Proposed Burlington Quarry Expansion
JART COMMENT SUMMARY TABLE – Agriculture

Please accept the following as feedback from the Burlington 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 (February 2021)	Reference	Source of Comment	Applicant Response	JART Response
Report/Date:	**Agricultural Impact Assessment, April 2020** **Soil Survey and Canada Land Inventory (CLI) Assessment, November 26, 2020**			**Author: MHBC** **Author: DBH Soil Services Inc.**	
1.	Better integration with the direction of the rehabilitation and after-use plan needs to be incorporated into the AIA. Much of the proposed rehabilitation, specifically on the western expansion lands, may result in the lands achieving the criteria for designation as Escarpment Protection Area if the work is successful. Recreation uses are not permitted within this designation but agriculture/ARU/OFDU may be.	General	Niagara Escarpment Commission		
2.	The AIA (pages 4 and 5) states that the proposed after use vision for the extension and existing quarry is to develop a landform suitable for a future park. As a result, the rehabilitation plan for the South extension includes a beach, lake, exposed quarry faces, wetlands, and forested areas. The rehabilitation plan for the West Extension includes a series of ponds, wetlands, exposed quarry faces and forested areas. There is no discussion how this proposed after use is compatible with agriculture in the context of agricultural use and soil capability in the area potentially influenced or affected by the existing quarry and proposed quarry extensions as well as the NEP, GBP, PPS, Halton, and Burlington plans.	Pages 4 and 5	AgPlan Limited		
3.	Based on publicly available materials (see link below), the applicant proposes a single/unified rehabilitation plan concept for the existing licenced area (licences #5657 and #5499) and the southern and western extensions. Recognizing that both the southern and western extensions cannot be rehabilitated if extraction occurs below the water table, the proposed rehabilitation should address opportunities to maximize agricultural rehabilitation in the remaining areas (licences #5657 and #5499). https://www.mtnemoquarrypark.com/	Page 19	City of Burlington		
4.	On page 37, the AIA opines that this final rehabilitated land-use is compatible with the surrounding agricultural uses and operations and will create landscape diversity. The open-water feature can provide benefits to the agricultural uses in the area through flood attenuation and the storage of fresh water for potential irrigation purposes. The MHBC AIA does not describe the probable use of the rehabilitated lands given human behaviour in areas with open water. There is some probability that the rehabilitated lands will be used for recreation rather than open space uses. Under those circumstances, OMAFRA's MDS Document would characterize the proposed rehabilitated use as type "B" because it would have a higher intensity of recreational use (formerly called active recreational use). Therefore, there is evidence that the proposed after use may be less compatible with agriculture if adjacent uses have or will have livestock production. Additionally, there is no discussion about whether open space uses and/or recreational uses will affect water quality. Neither is there any discussion about whether recreational uses such as swimming and the necessity for washroom facilities will affect coliform counts.	Page 37	AgPlan Limited		
5.	The proposed after use does not demonstrate that the agricultural rehabilitation of remaining areas [areas not underwater] is maximized and/or agricultural rehabilitation in the remaining areas will be maximized as a first priority. The presence of open water may result in water-based activities and other recreational uses. These active recreational uses have the potential to be incompatible with agricultural use.	Page 39 Bullet 10	AgPlan Limited		

