	Comment	Formal Response	Consultant
Township of Cavan-Monaghan (TOCM) – dated May 16, 2022			
1	The grading on the lots on the west side is unacceptable. Please consider moving the public road eastward until a flatter lot area can be achieved on the proposed lots. This configuration may mean that the number of lots in the inside loop will be reduced.	The Grading Plan has been modified to show the extent of the 4:1 sloping across the rear yard. It is unclear what flatter slope the TOCM requires as the proposed 4:1 slope is considered modest. All rear lots on the western edge will have at least 6.5m of useable space measured from the rear of the building to the toe of the slope. This landscaped area will be graded between 2% to 5%. The 6.5m useable space meets TOCM minimum rear yard requirements.	D.G. Biddle
2	The P Loop road layout is acceptable after incorporating the road pattern change requested.	Comment noted.	D.G. Biddle
3	The proposed subdivision has proposed a super pipe system for the west and south side of the pond, while the storm pond is proposed on the northeast corner of the plan. The Township does not accept the super pipe system; the consultant will have to provide an alternative design.	With the removal of three lots on the SE corner of the subject property, there is now an opportunity to propose a dry pond to attenuate post development flows. Refer to the Conceptual Servicing and Grading Plan for details. A slope stability assessment has also been conducted in the proposed location.	D.G. Biddle
4	The servicing design proposes a new watermain connection to King St. The Plans indicate the existing watermain will be abandoned. We note this as a remove and replace. You are required to rebuild and urbanize Turner St. from the subdivision to King Street.	Comment noted. We propose to urbanize the western portion of the existing Turner Street which would include a sidewalk and curb and gutter system. However, considering the eastern half will be fronting undeveloped open space it should be sufficient to leave the remaining half as a sloped boulevard with no curb and gutter.	D.G. Biddle
5	The grading plan for lots on the north side of the plan indicate split drainage but it appears to be draining northward onto other private property. Your consultant must revisit this and revise to direct it to the pond area.	The lot grading has been adjusted for lots 20 to 27 to drain to the internal road system. A minor 3:1 slope at the rear of the properties will meet the existing grade.	D.G. Biddle
6	There is significant grade change along Turner Street, from the existing to the proposed street. There are no details provided on the centerline profile; this detail is required. The Township expects that the centerline grading will be no more than 5%.	TOCM standard indicates a maximum road grade of 8% (page 54) for a 20m R.O.W. The existing grade at Turner Street, immediately south of the development limit and north of Hunter Street, is approximately 10.25% with 2 driveways fronting this area of Turner Street. When Turner Street is extended from the existing roadway, it is proposed to transition the existing centreline grade of 10.25% to a 6.9% centreline grade heading north from the existing road. A crest curve is provided near the south limit of the subject property to accommodate the transition. A preliminary profile drawing of the road grade has been provided with this submission. The proposed grade of 6.9% was not increased further to 8% because it would require a steeper grade to meet back into existing grade on the northeastern edge of the subject property. Furthermore, a reduction from 6.9% to 5% will require additional cuts which should not be necessary since we are meeting TOCM's criteria by maintaining a grade less than 8% as mentioned earlier. A preliminary profile of Turner Street Subdivision has been included with this submission.	D.G. Biddle
7	The bio-retention swale design is not a design the Township has used in the past. These swales are seasonal at best; please revisit the design.	The bio retention swale has been removed.	D.G. Biddle
8	Staff will have to review the proposed new storm pond location and outfall. We are unclear as to why the pond is located where it is and how the outfall works.	The pond was previously located in the Ephemeral Discharge – 30m setback boundary and had to be relocated outside this boundary. The proposed pond relocation is now outside of all significant setbacks including the associated grading with pond. Additionally, ORCA previously made the comment that sheet flows were crossing onto private property to the east before reaching a creek/stream which was undesirable. This relocation allows the discharge to drain directly to Little	O.R.E. / D.G. Biddle

