appears as though a 15-metre setback has been included in the development proposal in the absence of further study, and this approach is generally acceptable to our office.	Acknowledged.
58	Our office requests that subsequent submissions include the current site plan (with proposed lots and building envelopes) in mapping that clearly outlines the extent and elevations of the regional and the 100-year storms, 15-metre setbacks from top-of bank for erosion and any other constraint that may be applicable to the application. In our previous comments, we requested additional information regarding the flood plain and erosion rate within watercourse 9 but have not received this detailed information.	We have provided the extent of the Regional Floodline (which is larger than the 100 year and governs for the site) on the grading drawings and the constraints plan. GEO Morphix also prepared a Geomorphological Assessment and Stabilization Recommendations study dated September 11, 2020 investigating the meander belt widths and erosion potential of Watercourse 9 through the site. The lower reaches (below the Nipissing Ridge) were identified as an unconfined system, and a meander belt width of 17m was applied. The upper reaches (above Nipissing Ridge) were identified as a confined system, and for Reaches WC9-4 and WC905, a 5m erosion setback is applied. For Reach WC9-4, a toe erosion allowance is not required as the watercourse is greater than 15m from the valley toe of slope, and for Reach W9-6, a 1m erosion setback is applied. The erosion setback from stable top of slope is indicated in representative cross-sections in the GEO Morphix report and the Engineering grading drawings and Constraints Plan. Additional constraints shown on the constraints plan include butternut setbacks, the hazard zoning line provided by the TOBM, archaeological zones, medium and high-constraint areas.
B) Natural Heritage		
59	The following polices under the provincial policy statement would need to be considered. We have provided updated comments on the applicable policies based on our review of the proposal. Our comments remain the same for the significant woodlands and significant wildlife habitat as previously submitted. We recommend that the mitigation measures recommended in the original EIS (and updated EIS) be incorporated into the required Vegetation Management and Landscape plan required under condition 20 of draft approval. (i.e. eco-passage corridor enhancements for amphibians and other wildlife, woodland edge habitat and wildlife habitat enhancements, riparian buffers, etc.)	As confirmed in Azimuth's 2016 EIS, should recommendations for mitigation and compensation be followed, the proposed development is expected to conform with the Provincial Policy Statement and other applicable regulations. Outstanding considerations for mitigation and compensation as they relate to Significant Woodlands, Significant Wild Habitat, Species at Risk, etc., are described in Azimuth EIS Addendum (2020), all of which have been incorporated into the Landscape Plan, Stormwater Management facility design, and trail network design prepared by Crozier. Providing the mitigation and compensation measures detailed in the August 2020 submission are followed, the proposed application is expected to demonstrate consistency with Section 2.1 of the Provincial Policy Statement. Additional environmental enhancement at SWM Facility locations as negotiated through the recent LPAT settlement have also been incorporated.

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60	As stated in our previous comments, we advocate a minimum 30 metre setback on all water courses to provide a buffer for fish habitat, wildlife and water quality as a Natural Heritage feature. This 30-metre setback is generally being met on the watercourses present across the property, not including watercourse 9. The EIS submitted by Azimuth Environmental Consulting Inc. in 2016 had recommended a 15-metre buffer on each side of watercourse 9 from the top of bank, however in several areas it appears as though the 15-metre buffer around the watercourse for protection of the fish habitat does not appear to be met through the current proposal. We ask that the plans are revised to clearly show the boundaries of the current buffer to ensure that this area is kept outside of the construction and grading works. Additionally, the current plan shows rip-rap is planned to be added at all proposed water crossings and at the outflows and emergency spillways for both stormwater ponds. This involves a significant amount of alteration around and within the watercourse and we request that a geomorphologist review the proposed works planned for watercourse 9 in the absence of a 30 metre buffer for habitat. Additionally, as there are two crossings proposed over watercourse 9 and a number of proposed inwater structures, we recommend consultation with Fisheries and Oceans Canada to determine if an authorization is required for the project.	The EIS indicates the central watercourse is a permanent, direct fish habitat for warm/coolwater baitfish species, and a 30m (15m from each bank) natural setback is appropriate. This is contained within the hazard zoning per the zoning bylaw amendment. DFO self-assessment and consultation is also underway as required for the proposed three watercourse crossings to ensure proper sizing and fish passage. The Geomorphological Assessment and Stabilization Recommendations Study dated September 11, 2020 also proposes erosion and sediment controls to protect the watercourse during construction to minimize the extent of impacts to the watercourse, and alleviate the risk of sediment entering the watercourse. Furthermore, a forest edge management plan is proposed to minimize impacts and encroachment into the buffer. As mentioned in response to a prior comment, Section 3.1.7 of the PPS notes that development and site alteration may be permitted in those portions of hazardous lands where the effect and risk to public safety are minor and could be mitigated in accordance with the Provincial standard. Likewise, Section 7.1.2 of the GSCA Policies list a series of technical requirements associated with permitted development, interference or alteration within a regulated area.