Proposed Burlington Quarry Expansion
JART COMMENT SUMMARY TABLE – Air Quality

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	JART Comments (February 2021)	Reference	Source of Comment	Applicant Response (July 2021)	JART Response
Report/Date: Air Quality Study, March 2020		**Author: BCX Environmental Consulting**			
1.	The analysis appears to include a fairly thorough inventory of all the various emission-generating activities in each phase, however they relied almost entirely on US EPA AP-42 emission factors, many of which have very low data quality ratings, and some of which are not directly applicable to the source in question at the proposed facility. The AP-42 document makes it very clear that these lower rated emission factors should only be used as a last resort, and it is highly recommended that source-specific emission factors should be sought, either from source testing at the facility, or from directly applicable source tests from similar nearby sources. Although there may not be are any better (textbook) or more recent data sources for some of these activities, many of the AP-42 emission factors were obtained from very old sources (over 40 years old) and are only marginally related to the activities at the proposed Burlington site. Using such low quality emission factors will likely result in significantly large uncertainties in the modeled air quality impacts. A range of potential emission levels (and exposures) should be developed based on lower and upper bound emissions factors (which generally exist in AP-42 and its supporting documents). A careful review of each of the emissions factors used in the BCX analysis should be conducted to determine those emission factors that are not representative of actual emission levels at the proposed site, and the potential errors (and possible underprediction) due to the use of the emission factors to estimate emission levels. Source testing of existing operations at the facility should also be conducted where applicable.	General	Gray Sky Solutions	US EPA AP-42 emission factors are standardly accepted by the Ontario Ministry of the Environment, Conservation and Parks (Ministry) for air quality studies and Environmental Compliance Approvals (ECAs) for aggregate sites. The key to using these emission factors is to ensure that the emission scenarios assessed are conservative (i.e. they represent maximum emissions scenarios). For this study, the following conservative assumptions were made: 1. All operations were assumed to occur simultaneously at their maximum rates unless specifically limited. In reality, this will not occur. 2. Truck volumes used were very conservative. 3. Assumed all NOx emissions are converted to NO2 (i.e. the ozone limiting methods (OLM) were not used). 4. Wet/dry depletion options were not used in modelling. 5. Met anomalies were not removed as is permitted by the Ministry. 6. Conservative background concentrations were added to the maximum concentrations at sensitive receptors. Based on this, emission estimates are expected to be conservative.	

	JART Comments (February 2021)	Reference	Source of Comment	Applicant Response (July 2021)	JART Response
2.	The SO_2 emission factors that were used for diesel-fired engines are rated (in AP-42) as quality D (marginal), and the B(a)P emissions factors for diesel engines are rated E (marginal). The emission factors for Sand and Gravel processing were obtained from AP-42, Section 11.19.2 (mistakenly quoted in BCX Appendix B as Section 11.9.2), where it is stated that "The emission factors for industrial sand storage and screening presented in Table 11.19.1-1 are not recommended as surrogates for construction sand and gravel processing, because they are based on emissions from dried sand and may result in overestimates of emissions from those sources. Construction sand and gravel are processed at much higher moisture contents." PM emission factors for controlled tertiary crushing and controlled and uncontrolled screening were taken from AP-42, Section 11.19.2, and are all rated E (marginal). As stated in AP-42 (Section 11.19.2.2), "Factors affecting emissions from either source category [stone quarrying or processing] include the stone size distribution and the surface moisture content of the stone processed, the process throughput rate, the type of equipment and operating practices used, and topographical and climatic factors." PM emission factors for conveyor transfers and rock truck unloading were also taken from AP-42 (Section 11.19.2) and are all rated E (marginal). Estimates of emission rates using emission factors from AP-42 that are rated D or E cannot be considered reliable for the Burlington Quarry facility.				
3.	Although the estimated (modeled) levels of particulate matter (PM) were below acceptable "air quality criteria", there are still potential health effects (mortality and morbidity risk) associated with the emitted PM and these additional risks should be evaluated.	General	Gray Sky Solutions	This air quality study (AQS) relies on air quality standards set by the province or Environment Canada where provincial standards are not available. This AQS considers the health effects of PM by comparing PM2.5 modelled concentrations against the Canadian Ambient Air Quality Standards (CAAQS). The PM2.5 standards have been set by the Canadian Council of Ministers of the Environment (CCME) to be protective of health. The assessment very conservatively compares the maximum 24-hour and annual concentrations to the CAAQS which are in fact based on a 3-year average of the annual 98th percentile of the daily 24-hour average concentrations and 3-year average of the annual average of the daily 24-hour average concentrations, respectively. The maximum concentrations of PM2.5 at the property line and at all sensitive receptors are below the CAAQS. The AQS is not intended to be a risk assessment.	

