

September 12, 2024

Proj. 2535

Jessica Kennedy
Township of East Garafraxa
065371 Dufferin County Road 3, Unit 2
East Garafraxa, ON
L9W 7J8

Dear Jessica Kennedy,

**RE: Marsville South Development - EIS Addendum/Response to GRCA
Comments**

On behalf of Thomasfield Homes Ltd., Natural Resource Solutions Inc. (NRSI) is pleased to provide the following Environmental Impact Study (EIS) addendum for the Marsville South development within Marsville, Ontario that addresses Grand River Conservation Authority (GRCA) comments on the previous April 2022 EIS Report prepared by NRSI. Comments from the GRCA were provided in a letter dated September 9, 2022, which are provided in Appendix I along with NRSI responses.

A number of the comments provided by the GRCA require a more substantial response which is included within this EIS addendum letter. In general, the comments addressed within this letter pertain to the following:

- **Water quantity/water balance** – as requested, a monthly water balance has been provided in order to address potential impacts to the adjacent wetland;
- **Thermal Impacts to Fish Habitat** – potential thermal impacts to downstream fish habitat of the Thunderbird Drain are explored, along with recommended mitigation measures;
- **Wetland buffer** – a 15m buffer is proposed along with a rationale for the sufficiency of this width and additional mitigation and enhancement measures; and
- **Grading impacts to wetland** – grading plans have been added to the attached map in order to address potential impacts to the wetland and adjacent areas.

Where overlap occurs between this EIS addendum letter and the April 2022 report, this current report supersedes the former.

1.0 Water Quantity/Water Balance

A monthly water balance analysis has been provided by GEI (2024a) that includes an assessment of changes to the surface water and groundwater patterns in relation to the adjacent wetland to the south of the subject property. During existing conditions, none of the surface water within the subject property at Marsville South drains towards the wetland, although the offsite surface water catchment directed to this feature is approximately 15.32ha. Instead, surface runoff from the site currently sheet flows overland towards the northwest corner of the development area in the general direction of Catchment 120 towards County Road 3. Following development, it is anticipated that the overall surface catchment for this wetland will increase by 1.12ha, as a small catchment at the southwest corner of the site (Catchment 4000) will be directed towards the wetland (GEI 2024b). However, this is a small area when considered in conjunction with the overall off-site post-construction surface water catchment for this wetland, which totals 16.44ha. As such, only minor increases in runoff are expected to occur as a result of the proposed development.

During the growing season (April-August), runoff increases are expected to range from 9% in April (increase of 525m³) to 18% in August (increase of 381m³) (GEI 2024a). These volumes are generally considered to be within the normal range of seasonal variation in runoff patterns and are unlikely to negatively impact the adjacent wetlands, particularly given the additional analysis below.

An important factor to consider is that the wetlands on the adjacent lands do not represent closed depressions, but rather have existing outlets that will discharge any excess volumes to downstream receivers. GEI (2024a) has estimated that in a closed wetland system with no expedient outlet and no evapotranspiration, increases in ponded water depth within the wetland would range from a maximum of 67.6mm in May, decreasing to 19.0mm in August. However, this analysis does not take into account evapotranspiration. In addition, the wetland on the adjacent property drains via the cedar swamp (SWM1-1) southeast to the large open water wetland which in turn outlets through a riparian channel reaching 12th Line where it discharges through a culvert beneath the road, continuing northwest towards other wetlands. As such, substantial surface water ponding would not be expected due to the projected increases in runoff directed to the wetland.

In addition, the dominant wetland species within the Reed-canary Grass Marsh (MAM2-2) and White Cedar Swamp (SWM1-1) such as Reed Canary Grass (*Phalaris arundinacea*) and White Cedar (*Thuja occidentalis*) are not generally considered to be overly sensitive to hydrologic changes. Similarly, the communities themselves are considered to be of low sensitivity (MAM2-2) and medium sensitivity (SWM1-1) to hydrologic changes (TRCA 2017). This further indicates that a small addition to the surface water catchment is unlikely to impact these communities.

