

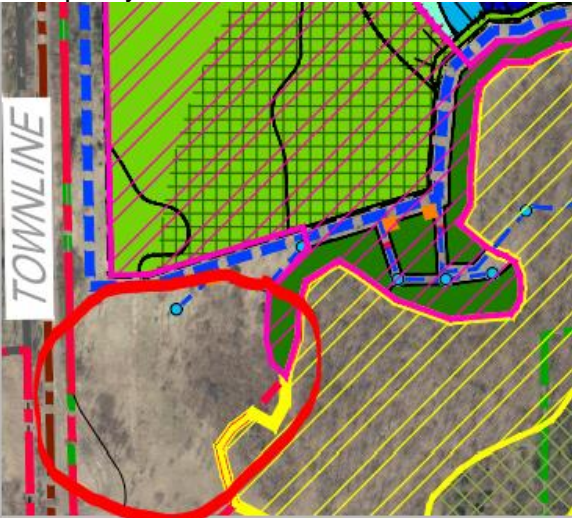
Proposed Milton Quarry East Extension
JART COMMENT SUMMARY TABLE – Ecological Enhancement Plan

Please accept the following as feedback from the Milton Quarry Joint Agency Review Team (JART). Fully addressing each comment below will help expedite the potential for resolutions of the consolidated JART objections and individual agency objections. **Additional, new comments may be provided once a response has been prepared to the comments raised below and additional information provided.**

	JART Comments (December, 2022)	Reference	Source of Comment	Applicant Response (January 2023)	JART Response
Report/Date: Ecological Enhancement Plan (EEP) & Rehabilitation Plan Report December 2021			Author: Goodban Ecological Consulting Inc.		
1.	The success of the EEP will be determined partly by whether non-native invasive species out-compete native species used for enhancement over the long term. It will also be determined by the survivability of planted species. While it is not expected that a highly detailed invasive species management plan be prepared at this stage, the framework of a management plan, and a proposed time frame for long-term monitoring, should be proposed.	General	Sarah Mainguy, NSE	GEC prepared a <i>Proposed Invasive Species Monitoring and Mitigation Strategy</i> , which was included in Dufferin’s July 22, 2022, response to objection letters from MNRF (May 9, 2022) and Region of Halton (May 6, 2022). Please see Tab C in the JART Natural Environment Comment Response Matrix for a copy of the <i>Proposed Invasive Species Monitoring and Mitigation Strategy</i> .	
2.	Please see comment # 24 in Natural Environment table. The rehabilitation plan should be composed as much as is feasible of vegetation communities characteristic of this part of the Niagara Escarpment.	General	Sarah Mainguy, NSE	<p>Please see the response to Comment 24 in the JART Natural Environment Comment Response Matrix. Key points from that detailed response are repeated below.</p> <p>The Ecodistrict 6E-7 (Oak Ridges Ecodistrict) is shown on Tab E, Figure 1, in the JART Natural Environment Comment Response Matrix. This expansive Ecodistrict covers approximately 4,418 km² and the main physiographic feature is the Oak Ridges Moraine, extending eastwards almost to Belleville. Only around 498 km² or 11.3% of the Ecodistrict falls within the Niagara Escarpment. Ecodistrict 6E-7 contains many features that are not representative of the Niagara Escarpment.</p> <p>The list of “vegetation types characteristic of this Ecodistrict” provided by JART includes a number of community types that are either not characteristic of the Niagara Escarpment in general or the Halton Section of the Niagara Escarpment in particular, or are not suitable for incorporation into a quarry rehabilitation plan for various practical reasons.</p> <p>The target communities for the EEP and Rehabilitation Plan are based on GEC’s field observations from the natural areas surrounding the Milton and Acton Quarries since the mid-1990’s, as well as the community listings for the Halton Section of the Niagara Escarpment and the Halton Forest North, Halton Forest South and Speyside Forest ANSIs, found in the ANSI site summaries provided in the <i>Ecological Survey of the Niagara Escarpment Biosphere Reserve</i> (Riley et al. 1996). The Halton Section of the</p>	