	JART Comments (February 2021)	Reference	Source of Comment	Applicant Response (July 2021)	JART Response
4.	Does Nelson track or have any data on emissions or undertake monitoring related to air quality from their current operation?	General	Halton Region	Nelson has a detailed Dust Management Plan. Nelson completes monitoring checklists from their Dust Management Plan. With the DMP in place, dust from the site is expected to be minimized.	

Proposed Burlington Quarry Expansion
JART COMMENT SUMMARY TABLE – AMP

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	JART Comments (February 2021)	Reference	Source of Comment	Applicant Response	JART Response
Report/Date: Adaptive Management Plan, April 2020		**Author: EarthFX Incorporated, Savanta and Tatham Engineering**			
1.	Staff recommends the Adaptive Management Plan be revisited and updated once significant issues with the Level 1 and Level 2 Natural Environment Technical Report, Surface Water Assessment, Phase 1 and 2 Hydrogeological and Hydrological Study, other reports and After Use have been resolved.	General	Conservation Halton		
2.	The Adaptive Management Plan (AMP) should identify securities to be posted by the applicant to protect the public agencies from financial liability for performance of the mitigation requirements and any on-going management over the long term, in the event the owner fails to do so.	General	Conservation Halton		
3.	The AMP chart should clearly identify targets for monitoring (which should include biota), thresholds against which monitoring will be measured, and concrete, meaningful actions to be taken should there be a clear indication that the quarry is affecting biota through impacts on surface or groundwater. The actions should include potential cessation of extraction.	General	North-South Environmental Inc.		
4.	The most important, central mitigation technique proposed by the Adaptive Management Plan to mitigate future surface water deficits in wetlands or streams is to maintain them by pumping water from the quarry. This means that if there is uncertainty as to the ability to maintain the pumping in perpetuity then it affects the entire mitigation plan. There are concerns about the uncertainty of relying so heavily on the ability to maintain pumping, considering uncertainty regarding so many factors (e.g., continued water supply and its quality, land ownership, financial viability) decades in the future.	General	North-South Environmental Inc.		
5.	Prior to the surrender of the existing ARA licence the licence is required to provide confirmation that any long term monitoring, pumping, or mitigation will not result in a financial liability to the public. Due to the uncertainty of the proposed mitigation measures for the proposed expansion, this should be confirmed prior to the issuance of the ARA licence.	General	Norbert M. Woerns		
6.	The long-term financial implications of the recommended final site rehabilitation scenario have not been addressed.	General	Norbert M. Woerns		
7.	The AMP approach to mitigation is reactive and should be proactive especially with respect to residential wells at high risk of potential well interference.	General	Norbert M. Woerns		
8.	Although titled “Adaptive”, this plan is not so – there is no reference to how the monitoring would be adjusted/revised based on results, particularly in the event of unanticipated impacts. One particular fault is the absence of any contingency recommendations in the event of impacts such as shifting or halting quarry operations.	General	Daryl W. Cowell & Associates Inc.		
9.	“Dewatering post extraction will also lower groundwater levels surrounding the west extension.” What are the implications for the karstic subwatersheds feeding the springs in the Medad Valley? What is the final groundwater elevations?	Page 4 3rd Paragraph	Daryl W. Cowell & Associates Inc.		
10.	‘Prior to the surrender of the *Aggregate Resources Act* licence, the licencee will provide, to the satisfaction of the MNRF, confirmation that any long-term monitoring, pumping, or mitigation will not result in a financial liability to the public.’	Page 4 Section 2.2. West Extension 3rd Paragraph	Norbert M. Woerns		