It is recommended that a topsoil amendment be added to the area of the proposed rear lots adjacent to the wetland (Lots 14, 15, 16 and 17), to a depth of approximately 10cm with a 5% organic component (in addition to the standard topsoil application) for enhanced water retention ability. This will increase the pore space available for water to be captured and subsequently infiltrated, which will reduce runoff. In addition, it is recommended that the development landscaping plan include 5 -10 caliper-sized native, non-cultivar trees, such as Red Maple, Bur Oak and White Spruce be planted near the southern extent of Lots 15 and 16 near the wetland and woodland buffer areas. This will further increase pore space, capture of runoff, and evapotranspiration, which will also contribute to a reduction in volumes reaching the wetland in this location, particularly as these trees mature and increase root mass.

Groundwater flow patterns within the subject property are variable, but in general occur in a westerly direction along the eastern portion of the site while in the western portion of the site flows are divided such that groundwater in the northwest portion of the site flows northwesterly and in the southwest portion of the site it flows in a southwesterly direction (GEI 2024b). As a result of these groundwater flow patterns, recharge directed to the wetland is not expected to change.

Based on this analysis, hydrologic and hydrogeologic impacts are not expected to the wetlands based on the water balance provided.

2.0 Thermal Impacts to Fish Habitat

As described in the Functional Servicing Report (GEI 2024b); the Thunderbird Drainage Works is the legal drainage outlet for the proposed Marsville North Subdivision, the proposed Marsville South Subdivision, the existing Thunderbird Subdivision and surrounding existing agricultural lands located to the south of Dufferin County Road 3. Under current conditions, water flows through the Thunderbird Drain Works to an unnamed watercourse approximately 2.8km west of County Road 3, which has been classified as coldwater but supports a variety of coolwater fish species, including; Brook Stickleback (*Culaea inconstans*), Central Stoneroller (*Campostoma anomalum*), Creek Chub (*Semotilus atromaculatus*), Blacknose Dace (*Rhinichthys obtusus*), Mottled Sculpin (*Cottus bairdii*), and White Sucker (*Catostomus commersonii*) (C. Lorenz, personal communication, 2022). The majority of these fish species prefer water temperatures at or above 20°C, which is generally above the coldwater threshold. The exception to this is Mottled Sculpin, which generally prefers a water temperature up to approximately 18°C (Eakins, 2024). Overall, the fish community could be considered moderately sensitive to changes in water temperature.

Several strategies will be implemented to minimize potential thermal impacts to fish habitat downstream of the subject property via the Thunderbird Drain. This includes the recommendation that tree plantings are incorporated into the Stormwater Management (SWM) pond landscape design in order to increase shading and cooling of water temperatures prior to outletting to the drain. The proposed stormwater strategy also includes a plan to direct the stormwater subsurface, which will act to further cool stormwater as it travels from the proposed Marsville North and South subdivisions

A petition has been filed under The Drainage Act for improvements to Thunderbird Drainage Works outlet, which are proposed to consist of a dedicated storm sewer system routed parallel to the existing Thunderbird Drainage Works (closed tile drain). The proposed dedicated storm sewer system is proposed to be installed parallel to the existing tile drain and would extend from the centre of the southwest half of Lot 7, Concession 13, Township of East Garafraxa to the outlet of the proposed Marsville North Subdivision stormwater management facility (approximately 1,010m in length) (GEI 2024b). A proposed dedicated storm sewer branch will drain to the west to capture, convey and re-direct flows generated from the Marsville South Subdivision stormwater management facility to the south of Dufferin County Road 3 around the existing Thunderbird Subdivision (approximately 555m in length).

In combination, the proposed shading from plantings around the Marsville South subdivision and the series of subsurface drains are expected to provide an overall cooling effect to stormwater prior to daylighting. As such, given the existing conditions, distance to downstream fish habitat, and the proposed mitigation measures, thermal impacts are not expected to occur to fish habitat as a result of the proposed development.

3.0 Wetland Buffer

No grading works are proposed to occur within the 15m buffer from the wetland on adjacent lands. This buffer width is deemed to be sufficient to protect both the form and function of this wetland. This wetland is unevaluated, but is not anticipated to meet the requirements of 'provincially significant' based on the details/characteristics provided for this feature within the previous EIS report (NRSI 2022) in comparison to the revised Ontario Wetland Evaluation System (OWES) guidelines (OMNR 2022).