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				<p>Niagara Escarpment is shown at Tab D, Figure 1, in the JART Natural Environment Comment Response Matrix.</p> <p>Volume II (Technical Appendices) of Riley et al. (1996) includes Appendix A, which is entitled <i>Vegetation Communities of the Niagara Escarpment Biosphere Reserve</i>. Appendix A provides listings of vegetation community types by Escarpment Section, e.g., Niagara, Halton, Dufferin, Grey and Bruce Peninsula. The community classification system used by Riley et al. (1996) predates the <i>Ecological Land Classification for Southern Ontario: A First Approximation</i> (Lee et al. 1998), but there are many similarities between the two. GEC reviewed Riley et al.'s (1996) community types documented for the Halton Section of the Niagara Escarpment; analogs of almost all of the ELC ecosites and community types listed by GEC for the MQEE EEP and Rehabilitation Plan are also listed from the Halton Section of the Niagara Escarpment by Riley et al. (1996).</p>	
3.	Figure 7a provides a conceptual presentation of the MQEE rehabilitation plan. Portions of the quarry excavation are to be filled with clean fill whereas other areas will be occupied by a lake and vertical bedrock wall of the quarry excavation. To what extent will the exposed vertical quarry walls impact the local groundwater table and will measures be incorporated to minimize lowering of the local groundwater table to reduce or eliminate the need for ongoing water management? See Comment # 55 on the Geology and Water Resources comment table.	Figure 7a Rehabilitation Plan (Issues list item 3.1)	Norbert M. Woerns	<p>The quarry walls were conservatively assessed as being in good connection with the surrounding groundwater flow system.</p> <p>If the areas of clean fill placement reduce this connectedness, there will be less flow of water in/out of the quarry. The most relevant effect, which is to the east, would be to further support higher groundwater levels to the east and hence reduce the potential need for seasonal groundwater recharge to the east. To the southeast, the quarry wall is exposed to the lake. To the southwest and west, any reduced connectedness would reduce the seepage of water to the North Quarry and Main Quarry resulting in a reduction in the potential top-up water volume needed for the East Lake.</p> <p>A high degree of connectedness (as represented) is consistent with observed performance at both Milton and Acton Quarries and is associated with the natural and blast-induced fracture permeability of the rock remaining in the quarry walls and underlying the quarry floor.</p> <p>Overall, the quarry rehabilitation plan was designed to maximize the terrestrial and aquatic land use benefits with practical water</p>	

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				management system requirements. There are no concerns that the proposed fill placement is detrimental to the proposed rehabilitation conditions and protection of water resources in the MQEE area.	
4.	Regarding woody species planting list, a single species should not represent more than 20% of a planting plan, this is to help with diversity and ensure survivability and resiliency within a restored area. Review units with species representing greater than 20% and revise by increasing other species or adding additional native species.	Table 20 EEP Unit Summary, (Page 3)	CH	<p>EEP Units TP-B1 to TP-B6 are “buffer” units that are located between the Significant Woodland boundary and the proposed extraction limit (see NETR & EIA Figure 39), or they are next to the proposed extraction limit and intended to buffer other EEP Units to be established farther away from the extraction area.</p> <p>The buffer planting areas are in proximity to the proposed MQEE extraction area and they provide a buffer for the Significant Woodland and/or other EEP planting areas. The species selected for this purpose are White Birch (<i>Betula papyrifera</i>), White Cedar (<i>Thuja occidentalis</i>), White Pine (<i>Pinus strobus</i>) and Trembling Aspen (<i>Populus tremuloides</i>). These pioneering species have all colonized newly created cliff rim habitats at the Milton Quarry and Acton Quarry, along the edges of former extraction areas, and they are well suited as buffer plantings. The buffer plantings are proposed to include 30% White Birch and 30% White Cedar. These two species were selected in particular because they are fast-growing and resilient in more extreme environments, including along the natural cliffs along the Escarpment. In GEC’s opinion, planting White Birch and White Cedar in these proportions is appropriate when the intended function of these plantings is taken into account, rather than imposing a hard cap at 20% for any one species.</p> <p>Similarly, there are other units where it is intended to plant 30% Red Oak because this species does well in open environments and it is well established on and adjacent to the MQEE property.</p> <p>Note also that any replacement plantings will take into account the survivorship of the various species that are initially planted, so the ultimate proportions of the various species may change over time. Species that generally perform well will be selected for replacement plantings.</p> <p>With only one exception, no single tree species will be planted in proportions greater than 30%, which is close to CH’s suggested cap at 20%. The exception is Unit TP-RB9, which is in a sheltered area with a fair amount of White Ash regeneration. The prescription for that area</p>	

