

Proposed Milton Quarry East Extension JART COMMENT SUMMARY TABLE – Natural Environment

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 (Jan 2023)	JART Response
Report/Date: Level 1 and 2 Natural Environment Technical Report (NETR) and Environmental Impact Assessment (EIA) December 2021 Author: Goodban Ecological Consulting Inc. (GEC)					
1.	The term “common setback” used in the first line of the fourth paragraph on page 1 should be explained/defined.	Page 1	Sarah Mainguy, NSE	The Aggregate Resources Act (ARA) provides for eliminating the prescribed excavation setback area adjacent to other properties when the adjacent landowner provides consent. Since the East Cell is licensed and owned by CRH, the excavation setback along the common boundary of the CRH lands, the Milton Quarry East Cell and the proposed MQEE, has been reduced to 0 m.	
2.	Section 1.3. Environmental Impact Assessment (EIS), Page 4, second full paragraph, third bullet references a local NHS. Please clarify what this refers to.	Section 1.3	Sarah Mainguy, NSE	The local NHS refers to the Town of Halton Hills Greenlands area. See Figure 7 of the MHBC Planning Report.	
3.	<p>It is stated on page 63 that there are no suitable breeding pools in the Cox Tract for Jefferson Salamander. However, the investigations within the Cox Tract are not described. Dates and other details for these investigations should be provided. Should woodland pools be present in the Cox Tract, the potential function of the pools as Jefferson Salamander habitat should be examined, with potential re-mapping of regulated habitat.</p> <ul style="list-style-type: none"> - The MECP should provide comment on the need to survey the Cox Tract for salamander habitat 	Level 1 and 2 Natural Environment Technical Report and Environmental Impact Assessment	Sarah Mainguy, NSE	<p>The portion of the Cox Tract between the existing haul road and the Townline Road allowance was surveyed for vegetation/flora at a reconnaissance level and detailed wildlife surveys (breeding birds, butterflies, etc.) were also completed. GEC had previously covered this area when preparing a Scoped EIA for the haul road crossing of the Cox Tract, circa 1997/98.</p> <p>There are no vernal pools or wet areas of any kind in the northeast portion of the Cox Tract. It is entirely upland and mainly comprises conifer plantations planted in 1951 on what was formerly agricultural land. The conifer plantations are gradually taking on a more natural character, as native deciduous tree species gradually become established.</p> <p>There is no need to survey the Cox Tract for salamander habitat. As noted, there are no vernal pools or wet areas in the northeast section of the Cox Tract. The haul road crossing is an impenetrable barrier to salamanders, with extensive erosion control measures in place on both sides of the haul road. There are no vernal pools in the remainder of the Cox Tract. The entire Cox Tract between Sixth Line and the Townline Road allowance is more than 1.25 km in length.</p>	

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4.	<p>The potential occurrence of bat hibernacula within 200 m of the study area should be investigated. The area of bat hibernacula SWH includes a 200m radius (OMNR 2000) around the entrance of the hibernaculum within which most development types have the potential for impacts.</p> <ul style="list-style-type: none"> - The absence of bat hibernacula in this part of the escarpment should be confirmed. 	Level 1 and 2 Natural Environment Technical Report and Environmental Impact Assessment	Sarah Mainguy, NSE	<p>Bat hibernacula may be found in caves, mine shafts, underground foundations and certain karst features. GEC did not identify any of these features within the Natural Environment Study Area (see NETR & EIA Figure 8 for the study area boundary). GEC has not observed any of these features in proximity to the existing Milton Quarry Extension either.</p> <p>Some areas within 500 m of the proposed extraction area fall beyond the original Natural Environment Study Area, i.e., beyond Wetlands W36 and W41. These areas were examined for the potential presence of caves, mine shafts, underground foundations and certain karst features by GEC on July 17, 2022. No such features were identified during the survey.</p> <p>GEC notes that portions of the MQEE Natural Environment Study Area are within 500 m of the extraction areas of the East Cell of the approved Milton Quarry Extension, the North Quarry and the Main Quarry.</p>	
5.	<p>Methods for bat maternity roost habitat assessment provided in Section 5.1.2, which state that trees over 25 cm diameter at breast height (dbh) were counted, do not conform to the most recent protocols published by MNRF (Guelph District Office, 2017). These state: “Following the completion of ELC mapping of a study area, any coniferous, deciduous or mixed wooded ecosite, including treed swamps, that includes trees at least 10cm dbh should be considered suitable maternity roost habitat.” All potential bat habitat trees of 10 cm dbh and over should be counted.</p>	Section 5.1.2	Sarah Mainguy, NSE	<p>In a document issued by Christopher Martin of the Ministry of Environment, Conservation and Parks (MECP) on March 29, 2021, it was stated that there are numerous peer-reviewed publications demonstrating that trees with a DBH of less than 25 cm support maternity and day roosts of species-at-risk bats. None of these references were provided however. The protocol for surveying for maternity roosts that was attached to that document stated that only those cavity trees 25 cm or larger needed to be documented, and all previous protocols had the same stipulation.</p> <p>In the July 22, 2022, MHBC response letter to MECP regarding species at risk, it was requested that MECP provide a list of references for peer-reviewed publications that demonstrate that trees measuring less than 25 cm DBH (diameter at breast height) support maternity and day roosts of species at risk bats.</p> <p>As research during the preparation of the NETR & EIA, a literature review on the characteristics of maternity roosts for Northern and Little Brown Myotis was completed and the results did not support that these species use trees smaller than 25 cm. The Northern Myotis typically roosts in very large trees, with an average DBH of 65 cm. The Little Brown Myotis prefers to roost in sites that are much warmer than ambient temperatures, generally >32°C. These temperatures are required for adequate development of the fetus and pup. It typically uses trees that are a minimum of 45 cm DBH, and rarely as small as 25 cm.</p>	

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				<p>Larger trees are required so that numerous bats can use the same cavity and thermoregulate together. The references that provide this information are cited in the NETR & EIA.</p> <p>In their May 14, 2022, email commenting on the MQEE application, with respect to species at risk, MECP stated the following:</p> <p><i>“With respect to Little Brown Myotis, Northern Myotis and Tri-coloured Bat, given the scale of the project relative to the local treed landscape the Ministry agrees that it is likely that impacts can be avoided by timing the tree removals to occur outside of the roost period. Given the possible presence of Eastern Small-footed Myotis, the recommended window to remove trees is December 1 to March 14.”</i></p> <p>Dufferin subsequently agreed to limit tree removal to the period between December 1 and March 14, and this is reflected on the updated Site Plans.</p>	
6.	<p>Analysis of Significant Features</p> <p>Black Ash (<i>Fraxinus nigra</i>) should be listed as a significant species in Section 6.1. This species was listed as Endangered under the Endangered Species Act, 2007 on January 26, 2022.</p>	Section 6.1	North South Environmental	<p>Comment noted. Black Ash was listed as Endangered in Ontario on January 26, 2022. Protections for Black Ash under the Endangered Species Act were temporarily suspended until January 25, 2024, through Ontario Regulation 23/22.</p> <p>The NETR & EIA was completed in December 2021, prior to Black Ash being listed as Endangered in Ontario. At that time the NETR & EIA did acknowledge that Black Ash had been designated as Threatened at the federal level by Environment and Climate Change Canada in November 2018.</p> <p>In GEC’s opinion there will be no negative impacts on Black Ash as a result of the proposed MQEE. Further discussion is provided below in response to Comment 15.</p>	
7.	<p>Section 7 provides an analysis of the provincial significance of wetlands in Ecoregion 6E. However, significance of wetlands in Halton Region should also be considered. Analysis of whether wetlands U1 and W56 would be considered significant according to Region of Halton criteria should be provided, in accordance with s.276.5(1) of the Regional Official Plan and in consultation with Conservation Halton and MNRF staff.</p> <ul style="list-style-type: none"> - it is noted that these wetlands are being protected from extraction, with a buffer of 50 m, which is likely more than a Regionally significant wetland would be buffered. 	Section 7	Sarah Mainguy, NSE	<p>Wetland U1 is already identified as a Key Natural Heritage Feature on Schedule 1G (Key Features within the Greenbelt and Regional Natural Heritage Systems) of the Region of Halton Official Plan.</p> <p>As indicated in Dufferin’s July 22, 2022, responses to ARA objection letters from the agencies, Wetland U1 is being treated as Provincially Significant for planning purposes. The ARA Site Plans were updated to reflect this.</p> <p>See Tab A (Updated NETR & EIA Figures 31, 32, 34 and 35) and Tab B (Updated ARA Site Plans).</p> <p>As indicated on page 75 of the NETR & EIA, Wetland W56 is a small, minor feature with a short, ephemeral</p>	

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				hydroperiod. GEC would not ordinarily recommend its inclusion within the Halton Escarpment Wetland Complex. W56 is located within the Significant Woodland, more than 400 m away from the proposed extraction area, and it will be protected from any dewatering influences through mitigation via the (WMS). Supplementary monitoring (surface water levels and wetland ecology) is proposed as part of the AMP Addendum.	
8.	As noted in Region's comments on the Terms of Reference, wetlands U1 and W56 have not been evaluated by the Ministry of Natural Resources and Forestry (MNRF); however, they have been identified within MNRF and Conservation Halton wetland mapping. It is recommended that the NETR/EIS assess whether these wetlands should be added to the Provincially Significant Wetland complex. Comments on the analysis of Wetland U1 as an ecological trap are provided in point 12 below.	Level 1 and 2 Natural Environment Technical Report and Environmental Impact Assessment	Sarah Mainguy, NSE	<p>Please refer to the response to Comment 7.</p> <p>Please note that Wetland W56 was not identified by MNRF.</p> <p>Shapefiles for Wetlands U1, V2 and W56 were provided to Aurora District MNRF on November 21, 2022.</p>	
9.	Section 7 recommends a 50 m buffer to Wetland U1. The appropriate buffer width for the wetlands should also be determined in accordance with s.220.1.1 of the ROP.	Level 1 and 2 Natural Environment Technical Report and Environmental Impact Assessment	Sarah Mainguy, NSE	<p>A 50 m buffer was proposed by GEC for Wetland U1, recognizing that if the wetland hydrology is enhanced over current conditions, it will become a viable Jefferson Salamander breeding pool. The buffer is presently a regenerating field that will be reforested. The open areas between Wetland U1 and the forested areas to the north, east and south will also be reforested and habitat features such as rock piles and woody debris will be added, creating forested migration habitat between Wetland U1 and the existing forest.</p> <p>In GEC's opinion, ROP policy s.220.1.1 has been satisfied through the documentation provided in the NETR & EIA.</p>	
10.	<p>Mapping and Interpretation of Significant Features</p> <p>Wetland U1 is described as an ecological trap, but no evidence is provided to support that statement other than the description of the hydroperiod. However, the wetland has been instrumented only since 2020 (with general observations in 2019). Section 6.1.2.4., page 63, referring to Figure 26, states that "The area shown in green tint would not function as dispersal habitat related to Wetland U1, because under existing conditions this pool does not contain water for a long enough period, i.e., its hydroperiod is too short, and no juveniles emanate from this feature." However, there is no description of drift fence studies to determine if juvenile salamanders emanate from the feature. This should be clarified. This wetland appears, on the basis of the breeding population numbers provided, to have a high function as breeding habitat for amphibians. It is described in Section 5.5.1.3 as having eight Jefferson Salamander captured in 2019 and 20 Jefferson Salamander captured in 2020. In addition, the wetland was found to have full choruses of Spring Peepers in one of the years studied, as well as low numbers of Wood Frogs, American Toad and Gray Treefrog. Salamanders and frogs have a high fidelity to breeding habitat, so their continued presence in this feature may indicate that they breed successfully in some years. Many amphibians are dependent on "good" years for reproduction. There is insufficient information on hydroperiod to show how long the low water levels have</p>	Section 6.1.2.4., page 63	Sarah Mainguy, NSE	<p>GEC acknowledges that a diverse mix of amphibians was recorded at Wetland U1 during the field surveys for the MQEE, including a surprising number of Jefferson Salamanders and Unisexual Ambystoma in 2019 and 2020 during minnow trapping surveys. This is the primary reason for GEC recommendations that the Wetland U1 be retained and enhanced as part of the MQEE.</p> <p>As noted on page 75 of the NETR & EIA, Wetland U1 presently lacks a suitable springtime high water level and hydroperiod of suitable duration to support amphibian breeding. Under existing conditions, it functions as an ecological trap for breeding frogs, toads and salamanders.</p> <p>On June 8, 2019, GEC observed a small pool of water at least 30 cm deep remaining in the grove of Green Ash trees at the southeast (lower) end of Wetland U1. On June 30 no standing water was observed and this</p>	

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	<p>persisted. The potential for successful breeding in some years should be discussed. The rationale for the conclusion that juveniles are not produced should be clarified.</p> <ul style="list-style-type: none"> - It is understood that the property was formerly owned by another company, and has only been monitored since 2019 because there was no access to the pond. It is not known when the spring water levels stopped being appropriate for amphibian breeding. The main quarry has likely affected the spring water levels in the pond for many years. The East Extension likely exacerbated these impacts, but it is not possible to separate the proportion of impact to the main quarry and East Extension. - Regardless of when the impacts took place, it is clear that water levels should be supplemented in this pond as soon as possible to restore the function of the pond to support breeding amphibians. We understand that Wetland V2 was temporarily restored prior to the implementation of the Water Management System, which effectively restored the function. We recommend that the same approach be used to supplement early spring water levels in Wetland U1 as early as possible after the license is obtained. 			<p>appeared to have been the case for at least one week. The hydroperiod may have been just long enough for transformation of Spring Peeper and Wood Frog tadpoles to occur but this is not a certainty, but the hydroperiod was far too short for transformation of salamander larvae to occur.</p> <p>The wetland contained little/no water during the spring period in 2020, 2021 and 2022. During the minnow trapping survey for salamanders on March 20, 2020, the standing water was not deep enough to entirely submerge the minnow traps; U1 was observed by GEC to be dry on May 16, 2020. GHD indicated that Wetland U1 likely dried out in late April, 2020, and this was confirmed on May 13, 2020.</p> <p>In 2021, GEC observed that no water was present on March 25, but GHD measured very shallow standing water briefly before and after that date. GHD confirmed Wetland U1 was dry on May 12, 2021.</p> <p>In 2022, water was first registered at the staff gauge on March 16. On April 10, 2022, GEC observed that there was only a small pool of shallow water in Wetland U1 that was less than 10 m by 10 m in size. The pool level declined to dry or nearly dry by of April 12, 2022 and intermittently received water until May 10. The wetland was dry from May 10, 2022 through the balance of the year.</p> <p>This means that from 2020 to 2022, the hydroperiod of Wetland U1 was too short to support any recruitment to amphibian populations. The hydroperiod was too short to allow any tadpoles and salamander larvae to mature and transform into terrestrial juveniles. There may have been some recruitment of Wood Frog and Spring Peeper in 2019, if water persisted in the wetland in mid-June.</p> <p>GEC agrees with the recommendation that water levels in Wetland U1 be supplemented as early as possible after the licence is obtained and the OWRA permits are amended. This would enhance the function of the pool, such that it functions as viable breeding habitat for amphibians. The wetland hydroperiod in nearby Wetland V2 was initially restored on a temporary basis using an overland pipe starting in early spring 2009 and continuing until the permanent WMS was installed in late 2011. CRH is prepared to implement the same approach for Wetland U1 subject to the issuance of any required approvals.</p>	

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11.	<p>The extraction footprint encroaches on a Jefferson Salamander movement corridor shown in Figure 26. The extraction footprint should be restricted outside the movement corridor, notwithstanding the application of the salamander habitat regulation shown in Section 6.1.2.4. As noted in point 12, the evidence indicating that Wetland U1 is not suitable salamander breeding habitat is quite weak. It is noted in Section 6.1.2.4. that the field habitat surrounding wetland U1 would not be ideal dispersal habitat, but there is no direct evidence of whether it does or does not in fact provide dispersal habitat. The fact that there are salamanders and frogs still breeding in the pond may indicate that the pond is still functional. Amphibians move through farmland and fields to and from breeding habitat in many areas of southern Ontario, moving through long grass or cropland at night and during rainy periods to minimize desiccation.</p> <ul style="list-style-type: none"> - The restoration of amphibian breeding in Wetland U1 may mean that the corridor between the ponds becomes more important to the breeding population of salamanders in the area. 	Section 6.1.2.4	Sarah Mainguy, NSE	<p>Section 16.1.2 of the NETR & EIA deals with potential effects on Jefferson Salamander and Unisexual Ambystoma (Jefferson Salamander dependent population). Section 16.1.2.1 (page 154) discusses the proposed extraction footprint and it is repeated below:</p> <p><i>“Based on an analysis of the Jefferson Salamander Habitat Regulation as shown on Figure 26, the proposed MQEE extraction footprint overlaps with approximately 3.99 ha of what is conservatively mapped as potential migration and dispersal habitat. This habitat is almost entirely comprised of old field vegetation, which is not the preferred habitat of the Jefferson Salamander and Unisexual Ambystoma (Jefferson Salamander dependent population). Salamanders may be susceptible to desiccation and predation when they move across open fields between forested areas and breeding pools. The habitat that will be removed by extraction is likely not actually used for migration or dispersal. The direct routes between Wetland U1 and the nearby forest do not overlap with the extraction footprint. Wetland U1 is approximately 115 m away from forest to the northwest, 115 away from forest to the northeast, and approximately 220 m from forest to the southeast. It is more likely that salamanders would select the more direct routes from the forest to Wetland U1, rather than wandering further out into the open fields and taking a more circuitous route.”</i></p> <p>Dufferin continues to work with MECP with respect to species at risk and, in particular, with regard to Jefferson Salamander and Unisexual Ambystoma (Jefferson Salamander dependent population).</p> <p>Correspondence from MECP dated May 15, 2022, states:</p> <p><i>“The Ministry generally supports what has been proposed for mitigation and overall benefit and will work with the project team as necessary to finalize the mitigation and overall benefit plans.”</i></p>	

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12.	The Cox Tract should be enhanced by connecting it to the forests to the east as much as possible following rehabilitation, by restoring the haul road (as well as providing linkage as shown in the Site Plans). It is important that the Cox Tract remain linked to the forests to the east, as they provide additional habitat for forest species. This linkage should be enhanced as part of the woodland restoration. Please refer to guidance in the Sustainable Halton Report 3.02 – Natural Heritage System Definition and Implementation (NSE 2009) to incorporate an ecologically appropriate linkage as part of the Regional NHS. It is understood that the linkage will be enhanced following rehabilitation, but the linkage should also be maintained during extraction.	Level 1 and 2 Natural Environment Technical Report and Environmental Impact Assessment	Sarah Mainguy, NSE	<p>During extraction of the MQEE, there will be 87 metres of land between the proposed MQEE extension area and the approved extraction area for the Milton Quarry. This will maintain a linkage between the Cox Tract and lands to the east during extraction. Following extraction, in conjunction with the restoration of the haul road across the Cox Tract, the reforestation to be completed as part of the MQEE Rehabilitation Plan will provide an improved connection between the Cox Tract and the existing Significant Woodland (see NETR & EIA Figures 41a, 43 and 44).</p> <p>As noted on pages 181-182 of the NETR & EIA, the Cox Tract haul road crossing is between 29 and 31 m wide. On both sides of the haul road crossing, heavy-duty silt fencing was installed at the request of the Region of Halton. On the southwest side of the Cox Tract crossing, large dolostone boulders have been placed along the top of the steep road shoulder for safety, and a heavy-duty silt fence and heavy-duty chain-link supporting fence have been installed, as well as a secondary silt fence. The crossing and associated silt fencing and other obstacles form a barrier to the movement of many species. Some of the more mobile mammals, such as Coyote, White-tailed Deer, Red Fox, Raccoon, etc. can still move across the haul road by crossing at either end. Any ecological linkage function is limited at present, but this function will continue during operations. As noted above, the haul road will ultimately be rehabilitated and only a small access road or driving trail will remain.</p>	
13.	Page 92 provides a description of Significant Wildlife Habitat (SWH) for breeding amphibians, which is supported by mapping in Figure 32. The Ecoregion Schedules for Ecoregion 7E specify that SWH for woodland breeding amphibians should include the breeding pool plus the woodland 230 m surrounding the pool. The SWH should be mapped accordingly.	Page 92	Sarah Mainguy, NSE	<p>Please note that the MQEE is located in Ecoregion 6E.</p> <p>In Dufferin's July 22, 2022, responses to agency objection letters, NETR Figures 32 and 35 have been updated to map all woodland habitat within 230 m of the vernal pool habitats within Wetlands V2, W41 and W46a as SWH for Amphibian Breeding Habitat (Woodland). The updated NETR & EIA figures and updated ARA Site Plan detail showing Key Natural Heritage Features were provided to the agencies at that time.</p> <p>For ease of reference, the revised NETR Figures 32 and 35 are provided again at Tab A. The current draft ARA Site Plans are provided at Tab B.</p>	

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14.	The methods for mapping of Significant Wildlife Habitat (SWH) for Forest Area-sensitive Breeding Birds and Significant Wildlife Habitat for bird Species of Conservation Concern should be explained, as the mapping shown on Figure 31 does not conform to standard practice. The entire forest unit, which is a mosaic of several forest types, should be included in area-sensitive breeding bird habitat. The habitat is described as “candidate” SWH on page 90, but the identification of a forest of the suitable configuration and size, meeting the criteria for the number and type of species, would be confirmed SWH rather than candidate.	Page 90	Sarah Mainguy, NSE	As noted in Dufferin’s July 22, 2022, responses to agency objection letters, GEC has updated Figures 31, 34 and 35 in the NETR to show almost the entire woodland as SWH for Woodland Area-sensitive Bird Breeding Habitat and Habitats for Species of Conservation Concern. The Key Natural Heritage Features Figure on the Existing Features page of the ARA Site Plans was also updated to show almost the entire woodland as SWH for Woodland Area-sensitive Bird Breeding Habitat and Habitats for Species of Conservation Concern. The updated NETR & EIA figures and updated ARA Site Plans were provided to the agencies at that time. For ease of reference, the revised NETR Figures 31, 34 and 35 are provided at Tab A . The current draft ARA Site Plans are provided at Tab B .	
15.	There should be discussion of potential impacts on habitat for Black Ash in wetland W41. This species was listed as Endangered under the Endangered Species Act, 2007 on January 26th, 2022, though the prohibitions of the Act were deferred. A recovery strategy for this species was prepared (by NSE), which has been posted on the Environmental Registry of Ontario (ERO) for additional information (ERO Number 019-5053). Even though the wetland that supports this species is being protected for Jefferson Salamander, the potential impacts on the wetland’s ability to support this tree species should be determined. Section 16.2.2 notes that additional water will be recharged to the wetland through the recharge wells designed to provide hydrogeological support to Jefferson Salamander breeding salamander ponds. Black Ash may not tolerate flooding to the same depth and duration as the salamander, should there be an increase in groundwater or flooding periods to Wetland W41, as is predicted in Section 16.2.2. We disagree with the statement in Section 9.3.1. that the habitat for Black Ash should not be considered for protection because the species is at risk because of Emerald Ash Borer. Without protection of the habitat, and thereby protection of populations that may be resistant, there would be no chance of recovery. The Recovery Strategy lists protection of remaining populations as an important part of recovery.	Section 16.2.2 and Section 9.3.1.	Sarah Mainguy, NSE	As noted in Section 16.2.2 of the NETR & EIA, there will be no reduction in surface catchment to Wetland W41 and any dewatering influence from the MQEE will be mitigated through the use of recharge wells to maintain groundwater levels and gradients. Figure 42b shows the groundwater contours in the rehabilitated condition (i.e., when the East Cell Lake is at its operational level of 333 mASL). The +0.2 m contour intersects with the southernmost portion Wetland W41, suggesting a slight increase in groundwater on an annualized basis. Wetland W41 has an existing outlet that drains to Wetland W42 and, ultimately, to Wetland W44. Standing water can only reach a certain level before excess water outlets from Wetland W41. Since any surplus water in Wetland W41 would outlet to Wetland W42 and, ultimately, Wetland W44, it is concluded that there will be no negative impact on Wetland W41 or on the declining Black Ash trees, saplings, or seedlings that grow primarily on hummocks and raised areas within this wetland.	
16.	Cumulative Impacts Cumulative impacts have been dealt with only in a cursory way (in short sections on page 16.2.1.4 and on 17.4). Additional detail of cumulative impact analysis should be provided that examines the potential interaction between the change in groundwater regime, increase in drying winds and ambient light as a result of removal of vegetation and extraction activities, and invasion of non-native species. These cumulative impacts particularly should be examined for the period between extraction and rehabilitation as well as post-rehabilitation. - The effect of the water management on wetland V2 was demonstrated during the site visit, and many aspects of cumulative impacts were addressed by the effect of the water management system on that wetland. It was noted that the non-native species that originally dominated the wetland (Reed Canary-grass) had been replaced by a more diverse suite of species because of the increase	Sections 16.2.1.4 and 17.4	Sarah Mainguy, NSE	As discussed at the meeting with JART on June 30, 2022, and as stated in Dufferin’s July 22, 2022, responses to the agency objection letters, cumulative impacts have been considered as part of the proposed MQEE application. As part of the Milton Quarry Extension in 2007, the impacts of the existing Milton Quarry operation were assessed and included as part of the technical information made available for review. This technical information was reviewed, considered and concluded on by the agencies at that time. The determinations on the impacts of the existing quarry operation were used to inform the design of the Milton Quarry extension, including the resulting water management system and agreements with	