In addition, this wetland was not found to contain any Significant Wildlife Habitat (SWH) that would be anticipated to be impacted by a buffer of 15m rather than 30m. Candidate bat maternity roosts have the potential to occur, but will be retained and protected following development.

Affording the wetland a 15m buffer allows for a gentler grade in the rear of Lots 15 and 16. A 30m wetland buffer would result in steeper grades ranging from 4.5 – 4.8% sloping toward the wetland in order to accommodate septic beds on these lots in comparison with the shallower 2.5% slope that is proposed. As such, the 15m buffer will allow for gentler grades that will also promote infiltration.

In order to provide further mitigation measures to the adjacent development, a topsoil amendment and tree planting plan is to be implemented within the rear lots adjacent to the wetland buffer to increase infiltration and water retention while also increasing canopy cover adjacent to the wetlands. The portion of the buffer on the Thomasfield parcel, specifically Lots 15 and 16, will not be altered through site grading and this no touch area will change from row crop and bare soil to vegetated cover in the form of turfgrass which reduces erosion potential and promotes infiltration of surface water.

The rear of the lots abutting the wetland will be permanently fenced to further reduce encroachment into the feature. A post and wire fence is shown on the attached mapping.

4.0 Grading Plan & Impact Analysis

A revised grading plan has been provided by GEI (2024b) and has been integrated into the natural heritage feature mapping prepared by NRSI (Map 3). As shown, the grading for the lots nearest to the wetland (Lots 14-16) is located towards the frontage on Street A and will not be located in close proximity to the wetland, woodlands or the respective buffers. Erosion and sediment control fencing will be located at the edge of the 15m wetland and 10m woodland buffers. The areas within the portion of these lots that are currently agricultural fields will be converted to turf grass during the construction period which is anticipated to reduce erosion and siltation into the wetland. Similarly, large caliber tree plantings will be provided at the rear of these lots to provide additional benefits such as shading, wildlife habitat, and increased absorption and transpiration of runoff, as described above.

Based on the grading and mitigation plans provided, no impacts are anticipated to the adjacent wetland as a result of the proposed development.

5.0 Summary

Revisions have been made to the development plan that are anticipated to address GRCA comments and concerns related to the proposed undertaking and potential impacts to the adjacent natural heritage features, particularly wetlands and downstream fish habitat. Providing

the mitigation measures within this report and the previous EIS are implemented, no negative impacts are anticipated as a result of this work.

Should you have any questions or comments regarding this letter, please do not hesitate to contact the undersigned.

Sincerely,

Natural Resource Solutions Inc.

A handwritten signature in black ink, appearing to read 'Nathan Miller', written in a cursive style.

Nathan Miller, M.Sc., P.Biol
Senior Biologist

6.0 References

Eakins, R.J. 2024. Ontario Freshwater Fishes Life History Database. Version 5.31. Online database. (<https://www.ontariofishes.ca>).

GEI. 2024a. Hydrogeological Study for Marsville South Subdivision. September 2024.

GEI. 2024b. Functional Servicing Report - Marsville North & Marsville South Subdivisions, Township of East Garafraxa (Marsville). September 2024.

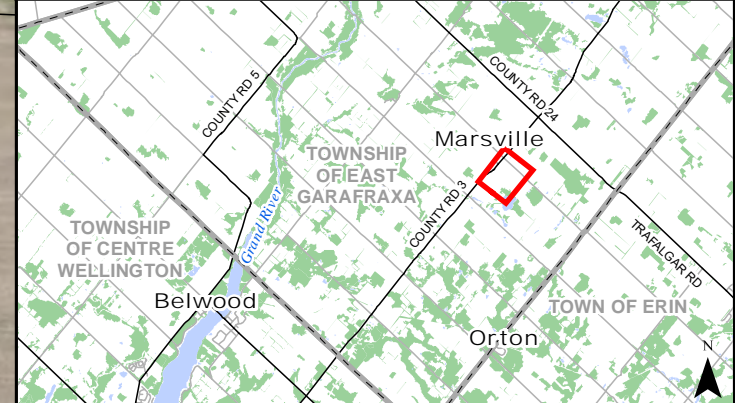
Lorenz, C. 2022. Resource Planner. Grand River Conservation Authority. Personal Communication. September 26, 2022.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2022. Ontario Wetland Evaluation System: Southern Manual. 4th Edition.