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				includes planting 40% Sugar Maple, which is the dominant species in the adjacent mature deciduous forest and the existing White Ash regeneration would act as a nurse crop by providing partial shade.	
5.	Please include an invasive species monitoring/management plan to help ensure establishment of desired vegetation communities and enhancement of existing features.	Section 3.14, Maintenance and Monitoring EEP (Page 7) and Section 4.4.3, Maintenance and Monitoring Restoration Plan (Page 16)	CH	GEC prepared a <i>Proposed Invasive Species Monitoring and Mitigation Strategy</i> , which was included in Dufferin's July 22, 2022, response to objection letters from MNRF (May 9, 2022) and Region of Halton (May 6, 2022). Please see Tab C in the JART Natural Environment Comment Response Matrix for a copy of the <i>Proposed Invasive Species Monitoring and Mitigation Strategy</i> .	
6.	<p>Figure 8. Combined Ecological Enhancement Plan (EEP) and MQEE Rehabilitation Plan: Regarding the CUM1-1c vegetation community (ELC unit, circled in red in figure below) located within the Southwest corner, given the lag time of potential future uses, CH recommends the opportunity for reforestation enhancement and the improvement of that quality and function of habitat.</p>  <p>NEC would also support seeing enhanced reforestation efforts in this area, in order to improve any remaining east-west linkages to the cox tract given removal of Woodland A. This would address the NEP objectives and policies respecting enhancing natural heritage features and functions.</p>	Ecological Enhancement Plan and Rehabilitation Plan Report	<p>CH</p> <p>NEC</p>	The EEP has been designed to provide net ecological enhancement for key natural heritage features proposed to be removed. Overall, the EEP provides a significant enhancement in overall forest cover compared to existing conditions and reforestation of this area was not deemed necessary to meet the policy requirements of the NEP. Furthermore, this area is part of the lands proposed to be conveyed to Conservation Halton and this area in the future could serve as a strategic area for a small parking area, trailhead etc.	
7.	<p>Figure 6 of the EEP and Rehabilitation Plan Report (Goodban 2021a) shows placement of access roads and watermain routing along the proposed enhancement area. This enhancement area generally provides an area for salamander movements between wetland U1 and adjacent forest habitats. The new watermain and service access roads are to be installed where they may be encountered by salamanders during their migration to and from their breeding ponds.</p> <p>Given the placement of this infrastructure within areas used for salamander movements, the applicant should discuss the potential impacts associated with the installation and operation of roads and watermain within this area.</p>		Matrix Solutions	The extension of the existing Water Management System (WMS) for the Milton Quarry East Extension (MQEE) is an essential component of the mitigation strategy to protect adjacent water-dependent natural features from the effects of quarry dewatering. The layout of the WMS is designed to optimize the performance of the recharge wells and protect natural heritage features. Recharge wells are more effective when located further away from an extraction face (to reduce recirculation of recharge water back into the quarry excavation).	