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	<p>in water levels. However, this is not necessarily certain to occur in wetland U1. It is understood that the water management system is proposed to compensate for the increase in drying winds, ambient light and change in groundwater regime. Monitoring should be proposed to assess the changes in the vegetation of the wetland over the long term, to account for these potential cumulative impacts.</p>			<p>Conservation Halton. Further, the existing Adaptive Management Plan and Protection Plan (AMP) in effect at the Milton Quarry provides ongoing assessment and hydrologic and natural environment data. The technical work for the proposed MQEE builds on the previous technical work completed at the quarry and the data collected over approximately 20 years.</p> <p>From a land use policy perspective, this is the last parcel of land designated 'Escarpment Rural Area' adjacent to the existing Milton Quarry and therefore the last viable area which can be contemplated for aggregate extraction in accordance with the policies of the NEP.</p> <p>The proposed MQEE application assesses baseline conditions taking into account the existing approved Milton Quarry and Milton Quarry Extension Lands, including the operating mitigation system and final rehabilitation. Baseline conditions are representative of the approved land uses to date and any impacts to water resources and the natural environment were recognized as existing approved impacts and would continue without further approvals and changes to the existing operation.</p> <p>A copy of the June 30, 2022, GHD/GEC presentation regarding baseline conditions and cumulative impacts was provided as Tab A in Dufferin's July 22, 2022, responses to the NEC's April 26, 2022, objection letter.</p> <p>Regarding Natural Environment Comment 16, GEC notes that most of the proposed MQEE extraction is comprised of existing open fields that are already exposed to the west winds. There are few trees associated with most of the extraction area, except in proximity to the Cox Tract where some woody regeneration has occurred over the past 30 years. The Cox Tract is on higher ground (340 mASL – see NETR Figure 6 for contours) relative to the young regeneration that will be removed as part of the MQEE extraction area. Stand data from Halton Region indicates that the trees in the plantations at the northeast end of the Cox Tract are between 21 m and 25 m in height. It is anticipated that the Cox Tract will provide some protection from the prevailing winds.</p> <p>The mature edges of the Significant Woodland are well established and contiguous tree regeneration was also included within the Significant Woodland boundary. The Significant Woodland buffers and Ecological Enhancement Plan (EEP) will be reforested which, over time, will further protect the edge of the existing woodland. "Increase in drying winds and ambient light" are not anticipated to result in negative</p>	

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				<p>impacts because no new woodland edges will be created, long-established woodland edges will be retained, existing suitable woody regeneration within buffers will be retained and augmented with woody plantings. Further, much of the proposed extraction area is already quite open and the portion that is not is partly sheltered from the prevailing wind by the Cox Tract.</p> <p>Regarding “invasion of non-native species”, 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.</p> <p>The groundwater regime that supports water-dependent natural features will be maintained and, where possible, enhanced, through the implementation of the AMP Addendum and the construction and operation of the Water Management System (WMS), and through the final rehabilitation condition.</p> <p>Wetland U1 is presently dominated by Reed Canary Grass. With the enhancement of wetland hydrology in U1 due to the operation of the WMS, GEC anticipates that Reed Canary Grass will decline over time. Wetlands V2 and W5 are 2 well documented examples where Reed Canary Grass has declined greatly as a result of WMS operation, with more conservative wetland plant species being more prevalent. The AMP Addendum includes requirements for ecological monitoring of Wetland U1, including fixed-point photography, wetland reconnaissance, amphibian call counts (using Song Meter SM4 units or equivalent), salamander egg mass surveys and wetland vegetation monitoring. Certain components of the AMP wetland monitoring will be able to assess changes in wetland vegetation over the long term.</p>	
17.	<p>Proposed Mitigation</p> <p>Section 15.3.1.2 describes that mitigation measures for potential impacts on groundwater (Section 15.3) prior to rehabilitation are highly dependent on the effectiveness of constructed recharge wells. The effectiveness of this mitigation should be discussed with JART’s groundwater experts.</p> <ul style="list-style-type: none"> - This comment still stands. It is our understanding that the groundwater rehabilitation is still under review. 	Section 15.3.1.2	Sarah Mainguy, NSE	Comment noted. The effectiveness of mitigation measures is best addressed by the groundwater experts as noted.	
18.	As described in Section 15.3.1.2, seasonal pumping with quarry water will be used extensively for mitigation prior to rehabilitation, should there be reductions in water levels in salamander breeding wetlands. It is understood that the water management system has been highly effective in the past. However, there is evidence that high	Section 15.3.1.2	Sarah Mainguy, NSE	The recharge water is compatible with the proposed extension of its use to support wetlands in the vicinity of the MQEE, similar to the existing approved quarry	

	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
	<p>conductivity, which can be found in quarry discharge, can impair amphibian larval development. It should be clarified whether water monitoring includes monitoring of parameters related to ecological function. For example, if quarry water continues to be used to mitigate impacts on vernal pool hydroperiod, it should be confirmed that discharge water conductivity (and other parameters that could affect amphibian breeding such as pH) will not change with excavation in the extension, and/or that it will be monitored for potential changes in conductivity, pH and other parameters that could affect amphibian breeding, with appropriate actions if mitigation indicated a potential adverse impact.</p>			<p>mitigation. As described in the GWRA (Section 7):</p> <p>“Water quality and the underlying water chemistry have been extensively evaluated at the Milton Quarry and continues to be monitored through the provisions of the WMS and the private well water supply monitoring program under the AMP and the Ontario Water Resources Act (OWRA) approvals. Based on the results of these monitoring programs to date and a substantial assessment completed for the 5-Year AMP Review (GHD 2020), there is no indication that Dufferin's operations have had any adverse water quantity or quality effects on residential wells or water resources in the vicinity of the quarry. These previous assessments have demonstrated the continued suitability of recharge water for mitigation and the proposed MQEE will not alter the water quality.”</p> <p>These assessments have included the demonstrated success in using the recharge water to maintain and/or enhance the conditions at existing amphibian breeding pools in Wetlands W5, V2, W7 and W8, as described in the 5-Year AMP Review (GHD 2020), which included the <i>Milton Quarry Extension AMP: Wetland Ecology 5-Year Review Report</i> (2013-2018) (GEC 2019).</p> <p>The following response from GHD was originally included in Dufferin's July 22, 2022, response to Halton Region's May 6, 2022, objection letter.</p> <p>The addition of the MQEE does not appreciably alter the water quality considerations or monitoring requirements for the Water Management System. The current program includes monitoring of recharge water, dewatering flows, and reservoir water quality, including the AMP requirements plus additional requirements of the Environmental Compliance Approval (ECA) for Industrial Sewage Works (ISW) issued by MECP.</p> <p>Recharge water quality is currently evaluated at the entry point to the WMS (recharge pumping station) and at 3 locations within the system (before first recharge well, adjacent to nearest private water well, and at a distant point from the recharge pumping station). It is anticipated that an additional recharge water quality sampling location within the MQEE will be added to the current monitoring program as will be reviewed with MECP.</p> <p>Quarry dewatering flows from the MQEE will be combined with flows from the East Cell and directed to the Reservoir prior to discharge. Reservoir discharge</p>	

	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
				<p>sampling is currently underway, and the program does not require amendment.</p> <p>Water quality sampling requirements will be reviewed with MECP prior to issuance of amended Ontario Water Resources Act (OWRA) approvals. Current sampling requirements and concentration limits are stipulated by the Environmental Compliance Approval (ECA) for Industrial Sewage Works (ISW). The application for such approvals will also be circulated to the water-related agencies.</p>	
19.	Some detail on compensation for Eastern Meadowlark and Bobolink habitat in accordance with requirements under the ESA should have been included, as this habitat is to be removed.	Level 1 and 2 Natural Environment Technical Report and Environmental Impact Assessment	Sarah Mainguy, NSE	Details on how Dufferin complied with the rules in regulation under the ESA with respect to Bobolink and Eastern Meadowlark habitat were provided in Section 16.1.3 (pages 160-161) of the NETR & EIA.	
20.	<p>Buffers</p> <p>Additional, detailed justification should be provided for reduction of buffers to the Significant Woodland on the southwest side of the extraction area on Page 173 (mapped on Figure 39). The Region OP Schedule 1G includes a 30 m buffer width from Key Features of the Regional Natural Heritage System (RNHS). Buffers are a component of the RNHS as per Section 115.3 of the ROP. Section 116.1 of the ROP allows for refinements and boundary adjustments to components of the RNHS, including buffers, through the submission of a study accepted by the Region. As part of the NETR, refinements to the 30 m buffer should be justified, including clearly illustrating the relationship between the buffer and the installation of the feedermain, recharge wells, control huts and the access road on more detailed mapping of this area.</p>	Section 115.3 and 116.1	Sarah Mainguy, NSE	<p>The following response is adapted from that provided in Dufferin's July 22, 2022, response to the NEC's April 26, 2022, objection letter.</p> <p>For mineral aggregate operations, planning policy does not require a 30 m buffer adjacent to Significant Woodlands. For example, Development Criteria 2.9.1 of the Niagara Escarpment Plan notes that mineral aggregate operations may be permitted in any vegetation protection zone. The buffer that has been recommended is a <i>minimum</i> of 10 m in width, plus an additional 10 m wide area to accommodate the WMS, e.g., watermain and access road, CV Huts, etc., resulting in a 20 m extraction setback to the Significant Woodland boundary that will protect the Significant Woodland from negative effects.</p> <p>The Ecological Enhancement Plan (EEP) includes a series of Significant Woodland buffer treatments. Units TP-B1 to TP-B6 are buffer planting areas that will be planted in the first two years after licence issuance (please refer to NETR & EIA Figure 39 for detailed mapping of EEP Units). 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. Existing suitable woody vegetation within the 10 m buffers will be retained.</p>	

	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
				<p>The 10 m Significant Woodland is the <i>minimum</i> buffer that will be applied. The Significant Woodland boundary on the MQEE property is approximately 2340 m in length. The 10 m buffer applies to only 215 m of the Significant Woodland boundary (see Tab D, Figures 1 and 2). The edge of the Significant Woodland in these areas is well established and no new woodland edges will be created.</p> <p>As shown on Tab D, Figure 1, only a very small portion of the Significant Woodland buffer is at the minimum 10 m width, with the remainder being up to 55 m in width in this general vicinity. It should also be noted that where the 10 m minimum buffer was applied, the Significant Woodland comprises a row of mature trees that were formerly in a hedgerow, as well as some deciduous regeneration that has spread into the former agricultural field. This can clearly be seen on the aerial photograph used for Figure 1 in Tab D.</p> <p>As shown on Tab D, Figure 2, adjacent to the southeast portion of the proposed MQEE extraction area, there are two sections of the Significant Woodland boundary where a 10 m buffer and 10 m WMS setback was applied. The edge of the Significant Woodland is generally comprised of younger successional growth next to the long-established mature forest edge. This was readily apparent during the site visits. This can clearly be seen on the aerial photograph used for Figure 2 in Tab D and this is quite clear when reviewing the sequence of historical air photos that are available.</p> <p>Elsewhere the Significant Woodland buffers are larger, often considerably larger. As much as possible the routing of the watermain and feeder lines, and the placement of recharge wells, was located away from the Significant Woodland boundary. It should be noted that the watermain and driving access and CV huts are all located outside of the Significant Woodland buffers. In a few instances the feeder lines and recharge wells are located within the buffer; installation of these WMS components is subject to strict conditions in Section 2.4 (WMS Installation) of the AMP Addendum and any buffers that are temporarily disturbed will be promptly restored.</p> <p>NETR & EIA Figures 38a, 39, 41a and 43 all show the carefully designed WMS layout.</p> <p>Minimum 10 m buffers for Significant Woodlands were accepted by the agencies for the Acton Quarry Extension. Considering that the 10 m minimum buffer, plus an additional 10 m setback to accommodate the WMS beside the extraction limit, is only applicable to relatively short lengths of the</p>	

	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
				Significant Woodland boundary (215 m out of a total length of 2340 m) that generally comprises successional growth at the edge, and that the 10 m buffers will be planted with suitable fast-growing woody species, the buffers in these cases are appropriate. This allows access to the dolostone bedrock resource while protecting the adjacent Significant Woodland. GEC has not observed any negative effects as a result of the woodland buffers applied to the Milton Quarry Extension and the Acton Quarry Extension. Elsewhere on the MQEE lands, the buffers are much larger and they form part of the EEP Units that will be planted. Furthermore, with the implementation of the EEP, these significant woodlands will increase in size and overall, the application results in an enhancement to significant woodlands in vicinity to the site.	
21.	In accordance with Section 116.1 of the ROP, the reduction in the 30 m buffer width for the woodland adjacent to wetland V2 should be justified in detail. This pond appears to have a high function, that is protected by the surrounding woodland.	Section 116.1	Sarah Mainguy, NSE	<p>Please see response to Comment 20.</p> <p>As shown on Tab D, Figure 1, at the closest points to the MQEE extraction footprint, Wetland V2 is located between 68 m and 79 m away. This means Wetland V2 has a 58 m to 69 m buffer, plus an additional 10 m setback.</p> <p>As noted in the response to Comment 20, only a very small portion of the Significant Woodland buffer is at the minimum 10 m width, with the remainder being up to 55 m in width in this general vicinity. It should also be noted that where the 10 m minimum buffer was applied, the Significant Woodland comprises a row of mature trees that were formerly in a hedgerow, as well as some deciduous regeneration that has spread into the former agricultural field. This can clearly be seen on the aerial photograph used for Figure 1 in Tab D.</p>	
22.	Monitoring Section 16.1.2.2: In areas where feeder lines will be installed within the woodland boundary, long-term commitment to monitoring and management of non-native species should be described.	Section 16.1.2.2	Sarah Mainguy, NSE	<p>The following response from GEC was originally included in Dufferin's July 22, 2022, response to MNRF's May 9, 2022, objection letter.</p> <p>GEC has not observed invasive plant species to be a significant problem in relation to WMS components installed within environmental features for the existing Milton Quarry Extension. Garlic Mustard (<i>Alliaria petiolata</i>) is the main species of concern and it only occurred in a few localized areas where it was previously established along old skidder trails and areas of past logging, unauthorized bike trails and pedestrian trails, and near former farmstead areas. Garlic Mustard was removed where feasible. All areas within natural features that were disturbed during the installation of feeder lines were promptly treated with a 4" to 6" layer of fresh wood chips, which break down over several years. This approach greatly</p>	

	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
				<p>reduces the establishment of woodland invasive plant species. Over time native woodland species such as Sugar Maple (<i>Acer saccharum</i>), Alternate-leaved Dogwood (<i>Cornus alternifolia</i>), Chokecherry (<i>Prunus virginiana</i>), Zigzag Goldenrod (<i>Solidago flexicaulis</i>), sedges (e.g., <i>Carex gracillima</i>, <i>C. pedunculata</i>, <i>C. pennsylvanica</i>), Bottlebrush Grass (<i>Elymus hystrix</i>), Virginia Wildrye (<i>Elymus virginicus</i>), Virginia Waterleaf (<i>Hydrophyllum virginianum</i>), Violets (<i>Viola</i> spp.), etc. gradually become established. See Natural Environment Technical Report & EIA Attachment B1: Photos 14-22 and 29-38.</p> <p>A woodland invasive species monitoring and mitigation strategy has been developed; this was provided to the agencies in Dufferin's July 22, 2022, responses to agency objection letters. Attached as Tab C, please find the program that will be added to the AMP Addendum.</p>	
23.	In addition, in Section 16.1.2.2, a long-term monitoring plan should be outlined to manage the potential for invasion of non-native invasive species into the restoration areas, also in the long term.	Section 16.1.2.2	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 MNR (May 9, 2022) and Region of Halton (May 6, 2022). Please see Tab C .	
24.	<p>Rehabilitation Plan</p> <p>The rehabilitation plan aims to create a lake, islands and cliffs in place of the current landscape that includes meadow, thicket and small patches of woodland. The restoration is to enhance Niagara Escarpment biodiversity. However, Policy 2.9.11 of the Niagara Escarpment Plan states: Rehabilitation shall incorporate the following:</p> <p>a) natural heritage and hydrologic features and functions shall be restored or enhanced;</p> <p>b) aquatic areas remaining after extraction shall be rehabilitated as representative of the natural ecosystem in that particular setting or ecodistrict, and the combined terrestrial and aquatic rehabilitation shall protect and where possible enhance the ecological value of the site.</p> <p>This policy emphasizes that the proposed rehabilitation should be representative of the existing ecodistrict. However, lakes, shoals and islands are not characteristic features within this Ecodistrict, Ecodistrict 6E-7 (Henson and Brodribb 2006). The following are documented as vegetation types characteristic of this Ecodistrict (Henson and Brodribb 2006):</p> <ul style="list-style-type: none"> • Broad-leaved Sedge Organic Shallow Marsh Type • Bulblet Fern - Herb Robert Open Shaded Limestone / Dolostone Cliff Face Type • Cliffbrake - Lichen Open Unshaded Limestone / Dolostone Cliff Face Type • Dry - Fresh Red Oak Deciduous Forest Type • Dry - Fresh Sugar Maple - Oak Deciduous Forest Type 	Section 110	Sarah Mainguy, NSE	<p>The Ecodistrict 6E-7 (Oak Ridges Ecodistrict) is shown on Tab E, Figure 1. 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. At Tab F, GEC sorted the list of 31 vegetation community types into the following groupings: Forest; Tallgrass Prairie, Oak Savannah and Oak Woodland; Cliff Rim, Cliff and Talus; and, Wetland.</p> <p>For the 12 forest community types listed as characteristic of Ecodistrict 6E-7:</p> <ul style="list-style-type: none"> • There are no White Oak or Black Oak dominated forests in the Halton Section of the Niagara Escarpment; • Red Pine is not native to Halton Region and it is 	

	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
	<ul style="list-style-type: none"> • Dry - Fresh White Oak Deciduous Forest Type • Dry - Fresh White Pine - Oak Mixed Forest Type • Dry - Fresh White Pine - Red Maple Mixed Forest Type • Dry Black Oak - White Oak Tallgrass Woodland Type • Dry Black Oak Deciduous Forest Type • Dry Black Oak-Pine Tallgrass Savannah Type • Dry Herbaceous Limestone / Dolostone Talus • Dry Red Pine - White Pine Coniferous Forest Type • Dry Tallgrass Prairie Type • Fresh Sugar Maple - Beech Deciduous Forest Type • Fresh Sugar Maple - White Ash Deciduous Forest Type • Fresh Sugar Maple Deciduous Forest Type • Hemlock - Sugar Maple Moist Limestone Talus Type • Leatherleaf Shrub Kettle Peatland Type • Moist - Fresh Hemlock - Sugar Maple Mixed Forest Type • Moist - Fresh Sugar Maple - Black Maple Deciduous Forest Type • Mountain Maple Open Limestone Talus Shrubland Type • Open Limestone / Dolostone Seepage Cliff Type • Round-leaved Dogwood Open Limestone / Dolostone Cliff Rim Shrubland Type • Sugar Maple Moist Treed Limestone Talus Type • White Birch Dry Treed Limestone Talus Type • White Cedar - Hemlock Coniferous Organic Swamp Type • White Cedar - White Spruce Coniferous Organic Swamp Type • White Cedar Dry Treed Limestone Talus Type • White Cedar Treed Limestone Cliff Type • Willow Organic Thicket Swamp Type <p>Additional policies emphasize the need for compatibility with the existing landscape. Goal of the Niagara Escarpment Plan section 1.9.1.5 states: To ensure that, after a licence is surrendered, the land is re-designated to a land use designation that is compatible with the rehabilitation of the site, the designation criteria of adjacent lands, the surrounding Escarpment environment and existing land uses in the area.</p> <p>In addition, Niagara Escarpment Plan policies governing the use of off-site material state: 2.9.9 The use of off-site material shall not be permitted unless it is determined through appropriate environmental, technical and planning studies that doing so will achieve greater long-term ecological and land use compatibility (e.g., the importation of topsoil to improve site capability for agriculture, forestry or habitat diversity) and the implementing authority is satisfied that the use of off-site material does not constitute a commercial fill or landfill operation.</p> <p>Regional policies echo this philosophy in Section 110 (7.2) d) C): Priorities for restorations or enhancements to the Greenbelt and/or Regional Natural Heritage Systems through post-extraction rehabilitation shall be based on the following in descending order of priority:</p>			<p>typically associated with conifer plantations, although it will spread by seed;</p> <ul style="list-style-type: none"> • White Ash is in severe decline due to the Emerald Ash Borer, making this species unsuitable for use in reforestation projects; and, • Most of the forest types listed are later successional or climax communities that are not readily established in reforestation projects or for pit/quarry rehabilitation. Also, species such as Beech and Eastern Hemlock would experience high mortality if planted in open areas. <p>There are 3 tallgrass communities listed, including Tallgrass Prairie, Tallgrass Savannah and Tallgrass Woodland. There are no tallgrass community types known from the Halton Section of the Niagara Escarpment. The only tallgrass prairie community listed by Riley et al. (1996) for the entire Niagara Escarpment is the Ancaster Prairie, which is a small, degraded remnant on a loess sand deposit.</p> <p>The 11 cliff rim, cliff and talus communities listed for Ecodistrict 6E-7 are all associated with the Niagara Escarpment. For the MQEE Rehabilitation Plan, opportunities to create cliffs are limited, but there are some cliff features that are proposed. The cliffs will occur next to open water, to promote the movement of groundwater under the rehabilitation condition.</p> <p>The list of 5 wetland communities are all organic community types, which are defined as having organic substrates that are at least 40 cm deep. It is not practical to create these types of wetlands as part of a lake-based quarry rehabilitation. There is no peat available at the site for this purpose. No conifer swamps with White Spruce as codominant are listed for the Halton Section of the Niagara Escarpment by Riley et al. (1996). White Spruce is arguably not native to Halton Region. The Leatherleaf Shrub Kettle Peatland Type is not representative of the Halton Section of the Niagara Escarpment. There are no Leatherleaf bog-like communities listed for the Halton Section by Riley et al. (1996).</p> <p>The target communities listed in the NETR & EIA for the Ecological Enhancement Plan (EEP) and Rehabilitation Plan are provided at Tab G. GEC sorted the list of 17 ecosites and vegetation community types into the following groupings: Forest; Tallgrass Prairie; Cliff; and Lake, Islands and Coves, Wetlands.</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</p>	

	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
	<p>[i] restoration to the original features and functions on the areas directly affected by the extractive operations,</p> <p>It is understood that there are no alternatives to a rehabilitation plan for a quarry on the Niagara Escarpment other than a large lake of some kind. However, it should be demonstrated that the rehabilitation plan is composed of communities as consistent as is feasible with the characteristic vegetation communities of the Niagara Escarpment.</p>			<p>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 Niagara Escarpment is shown at Tab D, Figure 1. 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 at Tab G for the MQEE EEP and Rehabilitation Plan are also listed from the Halton Section of the Niagara Escarpment by Riley et al. (1996).</p> <p>One exception is the Dry Tallgrass Prairie Ecosite (TPO1); prairie grasses are to be planted on the islands that will be created. These grass species are native to Halton Region and the intent is to keep the islands relatively open in character, so that the turtle nesting areas to be created will not be shaded out.</p> <p>Other exceptions are the beach/bar and gravel beach communities, associated with the lake feature. These communities provide important habitats for fish and wildlife. The Demo Area in the Main Quarry includes a lake, wetlands, islands, etc., that provide a variety of important habitats for wildlife and fish. For example, in 2021 and 2022, GEC noted breeding Common Loons and Trumpeter Swans, as well as foraging Common Terns, Caspian Terns and Ospreys. The Demo Area has become an important stopover habitat for migrating waterfowl and shorebirds.</p> <p>The islands, beach/bar and gravel beach features proposed for the MQEE Rehabilitation Plan, while not typical of the Halton Section of the Niagara Escarpment, do occur naturally in the Niagara, Grey and Bruce Peninsula sections. They also occur in the Halton Section in association with manmade lakes/reservoirs. The aquatic and wetland vegetation ecosites and communities are representative of the Halton Section, occurring mainly in lakes (e.g., Lake Medad), beaver pond wetlands, etc.</p>	