61	The federal and provincial agencies have responsibility to administer activities associated with threatened and endangered species. The presence of Butternut trees on the subject lands has been confirmed through and EIS and in site inspections of the property. The status of the Butternut trees was determined in a Butternut Health Assessment Report, submitted as Appendix E to the EIS. Through our review of the proposal it appears as though works will be occurring within the 25-metre buffer of Butternut trees 2, 4, 5, 6, 7, 8, 9, 10, 11, 13 and 14. Additionally, the works appear to require the removal of trees 6, 9, 10 and possibly 5 and 11. The taking, harming or killing of any Butternut tree must be authorized by the MNRF and a compensation plan must be established. We note that a plan was submitted to the MNRF outlining the extent that development would be encroaching into the Butternut tree buffers, however it did not capture the full extent of the works occurring through this proposal, specifically the site alteration and grading required for the development of the existing man-made pond into one of two stormwater management ponds planned for the development. We recommend that Azimuth revisit their evaluation of impacts to that species. We also note that the suitable space for compensation on the site may be limited, and should be evaluated in more detail given the likelihood that compensation will be required as a result of the current development proposal.	During preparation of the 2016 EIS Azimuth identified fifteen (15) Butternut trees within and directly adjacent to the property limits. A Butternut Health Assessment (BHA) was completed for all 15 stems identifying that all trees except Butternut #3 and #13 qualify as Category 2 (or, "retainable") under the Butternut Assessment Guidelines and are therefore protected under the ESA. Following submission of the 2016 EIS, in April 2018 Azimuth confirmed three (3) additional Butternut trees on the subject property. A BHA was completed for Butternut trees #16, #17, and #18 at which time all three trees were assessed as Category 2 (or, "retainable") and are therefore protected under the ESA. Azimuth engaged with MNRF throughout the course of the field program and post-submission phases with respect to Butternut identification, evaluation, mitigation, and compensation matters. MNRF issued a Letter of Advice on February 26, 2018 confirming that the proposed development plan as presented in the 2016 EIS will not contravene the ESA where development is proposed within the 25-50 m seed dispersal zone (referring to trees #4, #7, #8 and #14 discussed during a January 2018 teleconference). It was further agreed during the January 2018 teleconference that 1) SWM facility works within the 25-50 m seed dispersal zone would not constitute harm per the ESA, and 2) use of natural substrates (e.g. wood chips) for the trail system within 50 m of Butternut trees would also not constitute harm per the ESA. With consideration for the MNRF consultation and detailed design presented in Azimuth's EIS Addendum, a total of seven (7) Butternut stems (2 killed, 5 harmed) require Registration under Ontario Regulation 242/08 prior to vegetation clearing works (Butternut #2, #4, #5, #6, #16, #17, #18). A Registration was completed for Butternut #16, #17, and #18 in 2018 and compensation stems were installed at an offsite location in spring 2019 in accordance with the requirements and timelines of the Regulation. A second Registration under Ontario Regulation 242/08 for Butternut #2, #4, #5, and #6 will occur prior to the commencement of vegetation clearing. Compensation stems will similarly be installed at an offsite location in accordance with the requirements and timelines of the Regulation. Full details regarding Butternut associated with the property, impacts, and mitigation strategy relative to the project design are presented in Azimuth's EIS Addendum report and will be coordinated with the appropriate agencies.