	Public financial liability. How will this be addressed? There is no discussion of how this will be addressed in this document. This should be demonstrated prior to approval of the licence application.				
11.	'The predictive-based approach relied upon the simulated water level drawdowns in the bedrock aquifers resulting from both climatic conditions and quarry dewatering. The predicted water levels during drought conditions represent a worst-case scenario that may be encountered during the initial phases of quarry operation (Phase 1 and 2).' There is no discussion or predictions regarding the potential for water quality impacts.	Page 7 Section 4.3. Groundwater Impact Assessment Methodology 4th Paragraph	Norbert M. Woerns		
12.	'The extraction of the proposed West Extension (Phase 3 through to 6) is scheduled to commence approximately 10-years following the issuance of the ARA licence. No groundwater thresholds are proposed until enough groundwater monitoring data is collected to establish baseline conditions.' This suggests that currently there is insufficient groundwater monitoring information to establish threshold levels. As noted in comment 56 above, the additional monitoring will represent a baseline that is affected by the Phase 1 and 2 extraction and not represent an undisturbed condition. How will the additional monitoring data affect the AMP?	Page 17 Section 4.5.3. Groundwater Thresholds 1st Paragraph	Norbert M. Woerns		
13.	Are these measures intended to be maintained post-closure if the wetland hydroperiod/stream flow thresholds are exceeded?	Page 29 Additional Mitigative Measures	Daryl W. Cowell & Associates Inc.		
14.	It is noted in Section 7.3 on Page 38 that should pumping cease in the West Arm of the West Branch of the Mount Nemo Tributary of Grindstone Creek, fish habitat would be affected. It should also be noted that the small amphibian breeding pond associated with this tributary meets the criteria for Significant Wildlife Habitat. This breeding pond must also be maintained. Water quality of quarry water as a mitigation measure needs to be monitored, as quarry water may have high conductivity, and amphibian larvae are highly sensitive to increased conductivity. Conductivity should be monitored in ponds maintained by quarry discharge.	Page 38 Section 7.3	North-South Environmental Inc.		
15.	Any revisions should be based on review of the data/trends and should be separately identified for the southern and western extensions. Why would the AMP be revised for the western extension when only the southern extension is being extracted? This needs to be more clearly defined as it will eventually be part of the Site Plans.	Page 39 AMP Revisions	Daryl W. Cowell & Associates Inc.		

Proposed Burlington Quarry Expansion
JART COMMENT SUMMARY TABLE – Blast Impact Analysis (BIA)

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	JART Comments (January 2021)	Reference	Source of Comment	Applicant Response (June 2021)	JART Response
Report/Date: Blast Impact Analysis, March 24, 2020 & April 23, 2020			**Author: Explotech Engineering Ltd.**		
1.	The BIA report under the heading "RECOMMENDATIONS" provides nine (9) recommendations as the condition of blasting in the proposed Nelson Aggregates Burlington Quarry Extension areas. The following need to be addressed: • Critical conditions recommended by the BIA be included in the site plan notes.	Recommendations	DST Consulting Engineers Inc.	Explotech has reviewed the site plans and all required conditions are included and MHBC will be further updating the site plans to include the additional recommendations found in the revised BIA dated June 16, 2021	Comment addressed conditional upon the site plan notes being addressed. Please refer to last row comment for the site plan recommendation related to flyrock. The critical conditions have since been revised to include conditions of approval (with the exception of reference to latest Explotech's BIA report, please refer to Explotech's BIA report of June 16, 2021, Nelson_-_Blasting_Response_to_JART_June_2021_Package).
	JART Technical Comments (November 2021)	**Reference**	**Source of Comment**	**Applicant Response**	**JART Response**
2.	Item 1 and item 7 in the response matrix refers to a "site plan" and "site plan approval", to ensure vibration monitoring but the response matrix for Registered Agreement & Reference Plan, item 1 states "the proposed quarry application does not include site plan control." If there is no site plan approval required, how will vibration monitoring be ensured?		City of Burlington		
	JART Site Plan Comments (November 2021)	**Reference**	**Source of Comment**	**Applicant Response**	**JART Response**
3.	As of January 1, 2022, the aggregate Resources Act will require a licensee or permittee to take all reasonable measures to prevent flyrock from leaving the site during blasting if a sensitive receptor is located within 500 meters of the boundary of the site. Although this flyrock range prediction model is a useful tool used in proper blast design and planning to mitigate flyrock from escaping the site, visual inspection of the rock face, top bench, and communications between the drilling crew and the blasting crew plays a more crucial role. This is because the parameters in model does not include unexpected sources that may play a major role in production of flyrock in a given blast. DST recommend that the notes on the following Site Plan Drawings be revised to incorporate the changes in Explotech's updated BIA report of June 16, 2021: 1. Drawing Sheet 1 of 4, Existing Features, H. Technical Reports – References, Item 7. 2. Drawing Sheet 2 of 4, Operational Plan, N. Report Recommendations, Item 2.		DST Consulting Engineers Inc.		