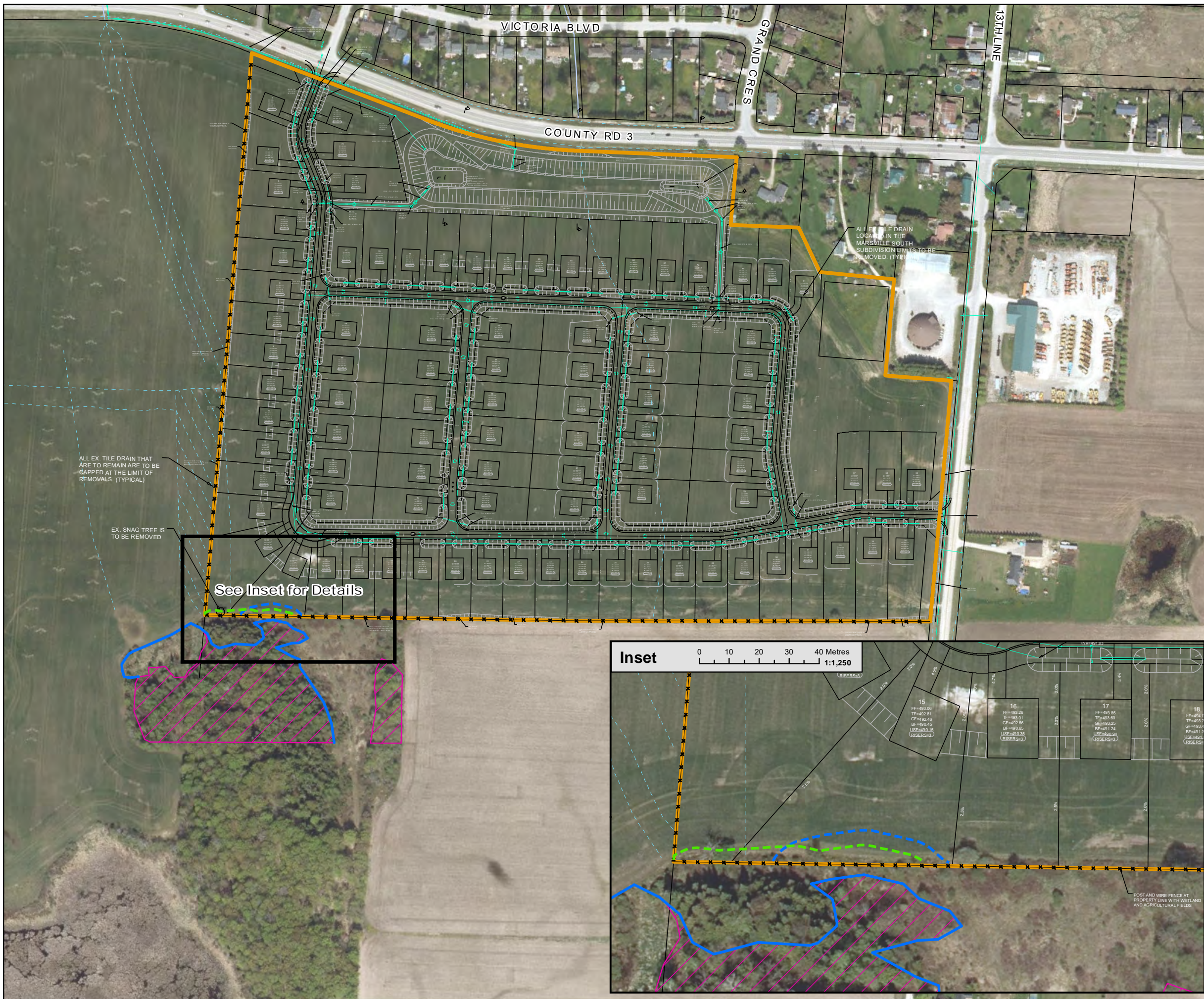
Toronto Region Conservation Authority (TRCA). 2017. Wetland Water Balance Risk Evaluation.