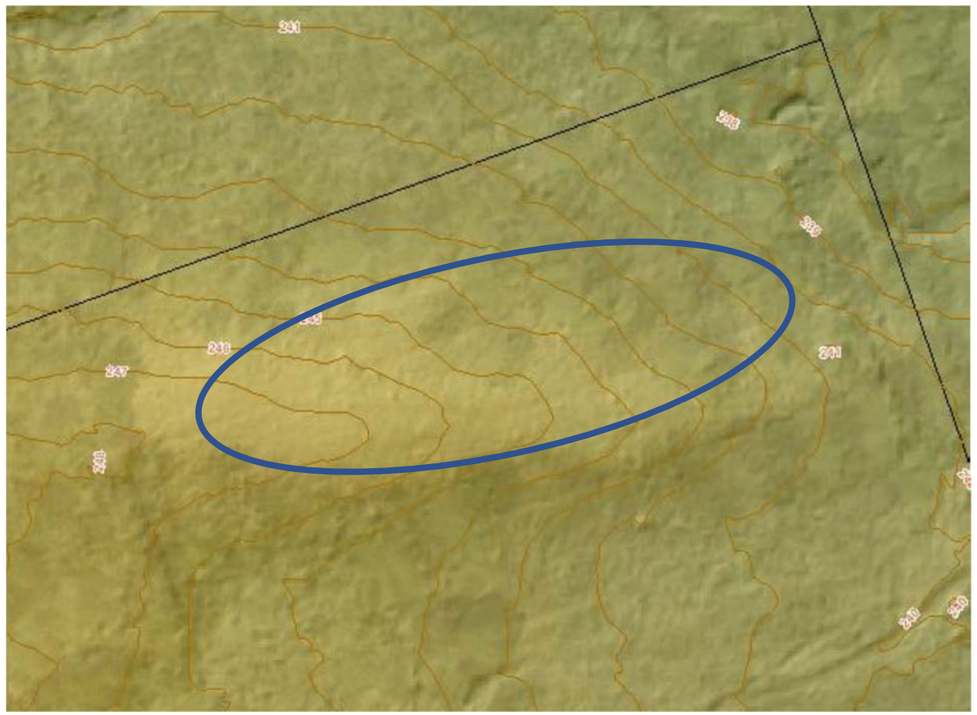
		Creek which crosses the subject property at the NE corner of the property.	
9	There is no servicing allocation available for this plan of subdivision at this time. The Township is currently undertaking a master servicing study. There has been a commitment made to the Towerhill North Development. The capacities of water and wastewater will be reviewed as Towerhill North develops. A review of water /wastewater capacities needs to be completed and any additional capacities allocated accordingly	Comment noted. In the meantime, Draft Plan approval can still be pursued and obtained while this is further discussed and coordinated.	D.G. Biddle
10	The hydrogeological background study documentation is insufficient to ensure that the municipal wells are protected. Additional work is required to confirm the protection of the aquifer.	GHD completed a Source Water Protection Risk Assessment report to review the risk from the proposed development to the municipal wells. The risk to the water quality of the aquifer from the application of road salt is deemed to be low. In our opinion, there are no other water quality threats to the aquifer based upon our understanding of the proposed development. There are no water quantity threats to the aquifer from this development.	GHD
11	Infiltration galleries are able to provide more storage volume than bio retention (this is what is being proposed for the lots within the WHPA-B). Are there ways to treat the infiltration gallery water prior to it infiltrating back into the aquifer	Below is an excerpt from the Low Impact Development Stormwater Management Planning And Design Guide (CVC and TRCA) pg. 4-46 to 4-47 as it pertains to soak away pits / infiltration galleries: -- *Risk of Groundwater Contamination*: Most pollutants in urban runoff are well retained by infiltration practices and soils and therefore, have a low to moderate potential for groundwater contamination (Pitt *et al.*, 1999). Chloride and sodium from de-icing salts applied to roads and parking areas during winter are not well attenuated in soil and can easily travel to shallow groundwater. Infiltration of de-icing salt constituents is also known to increase the mobility of certain heavy metals in soil (*e.g.*, lead, copper and cadmium), thereby raising the potential for elevated concentrations in underlying groundwater (Amrhein *et al.*, 1992; Bauske and Goetz, 1993). However, very few studies that have sampled groundwater below infiltration facilities or roadside ditches receiving de-icing salt laden runoff have found concentrations of heavy metals that exceed drinking water standards (*e.g.*, Howard and Beck, 1993; Granato *et al.*, 1995). To minimize risk of groundwater contamination the following management approaches are recommended (Pitt *et al*., 1999; TRCA, 2009b): • stormwater infiltration practices should not receive runoff from high traffic areas where large amounts of de-icing salts are applied (*e.g.*, busy highways), nor from pollution hot spots (*e.g.*, source areas where land uses or activities have the potential to generate highly contaminated runoff such as vehicle fuelling, servicing or demolition areas, outdoor storage or handling areas for hazardous materials and some heavy industry sites); • prioritize infiltration of runoff from source areas that are comparatively less contaminated such as roofs, low traffic roads and parking areas; and,	D.G. Biddle

		• apply sedimentation pretreatment practices (*e.g.*, oil and grit separators) before infiltration of road or parking area runoff; “ -- It should be noted for Turner Street subdivision, the LID’s tributary to the rear yard are only tributary to grassed landscape and rooftop which is subject to a low risk of contamination. Infiltration galleries within the pond are tributary to low volume roads and will additionally drain via an Oil/Grit separator to pre-treat the sedimentation such as road salts. Imbrium systems have OGS units that pre treat/ TSS, oils and heavy metals. They can be sized accordingly to ensure the water is within reasonable standards prior to infiltrating. Refer to the following website for further information: https://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef	
12	Although the desire is to maintain the ability for the well recharge area to continue to receive infiltration and recharge from precipitation etc., there also needs to be consideration for protecting this well recharge area because it is within the Municipal well’s WHPA-B. What are your plans for protecting that? The GHD report had a section on source water protection, but did they consider the Township’s Source Water Protection Plan?	All LIDs within the WHPA-B have been removed with the exception of clean rooftop water draining to the ground via downspouts. Post development conditions maintain a grassed landscape and will have no negative impact on the WHPA-B area. Please refer to the Engineering Drawings which shows the outer tributary limit boundary of the Municipal Well WHPA-B. All LID’s have been removed from this area - ie Lots 1 – 10 and Blocks 54, 55, 56, 66 and 67. The majority of the site is noted to be within a moderately vulnerable groundwater recharge area, thus infiltration of clean water should be maintained at pre-development values if possible. The majority of the site is not within a highly vulnerable aquifer area. We also noted that the development is NOT within a WHPA Q1 or Q2 area requiring activities that take water without returning it or activities that reduce recharge to replace the water displaced. However, our opinion is that best efforts should be made to maintain the water balance. As only a small portion of the Site is actually within WHPA-B or WHPA-C areas (the site itself provides a very small percentage of the recharge area captured by the municipal wellfield on the order of 0.3%), it is our opinion that this development will have no impact to the water quantity or quality of the underlying aquifer; however, best efforts to infiltrate clean stormwater, particularly within WHPA-B and C should be made.	GHD
13	The OGS and bio retention/infiltration galleries/stormwater pond strategy may meet the stormwater treatment requirements; however, the information does not seem to address the source water protection plan and the protection of the WHPAs.	GHD prepared a Source Water Protection Risk Assessment report to review the risk from the proposed development to the municipal wells. In our report, the risk of groundwater quality impacts is deemed to be low due to the development. Based upon our review of the stormwater strategies, none of the ponds / infiltration galleries are within WHPAs. We have no concern about infiltrating clean rooftop water from downspouts to the ground.	GHD
14	The properties on the westerly side will drain towards the infiltration gallery (that are within WHPA-B). You need to carefully protect this westerly area, because anything that	Comment noted. Refer to response to comment 12.	GHD / Biddle