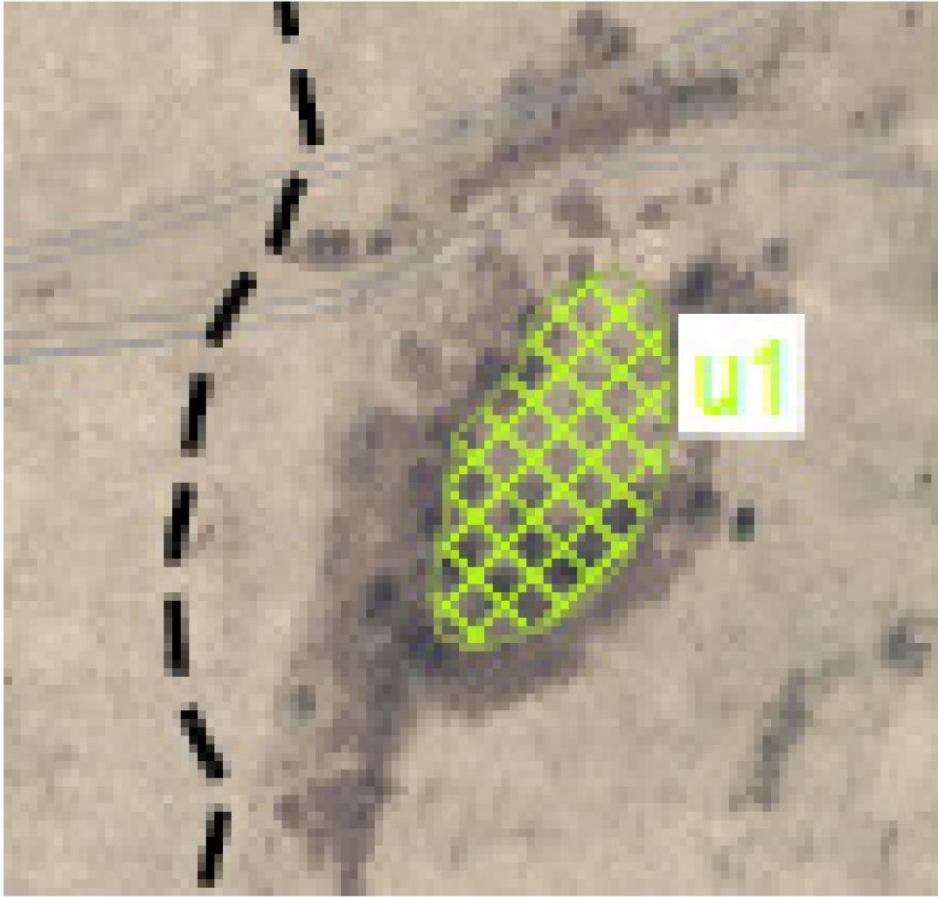
	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
				<p>For the earlier Milton Quarry Extension and Acton Quarry Extension applications, the agencies pushed Dufferin to create a range of lake-based habitats (wetlands, islands, shoreline features) because they didn't want "deep sterile lakes". That is why the Site Plans for the Milton Quarry Extension and Acton Quarry Extension include such habitat types and features. In order to create similar habitats and to enhance the Cox Tract linkage, fill importation is necessary. As proposed, the importation of soil allows for a greater diversity of features in the rehabilitation plan and resulting landform.</p> <p>In summary, the Rehabilitation Plan primarily includes plant species selections that are typical of the limestone plain above the Niagara Escarpment in this part of Halton Region. The terrestrial communities to be created include new forests and some cliffs, which are characteristic Escarpment features. A key theme in the Ecological Enhancement Plan (EEP) and Rehabilitation Plan is to use plant species that are characteristic of, and complementary to, the Escarpment landscape. There are some exceptions, but these are mainly in relation to the island features that will be created and essentially function as shoreline habitats. The lake feature is an essential part of the rehabilitated condition, to provide passive groundwater support and protect adjacent water-dependent features. The wetlands, shorelines and islands were designed to provide a range of naturalized habitats and features that will increase local biodiversity.</p> <p>In GEC's opinion, the NEP and ROP policies with respect to quarry rehabilitation and landscape compatibility have been satisfied to a high degree.</p> <p>Reference:</p> <p>Riley, J.L., J.V. Jalava and S. Varga. 1996. Ecological Survey of the Niagara Escarpment Biosphere Reserve. Volume I. Significant Natural Areas. Volume II. Technical Appendices. Ontario Ministry of Natural Resources, Southcentral Region, Peterborough, Ontario. Open File Site Report SR 9601. v + 629 pp., vii + 310 pp.</p>	

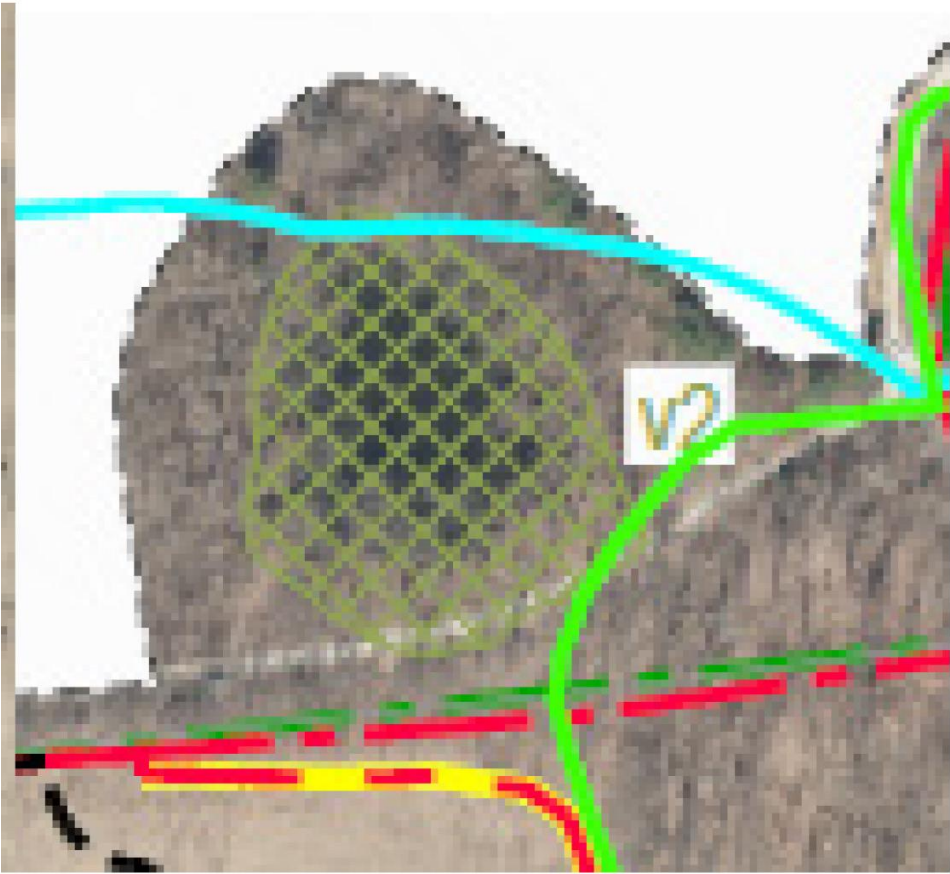
	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
25.	Within the Geology and Water Resources Assessment Report it is stated that some of the key wetlands are within the historic zone of influence of the Main, North Quarry and East Cell. Based on this, the proposed extension may cause additional impacts within its zone of influence, therefore, additional target levels are required, and further mitigation measures may be needed to ensure there will be no negative impacts to the regulated wetlands form and functions.	Level 1 and 2 Natural Environment Technical Report and Environmental Impact Assessment Sections 16.2.1.4 a and 17.4 Cumulative Effects (Pages 169 and 185)	CH	<p>The potential for negative impacts to wetlands if the MQEE proceeds without mitigation measures is clearly recognized in the NETR & EIA, as well as the GWRA. To address this potential for impacts and to enhance the existing condition of certain wetlands, a comprehensive program of mitigation and monitoring is proposed as part of the MQEE Extension, including appropriate additional target levels. It is not proposed to extract the MQEE in the absence of suitable mitigation and monitoring measures.</p> <p>Please also refer to the response provided for Comment #12 in the AMP Addendum Comment Table.</p>	
26.	We recommend a screening table be included that provides a full complement of SWH present within the MQEE area and Natural Environment Study area that incorporates all components in the SWH Ecoregion Criteria Schedule 7E, 2015 on the confirmed and candidate SWH identified, impacts to the ecological functions characterized to ensure the mitigation measures proposed are appropriate and ensure no negative impacts to natural heritage features and their ecological functions.	Level 1 and 2 Natural Environment Technical Report and Environmental Impact Assessment Section 9.0 Significant Wildlife Habitat (Page 83)	CH	<p>Please note that the MQEE is located in Ecoregion 6E.</p> <p>A comprehensive assessment of Significant Wildlife Habitat (SWH) was undertaken and documented in Section 9 of the NETR & EIA and as mapped on Figures 31 to 35.</p> <p>The primary resource for determining what qualifies as Significant Wildlife Habitat is the Significant Wildlife Habitat Technical Guide (SWHTG) prepared by OMNR (2000). OMNRF (2015) has also prepared Significant Wildlife Habitat Ecoregion Criteria Schedules (SWHECS) that may be used to assist in determining what constitutes Significant Wildlife Habitat. The Natural Heritage Reference Manual (NHRM) (OMNR 2010) states that the SWHECS are a resource that may be used to determine which features qualify as Significant Wildlife Habitat, but that the SWHTG “is still the authoritative source for the identification and evaluation of Significant Wildlife Habitat”. GEC has applied the SWHECS for Ecoregion 6E where it was appropriate to do so (e.g., Bat Maternity Colonies, Amphibian Breeding Habitat [Woodland], Woodland Area-sensitive Bird Breeding Habitat).</p> <p>If CH has any outstanding concerns with respect to SWH, then specific details of these concerns should be provided to Dufferin for consideration.</p>	
27.	We recommend consultation with MNRF to determine if the wetland significance of unevaluated wetlands U1 and W56 should be further evaluated from a complexing perspective as they both are within close proximity to the Halton Escarpment Wetland PSW Complex.	Level 1 and 2 Natural Environment Technical Report and Environmental Impact Assessment, Section 5.5 Wetland Characterization, (Page 43)	CH	<p>Please see response to Comment 7.</p> <p>As indicated in Dufferin's July 22, 2022, responses to ARA objection letters from the agencies, Wetland U1 is being treated as Provincially Significant for planning purposes. The ARA Site Plans were updated to reflect this.</p> <p>See Tab B (Updated ARA Site Plans).</p> <p>Shapefiles for Wetlands U1, V2 and W56 were provided to Aurora District MNRF on November 21, 2022.</p>	

	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
28.	<p>The boundary delineation for wetland U1 was completed on Wednesday, August 10th with CH staff, North South Environmental, and Goodban Consulting. Minor modifications to Dufferin's previously staked wetland boundary were completed by moving some of the stakes to better represent the wetland vegetation community and establish CH's regulatory limits.</p> <p>A memo entitled, "MQEE Wetland Boundary Review – August 10, 2022 Site Visit" dated August 29th, 2022, prepared by Goodban Consulting was provided regarding the updated wetland staking exercise and adjusted boundary limit. Upon review of this memo, CH does not have any concerns and agree with the adjusted limit of extraction in response to the adjusted boundary limits for wetland U1. Update all drawings, report figures and the proposed site plan to accurately show the updated boundary limits for wetland U1 and revised limits of extraction.</p>	Level 1 and 2 Natural Environment Technical Report and Environmental Impact Assessment	CH	The ARA Site Plans have been updated to reflect the minor changes made to the Significant Woodland boundary and Wetland U1 boundary resulting from the August 8 and 10, 2022, site visits. Please see Tab B for the updated ARA Site Plans.	
29.	<p>We recommend conducting targeted turtle basking or nesting surveys to provide a comprehensive characterization of potential habitat present to identify and address potential negative impacts to ensure the mitigation measures and habitat enhancements proposed are appropriate.</p>	Section 4.2.2 (Page 13)	CH	<p>In North-South Environmental's (NSE) May 2, 2022, letter report to Halton Region, which was not originally made available to Dufferin, the following comment was made:</p> <p><i>"The surveys of this proposed extension have been comprehensive and conducted in suitable weather conditions and times. The only exception is that surveys for basking turtles were not conducted. Turtle basking surveys can reveal turtle overwintering habitat if turtle surveys are conducted early in the spring. The omission of turtle surveys should be explained, as it appears possible that some of the areas of standing water could support turtles."</i></p> <p>In NSE's September 13, 2022, updated letter report, which was provided to Dufferin, the following was noted:</p> <p><i>"This comment is no longer relevant. Now that we have seen the site, we understand that turtle overwintering habitat is not present on the proposed extension."</i></p>	

	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
30.	This section indicates that if the final lake level is high enough to support wetlands and sufficient seasonal fluctuations the groundwater recharge system operation will be discontinued. Please clarify the expected monitoring duration to ensure the lake levels are sufficient to ensure the wetlands form and function are maintained post extraction.	Section 10.3.3.2 (Page 70)	CH	<p>The section and page number referenced do not correspond to those in the NETR & EIA.</p> <p>The AMP requirements for MQEE rehabilitation are listed in AMP Addendum Part I, Section 3.2 and Section 3.3 (MQEE Rehabilitation). These requirements include confirmatory studies prior to the completion of extraction and following lake filling to ensure the lake level and other mitigation measures are suitable optimized.</p> <p>AMP Addendum Part I, Table 1 provides a summary of AMP Addendum monitoring requirements. During the post lake filling period, water levels at trigger wells and in wetlands with targets will continue for a minimum of 3 years post lake filling then it will cease if appropriate. There is a contingency for long-term monitoring program if ongoing seasonal recharge is required.</p> <p>As described in AMP Addendum Part II, Section D.4.5.3, during the final rehabilitation and lake-filling stage, wetland ecology monitoring surveys will be conducted annually for Wetlands U1 and W36, and every two years for Wetlands W41, W46a, W46b and W56. Once the lakes are at their final elevations, data will be collected annually for an additional 3 years. The ecological monitoring frequency may be refined based on the results of the data collection.</p>	
31.	Without detailed surveys completed for the woodland within the Cox Tract (West of the extraction area), it is difficult to confirm that JESA habitat is not present. Therefore, we recommend conducting additional surveys to confirm the potential migration and dispersal habitat of the Jefferson Salamander and Unisexual Ambystoma (Jefferson Salamander dependent population) to the west of the extraction area.	Section 16.1.2.1, Extraction Footprint (Page 153)	CH	<p>There are no vernal pools or wet areas of any kind in the northeast portion of the Cox Tract. It is entirely upland and mainly comprises conifer plantations established in 1951 on what was formerly agricultural land.</p> <p>Please see the response to Comment 3.</p>	
32.	Figure 42b Simulated Water Level Change- Rehabilitation Condition: The Significant woodland located between the North and Main Quarry shows an increase water level ranging from 5.00 to 0.20m. Include additional discussion on potential impacts, as there is no interim condition proposed for the woodland.	16.2.1.2 Groundwater Assessment	CH	<p>The ground surface elevation in the Cox Tract near the Townline Road allowance is 336 to 344 mASL.</p> <p>The maximum depth of extraction closest to Cox Tract is 302.6 to 302.9 mASL.</p> <p>The existing water table is 327.6 to 327.9 mASL</p> <p>Under the rehabilitation condition the predicted 5.00 m increase in the water table, up to around 332.5 mASL, will still be 4.5 to 11.5 mASL below ground surface.</p> <p>Closer to the existing haul road, the water table increase is much smaller.</p> <p>Considering the above, no negative impacts on the Cox Tract are anticipated as a result of the predicted changes in the water table under the rehabilitation condition.</p>	

	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
33.	Figure 42a and 42b: There is a decrease in water level conditions for Wetland U1 during the proposed mitigation (interim period). Please provide discussion on the proposed conditions in the interim (during extraction) and after rehabilitation for this wetland. Please update the figures and discuss this in the report.	16.2.1.2 Groundwater Assessment	CH	<p>Figure 42a shows the predicted groundwater level changes during the interim period. Surface water level targets were established for Wetland U1, as described in Section 13.1.3 of the NETR & EIA, and Part II, Section B.3 of the AMP Addendum. The proposed preliminary surface water targets for Wetland U1 are shown on Figure B.2 of the AMP Addendum. Surface water targets for Wetland U1 will be achieved during the interim period using diffuse discharge, similar to the mitigation for Wetlands W7, W8 and V2 in the East Cell. The continued use of diffuse discharge for Wetland U1 may be necessary under the rehabilitation condition.</p> <p>It is not necessary to update the figures. The NETR & EIA, Geology and Water Resources Assessment Report and AMP Addendum all provide extensive discussion on the wetland characterization for Wetland U1, as well as the proposed mitigation under both the interim and final rehabilitation conditions.</p>	
34.	The Level 1 and 2 NETR and EIA (Goodban 2021b) identified a confirmed Jefferson Salamander and Unisexual Ambystoma breeding pond contained within the licensed area of the MQEE named as wetland U1. The NETR also identified another confirmed Jefferson Salamander and Unisexual Ambystoma breeding pond, known as wetland V2, that occurs just outside of the licensed area boundary to the north and northeast of the proposed extraction area limit.	General	Matrix Solutions	<p>This comment does not provide a specific question, only statements and assumptions.</p> <p>Tab D Figure 1 illustrates the buffers and setbacks associated with Wetland V2 which is located within the existing East Cell licence area. Extraction has already occurred in proximity to Wetland V2 and is completed. No evidence of blasting-related effects upon amphibians was observed during routine ecological and water resources monitoring at V2.</p> <p>A 50 m buffer is proposed for Wetland U1, as shown on numerous figures and described in detail in the NETR & EIA. Blasting will not “occur within 50 m of Wetland U1”. The limit of extraction-related disturbance is set at 50 m from Wetland U1. A stable 2:1 slope must be established between the ground surface and top of bedrock from that limit, so any blasting will occur at a distance greater than 50 m from Wetland U1.</p> <p>Please also refer to Dufferin’s responses provided in the separate <i>JART Comment Summary Table – Blast Impact Analysis (BIA)</i>.</p>	

	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
					

	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
	<div></div> <p>FIGURE 1 Wetland U1 and Wetland V2 in relation to the extraction limit boundary (Figure 36 of the Level 1 and 2 NETR)</p> <p>Figure 40 of the Level 1 and 2 NETR shows that the distance from the edge of the MQEE extraction limit and wetland U1 to be 50 m. For wetland V2, no distance measurement is provided between the edge of the MQEE extraction limit and the wetland boundary in any of the figures provided in in the Level 1 and 2 NETR. However, based on the scale of the mapping provided in the NETR, the distance from the northeast corner edge of the MQEE Extraction Limit to wetland V2 is estimated to be 60 to 70 m. The northern edge of wetland V2 appears to be within 35m of the southern extraction limit of the East Cell. It is not known whether blasting will occur or has already occurred within the northern edge of wetland V2, as this is within an existing approved licensed area in the East Cell. The Level 1 and 2 NETR states that expansion of the quarry will occur with the elimination of the common setback between the East Cell and the MQEE.</p> <p>As blasting is used to break up the rock as part of the excavation process, it is assumed that blasting activities in the East Cell and the MQEE will be conducted near wetland V2 at distances ranging from 35 to 70m. It is also assumed that blasting activities will be conducted within 50 m of wetland U1.</p>				
35.	Although the function of Salamander breeding within wetlands U1 and V2 is documented in the Level 1 and 2 NETR, the Environmental Impact Analysis does not discuss the potential impacts to Jefferson Salamanders and unisexual Ambystoma at all life stages and their habitat in relation to blasting activities. By extension, other animals using the wetlands U1 and V2, such as amphibians, may also be impacted by blasting. Although untested, amphibians with air-containing organs, such as lungs,	General	Matrix Solutions	Please refer to Dufferin's responses provided in the separate <i>JART Comment Summary Table – Blast Impact Analysis (BIA)</i> .	

	JART Comments (December 2022)	Reference	Source of Comment	Applicant Response (Jan 2023)	JART Response
	<p>probably have mortality comparable to fish with swim bladders. For impact assessment purposes, the relationship between distance/pressure and fish mortality/injury are likely to be similar.</p> <p>The Level 1 and 2 NETR, the Environmental Impact Analysis should include discussion of the potential impact of blasting associated with all animals residing in wetlands U1 and V2, given the close proximity of blasting activities to directly affect or disrupt their life cycle activities.</p>				
36.	NEC concurs with and relies upon all of the peer review findings and identified additional areas of concern identified herein as they relate to the requirements of the NEP. Of particular note are the comments respecting cumulative impacts in Item 16 above, as it relates to the conclusions of the PJR. NEC concurs that the cumulative impacts discussion requires additional consideration.	General	NEC	Please refer to the responses provided above with respect to the requirements of the NEP. Please refer to the response to Comment 16, with respect to cumulative impacts.	