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	<p>If salamanders will move from overwintering sites such as old rodent burrows and rock cracks that are below the frost line to breeding ponds, will the subsurface installation of watermain impede their movements to breeding ponds? How are salamanders traversing the surface of the access roads being protected from vehicles travelling in the service access roads during the peak migration periods?</p>			<p>Driving access is necessary for WMS operation and maintenance, water resource monitoring and ecological monitoring. Driving access will also help facilitate the implementation of the proposed Ecological Enhancement Plan (EEP), including initial tree-planting, watering, maintenance, monitoring, replacement plantings, invasive species management, etc.</p> <p>Section 13.2.5 (MQEE WMS Establishment) of the NETR & EIA describes in detail the restrictions and design considerations for the establishment of the WMS. AMP Addendum Part II – Section A.2.4 also outlines the various restrictions and design considerations that are aimed at minimizing negative effects on natural features and functions, and species at risk</p> <p>In areas located between Wetland U1 and the adjacent forested areas to the northwest, northeast and southeast, removal of ground vegetation to facilitate installation of the watermain, Control Valve Huts and driving access will avoid the salamander migration period, i.e., March 10 to May 10.</p> <p>The watermain and driving access will generally be installed at or close to existing grades, with gentle shoulders where they are required. NETR & EIA Section 13.2.2 describes the WMS installation and operating experience for the existing Milton Quarry Extension WMS. NETR & EIA Attachment B2 is a photo album that documents the installation of the WMS components and how they look several years after installation. Refer to NETR & EIA Attachment B2: Photos 1 and 2, for views of the East Cell driving access near Wetland V2, immediately after installation in late 2010, and then again in 2018. Note how woody and herbaceous plants have become established within the previously disturbed area. The lightly travelled access is essentially a driving trail that is 3 or 4 m wide.</p> <p>Please note that the Operation Plan (Site Plan Sheet 2 of 4) includes several recommendations of interest here. In the Technical Report Recommendations on Sheet 2 of 4, Notes E.4, E.5 and E.10 read as follows:</p> <p><i>“4. Silt/exclusion fencing shall be installed in the location shown on the plan view. Salamander Excluders will be installed at the locations shown on the plan view. Silt/Exclusion fencing may be</i></p>	

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				<p><i>heavy-duty silt fencing, Animex Wildlife Fencing or equivalent. The condition of the fencing shall be monitored on a regular basis and it shall be promptly repaired as necessary."</i></p> <p><i>"5. The watermain access road located between the two Salamander Excluders shall only be used for WMS monitoring and maintenance, ecological enhancement works and ecological monitoring. It shall not be used for operational purposes."</i></p> <p><i>"10. The Water Management System (WMS) shall be installed consistent with the restrictions and design considerations provided in the AMP Addendum (GHD and Goodban Ecological Consulting Inc., December 2021)."</i></p> <p>Therefore, use of the WMS driving access is restricted to essential uses and is it not available for operational uses. Mole salamanders typically migrate to/from their breeding pools in early spring on mild rainy/humid nights. The driving access it typically not in use after dark. Education/awareness training with respect to species at risk (including Jefferson Salamander) is routinely provided to site staff and contractors.</p> <p>GEC previously implemented a monitoring and mitigation program for mole salamanders around Wetlands W7 and V2 at the East Cell during the period between spring 2014 and spring 2020 (7 years). GEC checked pitfall traps installed along exclusion fencing on a daily basis for a period of up to one month duration each spring period. No evidence of salamander mortality was ever observed by GEC on the East Cell driving access since it was established in late 2010. During the same time periods, evidence of salamander mortality was regularly observed by GEC on 15th Sideroad, east of Townline.</p> <p>Mole salamanders typically use old rodent burrows and rock fissures and cracks filled with humus-rich soil as part of their foraging and over-wintering habitat. They migrate quickly overland, usually at night with the right conditions, to get to and from their breeding pools. They are not known to use rodent burrows and rock fissures as migration routes. The installation of a frost-protected watermain below grade will not impede salamander movements to/from breeding pools. Many breeding adult salamanders were observed in Wetlands W7 and V2 following installation of the East Cell watermain.</p>	