	is on this part of the site will end up entering in the infiltration gallery, which could make its way to WHPA-B within 2-year travel time; the westerly land needs to they should try to keep this Westerly land as natural as possible.		
15	The Millbrook wellfield is missing from the Well Inventory Map in Appendix B.1 in GHD's September 12, 2018, Geotechnical Investigation report	We have an updated Well Inventory Map provided within our Source Water Protection Risk Assessment report. This is provided as Figure 15 showing the municipal well field, other well record locations and topography.	GHD
16	Figure 5 of D.G Biddle's functional servicing report — are the infiltration galleries shown in the westerly lots (that are within the WHPA-B area) within the backyards of the proposed lots, or outside of the backyards?	The galleries were proposed within the backyards but have been removed to further reduce risk of confirmation of underground aquifer	GHD / D.G. Biddle
17	The existing (and proposed) grading seems very steep. Based on our review it appears that the infiltration galleries would not work on these slopes.	LID's in general can be revised as necessary at detailed design to suit the TOCM's needs and concerns. The LID's can be relocated away from the slopes. Generally, drainage would flow into the catchbasins first and then inundate the galleries. The slopes have been shifted further back west to confirm a 4:1 gentle slope.	D.G. Biddle
18	In terms of source water protection threats, road salt, fertilizer and pesticides are potential threats. What will you do to help avoid these being a threat within the WHPA-B? Will the road runoff end up infiltrating into the WHPA-B area or will it be diverted elsewhere? This issue also includes consideration of where 'snow storage' may occur as snow plowed along the roadways will accumulate chloride, sodium and even petroleum hydrocarbons and if the snow storage is close to these LIDs, then it could lead to these contaminants entering into the aquifer. In terms of possible fertilizer use, will the LIDs within the WHPA-B area be secluded and sectioned off from the residents' backyards or is it going to be part of the residents' property and thus exposed to potential damage?	GHD prepared a Source Water Protection Risk Assessment report to review the risk from the proposed development to the municipal wells. In our report, the risk of groundwater quality impacts is deemed to be low due to the development. The clean runoff from rooftops of homes within the WHPA-B are to be directed to the ground for infiltration in a best effort to maintain clean infiltration to this capture zone. There is minimal risk of any contaminants entering the aquifer in these areas via rooftops. Fertilizers, pesticides etc were assessed within the Source Water report and are low risk within the WHPA-B area. Runoff within the ROW will drain to an Oil/Grit separator prior to infiltration. No actual snow storage will only except from traditional plowing of the roads within the local R.O.W. and the snow melt will drain via the Oil/Grit Separator. It should also be noted that there are 15 existing lots within WHPA-A and about 40 existing lots within WHPA-B as well as existing roadways. The development would add 7 full lots within the WHPA-B and 7 partially overlapping lots. The type and number of LID's can be further explored at detailed design.	D.G. Biddle / GHD
19	There may also be other contaminants that occur as result of stormwater collection and run off, such as animal fecal matter, gasoline/oils/mechanical lubricants, heavy metals from vehicle and building materials wear etc. What is the developer's plans on dealing with these contaminants that may result from the development of this property? Your consultant needs to model this to show how it will be managed/treated.	See comment above. No further modelling should be required at this time. The OGS units can be sized accordingly again at detailed design to treat potential contaminants. This subdivision is a low traffic area with little to no risk of potential contamination.	D.G. Biddle / GHD
20	What is the highest groundwater level possible in this Westerly area (that is within the WHPA-B area)? Did GHD test the groundwater levels during a high recharge season (i.e. spring or fall) or during low groundwater levels? The recommendation is that the infiltration galleries have a least 1 metre of separation between its invert elevation and the seasonally high-water table. Is there enough distance to meet this? We concur with Stantec that there are 3 insufficient wells and monitoring to determine the groundwater levels and flow direction.	LIDs for the dwellings within the WHPA-B is recommended to be directing the clean stormwater runoff to the ground via downspouts. For other areas where subsurface LIDs are to be considered, GHD has data loggers installed within two (2) monitoring wells installed on the site. This groundwater level data will be downloaded to capture the Spring 2023 season and the high groundwater elevations. At that time, the 1 m	GHD