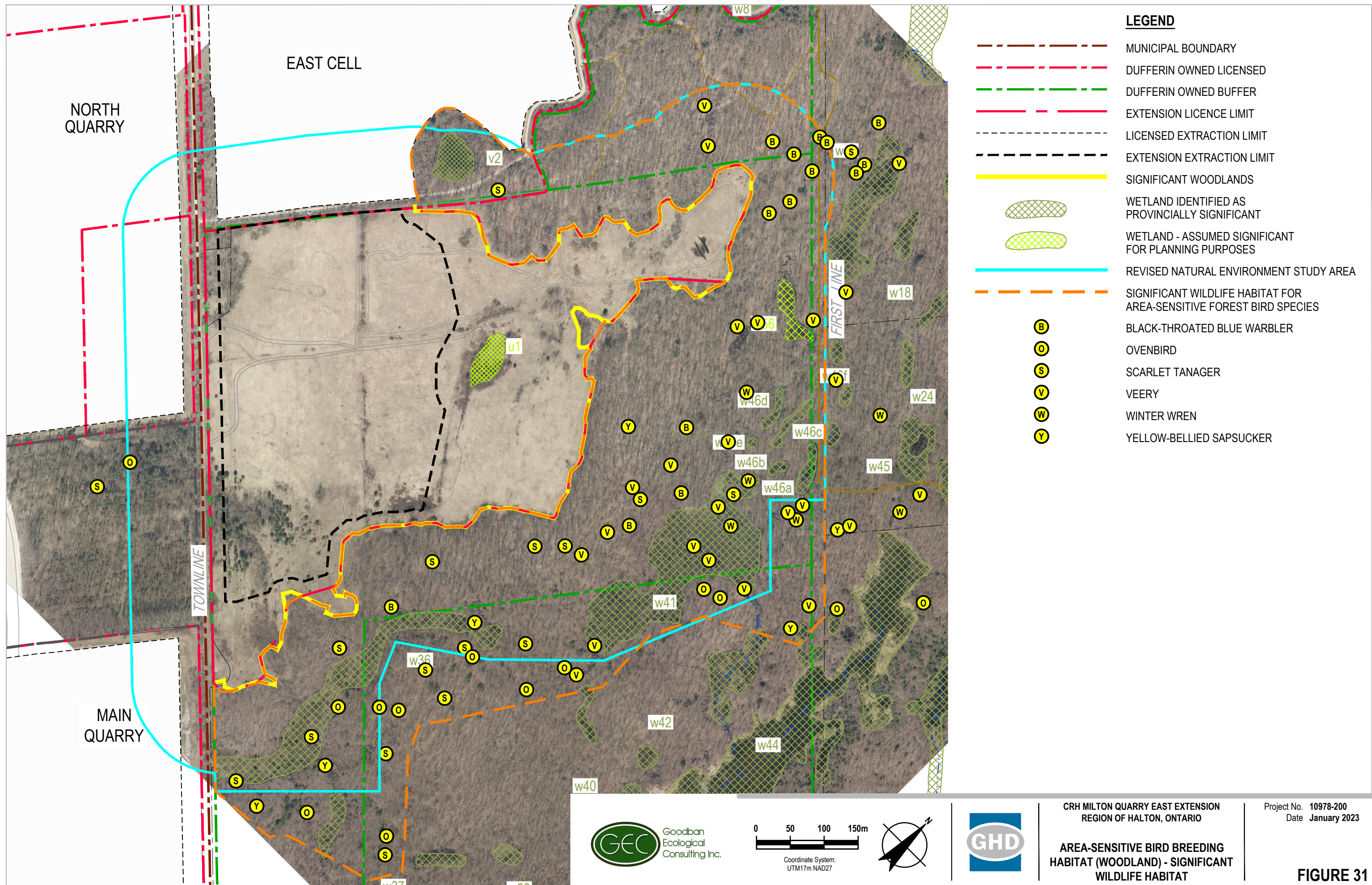
**JART NATURAL ENVIRONMENT COMMENT MATRIX
LIST OF TABS FOR DUFFERIN RESPONSES**

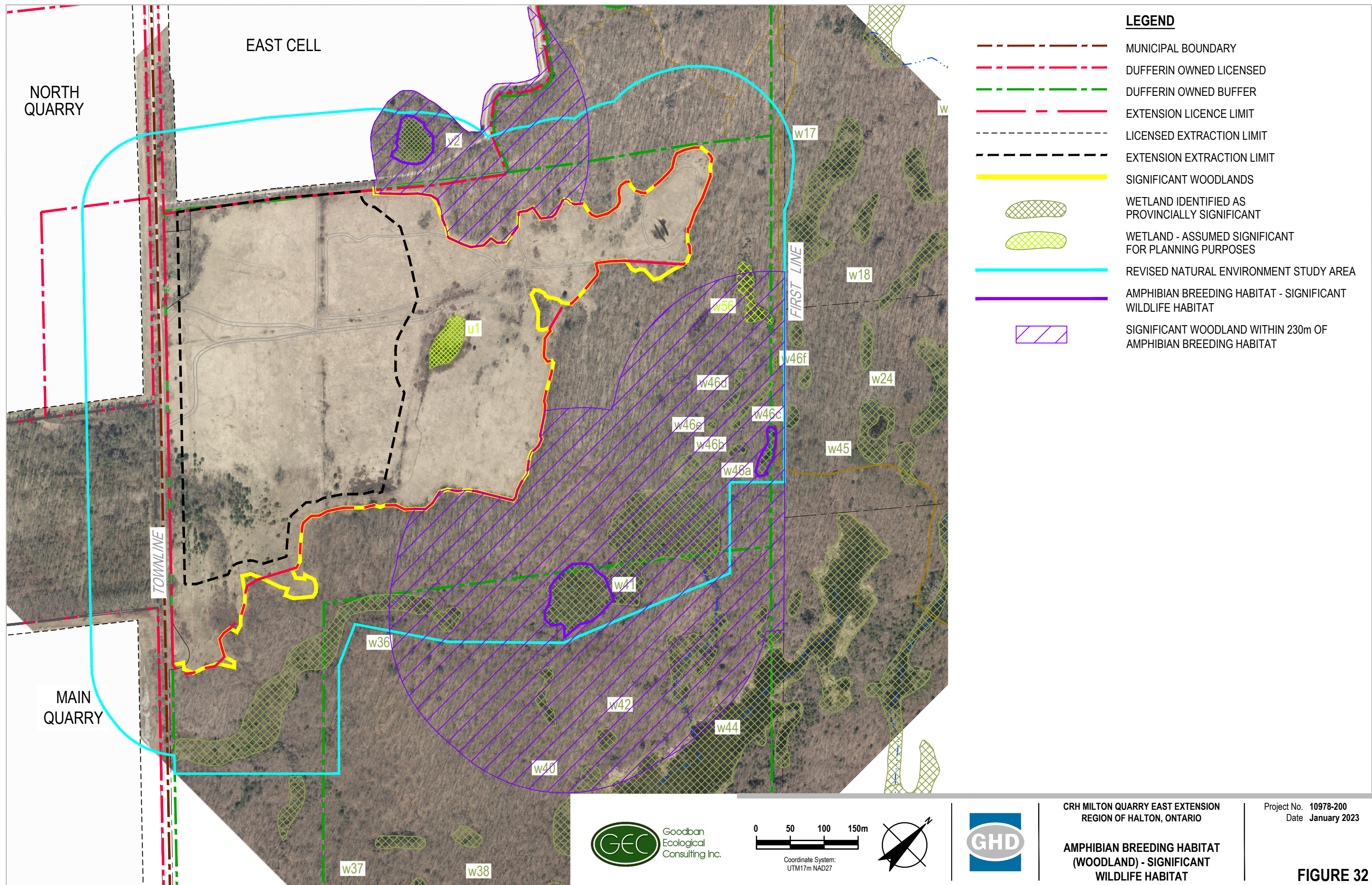
Goodban Ecological Consulting Inc. (GEC)
January, 2023

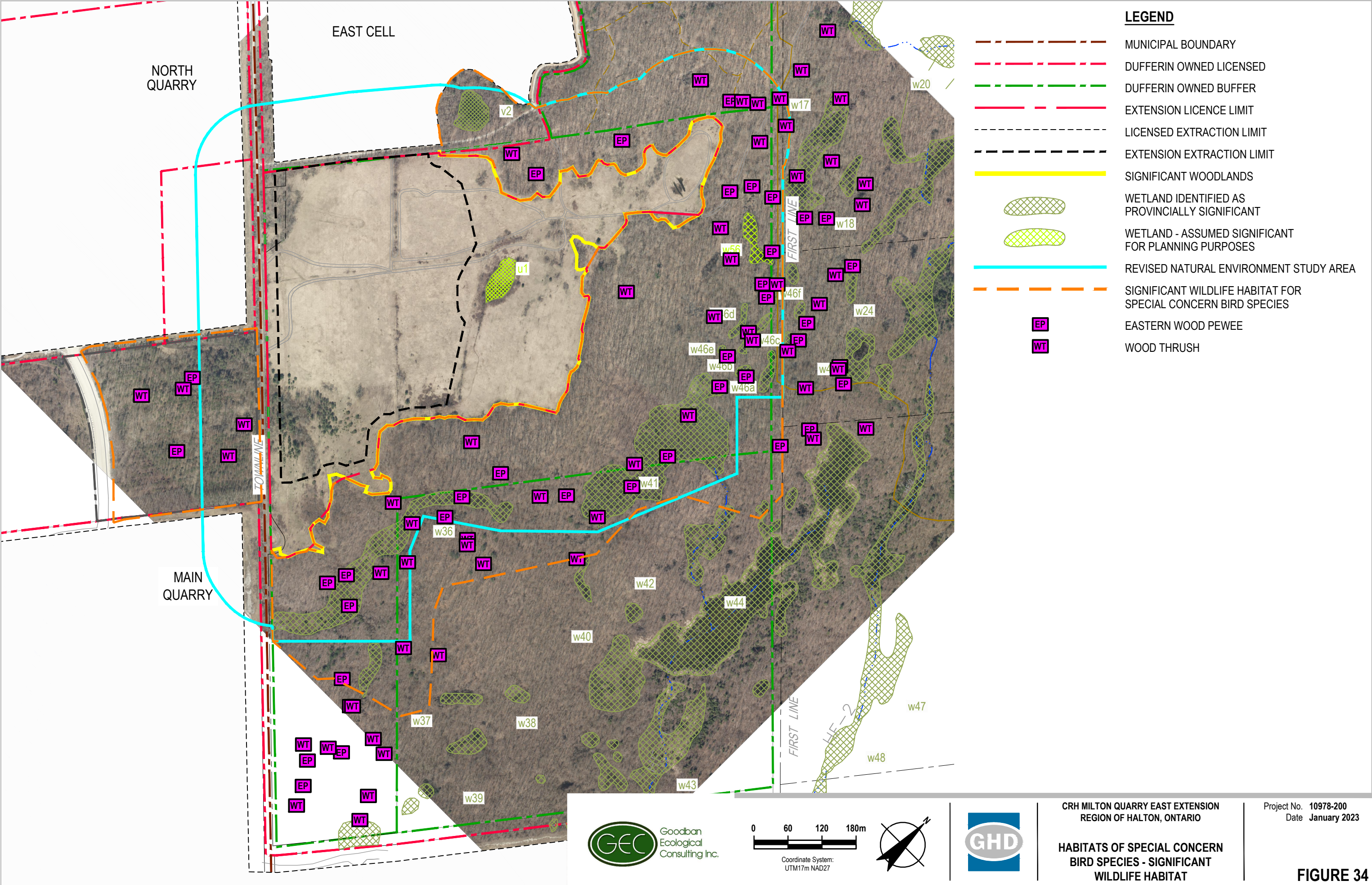
Tab A:	GEC Updates to Figures 31, 32, 34 & 35
Tab B:	Updated Milton Quarry East Extension Site Plans
Tab C:	Proposed Invasive Species Monitoring and Mitigation Strategy (GEC July 2022)
Tab D:	Figure 1 – Buffers and Setbacks for Significant Woodland and Wetland V2 Figure 2 – Buffers and Setbacks for Significant Woodland and Wetland W36
Tab E:	Figure 1 – Landscape Context
Tab F:	List of Vegetation Communities provided by NSE, sorted into groups by GEC
Tab G:	List of Target Ecosites and Vegetation Community Types for the MQEE Ecological Enhancement Plan (EEP) and Rehabilitation Plan

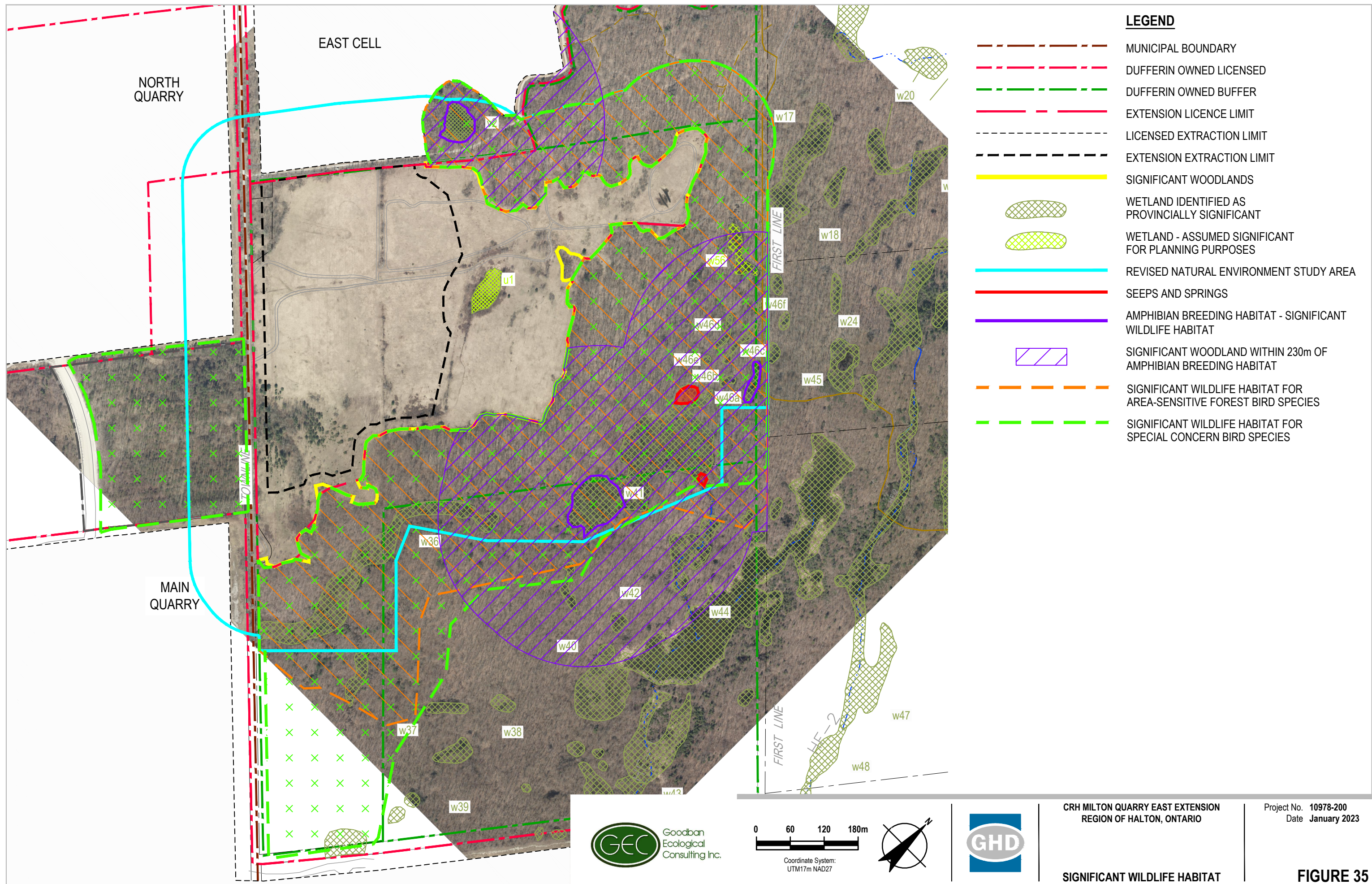
Tab **A**

GEC Updates to Figures 31, 32, 34 & 35



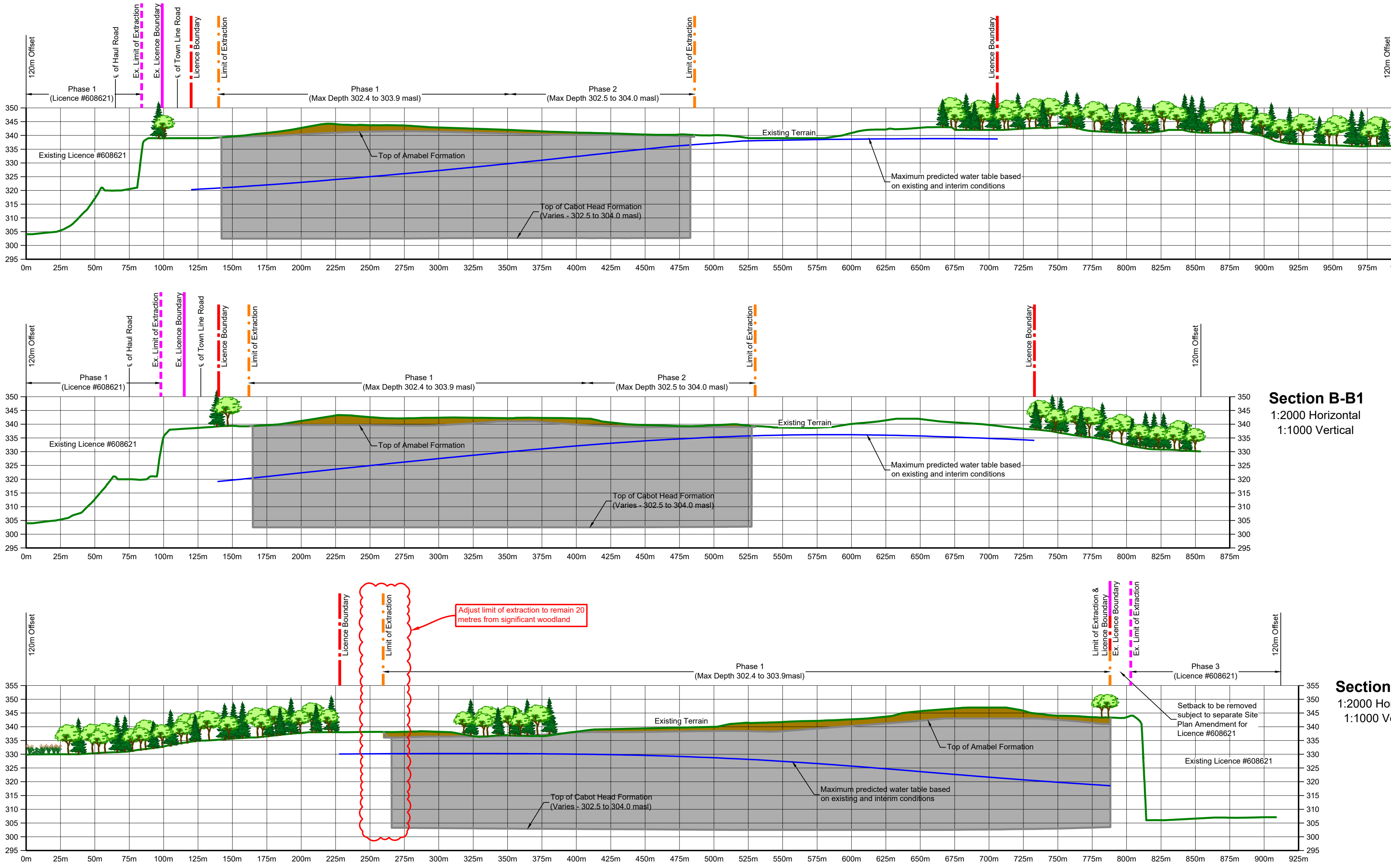




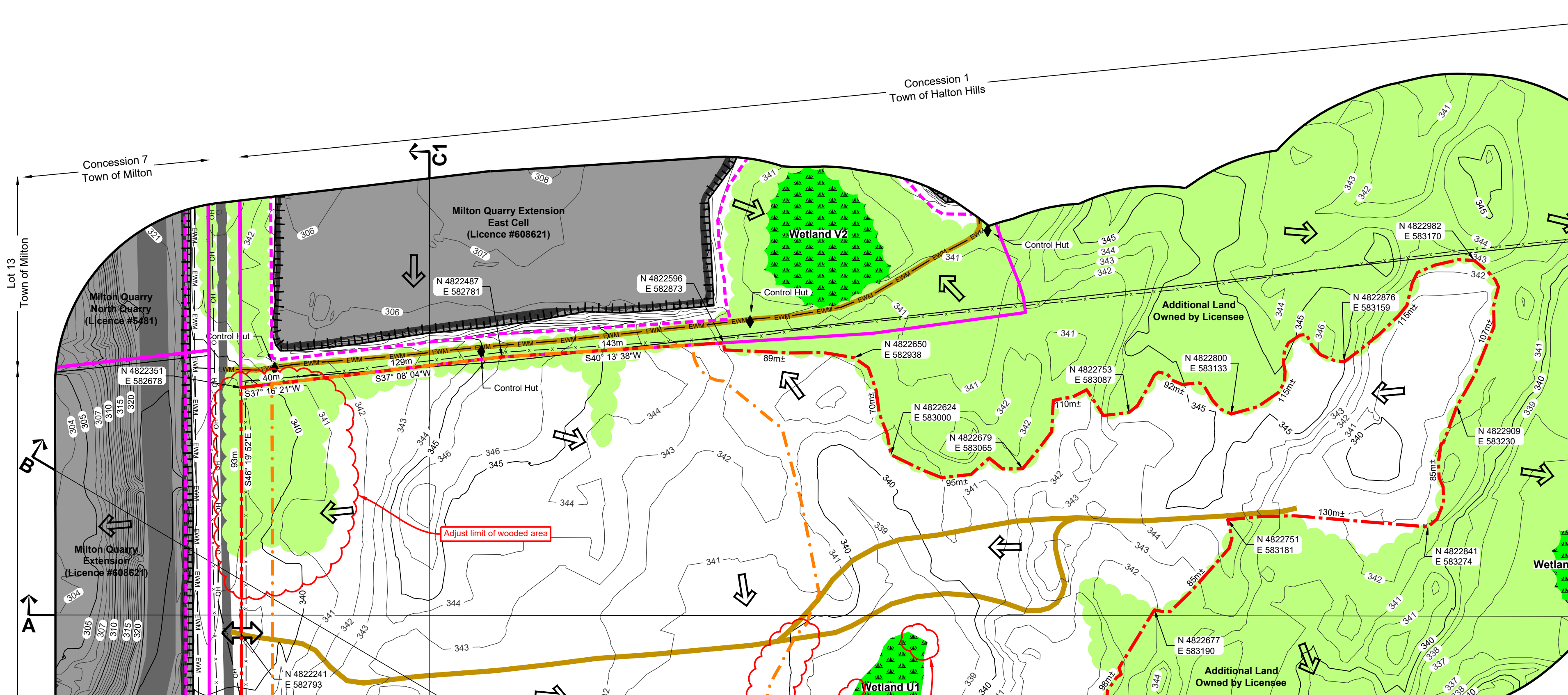


Tab **B**

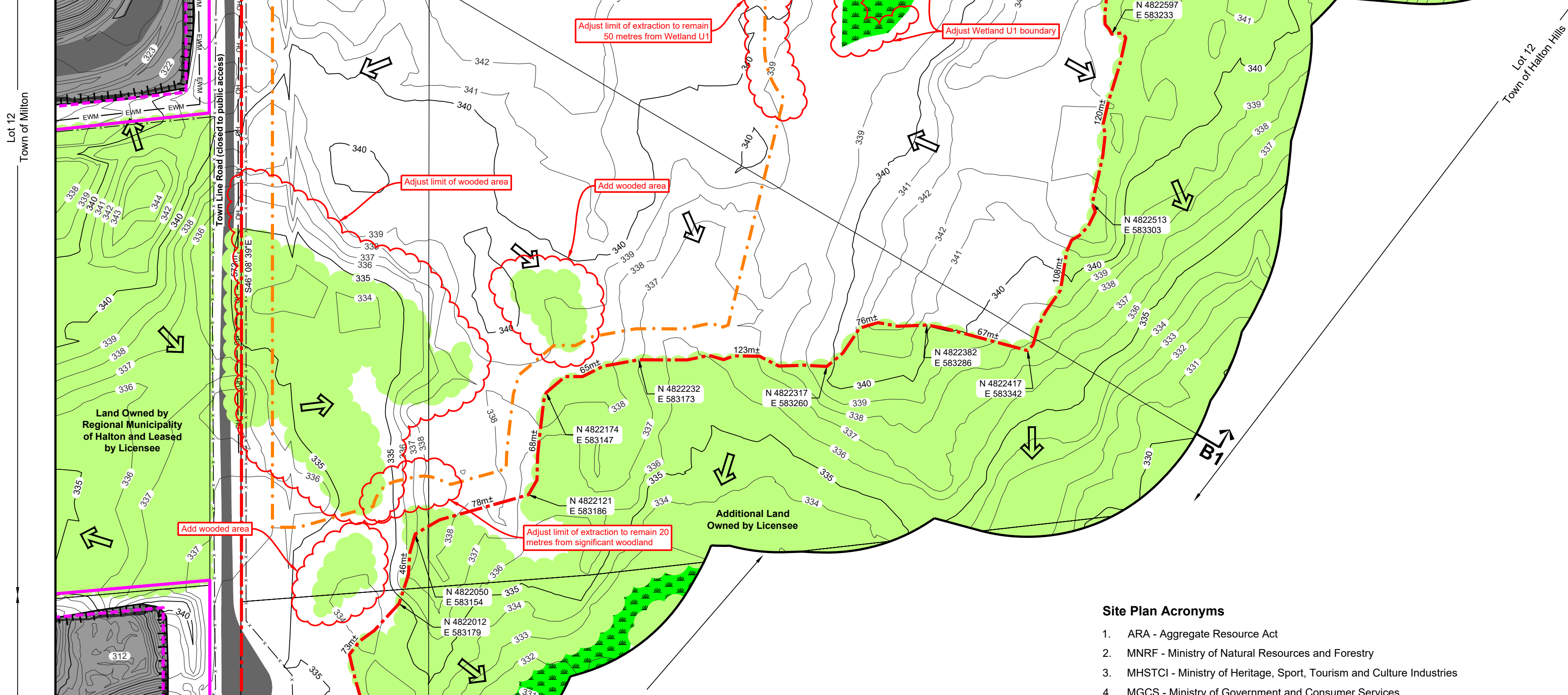
Updated Milton Quarry
East Extension Site Plans