Maps

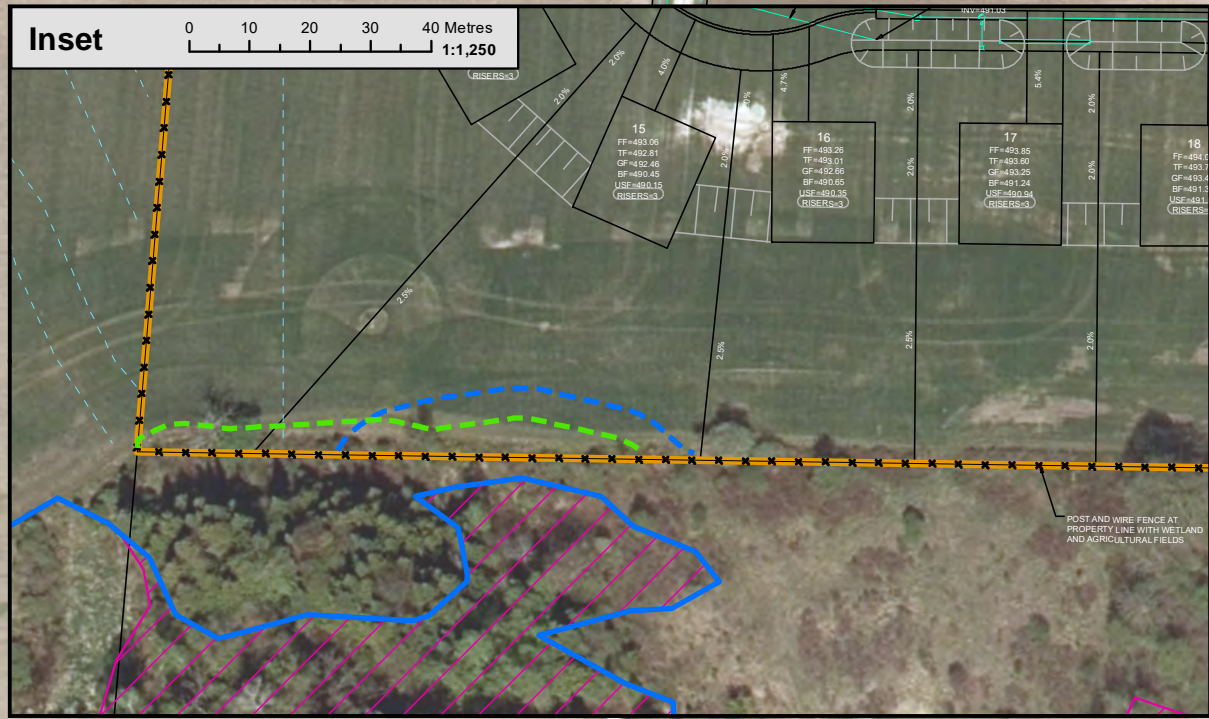
Marsville South (Graham Property) Significance/Sensitivity and Proposed Development Constraints



- Legend**
- Subject Property
 - Proposed Development Plan
 - Proposed Grading
 - ✕ Permanent Post & Wire Fence
 - Proposed Servicing
 - Existing Swale and Tile Drain
 - ~ Permanent Watercourse
 - Wetland Boundary - Confirmed with GRCA May 5, 2021
 - Wetland Buffer (15m)
 - Woodland Buffer (10m)
- Significant Wildlife Habitat**
- Bat Maternity Colony - Candidate



See Inset for Details



Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by MNRFC Copyright: King's Printer Ontario. Imagery: ESRI (2023).

Project: 2535 Date: August 23, 2024	NAD83 - UTM Zone 17 Size: 11x17" 1:3,500
0 40 80 120 160 200 Metres	

Appendix I
Comment Response Table

Marsville South Development EIS (proj#2535)
 NRSI Response to GRCA Comments on the April 2022 NRSI EIS