		separation can be considered for detailed design. In our opinion, the westerly area should utilize downspout disconnection to maintain natural infiltration of this area. Additionally, GHD has taken groundwater measurements documented within the report dated June 2, 2020 and previously submitted to TOCM. The report and response to comment was previously submitted in the last submission. For consideration, groundwater seepage was observed at variable depths within our boreholes between 0.8 m and 7.6 m during drilling. Seepage was generally noted either within or above the glacial till. Groundwater seepage was not encountered in any of the ten (10) test pits. It remains our opinion that any groundwater seepage will be controlled through conventional means as described in our reports.	
21	A detailed hydrogeological model of pollutants and water recharge for the aquifer is required.	Refer to previous comment responses. It is our opinion that further modelling is not required as potential for pollutants based upon the Source Water Protection Risk Assessment report is low.	GHD
22	Additional analysis is required to prove that the impacts to the WHPA-B are sufficiently reduced with the proposed LIDs. Background and detailed information regarding soils and groundwater in the area is required. This work may require additional design work to understand the effects of grading and LID design on the groundwater recharge and the potential effects on the groundwater table and water balance.	Refer to previous comment responses. It is our opinion that further analysis is not required as potential for pollutants based upon the Source Water Protection Risk Assessment report is low. We are of the opinion that the only LIDs within WHPA-B will be clean rooftop stormwater directed to sodded areas to enable the natural infiltration of water. This approach within WHPA-B will not impact the water balance or groundwater table in this area.	GHD / D.G. Biddle
23	Given that the proposed development is within the WHPA-B area of the municipal wells, more consideration on the protection of the WHPA-B area the source water protection plan for the Millbrook municipal wells is required.	GHD completed a Source Water Protection Risk Assessment report to review the risk from the proposed development to the municipal wells. The risk to the water quality is deemed to be low. There are no water quantity threats to the aquifer from this development.	GHD
24	Further consideration is required to reduce possible contamination that may occur from the area being developed (i.e. runoff from road salt, fertilizer, and pesticides). How will these threats will be mitigated through the proposed design?	Refer to response to comment 11 and 18. GHD completed a Source Water Protection Risk Assessment report to review the risk from the proposed development to the municipal wells from potential issues such as road salt, fertilizer and pesticides. The risk to the water quality is deemed to be low. There are no water quantity threats to the aquifer from this development.	GHD
25	The LIDs (especially in the WHPA-B area) must be contained within defined easements so that the property owners are prevented from damaging or impacting the LIDs	Comment noted.	D.G. Biddle
	Other Items		
26	The September 1, 2021 letter indicates that the old registered plan was deregistered by the township through a deeming by-law. Please provide the Township with a copy of the By-law for our records. The letter also indicates that the line work pertaining to previous conditions cannot be removed. Why not? The inclusion of the previous plan line work makes the Plan and lot descriptions complicated. The Township prefers the removal of the previous Registered Plan line work.	The property owners have been advised by Township staff that Registered Plan 19 has been deemed to no longer apply to the lands. The owners nor their consulting team have a copy of the Township's deeming by-law, and therefore are not able to provide a copy to Township staff. If the deeming by-law does exist, then the Township will have a copy within their corporate records. However; the status of the underlying Registered Plan 19 does not affect the appropriateness of the use nor the due processing of the draft plan. Lands dedicated as Turner Street and Irwin Street by Registered Plan 19 are owned by the Township of Cavan Monaghan and are shown as separate ownership on the draft plan. To remove the linework showing the separation of ownership would be a false representation of facts and therefore inappropriate as part of a municipal application.	D.G. Biddle

27	Contrary to ORCA comments, there are a number of rear lot catchbasins, mid rear lot. This design is not acceptable	The RLCB are in easements for the Town to access. This is a common design approach to drain rear lots into municipal infrastructure. TOCM has also accepted these in other recent developments. The RLCB's are also reducing surface drainage along the side-yard swales flowing to Turner Street.	D.G. Biddle
28	The major overland flood routing will not discharge directly to the creek on Turner St. An alternative design is required.	All drainage flowing south towards the existing Turner Street at the south limit of the subject site can be captured via catchbasins. The number of catchbasins to capture the 100-year storm can be further explored at detailed design.	D.G. Biddle
29	The lots show significant encroachment into the forested area. We are unclear from the Reports where tree preservation is occurring and how much vegetation 4 must be removed. We also do not see any compensation plan to offset the removals but we acknowledge that a draft plan condition can be used to address this matter.	Comment noted. The Draft Plan and the Grading Plan have been updated to significantly reduce the encroachment into the Vegetation Protection Zone. Minor sloping is still proposed from the newly proposed pond into the Vegetation Protection Zone. All matters relating to the compensation plan and tree preservation will be addressed through a draft plan condition.	D.G. Biddle / ORE
30	How do you plan to address the parkland dedication requirements? Where a development proposal includes non-developable land, the land may be dedicated to the Township but these lands will not be included as part of the parkland dedication.	The owner intends to make a cash-in-lieu of parkland payment. Lands that are dedicated for recreation purposes, including lands for public trails, are considered parkland to the extent that those lands are used for such purposes, typically 3m from the centre line of the trail on both sides.	D.G. Biddle
31	Blocks 78, 79, 80 and 81 are identified on the draft Plan as Open Space. What does Open Space mean? Who will own and maintain the Open Space? The proposed trail is located in the Open Space block but no details about the trail have been provided. Additional information is required	Open space lands are intended to be dedicated to the Township. Except for municipal facilities, open space does not require maintenance. Trails are intended to be used by residents of the Township for recreational purposes. The inclusion of trails on the draft plan does not affect the appropriateness of the use of the subject lands for residential purposes nor the due processing of the draft plan application. Detailed grading plans for the trails can be secured through an approval condition.	D.G. Biddle
32	Otonabee Conservation has indicated that additional information is required to demonstrate consistency with Section 2.1.2, 2.1.4 a), 2.1.8 and 2.2.1 of the Provincial Policy Statement is required. The Township supports this position; the information is required to illustrate conformity with the Township's Official Plan.	Refer to ORE's response to comment below	D.G. Biddle / ORE
33	Regard for the Residential Urban Design Guidelines (S. 4.1.7 of Official Plan) is required.	Please see attached Urban Design Guidelines summary.	D.G. Biddle
Otonabee Region Conservation Authority (ORCA) Engineering Review – dated February 4, 2022			
1	Proposed development within the Wetland Buffer a) The extent of fill placement associated with Street 'A' road construction and Lot #48 are within the wetland 30m buffer. Please adjust the layout to remove the fill placement within the wetland buffer. b) The extent of fill placement associated with Lot 55 and the proposed storm sewer are within the wetland 30m buffer? Please adjust the layout to remove the fill placement within the wetland buffer. c) The storm sewer infrastructure is within the wetland 30m buffer associated with Block 81. Please adjust the layout to remove the fill placement within the wetland buffer.	a) Comment noted. The Draft Plan and the engineering plans have been updated so that the lot fabric and associated proposed grading will be outside the wetland 30m buffer. b) Comment noted. The Draft Plan and the engineering plans have been updated so that the lot fabric and associated proposed grading and servicing will be outside the wetland 30m buffer. c) Comment noted. The Draft Plan and the engineering plans have been updated so that the lot fabric and associated proposed grading and servicing will be outside the wetland 30m buffer.	D.G. Biddle
2	The storm sewer infrastructure is shown in Lot 55. Should this infrastructure be within an easement or Block to identify Township ownership for maintenance/operation?	This lot has been removed and the servicing and grading design has been updated.	D.G. Biddle
3	The proposed dry pond with infiltration trench/gallery is placed on a terraced slope with potential seep activity, see Figure 1. Please provide a slope stability study that will:	a) Refer to slope stability assessment report prepared by GHD, dated March 7, 2023. Existing slopes are considered stable. Please note the	GHD / D.G. Biddle