Section A-A1
1:2000 Horizontal
1:1000 Vertical



Section B-B1
1:2000 Horizontal
1:1000 Vertical



Section C-C1
1:2000 Horizontal
1:1000 Vertical

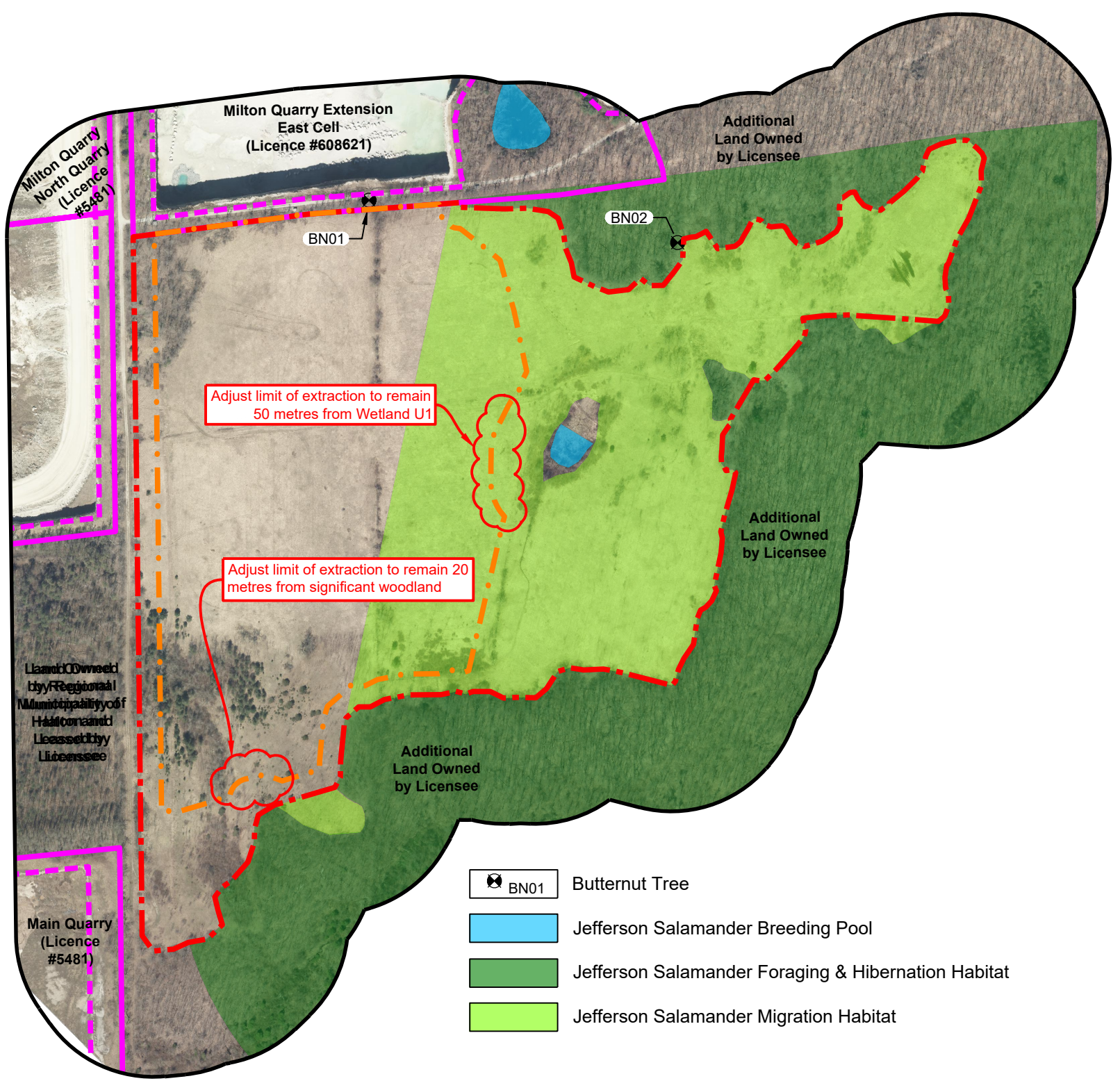
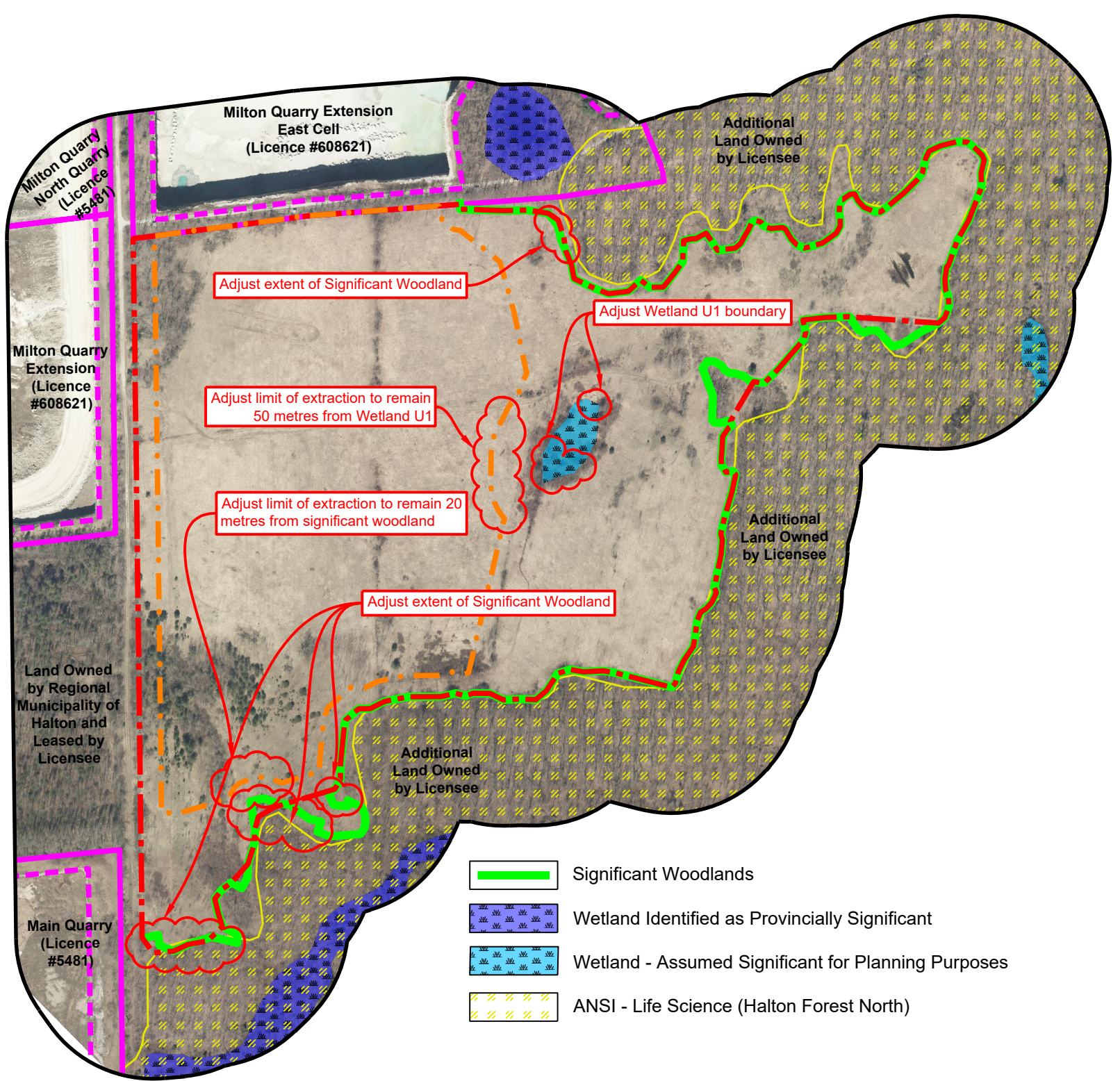
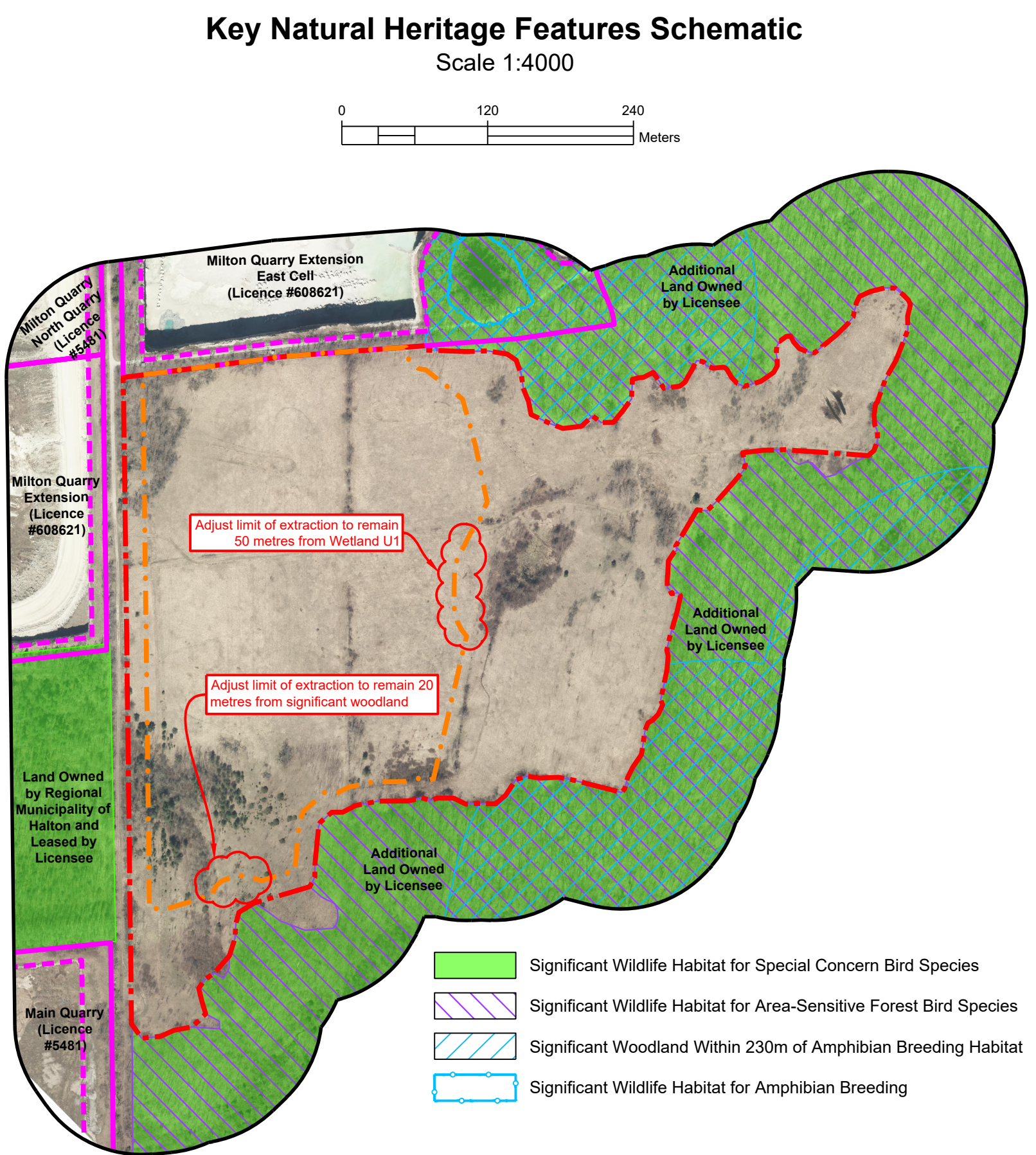
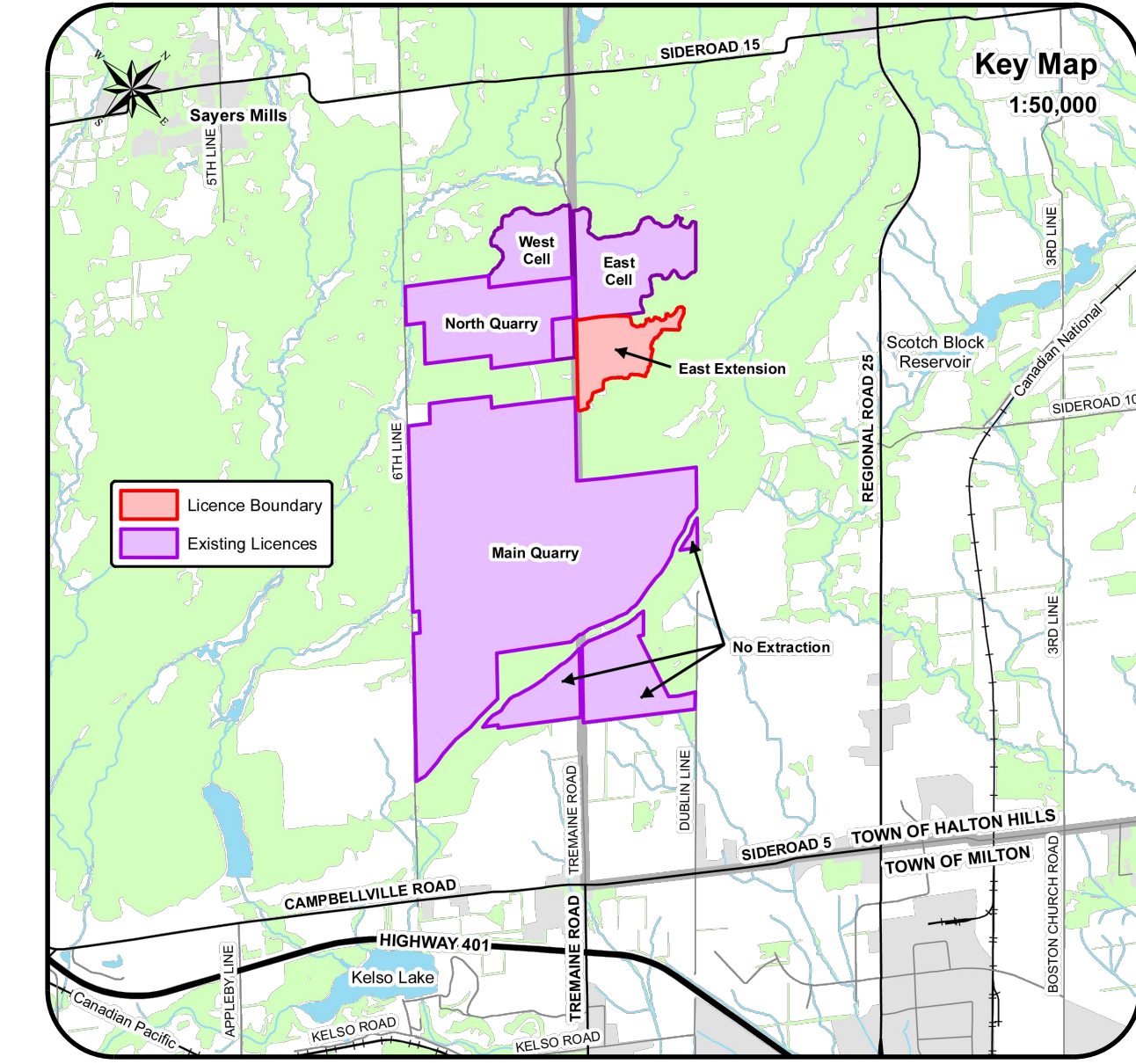


Site Plan Acronyms

- ARA - Aggregate Resource Act
- MNR - Ministry of Natural Resources and Forestry
- MHSTC - Ministry of Heritage, Sport, Tourism and Culture Industries
- MGCS - Ministry of Government and Consumer Services
- MECP - Ministry of the Environment, Conservation and Parks
- AMP - Adaptive Environmental Management and Protection Plan
- ANSI - Area of Natural and Scientific Interest
- ESA - Environmentally Sensitive Area
- OWRA - Ontario Water Resources Act
- MOEE - Milton Quarry East Extension
- EEP - Ecological Enhancement Plan
- MASL - Metres above mean sea level
- PTTW - Permit to Take Water

- General Notes:**
1. A key map identifying the location of the licence is provided on the plan view of this drawing.
 2. The general description of the geographic location of the site is provided in the titleblock on each drawing.
 3. All topographic features are shown to scale in Universal Transverse Mercator (UTM) with North American Datum 1927 (NAD27). Zone 17 (metre), Central Meridian 81 degrees west coordinate system. Northing and easting coordinates for selected corners and where an entrance/exit intersects the licence boundary have been identified on the plan view.
 4. The plan view on each drawing is at a scale of 1:2000 unless otherwise specified.
 5. The applicant's contact information and signature is contained in the titleblock on each drawing.
 6. Not applicable since it only applies to wayside permits.
 7. The name and signature of the individual who prepared the site plan is located in the titleblock on each drawing.
 8. This site plan is prepared under the Aggregate Resources Act (ARA) for a Class 'A' Licence for a quarry below the ground water table.
 9. All references to north, south, east and west are based on site north (not true north).
 10. The schedule for site plan amendments is contained in the titleblock for each drawing.
 11. See titleblock for legend.
 12. The licence boundary of the site including bearings (where applicable), dimensions and northing and easting coordinates are identified on the plan view of this drawing.
 13. Area Calculations:
Licence boundary 30.2 ha
Limit of extraction 15.9 ± 15.8 ha
 14. Lot and concession lines are displayed and labelled on the plan view for each drawing.
- Existing Features Notes:**
15. The following sources were utilized in preparation of this site plan:
 - a. General References
 - a.a. Topographic information (including contours - see Note 23 on this drawing) was obtained from numerous sources including Ontario Geohub (Land Information Ontario), Northway Photomaps Inc. aerial photography captured in the spring of 1987, Google Earth Pro aerial photography captured on May 7, 2019 and field investigations for technical reports.
 - a.b. The licence boundary was established using a Sketch prepared by Fred G. Cunningham - Ontario Land Surveyor, dated December 2, 1987 and the significant woodland boundary provided by Goodban Ecological Consulting Inc. (GEC) dated March 23, 2021. Distances between northings and eastings are approximate and for reference purposes only.
 - a.c. Land use designations on and within 120 metres of the licence boundary are from the Niagara Escarpment Plan, Map 3 - Regional Municipality of Halton, approved June 1, 2017. All land within the licence boundary is designated Escarpment Rural Area. Municipal zoning in this area does not apply.
 - a.d. Land use information identified on and within 120 metres of the licence boundary was determined using Google Earth Pro aerial photography captured on May 7, 2018.
 - b. Technical Report References
 - b.a. Agricultural Impact Assessment, Milton Quarry East Extension, DBH Soil Services Inc., November 4, 2021.
 - b.b. Milton Quarry East Extension Noise Impact Study, Aerocoustics Engineering Ltd., December 7, 2021.
 - b.c. Milton Quarry East Extension Agricultural Impact Assessment, DBH Soil Services Inc., November 4, 2021.
 - b.d. Dufferin Milton Quarry East Extension Air Quality Assessment, RWDI, November 16, 2021.
 - b.e. Stage 1 and 2 Archaeological Assessment Milton Quarry East Extension, Golder Associates Ltd., April 30, 2021.
 - b.f. Stage 3 Archaeological Assessment Milton Quarry East Extension, Golder Associates Ltd., April 30, 2021.
 - b.g. Blast Impact Analysis Milton Quarry East Extension, Explotech, November 25, 2021.
 - b.h. Cultural Heritage Impact Assessment Report Milton Quarry East Extension, MHBC, December 2021.
 - b.i. Milton Quarry East Extension Fiscal Impact Study, Altus Group Economic Consulting, November 15, 2021.
 - b.j. Geology and Water Resources Assessment Report Dufferin Aggregates Milton Quarry East Extension, GHQ, December 2021.
 - b.k. Addendum to Updated Adaptive Environmental Management and Protection Plan (AMP) Milton Quarry East Extension, GHQ and Goodban Ecological Consulting Inc. (GEC), December 2021.
 - b.l. Level 1 And 2 Natural Environment Technical Report (NETR) and Environmental Impact Assessment (EIA) Dufferin Aggregates Milton Quarry East Extension, Goodban Ecological Consulting Inc. (GEC), December 2021.
 - b.m. Ecological Enhancement Plan (EEP) & Rehabilitation Plan Report, Dufferin Aggregates Milton Quarry East Extension, Goodban Ecological Consulting Inc. (GEC), December 2021.
 - b.n. Traffic Impact Study/ Haul Route Assessment Dufferin Aggregates Milton Quarry East Extension, The Municipal Infrastructure Group Ltd. (TMIG), October 2021.
 - b.o. Visual Impact Assessment Proposed Extension of the Milton Quarry, MHBC, November 2021.
 - b.p. Progressive and Final Rehabilitation and Monitoring Study, Dufferin Aggregates Milton Quarry East Extension, MHBC, December 2021.
 16. Municipal zoning on and within 120 metres of the licence boundary does not apply (see Note 15.a.c. on this drawing).
 17. Existing land designations and uses are provided on this drawing.
 18. The maximum predicted water table (based on existing and interim conditions) within the limit of extraction varies between 315.1 and 336.9 ± 136.7 metres above mean sea level (see plan view on drawing 2 of 4 for location).
 19. A field access exists in the location shown on the plan view.
 20. All significant natural features on and within 120 metres of the licence boundary are shown on the Key Natural Heritage Schematic on this drawing.
 21. All significant human-made features on and within 120 metres of the licence boundary are shown on the plan view.
 22. There buildings and structures associated with the water mitigation system (eg. control huts) within 120 metres of the licence boundary.
 23. Contours were obtained from the Region of Halton's Open Data Catalogue which were derived from 2019 aerial photography and are displayed in one metre intervals. Elevations shown are in metres above mean sea level (masl).
 24. Surface drainage on and within 120 metres of the licence boundary is by overland flow in the directions shown by arrows on the plan view, or by infiltration.
 25. The location of existing tree cover on and within 120 metres of the licence boundary is shown on the plan view.
 26. Post and wire fencing (unless noted otherwise) exists in the locations shown on the plan view.

- Aggregate Resources of Ontario Site Plan Standards notes 27 to 32:
- There are no existing aggregate operations or features on-site such as processing areas with stationary or portable equipment, stockpiles, recyclable materials, scrap, haul roads, fuel storage, berms or excavation bays.



Legal Description
Part of Lots 11 and 12, Concession 1
(former geographic Township of Esquesing)
Town of Halton Hills
Regional Municipality of Halton

Legend

- Licence Boundary
- Limit of Extraction
- Contours with Elevation
- Road
- Field Access
- Excavation Face
- Disturbed Area
- Wooded Area
- Wetland
- Control Hut
- Existing Licence Boundary
- Existing Limit of Extraction
- 120m Offset From Licence Boundary
- Lots and Concessions
- Trail Segment
- Overhead Hydro
- Existing Watermain
- Fence
- Entrance / Exit
- Direction of Surface Drainage
- Cross Sections

Legend - Cross Sections

- Licence Boundary
- Limit of Extraction
- Existing Licence Boundary
- Existing Limit of Extraction
- Existing Grade
- Maximum Predicted Water Table
- Maximum Depth of Excavation
- Topsoil and/or Overburden
- Aggregate Available for Extraction

Site Plan Amendments			
No.	Date	Description	By

Site Plan Revisions (Pre-Licensing)			
1	2	3	4
1	January 2022	Update Operational Plan per feedback from MNR	CAP
2	July 2022	Add additional features to the Key Natural Heritage Features Schematic. Minor house keeping.	CAP
3	September 2022	Adjust limit of extraction based on revised wetland and woodland boundaries. Identify additional wooded areas on the plan view.	CAP

MHBC Stamp

Is authorized by the Ministry of Natural Resources and Forestry pursuant to the Access to Information Act (R.S.C. (1985), c. A23(1)) of Ontario, 2021/09/27 to prepare and certify site plans.

MHBC Stamp

Is authorized by the Ministry of Natural Resources and Forestry pursuant to the Access to Information Act (R.S.C. (1985), c. A23(1)) of Ontario, 2021/09/27 to prepare and certify site plans.

Site North

True North

Applicant

Dufferin Aggregates
A Division of CRH Canada Group Inc.
2300 Steeles Avenue West, 4th Floor
Concord, Ontario
L4K 5X6

Project
Milton Quarry East Extension
10305 Nassagaweya Esquesing Townline, Halton Hills, Ontario

MNR Licence Reference No.

Applicant's Signature

Plan Scale: 1:2000 (Arch E)

Date December 2021

Drawn By C.P. **File No.** 9061DJ

Checked By B.Z.

File Name Existing Features & Cross Sections

Drawing No. 1 of 4

File Path N:\Bran\9061DJ - Dufferin - Milton Quarry East Extension\Drawings - Must be in NAD 27 Site Plan\CAD\9061DJ - Site Plan - September 2022.dwg

Numbering scheme used for operational notes refers to Aggregate Resources of Ontario Site Plan Standards.

- All entrances and exits are shown on the plan view of this drawing. Highway trucks and quarry vehicles will access Phases 1 and 2 anywhere along the common limit of extraction with Licence #60821. Highway trucks and quarry vehicles (excluding off-road haul trucks) may also use the entrance/exist in the southwest corner of Phase 1 to access the site from Licence #5481 for rehabilitation purposes.

A gate shall be installed at the entrance/exist in the southwest corner of Phase 1, kept closed during hours of non-operation and maintained. A gate shall not be required where haul roads cross the common boundary with Licence #60821 (see Operational Note 54 - Variations from Control and Operation Standards on this drawing).

- The area to be extracted is 149.15 ha.

Not applicable since it only applies to aggregate permits.

- Prior to any site clearing, the licence boundary shall be fenced with 1.2 m post and wire fencing in the locations shown on the plan view. Fencing shall not be required along the common boundary with Licence #60821 to eliminate constraints associated with the extraction operation, along the north boundary of the licence since the property boundary is already fenced and in the southwest corner since there is an existing fence to the east (see Operational Note 54 - Variations from Control and Operation Standards on this drawing).

Wherever the licence boundary is not fenced, the licence boundary shall be delineated with marker posts a maximum of 30 metres apart. The marker posts shall be visible from one marker post to the next.

The entire site will be fenced through a combination of existing and proposed fencing to restrict access to the extraction area and the area consisting of the main watermain. All fencing shall be maintained.

- Throughout the life of the operation there shall:

- 37.1. Be no buildings or structures except those associated with the Water Management System;
- 37.2. Be no scrap areas;
- 37.3. Be internal haul roads located anywhere on the quarry floor;

- 37.4. Be service access roads to access the watermain, feeder lines and associated facilities for the recharge mitigation system, and for drills and blasting trucks; and

- 37.5. Be stockpiles of aggregate, topsoil and overburden located anywhere within the limit of extraction (see Operational Note 54 - Variations from Control and Operation Standards on this drawing).