Proposed Burlington Quarry Expansion
JART COMMENT SUMMARY TABLE – Financial

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	JART Comments (February 2021)	Reference	Source of Comment	Applicant Response (June 2021)	JART Response
Report/Date: Financial Impact Study, April 2020		**Author: Nelson Aggregates Co.**			
1.	The Progressive and Final Rehabilitation Monitoring Study suggests the rehabilitated quarry lands, including water management system, be conveyed to Conservation Halton or another public agency. No formal discussion has taken place with Conservation Halton on future land ownership. How will the Licensee ensure that the long-term monitoring and pumping will not result in financial liability to the public? How will adequate securities be put in place? The Financial Impact Study should be revisited and refined once significant issues with all other reports and the after use have been resolved.	General	Conservation Halton	If Conservation Halton or another public agency are interested in the future ownership of the land then discussions with that public agency will take place to ensure no financial liability to the public for long-term monitoring and pumping.	
2.	Areas for Further Analysis: Road Crossing: Although Nelson plans to incur the capital and maintenance costs of the road crossing, the specific works being undertaken have not been identified. These should be identified and quantified in the study.	General	Watson & Associates Economists Ltd.	Issue resolved. As confirmed in our meeting, the detailed design for the road crossing will not be completed until such time as the land use is approved. Despite this Nelson has committed the pay for the cost to upgrade the section of the proposed road crossing and maintain this crossing while in use by the South Quarry Extension. This is a requirement of the proposed ARA Site Plans. As a result there will be no financial liability to the public.	
3.	This section identifies specific financial commitments for which Nelson agrees to take responsibility. These include two main cost components: • A crossing upgrade on No. 2 Sideroad: This crossing upgrade is required for the trucks to access the Southern Extension from the main quarry. It is indicated that the cost to upgrade this crossing would be funded by Nelson along with the ongoing operating costs and maintenance of the crossing. • Water Supply: It is noted that Nelson would be responsible for the cost of any replacement water supply if it has been impacted by the quarry. This section details the complaint process if there is an issue and the temporary solutions that would be employed until the local residents' well supply is restored.	Section 2. Undertaking of Financial Commitments	Watson & Associates Economists Ltd.	Comment noted. Also see response to Comments 3, 4, and 9.	