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8.	Section 4.1 of the EEP and Rehabilitation Plan Report (Goodban 2021a) describes the creation of a 7.7 ha deep lake to support the water dependent natural features surrounding the proposed MQEE. This lake is anticipated to support fish populations. As lake habitats in general experience hydroperiods whereby water levels along the shoreline are expected to fluctuate in accordance with seasonal changes with precipitation/snowmelt periods, the applicant should discuss how fish are prevented from entering wetlands U1 and V2 and potentially invade these areas during the high-water periods. Given the short distance from the wetlands and the lake, what is the potential for lake water and fish to occupy these wetlands during flood events? It is anticipated that fish invasion of these wetlands will destroy their ability to function as breeding ponds for Jefferson Salamander populations. The applicant should describe measures to ensure to ensure that the proposed lake and wetland habitats are kept separated during extreme high-water events.		Matrix Solutions	<p>The proposed MQEE 7.7 ha deep lake is an extension of the East Cell Lake. The final East Cell Lake elevation is approximately 333 mASL. A control structure is being installed across Townline, such that whenever the East Cell Lake rises above 333 mASL water will overflow into the West Cell Lake, on the west side of the Townline Road allowance.</p> <p>The lowest point in Wetland U1 is 337.5 mASL, so fish would need to cross approximately 50 to 60 m of dry land to get to Wetland U1, up an elevation difference of 4.5 m.</p> <p>The lowest point in Wetland V2 is approximately 339.7 mASL, so the fish would have to scale a 6.7 m cliff and cross 30+ m of dry land to get to Wetland V2.</p> <p>Wetlands U1 and V2 are essentially isolated wetland features with no direct connection to the East Cell Lake. The bottom elevations of these wetlands are between 4.5 m and 6.7 m. There is absolutely no potential for lake water and fish to occupy these wetlands during flood events or at any other time.</p>	
9.	Given the extent of rehabilitation that will be planned for the MQEE habitat enhancement area, will salamander movements during quarry operations be monitored as the new salamander habitat develops and during quarry operations?		Matrix Solutions	The monitoring of salamander movements is not proposed in relation to the proposed Ecological Enhancement Plan (EEP) and Rehabilitation Plan. The monitoring of salamander breeding pools does include ecological monitoring including field reconnaissance, fixed-point photography, amphibian call count surveys (frogs/toads), salamander egg mass surveys and wetland vegetation monitoring.	
10.	Given the level of sophistication needed to operate the water facilities needed to maintain salamander habitat water levels, what assurances are there for future operators to continue to maintain these habitats in the distant future? What assurances are there that the water quality provided to the salamander habitat are of high quality?		Matrix Solutions	<p>During the extraction and lake filling period, CRH is fully responsible for the successful operation of the mitigation measures. It is intended that these requirements will be stipulated in the associated approvals from NEC, MNRF, and MECP and further required by the legal agreements with Halton Region and Conservation Halton as is the case with the Existing Quarry. The legal agreements include financial assurance contingencies in the unexpected event that CRH does not fulfil their obligations.</p> <p>Under long-term conditions, the portions of the quarry lands and all relevant portions of the water management system will be transferred to Conservation Halton. CRH is fully funding the future Conservation Halton operation of the water management systems so that there will be no cost to taxpayers in the future.</p>	

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11.	The applicant should include a discussion of how transformation of the farmland into a lake and raising water levels would affect the moisture regimes of the adjacent natural heritage features.		Matrix Solutions	Of the proposed 15.9 ha extraction area, around 7.7 ha will form an extension to the approved East Cell Lake. Establishing a lake with a lake level set at approximately 333 mASL will, to some extent, mimic the pre-extraction water table. Figure 42b in the NETR & EIA shows the simulated water level change under the rehabilitation condition, i.e., when the East Cell Lake is at its operating level. Increases in groundwater levels in the vicinity of Wetland W41 may around 0.2 m or less. In the vicinity of Wetland W36, groundwater level increases of 0.5 m to 2.0 m are predicted. Given that Wetland W36 was previously affected by extraction in the Main Quarry and North Quarry, this increase in groundwater levels relative to existing conditions is considered to be a positive change.	