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C) Stormwater Management		
62	We have reviewed the Servicing and Stormwater Management Implementation Report submitted by C.F. Crozier & Associates Inc. submitted in October 2018 and the draft Regional Stormwater Management Pan for Watercourses 7, 8, 9 & 10 submitted in April 2018. Our office is still of the opinion that the stormwater management approach is generally consistent with GSCA policies and the Craigleith Camperdown subwatershed study. GSCA policies state that the minor system must be designed to control up to the 5-year storm, and the major system must be designed to accommodate the Regulatory storm. Additionally, the runoff from the site must be controlled to pre-development levels. We are generally accepting of the findings of the Regional Plan, and the options for stormwater management provided therein. We note that further assessment of the potential impacts to fish habitat should be addressed for any anticipated changes in flow within any of the watercourses that currently contain fish habitat.	Acknowledged. DFO self-assessment and consultation is also underway as required for the proposed three watercourse crossings of watercourse 9 to ensure proper sizing and fish passage. Further DFO consultation will occur through the detailed design of the proposed Regional Stormwater Solution.
63	The implementation report states on page 9 that "the development has been designed to respect Watercourse 9 by implementing a 15-metre undisturbed setback from both sides of the watercourse". Referring to the proposed grading plans and the proposed floodproofing and grading works along watercourse 9, this 15-metre undisturbed setback does not appear to be met. The 15-metre setback should be from the confirmed top of bank on each side of the watercourse. This constraint should be clearly indicated in the site grading plans moving forward.	Through the LPAT approval process settlement of setback adjacent to onsite watercourse was reached and reflected in site zoning. A comprehensive illustration of all constraints is shown on the constraints plan (Drawing C111) Additionally, GEO Morphix completed a Geomorphological Assessment and Stabilization Recommendations Report dated September 11, 2020, that prepared recommendations for erosion protection and bank stability associated with the proposed watercourse crossings and SWM outfalls to ensure that natural hazards are addressed from a fluvial geomorphological perspective.
64	With fill being proposed in the areas adjacent to watercourse 9 for grading and floodproofing, please confirm if there will be no overall loss in flood storage on the property.	Flood storage for existing spill conditions is outlined in the Regional Spill Management Letter submitted to the TOBM on February 8, 2019. The improvements proposed in the Regional Stormwater Management Report results in increased conveyance for watercourses 7, 8, 9 and 10, and this increased conveyance will result in a decreased requirement for flood storage for the spill seen in existing conditions. Furthermore, the subject lands are very close to the ultimate outlet of Georgian Bay. As flood storage is typically required to improve downstream conditions, these conditions have already been assessed and improvements proposed through the Regional Stormwater Management works.
D) Additional Comments		
65	A portion of the subject site is regulated under Ontario Regulation 151/06: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses administered by the GSCA. Under this regulation, a permit is required from this office prior to the construction and/or re-construction of buildings or structures, the temporary or permanent placement of fill within the affected area, interference with a wetland, and/or the straightening, changing, diverting or in any way interfering with an existing channel of a river, lake, creek, stream or watercourse. The regulated areas are associated with the watercourses that are on and adjacent to the subject lands and the Nipissing Ridge. Prior to any site alterations on the subject lands, a permit from our office will be required under the regulation.	Acknowledged.
66	We note that it appears as though lots 184 and 185 have proposed lot boundaries and/or building envelopes within the area zoned Open Space.	These lots have been adjusted so the building envelopes do not encroach into the area zoned Open Space.

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67	As noted above, we require additional information regarding the flood plain and erosion rate for watercourse 9. As noted in our previous comments, this information may change the block configuration and/or lot layout.	We have provided the extent of the Regional Floodline on the grading drawings and constraints plan. GEO Morphix also prepared a Geomorphological Assessment and Stabilization Recommendations study dated September 11, 2020 investigating the meander belt widths and erosion potential of Watercourse 9 through the site.
68	Based on our previous correspondence, our requested draft plan conditions have been incorporated into the current draft plan approval. However, the comments as noted above need to be addressed as part of the satisfaction of the draft plan conditions as outlined in conditions 2, 12, 20 and 21.	Acknowledged.