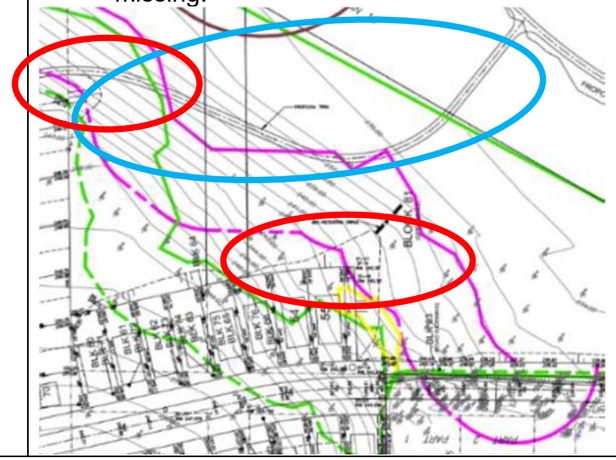
	a) Assess slope stability of the existing slope, b) Assess slope stability with the proposed fill activity and load (pond full of water) applied to slope and berm material, c) Assess the existing groundwater and seep activity, d) Assess what affects the infiltration trench/gallery below the bottom of the pond will have on stability when the soils are saturated. e) Provide cross-sections of existing and proposed slopes, including the fill placement for pond.  	Infiltration gallery within the pond was removed and an alternate location is proposed on the east limits (east of ST-3) in order to ensure the gallery is not influenced by the water table, refer to the General Servicing Plan, CSP-1. This area does not cu-in as deep into the original ground significantly. Efforts can be made to further raise the gallery at detailed design to further reduce the risk of impact from the groundwater table. b) Refer to slope stability assessment report prepared by GHD, dated March 7, 2023. Proposed storm water management ponds including constructed berms are considered stable. c) Refer to slope stability assessment report prepared by GHD, dated March 7, 2023 for groundwater information within the proposed storm water management ponds. As stated above please note that the gallery within the pond has been removed and a new location has been suggested. d) Refer to slope stability assessment report prepared by GHD, dated March 7, 2023. Effects of infiltration trench/gallery below the bottom of the pond considered in the Drawdown scenario and found to be stable. However, as stated above the infiltration gallery within the pond has been removed. e) A cross-section has previously been provided on the Conceptual Grading Plan, CGP-1.	

The following material is required at <u>detail design</u> stage (**not required for Draft approval**) As stated in the comments, page 2 of 5 "<u>The following material is required at detailed design stage.</u>" However, a preliminary response has been provided below.			
<u>1</u>	<u>Storm Sewer Design Sheet</u> a) The concept for post development drainage area #7 (0.52Ha – CSP-1) is to capture and convey the 100-year storm flows. The storm sewer design sheet only calculates and transfers the 5-year storm flows. i. Please adjust the RLCB-2 to ST-11 leg to calculate the 100-year flows. ii. Place 'capture/convey 100-yr storm' in the Notes section.	All comments below 1-11 can be addressed through detailed design. a) Refer to Figure 3 within the SWM & FSR Report. Hyd Area 6 and 7 flowing north and HYD 9 and 10 flowing south will be 100% captured and be conveyed to the Dry Ponds. A 100-yr storm design sheet has been included in Schedule 1 to show the pipes have been relatively sized to capture the 100-yr flows. The 100-yr capture note is shown in the General Servicing Plan.	D.G. Biddle