Proposed Burlington Quarry Expansion
JART COMMENT SUMMARY TABLE – Hydrogeology

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	JART Comments (February 2021)	Reference	Source of Comment	Applicant Response	JART Response
Report/Date: Level 1 and Level 2 Hydrogeological and Hydrological Impact Assessment Report, April 2020				**Author: Earthfx Incorporated (July 2021)**	
1.	The proposed external catchment diversion along Colling Road should be discussed within the Impact Assessment, with modeling updated if necessary. Identify and address any uncertainty associated with completion of these works within the analysis and report.	General	Conservation Halton	The roadside ditch along Colling Rd. currently flows into the quarry at Blind Line. The diversion is to carry ditch further along to discharge to the unnamed tributary to Willoughby Creek. An approval for the diversion will be required. As noted by Tatham, the Colling Road diversion is not central to the management of quarry water. If the diversion is not approved, the surface runoff from north of Colling Road will continue to drain through the quarry as it currently does. Accordingly, we simulated the ditch as it is currently configured in the remedial scenarios.	
2.	Review of rehabilitation scenarios should better reflect the requirements of the NEP (2017). Currently there is no concrete evidence that the natural and hydrological features of either expansion sites are being restored or enhanced. • Scenario 1 describes that "the overall hydrogeologic and hydrologic conditions will be similar to the final extraction "phase". Please consider Part 2.9.11 (a) & (b) of the NEP. • Scenario 1 will require perpetual pumping of the site to ensure appropriate water levels. More detail on how this would support other public water management needs should be provided. NEC Staff interpret this to mean supporting existing water management needs, not as a mitigation measure to achieve a proposed after-use. (Part 2.9.11 (j)). • Scenario 2 describes that the whole quarry will be allowed to fill and become a lake. Additionally, groundwater levels will be impacted as will stream segments (key hydrologic features). Please consider 2.9.11 (a) & (b) of the NEP.	General	Niagara Escarpment Commission	The rehabilitation objectives and designs are discussed in further detail in the other companion reports (i.e. MHBC 2020). Considerable thought and analysis went into the preparation of the design and it reflected factors including the requirements of the NEP (2017). The integrated modelling rehabilitation analysis indicates that the proposed scenarios will preserve and restore streamflow, groundwater levels, wetland stage, and wetland hydroperiod to conditions similar to those currently observed at the site. The phrase "the overall hydrogeologic and hydrologic conditions will be similar to the final extraction phase" was referring to the groundwater levels and water management features from a modelling context. Considerable site rehabilitation will be done to create and enhance recreational features and enhance natural features on the site. Pumping will be required in Scenario RHB1 to manage groundwater inflows into the site, maintain the recreational features and enhanced natural features on site. Discharge from the site will have the added benefit of helping maintain current flows in the tributaries to Willoughby and Mount Nemo Creeks and to sustain the fisheries that have adapted to these long established rates of flow. Future operations will no longer be driven by golf course irrigation needs and can be optimized for ecological and fisheries benefits as there is considerable water storage in the quarry. The proposed infiltration pond in RHB1 is both larger than the current golf course pond system and closer to the Medad Valley and can also be operated in a manner beneficial to the natural features of the valley. Scenario 2 allows the groundwater levels within the excavated areas to recover. This will also allow groundwater levels outside the site to recover. Flows in the tributaries to Willoughby and Mt Nemo Creeks will decrease because of the cessation of pumping, but a new, more natural equilibrium would be restored with increased groundwater discharge to the Medad Valley. Taking into consideration both rehabilitation scenarios, the water resources and natural environment team recommend rehabilitation scenario RHB1.	