Comment #	Comment	NRSI Response
Grand River Conservation Authority (GRCA) Comment Letter, September 9, 2022		
<u>Natural Heritage</u>		
1	<p>The EIS report suggests that a minor increase in surface water directed toward the offsite wetland is acceptable. A feature-based water balance assessment would be required to substantiate this conclusion. Depending on the sensitivity of the vegetation communities and the degree of hydrologic alterations, a monthly water balance assessment could be required to fully assess impacts on the offsite wetland. Additional information regarding the sensitivity of the wetland communities and pre- and postdevelopment surface runoff volumes of water directed toward the wetland is required to assess impacts to the wetland. If all drainage from Catchment 4000 is directed to the Thunderbird Drainage Works, resulting in no increase in surface water directed toward the offsite wetland, the above additional information would not be required.</p>	<p>Catchment 4000 (1.12ha) is planned to be directed to the wetland. As such, a monthly water balance has been provided detailing the changes to recharge and runoff directed to the wetland following development. A detailed analysis of the water balance in relation to this feature and the sensitivity of the natural features is provided within the EIS Addendum letter. Based on the small area of runoff and corresponding volumetric increases relative to the larger catchment, the flow-through nature of the wetland, and the sensitivity of vegetation, there are no anticipated impacts to the feature providing the recommended mitigation measures are provided.</p>
2	<p>A detailed grading plan showing existing and post-development contours within catchment 4000 is needed to fully assess impacts to the offsite wetland.</p>	<p>A detailed grading plan has now been provided for the site and is attached to the EIS addendum letter. The attached map provides an inset of the Catchment 4000 area in relation to the wetland. As shown on this map, grading will be gradual towards the wetland and will be located outside of the wetland buffer.</p>
3	<p>According to the EIS, the lands do not slope steeply toward the wetland. This is not sufficient rationale to support a 15 meter development setback from the wetland. A 30 meter setback from the offsite wetland is requested and would be consistent with subdivision applications in other portions of the watershed.</p>	<p>NRSI has provided a revised analysis of the buffer width along with additional mitigation measures such as large caliper tree plantings, topsoil amendments, and installation of a permanent fence at the rear lot line to prevent encroachment into the wetland.</p>
4	<p>Post-development flow volumes toward the Thunderbird Drain are expected to increase significantly during the 25 mm and 2-year events. The current agricultural drain outlets to a watercourse that supports cold water fish habitat. The potential for thermal impacts should be assessed.</p>	<p>A number of mitigation measures are proposed to ensure that thermal impacts are unlikely to occur to downstream cold water fish habitat. An analysis is provided within the EIS addendum letter, and no thermal impacts are expected as a result of these works associated with Marsville South or the Thunderbird Drain upgrades.</p>
5	<p>It is requested that the offsite wetland boundary and setback approved by the GRCA be clearly illustrated and labelled on the draft plan.</p>	<p>The surveyed wetland boundary that was approved by the GRCA is now shown on the site drawings and draft plan.</p>
Comments for Detailed Design		

Comment #	Comment	NRSI Response
6	It is requested that heavy-duty sediment fencing be placed along the approved setback limit.	A heavy-duty ESC fence will be installed at the edge of the setback limit for the duration of construction until the area is stabilized.
7	Part of the proposed Thunderbird Drainage Works appear to cross a GRCA regulated wetland northwest of the proposed subdivision. GRCA requests that the presence of this wetland be confirmed and, if present, measures are taken to ensure its protection during and post development. Please delineate the wetland on the drawings to allow for the review of drainage, grading and site works proposed in the regulated area.	The presence of this wetland is to be confirmed through the detailed design process in advance of the proposed improvements to the Thunderbird Drain.
Advisory Comments for Municipality		
8	We acknowledge that as part of the subdivision stormwater management strategy, upgrades to the Thunderbird Drainage Works are proposed. This includes extending a storm sewer from the outlet of the SWM Facility to the open drain portion of the Thunderbird Drainage Works. We presume that overland flow relief is will be provided along this route. A typical section for an overland flow path is recommended.	Addressed in GEI materials.
9	A table summarizing the hydraulic parameters used in the MIDUSS model is recommended.	Addressed in GEI materials.
10	There appears to be inconsistency in the elevations shown in Figure 21 compared to the rest of the report. The emergency overland flow weir and top of berm elevations should be confirmed	Addressed in GEI materials.
11	We recommend using a permanent pool depth of at least 1.0m to minimize resuspension of sediment.	Addressed in GEI materials.
12	Please be advised that Appendix C in the FSR is missing the Geotechnical Investigation report for the Marsville South Subdivision. However, the document was provided standalone with the submission package and has been reviewed.	Addressed in GEI materials.
13	GRCA recommends running a 24-hr SCS storm event to confirm that the pond can sufficiently provide volume detention from that storm event.	Addressed in GEI materials.