- 37.6. No processing shall occur on-site. Excavated material shall be hauled to Licence #5481 for processing (extraction Scenario 1, see Note Note F.6) or to portable processing plants in the East Cell of Licence #60821 and Main Quarry of Licence #5481 for processing (extraction Scenario 2, see Note Note F.7).

- 37.7. Aggregate recycling shall not occur within this licence.

- 37.8. The site shall be extracted in two phases. Phase 1 shall be extracted in a southerly direction and Phase 2 shall be extracted in an easterly direction (as depicted on the plan view).

If extraction in Phase 2 commences prior to year 3 of the ARA Licence being issued, 50% of the Ecological Enhancements, as outlined in Table 1 on drawing 3 of 4, shall be completed and the remainder of the Ecological Enhancement Plan shall be completed within the timeframes outlined in Table 1. In addition, site sloping along 50% of the west rock face of Phase 1 shall be commenced.

- 41. Prior to the stripping of topsoil and overburden, Natural Environment Notes E.2 and E.4 shall be implemented and notes E.5 to E.9 shall be adhered to. Topsoil and overburden shall be stripped separately wherever there are distinguishable layers and sufficient thickness to allow separate handling.

Topsoil and overburden materials may be moved between this site and Licence #5481 and #60821 (see Operational Note 54 - Variations from Control and Operation Standards on this drawing). Soil materials on site shall be classified and separated where appropriate as:

- Organics and topsoils (for final dressing to promote revegetation);
- Non-structural fill; and
- Structural material

Temporary topsoil and overburden stockpiles which remain for more than six months shall be graded and seeded to control erosion. Seeding shall not be required if these stockpiles have vegetated naturally in the six months.

- 42. The maximum number of lifts is three, while the majority of the operation will occur in two lifts. Operations may go to one or three lifts as required based on depth of resource or mitigation requirements. The depth of the first lift will vary from one surface to another topography and thickness of the resource but shall have a minimum elevation of 325 msl. The third lift includes a shallow extraction lift (replaces formation) across the quarry floor. The maximum height of each lift shall not exceed Ministry of Labour requirements.

- 43. Surface runoff from site preparation areas shall be controlled to contain erosion and sedimentation outside of the extraction area by installing the siltation fencing in the locations shown on the plan view. The extraction operations shall be conducted in a dry (desaturated) state and fence desaturation of the extraction areas shall be required. Desaturation and discharge shall be in accordance with a Permit to Take Water (PTTW) under the Ontario Water Resources Act (OWRA) and an Environmental Compliance and Assessment (ECA) under the Environmental Protection Act. The active quarry area shall be desaturated using a pump constructed in the quarry floor, through the royalties and into the top of the cabot head shale. Water shall be pumped from the pump and conveyed through a surface and/or buried pipe discharge system. Ground and surface water is collected and diverted to adjacent Licence #60821 and Licence #5481 for storage and integration into the ground water recharge and mitigation system.

The priority for water use will be for:

- The protection of the environment first (i.e. downstream flow to the Hilton Falls Tributary as per agreement with Conservation Halton and operation of the mitigation system to maintain target water levels & support natural features (excluding off-road haul trucks) may also use the entrance/exist in the southwest corner of Phase 1 to access the site from Licence #5481 for rehabilitation purposes.
- Operation of the quarry second; and
- Filling of the lakes third.

Any surplus water not required for these purposes and for which no storage is available shall be discharged to Hilton Falls Reservoir Tributary.

- The site is not within a wetland protection area and source water protection policies do not apply.

- 45. Prior to site preparation, a Spills Contingency Plan shall be developed and implemented. Fuel trucks shall be utilized for refueling mobile quarry equipment in accordance with the Liquid Fuels Handling Code. All spills on site shall be handled in accordance with the Spills Contingency Plan. No fuel shall be stored on-site.

- 46. See plan view on this drawing for the location and labelling of all extraction limits from the licence boundary.

- 47. See plan view on this drawing for maximum depth of extraction elevations through the use of spot elevations. The site plan allows for the full removal of the amenable/unsuitable limestone units and the proposed spot elevations may vary by 5-3 metres with the depth of the resources encountered.

- 48. No acoustic or visual berms are required. Therefore, the location and minimum height of berms have not been provided.

- 48. No acoustic or visual berms are required. Therefore, details regarding how berms will be vegetation and maintained are not provided.

- 49. Prior to extraction below the water table, installation of the hydrogeologic monitoring and mitigation systems shall occur. Extraction of the bedrock will involve drilling blast holes, blasting and loading blasted aggregate into Off-Road trucks where it will be transferred to Licence #60821 and Licence #5481 for processing and shipping to market. See Operational Note 38 for additional information.

On-site equipment (and reference to noise emission levels in dB @ 30m) will include:

Site preparation and Rehabilitation

- Backhoes
- Haul trucks
- Buildings
- Scrapers
- Graders
- Compactors
- Water and fuel trucks
- Tree clearing equipment
- Maintenance trucks
- Highway trucks
- Pickup trucks

- Drilling, extraction and transport

- 3 rock drills
- 2 extraction loaders
- 1 excavator
- 24 Off-Road trucks per hour (48 passes per hour)
- Water trucks
- Flat trucks
- Maintenance trucks
- Explosive trucks & service vehicles as required
- Pickup trucks

- 51. No visual tree screens are required.

- 52. Hours of operation:

- Extraction & processing Monday to Sunday, 24 hours per day
- Loading and shipping Monday to Sunday, 24 hours per day
- Maintenance Monday to Sunday, 24 hours per day
- Site preparation & rehabilitation Monday to Sunday between 7:00 a.m. and 7:00 p.m.
- Drilling Monday to Friday between 8:00 a.m. and 6:00 p.m.
- Blasting Monday to Friday between 8:00 a.m. and 6:00 p.m.

Operations shall not occur on statutory holidays but maintenance may occur.

- 53. Timber resources shall be salvaged for use as saw logs, fence posts and fuel wood where appropriate. Stumps, trees, shrubs and brush cleared shall be used for rehabilitation of this site and Licence # 60821 and Licence #5481 to provide coarse and fine wood debris to enhance soils and create habitat during site rehabilitation (see Natural Environment Note E.9 for additional information).

54. Variations from Control and Operation Standards

Section 6.13 Standard	Variation	Rationale
(11) & (12)	Gates shall not be required where haul roads cross the common boundary with Licence #60821.	This will eliminate constraints to the movement of equipment between licences owned by the same licensee.
(1) & 8.11	Excavation shall occur in the wetland area to install the water mitigation system.	Water mitigation system is required to be built below the first line.
(11)G	A 0 metre setback shall be provided where the licence abuts existing Licence #60821.	This will enable material to be extracted along the common boundary and for rehabilitation to transition between licences. A site plan amendment for existing Licence #60821 is required.
(11)G.ii	A 20 metre setback shall be provided along the western boundary adjacent to the road allowance which is closed to public access.	This will be consistent with Licence #60821 to the north which has a 20 metre setback along the western boundary adjacent to the road allowance which is closed to public access.
(11)3	Aggregate, topsoil and overburden stockpiles may be located within 30 metres of the licence boundary.	The licensee owns the land to the north, east and south while Town Line Road to the west is closed to public access.
(11)7 & (11)8	Topsoil and overburden may be transferred to existing Licence #5481 and/or Licence #60821.	This will allow stripped material from site preparation to be used immediately for progressive rehabilitation or for overburden to be used in ramp construction in other parts of the existing licenses.
(1) 19	Portions of the quarry faces shall remain vertical. See drawings 3 of 4 and 4 of 4.	To allow movement of groundwater from the lakes towards off site features and to create a more diversified habitat and visually interesting rehabilitated landform.
(3)A	Portions of the licence boundary shall not be fenced.	The licence boundary shall be demarcated every 30 metres where required. See Operational Note 36 for additional information.

- 55. The maximum annual tonnage for this site is 5.5 million.

- 56. The site is not located within the Protected Countryside of the Greenbelt Plan.

- 57. Blasting may occur up to three times per week. Monday to Friday between 8:00 a.m. and 6:00 p.m. excluding statutory holidays.

- 58. There are no sensitive receptors within 500 m of the site. The closest sensitive receptor is over 1,200 metres from the site.

Technical Report Recommendations

A. Air Quality

- The licensee shall apply water or another provincially approved dust suppressant to internal haul roads and processing areas, as necessary to mitigate dust, if the quarry is located within 1,000 metres of a sensitive receptor.
 - The licensee shall equip any processing equipment that creates dust with dust suppressing or collection devices if it is located within 300 metres of a sensitive receptor.
 - The licensee shall obtain an Environmental Compliance Approval under the Environmental Protection Act where required to carry out operations at the quarry.
- The site will operate in accordance with CRHS Dust Control Work Instruction, which functions as a Best Management Practices Plan for fugitive dust, which may be amended from time to time, considering actual impacts and operational considerations. The recommendations in the Work Instruction are based on the maximum daily production rates. At lower production rates, the control measures specified in the Dust Control Work Instruction can be reduced accordingly, provided dust remains mitigated on site.

B. Archaeology

- Should deeply buried archaeology remains be found during the course of site preparation and/or extraction related activities, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) shall be notified.
- In the event that human remains are encountered during construction or extraction activities, the licensee shall immediately contact both the MHSTCI and the Registrar or Deputy Registrar of the Cemeteries Regulation Unit of the Ministry of Government and Consumer Services (MGCS).

C. Blasting

- All blasts shall be monitored for both ground vibration and overpressure by an independent Blast Consultant at the closest privately owned sensitive receptors adjacent the site, or at a location that is closer than a sensitive receptor, with a minimum of two (2) instruments - one installed in front of the blast and one installed behind the blast.
- The guideline limits for vibration and overpressure shall adhere to standards as outlined in the MECP Model Municipal Noise Control By-law publication NPC-119 (1978) or any such document, regulation or guideline which supersedes this standard.
- In the event of an exceedance of NPC 119 limits or any such document, regulation or guideline which supersedes this standard, blast designs and protocols shall be reviewed prior to any subsequent blasts and revised accordingly in order to return the operations to compliance.
- Orientation of the aggregate extraction operation will be designed and maintained so that the direction of the overpressure propagation will be away from structures as much as possible.
- Blast designs shall be continually reviewed with respect to fragmentation, ground vibration and overpressure. Blast designs shall be modified as required to ensure compliance with applicable guidelines and regulations.
- Blasting procedures such as drilling and loading shall be reviewed on a yearly basis and modified as needed to ensure compliance with industry standards.
- Detailed blast records shall be maintained in accordance with current industry best practices.

D. Geology and Water Resource

- Implement and operate the proposed Water Management System mitigation and rehabilitation measures, including any necessary response actions, in accordance with the Adaptive Environmental Management and Protection Plan (AMP) Addendum.
- Conduct the water and ecology monitoring program and reporting in accordance with the AMP Addendum.
- Amend the OWRA approvals as necessary to reflect the aspects of the water management measures relevant to those approvals.
- Extend the implementation of the Milton Quarry Contingency and Pollution Prevention Plan to include the Milton Quarry East Extension (MQEE).

E. Natural Environment

- No development is permitted within the habitat of Jefferson Salamander and Unisexual Ambystoma (Jefferson Salamander dependent population) unless authorized by an Endangered Species Act (ESA) Permit or other authorization from the Ministry of Environment, Conservation and Parks (MECP). A copy of the ESA Permit will be provided by the proponent to the MNR Aggregate Inspector.
- The limit of extraction shall be clearly demarcated with monument markers (e.g., metal flags or equivalent) with maximum spacing of 20 metres between markers. In proximity to the Significant Woodland Boundary and Ecological Enhancement Plan (EEP) areas, the maximum spacing of monument markers shall be 10 metres and signage stating "Ecological Area - No Disturbance" or equivalent wording shall be installed.
- The limits of disturbance for the Water Management System installation shall be clearly demarcated, especially in the vicinity of the Significant Woodland, wetlands, buffer areas and EEP areas, prior to commencing Water Management System installation works.
- Silt/exclusion fencing shall be installed in the location shown on the plan view. Silt/exclusion fencing will be installed at the locations shown on the plan view. Silt/exclusion fencing may be heavy-duty silt fencing, Arminex Wildlife Fencing or equivalent. The condition of the fencing shall be monitored on a regular basis and it shall be promptly repaired as necessary. The fencing shall be designed and installed in accordance with the Province's Best Management Practices for reptile and exclusion fencing (https://www.ontario.ca/page/reptile-and-amphibian-exclusion-fencing).
- The watermain access road located between the two Salamander Excluders shall only be used for Water Management System monitoring and maintenance, ecological enhancement works and ecological monitoring. It shall not be used for operational purposes.
- Tree-clearing shall occur during the active period for bats and the bird breeding season between March 14th and December 1st. This will avoid potential contraventions of the Migratory Bird Convention Act and the Endangered Species Act.
- Stripping of topsoil and ground vegetation shall not occur during the bird breeding season between April 1st and August 26th. This will avoid potential contraventions of the Migratory Bird Convention Act and the Endangered Species Act.
- Stripping of overburden may occur during the bird breeding season, provided that the topsoil and ground vegetation has already been removed.
- Boulders, rocks and cobbles will be salvaged from fence lines and stone piles within the limit of extraction. Weathered rocks will also be salvaged during stripping operations. This material will be stockpiled within the extraction area for use as part of the Ecological Enhancement Plan (EEP), off-site discharge, and future quarry rehabilitation.
- Logs, stumps, root wads and branches will be salvaged during clearing and grubbing operations. Tree tops may be chipped. The salvaged woody material and wood chips will be stockpiled within the extraction area for use as part of the EEP and future quarry rehabilitation.
- The Water Management System shall be installed consistent with the restrictions and design considerations provided in the AMP Addendum (GHD and Goodwin Ecological Consulting Inc., December 2021).
- The EEP shall be implemented as per the details outlined on drawings 3 of 4 and 4 of 4.
- Blasting - Peregrine Falcon
 - Each year, between early April and mid-May, a qualified ecologist will check to see if Peregrine Falcons are present and nesting within the area to be extracted.

- In the event the qualified ecologist confirms Peregrine Falcons are nesting within the area to be extracted or within the adjacent Licence No. 60821:
 - Quarry personnel shall not walk within 100 metres of an active falcon nest during the period April 15th to July 31st to the extent feasible.
 - Quarry equipment (such as trucks and loaders) shall not be operated within 25 metres of a nest between April 15th to July 31st.
 - When extending the existing south face of the quarry southward into the MQEE extraction area, blasting shall not occur within 125 metres of a nest while it is occupied and overpressure shall not exceed 140 dB. During the egg-laying and incubation period (April 20th to June 20th), the ground vibration at a nest shall not exceed 35 millimetres per second and overpressure shall not exceed 140 dB. Despite these blasting limits, the Licensee shall also ensure that Provincial limits for overpressure as outlined in NPC-119 are not exceeded at surrounding sensitive receptors.

F. Noise

- The quarry equipment shall satisfy the noise emission levels listed below.

Equipment	Reference Sound Pressure Level at 30m (dBA)
Rock Drill	85
Extraction Loader	76
Excavator	70
Off-Road Truck	74

- New equipment technology or different configurations may allow proposed changes to any portion of the extraction and processing operations including additional equipment to operate on the site, equipment to be substituted, altered or different berm heights, while still meeting the applicable sound level limits. Changes may be permitted to the site operations and noise controls provided that the changes still meet the sound level limits, as confirmed through documentation prepared by a Professional Engineer specializing in noise control.
- Drilling operations shall be limited to daytime hours only (07:00 to 19:00).
- The operation may be carried out in one or more separate lifts. If extraction is carried out in multiple lifts, the first lift shall have a maximum elevation of 325 msl.
- The sound emissions of all construction equipment involved in site preparation and rehabilitation activities shall comply with the sound level limits specified in the MECP publication NPC-115 "Construction Equipment".

- Noise controls for Scenario 1

- The extraction, processing and shipping equipment operating in the quarry is limited to:

- Three (3) Rock Drills
- Two (2) Extraction Loaders
- One (1) Excavator
- 24 Off-Road Truck trips per hour (48 passes per hour)

- Phase 1

- Drilling in the Phase 1 "restricted drilling area" indicated on the operational plan is limited to two (2) rock drills operating simultaneously for the first lift only.
- Drilling in the Phase 1 "single drill area" indicated the operational plan is limited to one (1) rock drill for the first lift only. Two drills can be used simultaneously in this area on the first lift if a 3 m acoustic barrier is constructed to block line of sight between any drills and R17.

- Phase 2

- c.a. No additional Noise Controls.

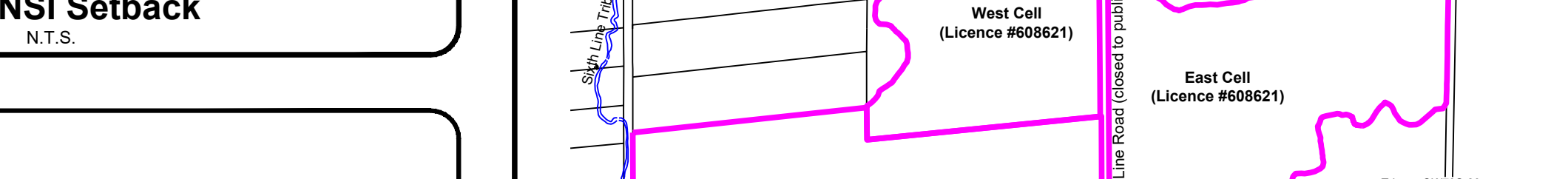
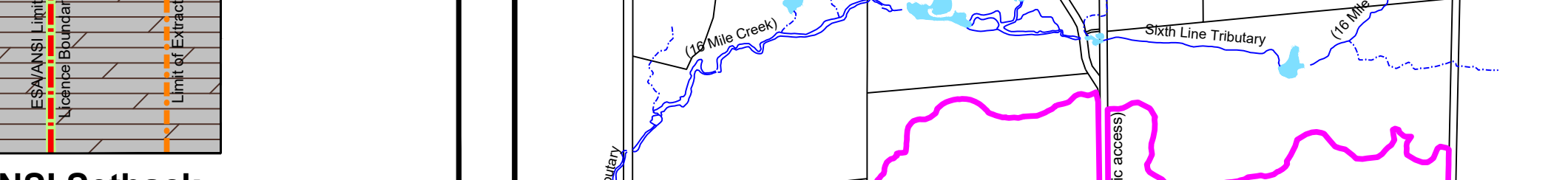
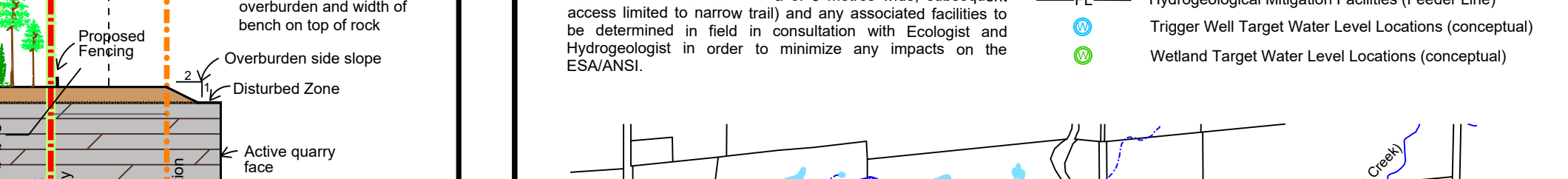
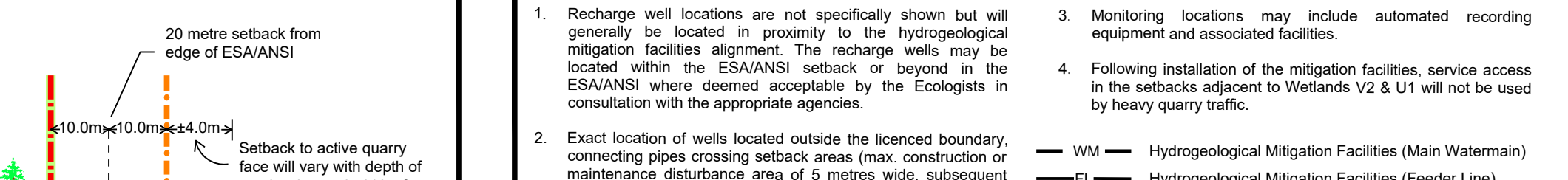
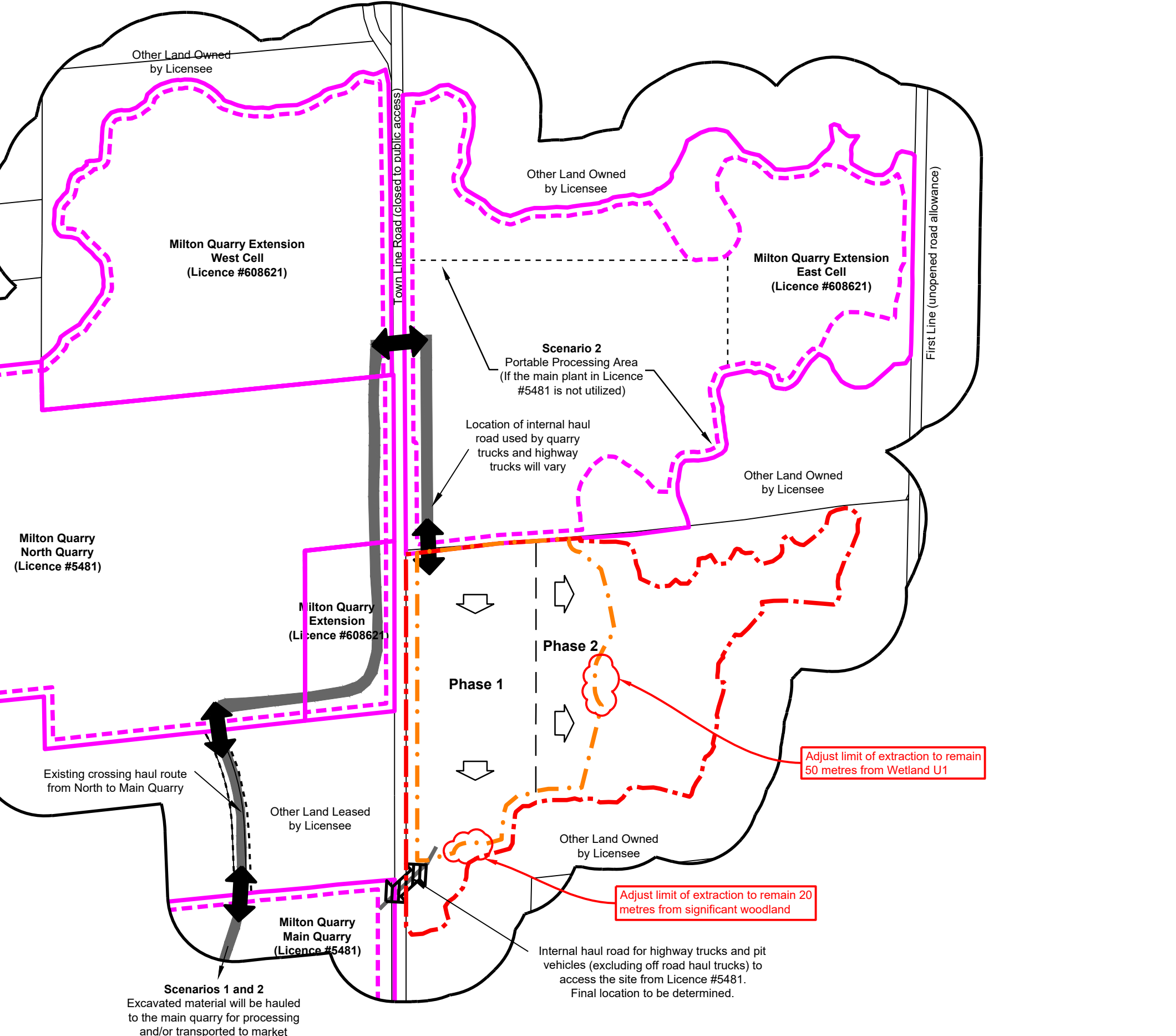
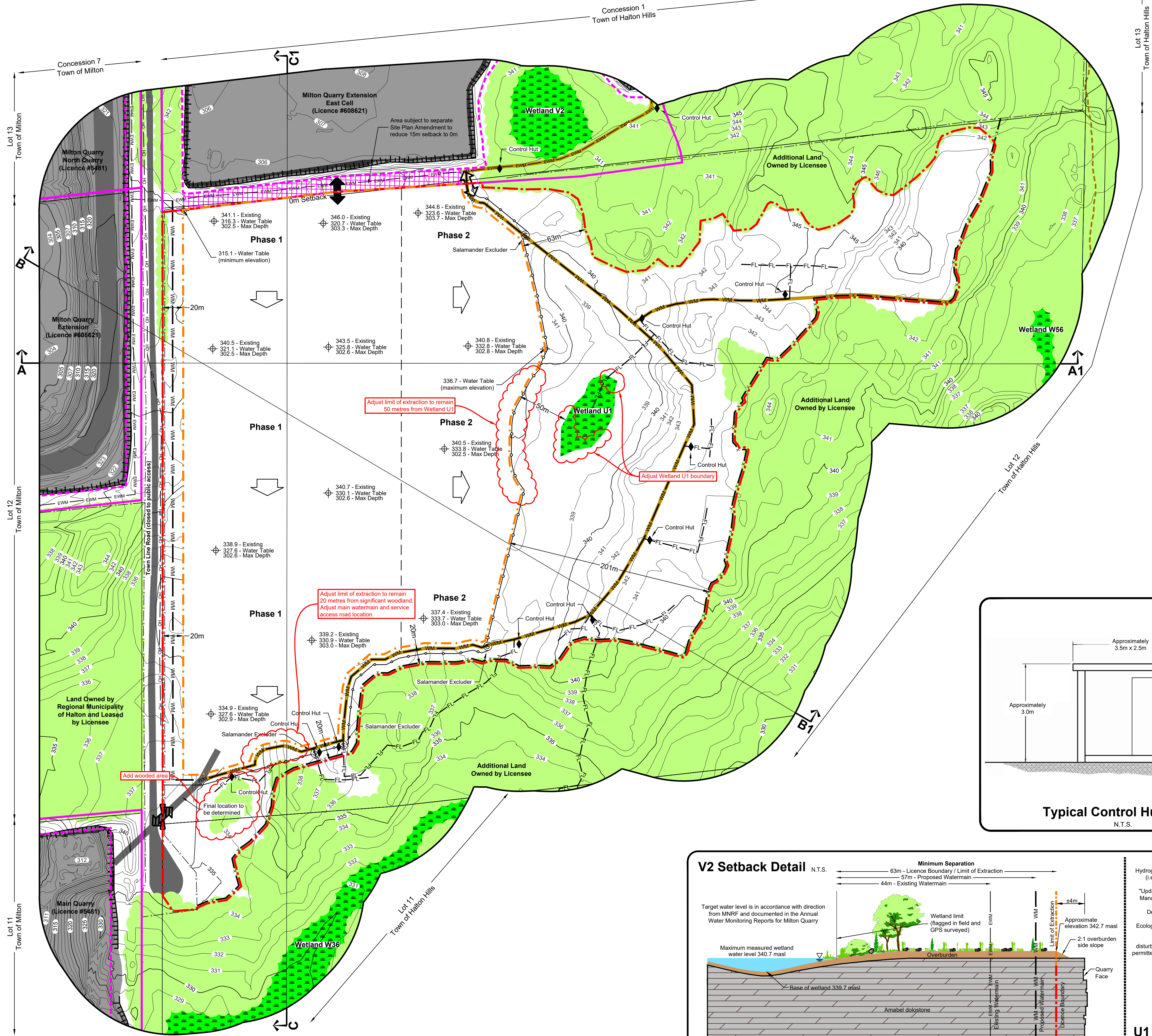
- Noise controls for Scenario 2

- The extraction, processing and shipping equipment operating in the quarry is limited to:

- Three (3) Rock Drills
- Two (2) Extraction Loaders
- One (1) Excavator
- 32 Off-Road Truck trips per hour (48 passes per hour)

- Phases 1 and 2

- c.a. No additional Noise Controls.