	b) The concept for post development drainage area #6 (0.32Ha – CSP-1) is to capture and convey the 25-year storm flows. The storm sewer design sheet only calculates and transfers the 5-year storm flows. i. Please adjust the RLCB-2 to ST-11 leg to calculate the 25-year flows. ii. Place 'capture/convey 25-yr storm' in the Notes section. c) The concept for post development drainage area #9 (0.12Ha + 0.20Ha) is to capture and convey the 25-year storm flows. The storm sewer design sheet only calculates and transfers the 5-year storm flows. iii. Please adjust the ST-11 to ST-13 leg to calculate the 25-year flows. iv. Place 'capture/convey 25-yr storm' in the Notes section. d) The concept for post development drainage area #10 (0.44Ha – CSP-1) is to capture and convey the 100-year storm flows. The storm sewer design sheet only calculates and transfers the 5-year storm flows. iii. Please adjust the RLCB-3 to ST-13 leg to calculate the 100-year flows. iv. Place 'capture/convey 100-yr storm' in the Notes section. e) Please demonstrate that the number of catchbasins in each drainage area can capture the 25-year flows. Provide inlet capacity calculations. f) Essentially, the storm sewer design should be modified to demonstrate that the storm sewers are being sized appropriately for the storm flows it's meant to capture and convey. The note section should be used to show which storm is being used.	b) See response to comment above c) See response to comment above d) See response to comment above e) This can be completed at detailed design f) Refer to response to comment a)	
2	Servicing Plan a) The label for ST-14 and associated notes are missing.	Storm Layout has been updated	
3	Grading Plan d) RLCB1, RLCB2 and RLCB3 are to capture and convey the 100-year storm flows for their respective drainage areas. i. Does the catchbasins have the capacity to convey the 100-year storm flows? ii. Provide inlet capacity calculations. iii. Please delineate the extent of ponding within the rear-yard swale generated by each RLCB. e) Please delineate all ponding areas within the road allowance. No surface ponding will affect private property. f) A cross-section of the overland flow route between Street 'A' and the dry pond will be required. Please also provide calculations for the overland flow route demonstrating it can convey the 100-year storm flows. g) Why are lots 54 & 55 along with Blocks 66, 76, 65, 75, 63, 74, 62, 73, 61 and 72 within the vegetation protection zone and the proposed 30m setback? h) Discharge from the Dry Pond Headwall and the Bio-Retention Swale (Large Pipe Storage Outlet)	d) Refer to response to comment 1a) above. Any additional information can be completed at detailed design to ensure additional capture within the storm sewer system and ensure there is no adverse impact on surrounding development. e) This can be completed at detailed design f) This can be completed at detailed design. g) This has been revised to have all blocks outside of the significant woodland boundary. Lots are still proposed within the 30m setback but is still consistent with policy. Refer to ORE's response to comments below	

	i. The discharge from these point sources will be done in a manner that replicates the current overland sheet flow. ▪ The vegetated filter strip, Section 4.5.12 of the MOE 2003 Stormwater Management Planning and Design Manual will be implemented at both discharge locations. ▪ Please provide the sizing calculations. ▪ Please provide a cross-section on the grading plan of the vegetated filter strip, including all dimensions, notes and vegetation types. ii. The swale like feature on the grading plan between the dry pond and the watercourse will be removed and replaced with the vegetated filter strip, outside the 30m setback. iii. The discharge pipe and bio-retention swale for the large storage pipe will be removed from the wetland buffer. The vegetated filter strip will be placed after the bio-retention swale. i) Additional grades/elevation points are required within and around the dry pond. j) The legend does not contain symbols/information represented on the grading plan (i.e. existing and proposed grades).	h) A small Dry Pond is now proposed in southern area. All current overland flows will be replicated. Pre-development levels are met to both creeks. Any additional information can be addressed at detailed design. i) This can be addressed at detailed design j) This can be addressed at detailed design	
4	<u>Hydrologic Parameters</u> a) Please explain how drainage area #10 has zero impervious when all the houses are included. b) Drainage area #9 has 0.32 ha. The VO model has applied 0.29Ha. Please make the appropriate corrections. c) The outflow-storage table in Reservoir 55 within the VO model, has an additional outflow-storage discharge value of 0.05m3/s with 600m3 storage. The oversized pipe system only has 142m3 of storage. i. Where is this additional storage? ii. Please correct the outflow-storage table in Reservoir 55 to match the sizing table in the Appendix.	a) Please note: in VH Otthymo, if the imperviousness is less than 20% than a NASHYD node is typically used and is assumed pervious. However, the overall drainage scheme has been updated. HYD 7 and 10 have approximately 20% Imperviousness and a STANDHYD was used to simulate the runoff volumes. b) SWM Strategy for the south end has been updated. c) SWM Strategy for the south end has been updated.	
5	<u>Infiltration Methods</u> a) The grading and servicing plans will include the locations of the infiltration features, including cross-sections 9typical detail) with proper notes. b) The issue/concern that I have with bio-retention swale versus infiltration trench would be with the ability to capture and hold the required volume of water within the feature as water slowly exfiltrates. i. Both designs need to provide enough volume within the swale to capture the required volume and allow to infiltrate into feature. Provide design calculations. c) Please provide the sizing calculations for the infiltration trenches and bio-retention features.	a) Comment noted. b) This can be reviewed and updated at detailed design. b) This can be reviewed and updated at detailed design.	
6	With the dry pond now providing infiltration capacity (portion of site's water balance) within the bottom of the pond, I suggest the oil-grit separator be relocated upstream of the pond to capture sediment.	The OGS is located upstream of the pond. This can also be reviewed at detailed design.	
7	The dry pond requires a maintenance access route to service the inlet and outlet structures.	Comment noted. A maintenance access is provided at the top of bank. This can be further reviewed at detailed design.	