Legal Description
Part of Lots 11 and 12, Concession 1
(former geographic Township of Esquering)
Town of Halton Hills
Regional Municipality of Halton

Legend

- Licence Boundary
- Limit of Extraction
- Contours with Elevation
- Road
- Service Access Road
- Extraction Face
- Disturbed Area
- Wooded Area
- Wetland
- Operational Access Unrestricted
- Operational Access Limited - No Off Road Haul Trucks
- Field Entrance / Exit
- Gate
- Salamander Excluder Location
- Control Hut

Existing Licence Boundary

Existing Limit of Extraction

120m Offset From Licence Boundary

Lots and Concessions

Trail Segment

Overhead Hydro

Silt / Exclusion Fencing

Existing Watermain

Main Watermain

Feeder Line

Fence

General Direction of Excavation & Boundary

Spot Elevation

Cross Sections

Site Plan Acronyms

- ARA - Aggregate Resource Act
- MNR - Ministry of Natural Resources and Forestry
- MHSTCI - Ministry of Heritage, Sport, Tourism and Culture Industries
- MGCS - Ministry of Government and Consumer Services
- MECP - Ministry of the Environment, Conservation and Parks
- AMP - Adaptive Environmental Management and Protection Plan
- ANSI - Area of Natural and Scientific Interest
- ESA - Environmentally Sensitive Area
- OWRA - Ontario Water Resources Act
- MQEE - Milton Quarry East Extension
- EEP - Ecological Enhancement Plan
- MASL - Metres above mean sea level
- PTTW - Permit to Take Water

Site Plan Amendments

No.	Date	Description	By
1	January 2022	Update Natural Environment note E.12 b.c. per feedback from MNR	CAP
2	July 2022	Update site plan per agency comments. Review notes 40, 55, E.4 and E.6 Minor housekeeping.	CAP
3	September 2022	Adjust limit of extraction, main watermain and service access road location based on revised wetland and wooded boundaries. Identify additional wooded areas on the plan view.	CAP

Site Plan Revisions (Pre-Licensing)

No.	Date	Description	By
1	January 2022	Update Natural Environment note E.12 b.c. per feedback from MNR	CAP
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MHBC Stamp

MHBC Stamp

Site North

True North

PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE

MHBC Stamp

MHBC Stamp

Site North

True North

Applicant

Dufferin Aggregates
A Division of CRH Canada Group Inc.
2300 Steeles Avenue West, 4th Floor
Concord, Ontario
L4K 5X6

Project
Milton Quarry East Extension
10305 Nassagaweya Esquering Townline, Halton Hills, Ontario

MNR Licence Reference No.

Applicant's Signature

Plan Scale: 1:2000 (Arch E)

Date
December 2021

Drawn By
C.P.

File No.
9061DJ

Checked By
B.Z.

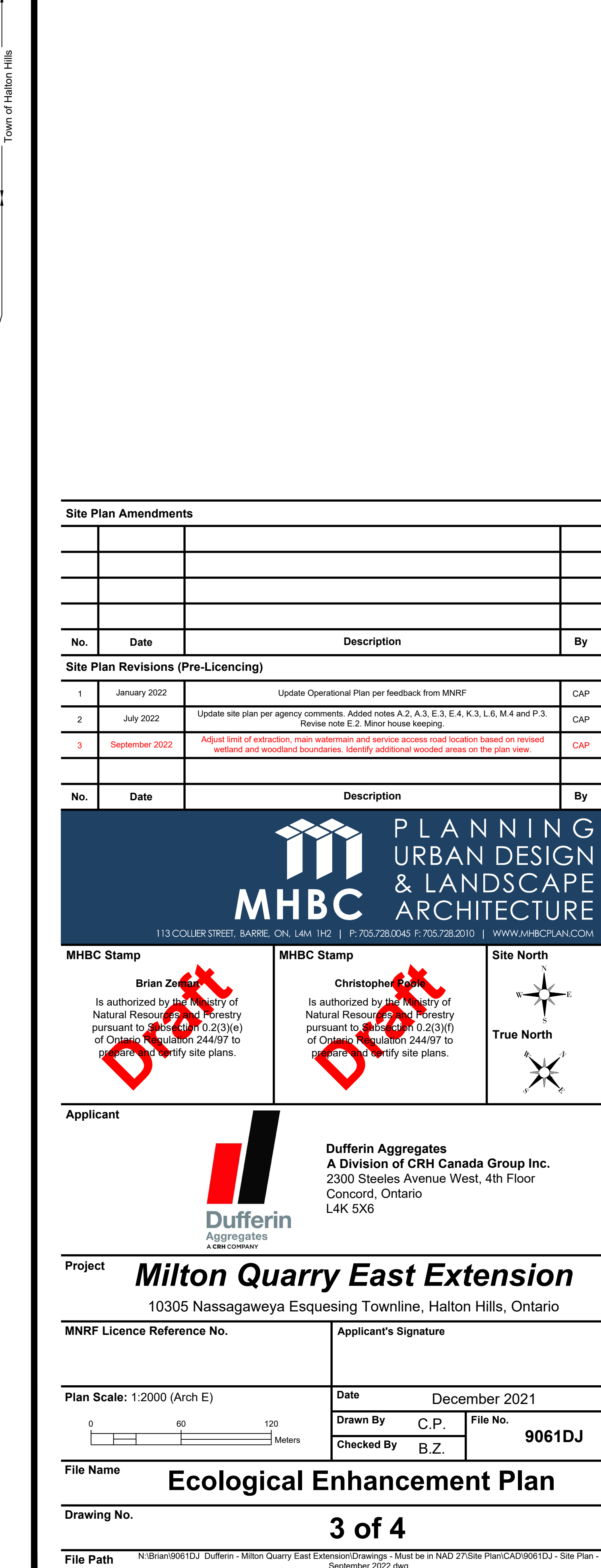
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Operational Plan

Drawing No.
2 of 4

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Table 2: Millon Quarry East Extension - Rehabilitation Plan Unit Summary						
Unit#	Area (ha)	Feature	Plant List	Purpose	Other Management Activities	Notes
TR-BCT1	1.038	Reforestation Area	White Birch (20%) - White Pine (20%) - Trembling Aspen (10%) - Other suitable native species (10%)	<ul style="list-style-type: none">• Expand and enhance Significant Woodlands.• Create wildlife habitat.• Enhance Cuckoo Train linkage.• Expand and enhance habitat for Jefferson Salamander and Ureweatus.	<ul style="list-style-type: none">• Install habitat features: rock piles (26) and woody debris (26).• Seed with suitable groundcover seed mix.• Control weedy competition and invasive woody species during establishment stage.	This will be a generally north-facing slope that has 7 m of steep (340 MSL – 353 MSL), leading down to the shoreline wetlands.
TR-RC2	9.998 1.953	Reforestation Area	Bur Oak (20%) - Red Oak (20%) - Sugar Maple (20%) - Bitternut Hickory (10%) - Basswood (10%) - White Pine (10%) - Other suitable native species (10%)	<ul style="list-style-type: none">• Expand and enhance Significant Woodlands.• Create wildlife habitat.• Enhance Cuckoo Train linkage.• Expand and enhance habitat for Jefferson Salamander and Ureweatus.	<ul style="list-style-type: none">• Install habitat features: rock piles (46) and woody debris (46).• Seed with suitable groundcover seed mix.• Control weedy competition and invasive woody species during establishment stage.	This will be a ridge at elevations of 340 MSL to 336 MSL.
TR-RCS3	2.279 0.205	Reforestation Area	Red Maple (20%) - White Cedar (20%) - Sugar Maple (10%) - Trembling Aspen (10%) - Balsam Poplar (10%) - Black Spruce (10%) - White Birch (10%) - Other suitable native species (10%)	<ul style="list-style-type: none">• Expand and enhance Significant Woodlands.• Create wildlife habitat.• Enhance Cuckoo Train linkages.• Expand and enhance habitat for Jefferson Salamander and Ureweatus.	<ul style="list-style-type: none">• Create pit and mound microtopography.• Seed with suitable groundcover seed mix (32) and woody debris (32).• Seed with suitable groundcover seed mix.• Control weedy competition and invasive woody species during establishment stage.	This will be a two-leveling area between the 334 and 338 MSL contours. Ground surface will be approximately 1 m to 3.0 m above the lake level.
TR-RCS4	0.078	Reforestation Area	Trembling Aspen (20%) - Red Maple (20%) - White Cedar (20%) - Shiner Maple (10%) - Balsam Poplar (10%) - Yellow Birch (10%) - Other suitable native species (10%)	<ul style="list-style-type: none">• Expand and enhance Significant Woodlands.• Create wildlife habitat.• Enhance Cuckoo Train linkages.• Expand and enhance habitat for Jefferson Salamander and Ureweatus.	<ul style="list-style-type: none">• Create pit and mound microtopography.• Install habitat feature: rock piles (2) and woody debris (2).• Seed with suitable groundcover seed mix.• Control weedy competition and invasive woody species during establishment stage.	This will be a leveling area or below the 334 MSL contour. Near Townline. Ground surface will be approximately 1.0 m above the lake level.
TR-RCS5	0.122	Reforestation Area	Bur Oak (20%) - Red Oak (20%) - Sugar Maple (20%) - Bitternut Hickory (10%) - Basswood (10%) - White Pine (10%) - Other suitable native species (10%)	<ul style="list-style-type: none">• Expand and enhance Significant Woodlands.• Create wildlife habitat.• Enhance Cuckoo Train linkages.• Expand and enhance habitat for Jefferson Salamander and Ureweatus.	<ul style="list-style-type: none">• Seed with suitable groundcover seed mix.• Install habitat features: rock piles (3) and woody debris (3).• Seed with suitable groundcover seed mix.• Control weedy competition and invasive woody species during establishment stage.	This is a small level near Townline at or above the 335 MSL contour.
TR-RCS8	0.444 0.467	Reforestation Area	Bur Oak (20%) - Red Oak (20%) - Sugar Maple (20%) - Bitternut Hickory (10%) - Basswood (10%) - White Pine (10%) - Other suitable native species (10%)	<ul style="list-style-type: none">• Expand and enhance Significant Woodlands.• Create wildlife habitat.• Enhance Cuckoo Train linkages.• Expand and enhance habitat for Jefferson Salamander and Ureweatus.	<ul style="list-style-type: none">• Install habitat features: rock piles (11) and woody debris (11).• Seed with suitable groundcover seed mix.• Control weedy competition and invasive woody species during establishment stage.	Southwest-facing slope. Located as close as 50 m from Wetland U1. Compatible with EEP Unit TR-PD2.
SW1	0.530	Shallow Wetland	Common Cattail (<i>Typha latifolia</i>) - Sedges (e.g., <i>Carex</i> spp., <i>Sagittaria arifolia</i>) - Scattered shrubs (mainly Salix spp.) - Water plantain (<i>Alisma plantago-aquatica</i>) - Common Arrowweed (<i>Sagittaria arifolia</i>) - Scattered duffs (mainly Salix spp.) - Other suitable native wetland species (10%)	<ul style="list-style-type: none">• Create new lacustrine wetland area.• Create habitat for fish, amphibians, turtles, snakes, waterfowl and other wildlife.	<ul style="list-style-type: none">• Grading (erosion and fill) used as irregular shoreline and produce a variety of slopes.• At least 10% of the bank and shoreward, transitioning to nonurbanized areas and deep-water areas.• Gravel or sand beaches will be created along the shoreline.• Install submerged and partially submerged rockbeds, not masses and logs.	Unit SW1B is the main shoreline wetland located adjacent to the base of the north-facing slope that contains Unit TP-CAT1.
SW1	0.727	Shallow Wetland	Common Cattail (<i>Typha latifolia</i>) - Sedges (e.g., <i>Carex</i> spp., <i>Sagittaria arifolia</i>) - Scattered shrubs (mainly Salix spp.) - Water plantain (<i>Alisma plantago-aquatica</i>) - Common Arrowweed (<i>Sagittaria arifolia</i>) - Scattered duffs (mainly Salix spp.) - Other suitable native wetland species (10%)	<ul style="list-style-type: none">• Create new lacustrine wetland area.• Create habitat for fish, amphibians, turtles, snakes, waterfowl and other wildlife.	<ul style="list-style-type: none">• Grading (erosion and fill) used as irregular shoreline and produce a variety of slopes.• At least 10% of the bank and shoreward, transitioning to nonurbanized areas and deep-water areas.• Gravel or sand beaches will be created along the shoreline.• Install submerged and partially submerged rockbeds, not masses and logs.	Unit SW2 is the shallow water around islands IS1, IS2 and IS3.
SW1	0.260	Shallow Wetland	Common Cattail (<i>Typha latifolia</i>) - Sedges (e.g., <i>Carex</i> spp., <i>Sagittaria arifolia</i>) - Scattered shrubs (mainly Salix spp.) - Water plantain (<i>Alisma plantago-aquatica</i>) - Common Arrowweed (<i>Sagittaria arifolia</i>) - Scattered duffs (mainly Salix spp.) - Other suitable native wetland species (10%)	<ul style="list-style-type: none">• Create new lacustrine wetland area.• Create habitat for fish, amphibians, turtles, snakes, waterfowl and other wildlife.	<ul style="list-style-type: none">• Grading (erosion and fill) used as irregular shoreline and produce a variety of slopes.• At least 10% of the bank and shoreward, transitioning to nonurbanized areas and deep-water areas.• Gravel or sand beaches will be created along the shoreline.• Install submerged and partially submerged rockbeds, not masses and logs.• At the interface with deeper water, create rocky shoals to within 1.0 m of the water surface, with some areas just above water.	Unit SW3 is the shallow water area adjacent to the wooded wooded slope (Unit TR-PD6).
DW1	1.088	Deep Wetland	Potamogeton (<i>Potamogeton</i> sp.) - Common Bladderwort (<i>Utricularia vulgaris</i>) - Common Bladderwort (<i>Utricularia vulgaris</i>) - Fringed Water-lily (<i>Nymphaea odorata</i>) - Common Duckweed (<i>Lemna minor</i>) - Spatterdock (<i>Claytonia</i> sp.) - Other suitable native aquatic species	<ul style="list-style-type: none">• Create new lacustrine wetland area.• Create habitat for fish, amphibians, turtles, waterfowl and other wildlife.	<ul style="list-style-type: none">• Grading will produce a variety of slopes and deeper depths.• At least 10% of the bank and shoreward, creating rocky shoals to within 1.0 m of the water surface, with some areas just above water.• Install submerged rockbeds, not masses and logs.	Unit DW1B is the main Deep Wetland area that surrounds Islands IS1, IS2 and IS3.
DW2	0.035	Deep Wetland	Potamogeton (<i>Potamogeton</i> sp.) - Common Bladderwort (<i>Utricularia vulgaris</i>) - Common Bladderwort (<i>Utricularia vulgaris</i>) - Fringed Water-lily (<i>Nymphaea odorata</i>) - Common Duckweed (<i>Lemna minor</i>) - Spatterdock (<i>Claytonia</i> sp.) - Other suitable native aquatic species	<ul style="list-style-type: none">• Create new lacustrine wetland area.• Create habitat for fish, amphibians, turtles, waterfowl and other wildlife.	<ul style="list-style-type: none">• Grading will produce a variety of slopes and deeper depths.• Install submerged rockbeds, not masses and logs.	Unit DW2 is a small area of Deep Wetland located in between Islands IS1 and IS2.
DW3	0.035	Deep Wetland	Potamogeton (<i>Potamogeton</i> sp.) - Common Bladderwort (<i>Utricularia vulgaris</i>) - Common Bladderwort (<i>Utricularia vulgaris</i>) - Fringed Water-lily (<i>Nymphaea odorata</i>) - Common Duckweed (<i>Lemna minor</i>) - Spatterdock (<i>Claytonia</i> sp.) - Other suitable native aquatic species	<ul style="list-style-type: none">• Create new lacustrine wetland area.• Create habitat for fish, amphibians, turtles, waterfowl and other wildlife.	<ul style="list-style-type: none">• Grading will produce a variety of slopes and deeper depths.• Install submerged rockbeds, not masses and logs.	Unit DW3 is a small area of Deep Wetland located in between Islands IS2 and IS3.
IS1	0.114	Island	Little Bluestem (<i>Scythanthus scoparius</i>) (40%) - Switchgrass (<i>Panicum virgatum</i>) (20%) - Big Bluestem (<i>Andropogon gerardii</i>) (20%) - Suitable native wildflower species (20%)	<ul style="list-style-type: none">• Create island habitat that will provide habitat for nesting waterfowl, shorebirds and turkeys.	<ul style="list-style-type: none">• The island will be capped with various granular substrates (gravel and coarse sands), as well as patches of bedrock.• A 10-m wide band 10 ft deep will surround the island well above the high-water line, being suitable for nesting and egg collection.• At least 3 turtle nesting sites will be constructed on the island well above the high-water line, allowing public turbine nesting areas will be approximately 8 to 10 m by 4.5 m and the nesting areas will be oriented to provide south and/or southwest exposures.	The island is oriented towards the prevailing wind from the west and northeast, with sheltered corners on the leeward side. Shallow Wetland and Deep Wetland areas are associated with the islands.
IS2	0.123	Island	Little Bluestem (<i>Scythanthus scoparius</i>) (40%) - Switchgrass (<i>Panicum virgatum</i>) (20%) - Big Bluestem (<i>Andropogon gerardii</i>) (20%) - Suitable native wildflower species (20%)	<ul style="list-style-type: none">• Create island habitat that will provide habitat for nesting waterfowl, shorebirds and turkeys.	<ul style="list-style-type: none">• The island will be capped with various granular substrates (gravel and coarse sands), as well as patches of bedrock.• A 10-m wide band 10 ft deep will surround the island well above the high-water line, being suitable for nesting and egg collection.• At least 3 turtle nesting sites will be constructed on the island well above the high-water line, allowing public turbine nesting areas will be approximately 8 to 10 m by 4.5 m and the nesting areas will be oriented to provide south and/or southwest exposures.	The island is oriented towards the prevailing wind from the west and northeast, with sheltered corners on the leeward side. Shallow Wetland and Deep Wetland areas are associated with the islands.
IS3	0.150	Island	Little Bluestem (<i>Scythanthus scoparius</i>) (40%) - Switchgrass (<i>Panicum virgatum</i>) (20%) - Big Bluestem (<i>Andropogon gerardii</i>) (20%) - Suitable native wildflower species (20%)	<ul style="list-style-type: none">• Create island habitat that will provide habitat for nesting waterfowl, shorebirds and turkeys.	<ul style="list-style-type: none">• The island will be capped with various granular substrates (gravel and coarse sands), as well as patches of bedrock.• A 10-m wide band 10 ft deep will surround the island well above the high-water line, being suitable for nesting and egg collection.• At least 3 turtle nesting sites will be constructed on the island well above the high-water line, allowing public turbine nesting areas will be approximately 8 to 10 m by 4.5 m and the nesting areas will be oriented to provide south and/or southwest exposures.	The island is oriented towards the prevailing wind from the west and northeast, with sheltered corners on the leeward side. Shallow Wetland and Deep Wetland areas are associated with the islands.
Total		6.646 ha 6.646 ha				
Rehabilitation Plan Unit Codes: TR-RC, Tree-planting/Reforestation SW - Shallow Wetland DW - Deep Wetland IS - Island						

13. PTTW - Permit to Take Water	



Tab C

Proposed Invasive Species Monitoring
and Mitigation Strategy (GEC July 2022)

MILTON QUARRY EAST EXTENSION (MQEE) – DUFFERIN AGGREGATES

PROPOSED INVASIVE SPECIES MONITORING AND MITIGATION STRATEGY

Goodban Ecological Consulting Inc. (GEC)

July 20, 2022

1.0 Introduction

Concerns with respect to invasive species were raised by the Ministry of Natural Resources and Forestry (MNRF) and the Region of Halton in their objection letters dated May 9 and May 6, 2022, respectively.

MNRF identified a potential concern that the temporary disturbance associated with the installation of Water Management System (WMS) components within wooded areas will result in the establishment of invasive plant species. The Ministry requested that a woodland invasive monitoring and mitigation strategy be developed and included in the Adaptive Management Plan (AMP) Addendum.

The Region of Halton identified a potential concern with respect to invasive plant species, as follows:

“Without long-term monitoring of non-native species in place, the forests, islands and wetlands in the proposed rehabilitation plan will become dominated by non-native invasive species, most likely Common Reed, Common and Glossy Buckthorn, and Reed Canary-grass. A long-term monitoring plan should be outlined for all areas that will be restored as well as those that will be rehabilitated.”

In response to the agency comments described above, this document has been prepared to outline the proposed approach for invasive species management for the proposed Milton Quarry East Extension (MQEE). The strategy will be incorporated into the updated ARA Site Plans, AMP Addendum and the Ecological Enhancement Plan (EEP) & Rehabilitation Plan Report, to ensure that it is implemented. The *Invasive Species Monitoring and Mitigation Strategy* is described below under the following headings:

- 2.0 Invasive Plant Species of Potential Concern for the MQEE
- 3.0 Adaptive Management Plan (AMP) Addendum
- 4.0 ARA Site Plans
- 5.0 Ecological Enhancement Plan (EEP) & Rehabilitation Plan Report

2.0 Invasive Plant Species of Potential Concern for the MQEE

Potential invasive plant species of concern for the MQEE are listed below under the headings Existing Woodlands and Wetlands, New Woodlands and Lake-based Features.