8	The major overland conveyance system is the road network from the proposed Turner Street with urban profile (curb & gutters) onto the existing rural profile (roadside ditch) then discharge into the watercourse on Turner Street. a) Please demonstrate with calculations and cross-sections, that the existing rural profile of Turner Street has sufficient capacity to convey the proposed flows. b) The grading plan should be updated to show how the urban profile will be connected to the existing rural profile.	a) It is proposed to direct all flows up to the 100-year storm the newly proposed dry pond. This will likely require additional CB's but can be reviewed at detailed design. b) This can be reviewed at detailed design as this primarily needs to be coordinated with TOCM.	
9	Is the road widening work associated with Block 83 part of the subdivision work? Additional design information should be provided.	This will be coordinated with TOCM	
10	The drainage swale along the rear of lots 14 to 18 requires capacity calculations to demonstrate the conveyance of the 100-year storm flows from the external drainage area.	Any drainage capacity calculations for swales can be completed at detailed design.	
11	Erosion and sediment control plans will be provided for each component of the development including sequencing of work and all required detail drawings and notes.	Comment noted for detailed design.	
Otonabee Region Conservation Authority (ORCA) Ecology Review – dated February 4, 2022			
Hydrologic Features and Functions: Wetlands & Watercourses **In addition to the responses below, refer to the response to ORCA comments document completed by Oakridge Environmental Limited, dated October 2023. The asterisk (*) symbol indicates an additional response provided in the above-mentioned response letter.**			
1	a) Based on comments to date, which include technical staff observations, the lands along Turner Street represent a wetland to upland gradient of eastern white cedar dominated areas. While technical staff are still of the opinion that the wetland boundary along Turner Street is further north than what has been mapped by ORE, given wetland boundaries are not static, i.e., may expand in wet years or retract in dryer years, technical staff accept the area labelled as 'ephemeral drainage boundary' on 5r (August 2021) to be the current wetland boundary location.	* Comment noted.	
	b) According to ORE, "development will remain entirely outside of the 30 m VPA setback of all hydrological features" and "if the 30 m setback cannot be achieved/maintained from the wetland, or if the proponent would like to challenge the wetland boundary, a Wetland Evaluation must be completed to the MNRF's satisfaction" (see ORE comments pages 9-15 & 18). ▪ Firstly, technical staff note that development is proposed within the 30 m VPA/VPZ of hydrologic features (please see red and blue ovals in Figure A and review in context of entire grading plan –more areas impacted). ▪ Secondly, technical staff received similar policy advice from ministry staff in support of assessing the ability of Planning Act applications to demonstrate consistency with PPS policies 2.1.2, 2.1.4a), 2.2.1 e) and 4.6, i.e., either avoid all wetlands and the 30-m buffer or conduct an OWES evaluation to support development or site alteration within 30-metres of a non-PSW wetland. Based on the information/conclusions provided by ORE and others below, technical staff are still of the opinion that consistency with PPS 2.1.2, 2.1.4 a), 2.1.8 and 2.2.1, as these provincial policies relate to hydrologic features and functions, has not been demonstrated: ▪ Development or site alteration (grading to support new lots and roads) is proposed within 30-metres of unevaluated wetlands (red ovals) contrary to ORE	* The Draft Plan and the engineering plans have been updated so that the lot fabric and associated proposed grading and servicing will be outside the wetland and 30m buffer. * Refer to slope stability assessment report prepared by GHD, dated March 7, 2023. Slope stability assessment of existing slope conditions for the areas fronting Turner Street completed (cross-section C-C and D-D). Existing and proposed slopes are found to be stable.	ORE / GHD

	recommendations and in the absence of a wetland evaluation or confirmation of provincial status of these wetlands. ▪ The reports by others have not discussed site feasibility to maintain the undisturbed 30-m buffer around hydrologic features to be consistent with the ecological review by ORE. ▪ The southern facing slope and areas fronting Turner Street are impacted by poor drainage resulting from seasonal “heavy sheet flow” (page 4) and/or seeps. Development or site alteration in this area may impact drainage downslope and/or infrastructure maintenance. ▪ A soil/slope stability report, as recommended by qualified professionals, is missing. 		
Technical staff recommend the following to demonstrate consistency with PPS policies:			
	c) All new development and site alteration avoid wetlands/hydrologic features and the associated 30-m buffer/VPZ in lieu of an OWES evaluation to demonstrate consistency with PPS policy 2.1.4 a) and associated policies listed above. (Please note that development does not include activities that create or maintain infrastructure authorized under an environmental assessment process according to the PPS definition).	* The Draft Plan and the engineering plans have been updated so that the lot fabric and associated proposed grading and servicing will be outside the wetland 30m buffer.	ORE
	d) Would grading into the 30-m wetland buffer still be necessary if lot fabric was reconfigured? To satisfy relevant policies, technical staff recommend using Lots 54 and 55, and associated blocks, as a planting area to compensate wetland/woodland loss from the proposed upgrades to existing uses (e.g., road widening and/or recreational trails).	* The Draft Plan and the engineering plans have been updated so that the lot fabric and associated proposed grading and servicing will be outside the wetland 30m buffer.	ORE
	e) The slope stability should be addressed prior to detailed design to ensure additional policies are not triggered should the SWM pond be relocated elsewhere on site.	* Refer to slope stability assessment report prepared by GHD, dated March 7, 2023. Slope stability assessment of existing and proposed conditions at each stormwater management pond location completed and found to be stable. No additional setbacks required from a slope stability standpoint.	ORE/GHD
	f) Technical staff support a naturalized SWM pond and recommend incorporating planting principles outlined in TRCA and CVC SWM criteria planting guidelines into the site’s Landscape/Planting Plan. (Monitoring of planting success is also recommended.)	* A natural channel is proposed to the outlet to Little Creek. It will be lined with FM200 Turf Reinforcement Matt and will have velocity check dams to ensure disturbance of the downstream Creek is minimal. Refer to Grading plan and refer to SWM/FSR Report for Turf Mat Specification Sheet with Schedule 2	ORE

Technical staff recommend the following to satisfy Otonabee Conservation permit policies:
In addition to the responses below, refer to the response to ORCA comments document completed by Oakridge Environmental Limited, dated November 17, 2023.
The asterisk (*) symbol indicates an additional response provided in the above-mentioned response letter.