Existing Woodlands and Wetlands

GEC has not observed invasive plant species to be a significant problem in relation to WMS components installed within environmental features for the existing Milton Quarry Extension. Garlic Mustard (*Alliaria petiolata*) is the main species of concern and it only occurred in a few localized areas where it was previously established along old skidder trails and in areas of past logging, unauthorized bike trails and pedestrian trails, and near former farmstead areas. Garlic Mustard was removed where feasible. All areas within natural features that were disturbed during the installation of feeder lines were promptly treated with a 4" to 6" layer of fresh wood chips, which break down over several years. This approach greatly reduces the establishment of woodland invasive plant species. Over time native woodland species such as Sugar Maple (*Acer saccharum*), Alternate-leaved Dogwood (*Cornus alternifolia*), Chokecherry (*Prunus virginiana*), Zigzag Goldenrod (*Solidago flexicaulis*), sedges (e.g., *Carex gracillima*, *C. pedunculata*, *C. pensylvanica*), Bottlebrush Grass (*Elymus hystrix*), Virginia Wildrye (*Elymus virginicus*), Virginia Waterleaf (*Hydrophyllum virginianum*), Violets (*Viola* spp.), etc. gradually become established. See *Natural Environment Technical Report & EIA* Attachment B1: Photos 14-22 and 29-38.

Other potential invasive plant species in existing woodlands include Common Buckthorn (*Rhamnus cathartica*), Dame's Rocket (*Hesperis matronalis*), Urban Avens (*Geum urbanum*) and Dog-strangling Vine or Swallowwort (*Cynanchum louiseae* [*Vincetoxicum nigrum*], *Cynanchum rossicum* [*Vincetoxicum rossicum*]).

Wetland U1 is already dominated in part by Reed Canary Grass (*Phalaris arundinacea*), which is a robust native grass species that can be invasive. Reed Canary Grass is also present in the upper pools within Wetland W36. It is anticipated that Reed Canary Grass cover will be reduced following enhancement of wetland hydrology in Wetlands U1 and W36, through use of the WMS. Purple Loosestrife (*Lythrum salicaria*) is also present in Wetland U1.

New Woodlands

New woodlands will be created as part of the MQEE Ecological Enhancement Plan (EEP) and Rehabilitation Plan. The proposed EEP planting areas are relatively open and generally lacking in woody cover. Similarly, any rehabilitated areas that will be above the final lake level will initially be open and woody cover will be generally absent. The EEP units will be planted within the first 5 years after licence issuance whereas the rehabilitation will occur progressively over a period of time.

There is the potential that these open areas will be invaded by non-native species such as Common Buckthorn (*Rhamnus cathartica*), Tartarian Honeysuckle (*Lonicera tatarica*) and other invasive honeysuckles. Groundcovers such as Wild Parsnip (*Pastinaca sativa*), Dog-strangling Vine or Swallowwort (*Cynanchum louiseae* [*Vincetoxicum nigrum*], *Cynanchum rossicum* [*Vincetoxicum rossicum*]), Japanese Knotweed (*Fallopia japonica*) and other invasive species.

Although a native species, Manitoba Maple (*Acer negundo*) is also potentially invasive and may compete with the native plantings. Glossy Buckthorn (*Frangula alnus*) is not common within the

MQEE Natural Environment Study Area, but it could become well established in the future since it is bird-dispersed.

Lake-based Features (Shorelines, Islands, Wetlands)

European Common Reed (*Phragmites australis* ssp. *australis*) is of most concern in relation to the lake-based features that will be created as part of the MQEE Rehabilitation Plan. This species has the potential to form dense monocultures along shorelines, around islands and in wetlands.

Mitigation Approach for Invasive Plant Species

The mitigation approach will vary according to species but will generally follow best management practices as described by *Ontario's Invading Species Awareness Program* and in other available resources. Regular monitoring and surveillance for invasive species should allow for early interventions to occur and prevent widespread establishment of invasive species.

Some species such as European Common Reed, Common Buckthorn and Garlic Mustard are already well established in the local area and complete eradication is not feasible. Mitigation measures for these species will focus on preventing establishment and/or spread in existing natural areas and controlling these species in EEP and Rehabilitation Plan areas to the point that invasive species do not prevent the development of target communities and achievement of "free-to-grow" conditions.

3.0 Adaptive Management Plan (AMP) Addendum

Part II, Section 2.4 of the Adaptive Management Plan (AMP) Addendum deals with Water Management System (WMS) implementation. Section 2.4.1 lists restrictions, best practices and design considerations that are recommended for the WMS installation in those areas that are outside of Significant Woodlands, Significant Wetlands and their buffers. Section 2.4.2 lists restrictions, best practices and design considerations that are recommended for the WMS installation within Significant Woodlands, Significant Wetlands and their buffers.

AMP Addendum Part II, Section 2.4.2, already includes the following requirement:

"Prior to working in sensitive areas, equipment will be sufficiently cleaned following applicable protocols to ensure invasive plant species are not introduced to an area."

The following additional requirements will be included in AMP Addendum Part II, Section 2.4.2, to address invasive species monitoring and mitigation:

- Prior to installation of feeder lines, recharge wells and/or diffuse discharges within Significant Woodlands, Significant Wetlands and their buffers, a qualified ecologist will complete an invasive species survey. Best management practices will be followed to remove/control any invasive plant species, so that they are not spread and further established as a result of the WMS installation.

- For the next 5 calendar years following WMS installation within sensitive features, a qualified ecologist will monitor the restored areas for the establishment of invasive plant species. Best management practices will be followed to remove/control any invasive plant species that may become established.
- The findings of the invasive plant species surveys and descriptions of any mitigative actions undertaken in a given year will be included in the AMP annual reporting and the first AMP 5-year review report.

4.0 ARA Site Plans

Sheet 3 of the ARA Site Plans for the MQEE provides the details for the Ecological Enhancement Plan (EEP) for land that will not be extracted and the Rehabilitation Plan for land that will be extracted.

The following notes will be added to “E. EEP Reforestation – Maintenance and Monitoring”:

3. Monitoring for invasive plant species by a qualified ecologist will occur at least annually until “free-to-grow” conditions have been achieved. Best management practices will be followed to remove/control any invasive plant species that may become established.
4. Following the achievement of free-to-grow conditions, monitoring for invasive plant species by a qualified ecologist will occur at least biennially. Best management practices will be followed to remove/control any invasive plant species that may become established.

The following note will be added to “K. Rehabilitation Plan – Deep Lake”:

3. During the operational and lake-filling stages, monitoring for invasive plant species including European Common Reed (*Phragmites australis* ssp. *australis*) will occur at least annually. Sumps, drainage ditches and other detention areas will be checked for European Common Reed. Best management practices will be followed to remove/control any invasive plant species that may become established.

The following note will be added to “L. Rehabilitation Plan – Wetlands”:

6. During and following the creation of shallower wetlands, monitoring for invasive plant species by a qualified ecologist will occur at least annually until the wetland vegetation communities are established. Best management practices will be followed to remove/control any invasive plant species that may become established.

The following note will be added to “M. Rehabilitation Plan – Islands”:

4. During and following the creation of islands, monitoring for invasive plant species by a qualified ecologist will occur at least annually until the island vegetation communities are established. Best management practices will be followed to remove/control any invasive plant species that may become established.

The following note will be added to “P. Rehabilitation Plan – Reforestation – Maintenance and Monitoring”:

3. Monitoring for invasive plant species by a qualified ecologist will occur at least annually until “free-to-grow” conditions have been achieved. Best management practices will be followed to remove/control any invasive plant species that may become established.

5.0 Ecological Enhancement Plan (EEP) & Rehabilitation Plan Report

The *Ecological Enhancement Plan (EEP) & Rehabilitation Plan Report* (GEC 2021) will be updated to reflect the proposed changes outlined above in Sections 3.0 and 4.0.

The following text will be added to Ecological Enhancement Plan (EEP) & Rehabilitation Plan Report Section 3.1.4 (EEP Reforestation – Maintenance and Monitoring):

Monitoring for invasive plant species by a qualified ecologist will occur at least annually until “free-to-grow” conditions have been achieved. Best management practices will be followed to remove/control any invasive plant species that may become established.

Following the achievement of free-to-grow conditions, monitoring for invasive plant species by a qualified ecologist will occur at least biennially. Best management practices will be followed to remove/control any invasive plant species that may become established.

The following text will be added at the end of Ecological Enhancement Plan (EEP) & Rehabilitation Plan Report Section 4.1 (Deep Lake):

During the operational and lake-filling stages, monitoring for invasive plant species including European Common Reed (*Phragmites australis* ssp. *australis*) will occur at least annually. Sumps, drainage ditches and other detention areas will be checked for European Common Reed. Best management practices will be followed to remove/control any invasive plant species that may become established.

The following text will be added at the end of Ecological Enhancement Plan (EEP) & Rehabilitation Plan Report Section 4.2 (Wetlands):

During and following the creation of shallower wetlands, monitoring for invasive plant species by a qualified ecologist will occur at least annually until the wetland vegetation communities are established. Best management practices will be followed to remove/control any invasive plant species that may become established.

The following text will be added at the end of Ecological Enhancement Plan (EEP) & Rehabilitation Plan Report Section 4.3 (Islands):

During and following the creation of islands, monitoring for invasive plant species by a qualified ecologist will occur at least annually until the island vegetation communities are established. Best management practices will be followed to remove/control any invasive plant species that may become established.

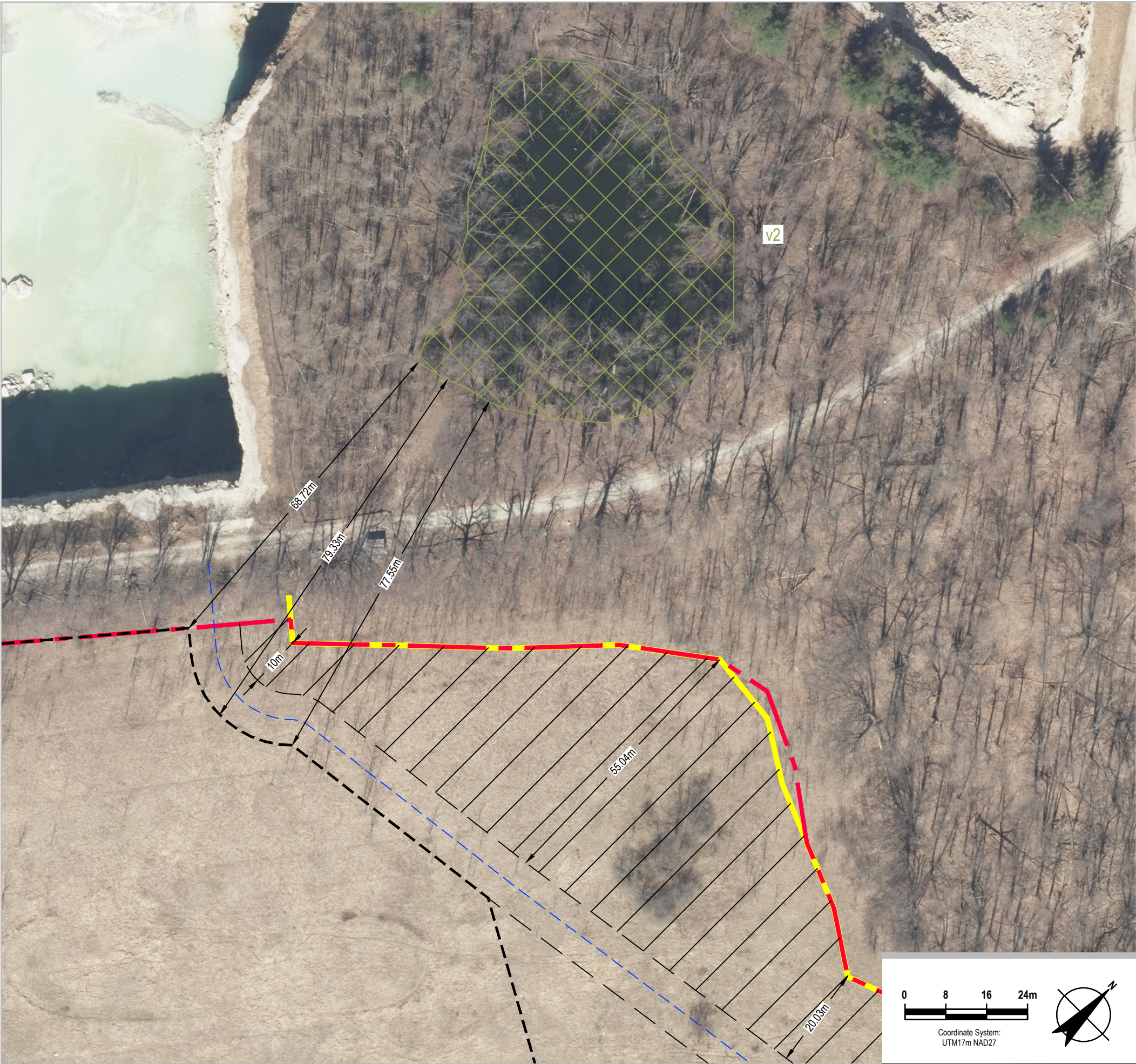
The following text will be added at the end of Ecological Enhancement Plan (EEP) & Rehabilitation Plan Report Section 4.4 (Reforestation – Maintenance & Monitoring):

Monitoring for invasive plant species by a qualified ecologist will occur at least annually until “free-to-grow” conditions have been achieved. Best management practices will be followed to remove/control any invasive plant species that may become established.

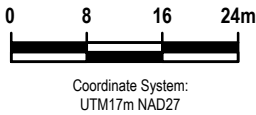
Tab D

Figure 1 – Buffers and Setbacks for Significant Woodland and Wetland V2

Figure 2 – Buffers and Setbacks for Significant Woodland and Wetland W36



- LEGEND**
- WETLAND IDENTIFIED AS PROVINCIALY SIGNIFICANT
 - EXTENSION EXTRACTION LIMIT
 - SIGNIFICANT WOODLANDS
 - EXTENSION LICENCE LIMIT
 - PROPOSED WATERMAIN
 - 10m WMS ZONE
 - BUFFER

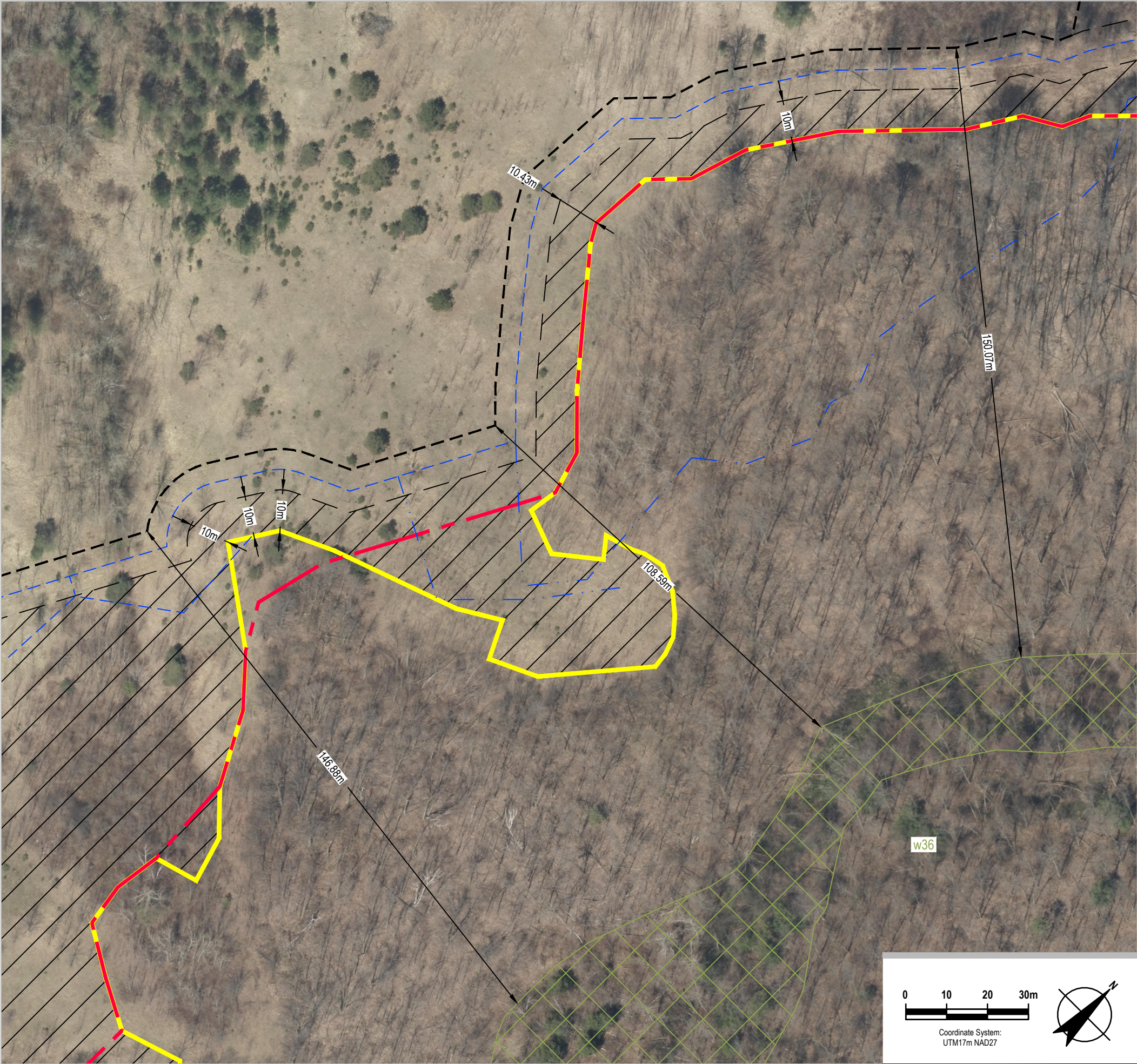


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REGION OF HALTON, ONTARIO



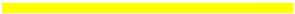




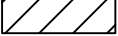
**BUFFERS AND SETBACKS FOR
SIGNIFICANT WOODLAND AND
WETLAND V2**

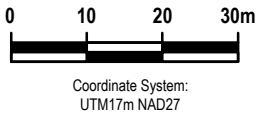
Project No. 10978
Date January 2023

TAB D - FIGURE 1



LEGEND

-  WETLAND IDENTIFIED AS PROVINCIALY SIGNIFICANT
-  EXTENSION EXTRACTION LIMIT
-  SIGNIFICANT WOODLANDS
-  EXTENSION LICENCE LIMIT
-  PROPOSED WATERMAIN
-  PROPOSED FEEDER LINES
-  10m WMS ZONE
-  BUFFER



CRH MILTON QUARRY EAST EXTENSION
REGION OF HALTON, ONTARIO

**BUFFERS AND SETBACKS FOR
SIGNIFICANT WOODLAND AND
WETLAND W36**

Project No. 10978
Date January 2023

TAB D - FIGURE 2

Tab **E**

Figure 1 – Landscape Context



Tab **F**

List of Vegetation Communities
provided by NSE, sorted into
groups by GEC

Tab F – List of Vegetation Communities provided by NSE, sorted into groups by GEC
Goodban Ecological Consulting Inc. (GEC) – January 9, 2023

The following list of vegetation types was originally provided in peer review comments provided by North-South Environmental (NSE) in their peer review letter to Halton Region dated September 13, 2022 and included in the JART Comment Summary Table – Natural Environment (December 2022). The list is described by NSE for Ecodistrict 6E-7 “...as documented as vegetation types characteristic of this Ecodistrict (Henson and Brodribb 2006).”

GEC has sorted the list of vegetation community types into the following groups: Forest; Tallgrass Prairie, Oak Savannah and Oak Woodland; Cliff Rim, Cliff and Talus; and, Wetland.

Forest

Dry - Fresh Red Oak Deciduous Forest Type
Dry - Fresh Sugar Maple - Oak Deciduous Forest Type
Dry - Fresh White Oak Deciduous Forest Type
Dry - Fresh White Pine - Oak Mixed Forest Type
Dry - Fresh White Pine - Red Maple Mixed Forest Type
Dry Black Oak Deciduous Forest Type
Dry Red Pine - White Pine Coniferous Forest Type
Fresh Sugar Maple - Beech Deciduous Forest Type
Fresh Sugar Maple - White Ash Deciduous Forest Type
Fresh Sugar Maple Deciduous Forest Type
Moist - Fresh Hemlock - Sugar Maple Mixed Forest Type
Moist - Fresh Sugar Maple - Black Maple Deciduous Forest Type

Tallgrass Prairie, Oak Savannah and Oak Woodland

Dry Black Oak - White Oak Tallgrass Woodland Type
Dry Black Oak-Pine Tallgrass Savannah Type
Dry Tallgrass Prairie Type

Cliff Rim, Cliff and Talus

Bulblet Fern - Herb Robert Open Shaded Limestone / Dolostone Cliff Face Type
Cliffbrake - Lichen Open Unshaded Limestone / Dolostone Cliff Face Type
Dry Herbaceous Limestone / Dolostone Talus
Hemlock - Sugar Maple Moist Limestone Talus Type
Mountain Maple Open Limestone Talus Shrubland Type
Open Limestone / Dolostone Seepage Cliff Type
Round-leaved Dogwood Open Limestone / Dolostone Cliff Rim Shrubland Type
Sugar Maple Moist Treed Limestone Talus Type
White Birch Dry Treed Limestone Talus Type
White Cedar Dry Treed Limestone Talus Type
White Cedar Treed Limestone Cliff Type

Wetland

Broad-leaved Sedge Organic Shallow Marsh Type
Leatherleaf Shrub Kettle Peatland Type
White Cedar - Hemlock Coniferous Organic Swamp Type
White Cedar - White Spruce Coniferous Organic Swamp Type
Willow Organic Thicket Swamp Type

Tab G

List of Target Ecosites and Vegetation
Community Types for the MQEE
Ecological Enhancement Plan (EEP) and
Rehabilitation Plan

Tab G – List of Target Ecosites and Vegetation Community Types for the MQEE Ecological Enhancement Plan (EEP) and Rehabilitation Plan

Goodban Ecological Consulting Inc. (GEC)
January 13, 2023

The following list of ecosites and vegetation community types are the targets for the MQEE Ecological Enhancement Plan (EEP) and Rehabilitation Plan, as described in the Natural Environment Technical Report (NETR) and Environmental Impact Assessment (EIA) (Goodban Ecological Consulting Inc. 2021). Refer to the following NETR & EIA Sections for further discussion:

- Section 14.2.1 (Ecological Enhancement Plan – Reforestation): Page 129
- Section 15.3.2.1 (Rehabilitation Plan – Deep Lake): Page 147
- Section 15.3.2.2 (Rehabilitation Plan – Wetlands): Page 147
- Section 15.3.2.3 (Rehabilitation Plan – Islands): Page 148
- Section 15.3.2.4 (Rehabilitation Plan – Reforestation): Page 149
- Section 15.3.2.5 (Rehabilitation Plan – Cliffs): Page 151

The ecosites and vegetation community types listed below follow *Ecological Land Classification for Southern Ontario: A First Approximation* (Lee et al. 1998). The target communities 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 *Ecological Survey of the Niagara Escarpment Biosphere Reserve* (Riley et al. 1996). Volume II (Technical Appendices) of Riley et al. (1996) includes Appendix A, which is entitled *Vegetation Communities of the Niagara Escarpment Biosphere Reserve*. 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 *Ecological Land Classification for Southern Ontario: A First Approximation* (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 below for the MQEE EEP and Rehabilitation Plan are also listed from the Halton Section of the Niagara Escarpment by Riley et al. (1996).

List of Target Ecosites and Vegetation Community Types for the MQEE Ecological Enhancement Plan (EEP) and Rehabilitation Plan

Forest

- Dry-Fresh Cedar Coniferous Forest Ecosite (FOC2)
- Fresh-Moist White Cedar Coniferous Forest Ecosite (FOC4)
- Dry-Fresh White Cedar Mixed Forest Ecosite (FOM4)
- Fresh-Moist White Cedar - Hardwood Mixed Forest Ecosite (FOM7)
- Dry-Fresh Oak – Maple – Hickory Ecosite (FOD2)
- Dry Fresh Poplar – White Birch Deciduous Forest Ecosite (FOD3)

Tallgrass Prairie

- Dry Tallgrass Prairie Ecosite (TPO1)

Cliff

- Carbonate Open Cliff Ecosite (CLO1)
- White Cedar Treed Carbonate Cliff Type (CLT1-1)
- White Birch – Aspen Treed Carbonate Cliff Type (CLT1-3)

Lake, Islands and Coves, Wetlands

- Open Water (OAO)
- Mineral Open Beach/Bar (BBO1)
- Willow Gravel Shrub Beach Type (BBS1-2)
- Mineral Shallow Marsh Ecosite (MAS2)
- Mixed Shallow Aquatic Ecosite (SAM1)
- Mineral Thicket Swamp Ecosite (SWT2)
- Maple Mineral Deciduous Swamp Ecosite (SWD3)

References

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