	g) Otonabee Conservation policies 7.0(1), 7.1(1, 2, & 6) and 7.2(2, 4, 8, 10, & 16) direct development outside of wetlands and/or within 30-metres of the wetland boundary. ▪ ORE confirms wetland communities SWC1-1, SWT2, and SWM1-1 maintain the same boundary as the 'ephemeral discharge' area. Updated plans will rename 'ephemeral discharge' area to 'wetland' in support of the Otonabee Conservation permit. ▪ Fill placement within 30-metres of a wetland to create new residential lots is not consistent with regulatory policies. Grading limits should end 30-m from the wetland boundary to be consistent with regulatory policies 7.1(1 & 2) and 7.2(2, 4, & 16) and the EIS recommendations. ▪ Whenever possible, existing trails or disturbed areas should be used for recreational purposes to minimize impacts to wetlands. To satisfy Otonabee Conservation policies 7.1(6) and 7.2 (10), additional technical review by a qualified professional of the proposed trail network is required that includes measures to avoid wetland features and offset impacts (e.g., wetland compensation plan). ▪ To satisfy Otonabee Conservation policy 7.2(8), an ecological review of the engineered solutions that confirms hydrological and ecological functions are maintained is required where encroachment into the wetland is proposed to support upgrades to Turner Street.	▪ * All drawings have been updated to refence 'wetland' ▪ * The lot fabric has been updated to avoid (including grading) the wetland boundary and the 30m offset boundary. ▪ * See response to comment above. ▪ * See response to comment above. ▪ * See response to comment above.	ORE / Biddle

Fish Habitat Features & Functions
Technical staff recommend the following to demonstrate consistency with PPS policies:
Refer to the response to ORCA comments document completed by Oakridge Environmental Limited, dated October 2023.
The asterisk (*) symbol indicates an additional response provided in the above-mentioned response letter.

2	a) To demonstrate consistency with the intent of PPS policy 2.1.2, 2.1.6and 2.2.1, as well as ORE comments on pages 7, 11 and 18, to protect cold-water fish habitat and seeps within the valley (Figure B), development and site alteration should avoid encroachment into these hydrologic features and the 30-metre buffer/VPZ (orange circle).	* Comment noted. Refer to the aforementioned document for a complete response completed by ORE included in this submission.	ORE
	b) If the Planning Authority supports the SWM pond location and design, technical staff recommends a project review by a fisheries biologist to demonstrate compliance with the Fisheries Act (FFHPP Regulatory Review Process Map (dfo-mpo.gc.ca) and consistency with PPS policy2.1.6 as a condition of approval. The applicant should demonstrate how the SWM outlet complies with the Fisheries Act, i.e., how the location of the outlet minimizes impacts to fish and fish habitat within the feature (e.g., does the outlet avoid groundwater upwelling/preferred spawning habitat for brook/brown trout?). These details have not been provided in the technical reports. Given changes to the outlet design may impact the overall SWM pond location and lot layout, technical staff recommend addressing these issues prior to detailed design. Technical staff recommend the following to satisfy Otonabee Conservation permit policies (c):	b) * Comment noted. Refer to the aforementioned document for a complete response completed by ORE included in this submission.	ORE

	c) Details of the SWM pond outlet design is required to satisfy Otonabee Conservation policy 8.1(9). Please include natural channel design principles to the outlet channel and an ecological opinion/written response (sign off) from ORE, in collaboration with D.G. Biddle & Associates/other consultants, that confirms infrastructure design and remedial measures will mitigate functional disturbances (minimal scouring, erosion, sedimentation, pollution, etc.) to the watercourse.	c) * The natural outfall channel has been incorporated in the SWM design/outfall. The outfall channel will consist of a FM200 Turf Reinforcement Matt (TRM) which can withstand flow velocities of up to 3.8m/sec, refer to specification sheet in Schedule 2 of the SWM/FSR report. Calculations have also been provided in Schedule 2. Furthermore, the channel will incorporate check dams to further dissipate flow velocity. The slope of the last leg of the outfall channel will be reduced to approximately 1% so that the exit flow velocity (100-yr storm) is reduced to below 0.50m/sec, to further reduce downstream aquatic impacts. Note: The LID SWM Planning and Design Guide completed by CVC and TRCA (2010) suggests limiting channel velocity to 0.50m/sec for enhanced grass swales (25 mm storm) for water quality purposes but this target was still used as a guide to limit aquatic disturbance. The existing channel velocity could be further reduced at detailed design if required. Please also note flows should never reach the level of the emergency overflow route unless, in the extremely unlikely event, the orifice device is blocked and is intended to direct emergency overflows away from private property	
Habitat of Endangered and Threatened Species and/or Significant Wildlife, including Significant Woodlands **Refer to the response to ORCA comments document completed by Oakridge Environmental Limited, dated October 2023.** **The asterisk (*) symbol indicates an additional response provided in the above-mentioned response letter.**			
3	PPS policies 2.1.5 b) and d) permit new development and site alteration within significant woodlands and significant wildlife habitat provided functional loss is mitigated. Technical staff note that municipal official plan policies in Sections 6.7 and the OMB decision associated with the property suggest feature/NHS avoidance.	* Comment noted. Refer to the aforementioned document for a complete response completed by ORE included in this submission.	ORE
	d) If the Planning Authority approves encroachment into the 'significant woodland/wildlife habitat', technical staff are of the opinion that compensation plantings and timing windows for tree removal are appropriate mitigation strategies to offset impacts from the removal of non-wetland significant woodland and associated habitat features on site. Technical staff recommend the following recommendations be applied to the design and implementation of the approved compensation/planting plan as a condition of approval: ▪ Compensation ratios are based on tree densities to establish no net loss of function. ▪ Includes species-specific habitat compensation features for local SWH/SAR species. ▪ Tree removal timing window is broad-based, e.g., April 1st to October 31st, to protect breeding birds and endangered bat roosts. ▪ Complies with the Endangered Species Act prior to commencement of work.	* Comment noted. Refer to the aforementioned document for a complete response completed by ORE included in this submission.	ORE