3.	Recommendation: - Following quarrying, the western extension should be rehabilitated to lakes.	General	Daryl W. Cowell & Associates Inc.	A portion of the west extension is being rehabilitated to a shallow lake. As JART is aware, the existing approved rehabilitation plan for the Burlington Quarry requires dewatering to stop and the site to naturally flood to a lake with no off-site discharge. As part of the Burlington Quarry Extension application, Nelson agreed to modify the existing quarry rehabilitation plan to maintain off-site pumping to improve conditions for surrounding lands compared to existing approvals and maximize land area for future after uses. The proposed modification to the existing quarry rehabilitation also results in the West extension being maintained in a dewatered state. Rehabilitating the existing quarry and west extension to a lake with no off-site discharge does not mitigate impacts from the existing approved rehabilitation plan for the existing quarry or maximize land area for future after uses and therefore is not recommended. Both alternative rehabilitation designs were evaluated using the integrated model as described in the report.	
4.	Paragraph five of this section explains that white areas on Figure 6.17 represent areas where groundwater discharge exceeds groundwater recharge. It should be noted that these areas coincide with wetland locations surrounding the proposed southern extension and south of the western extension area (wetland 13201), and abut the West Branch of Mount Nemo the tributary to Grindstone Creek. Considering that the baseline scenario represents partially impacted groundwater conditions the amount of groundwater discharge in these areas was potentially higher. How would groundwater discharge function be restored and maintained during extraction face moving closer to those features resulting in additional groundwater lowering?	Page 135 Section 6.9. PRMS Submodel Outputs, Figure 6.17. Simulated annual net average groundwater recharge in mm/yr	Conservation Halton	Areas of groundwater discharge typically occur in the vicinity of the groundwater-fed wetlands and in riparian areas of streams. This is shown more clearly in Figure 7.20.	
5.	‘Near the existing quarry that available drawdown is reduced, but many existing wells are in close proximity to the quarry, and yet have been providing suitable water supply for many years.’ Evidence to support the conclusion regarding suitable water supply for wells in close proximity to the existing quarry should be provided.	Page 190 Section 7.3. Baseline Conditions, 3rd Paragraph	Norbert M. Woerns	The observation being made here is simply that adequate water quantity has not been a problem in the quarry vicinity despite ongoing operations at the quarry and climate variability. It is recognized that additional drawdowns will likely occur as a result of the quarry extensions. This is discussed in Chapter 8. Please refer to the well survey discussion for more information on local water supply.	
6.	‘However, the off-site discharge will continue as per the conditions of Nelson’s PTTW and ECA.’ There is a recommendation to increase the discharge volume for Sump 100. Tatham page 92 last paragraph. This is contradictory to the above statement. No assessment of the impact of this increase in pumping on downstream areas has been completed to support this increase in pumping. An assessment of the impact of the increase in pumping on downstream areas is required to support this increase in pumping.	Page 191 Section 8.1. Proposed Extraction, 1st Paragraph	Norbert M. Woerns	The model simulated the discharge volumes for the expanded quarry in a similar manner as the baseline conditions where discharge was triggered based on the elevations of the water in the sumps. Thus, discharge was increased automatically in the model due to expansion of the quarry and the assumed drainage of water (precipitation and groundwater inflow). Accordingly, the assessment of the impact of the increase in pumping on downstream areas has been completed.	

7.	'Water is currently routinely diverted from the north quarry discharge pond, through golf course ditches, to the golf course ponds. This water is used for irrigation and a portion also likely infiltrates directly to the groundwater system. The proposed infiltration pond is intended to function in a similar manner to the irrigation ditches and golf course ponds, so as to help maintain the current surface and groundwater system patterns. In addition, based on the findings of this report, Tatham (2020), and Savanta (2020), pumping to the north and south (Quarry discharge locations Sump 0100 and 0200), must be maintained.' The infiltration capability of the irrigation pond is assumed and has not been confirmed with field instrumentation. A compelling case for the maintenance of pumping to the north and south (Quarry discharge locations Sump 0100 and 0200) is not supported with the analysis. A more complete analysis of the impact of the rehabilitation scenarios should be completed considering not only individual stream reaches but the sub-watershed as a whole.	Page 226 Section 8.6.1. Infiltration Pond, 1st Paragraph	Norbert M. Woerns	Modelling analysis showed that leakage from the infiltration pond, presumed to be in contact with the weathered bedrock, would be much higher than for the golf course ponds. Pumping to the sumps would continue in order to: (1) dewater the existing quarry and the quarry extensions, and (2) to help maintain hydrologic and biologic features that have adapted to the higher flows. Predicted changes in discharge from the sumps were analyzed in each scenario. The comprehensive analysis of the rehabilitation scenarios (RHB1 and RHB2) considered potential impacts to groundwater and streamflow across the entire study area including the Willoughby Creek sub-watershed.	
8.	'The final rehabilitation plan will preserve the form and function of the upper reaches of a tributary of Willoughby Creek and the West Arm of the West Branch of Mount Nemo Creek as quarry discharge will continue.' The current conditions within the unnamed tributary of Willoughby Creek and the upper reaches of the West Arm of the West Branch of Mount Nemo Creek have been altered by quarry pump discharge. Is it appropriate to preserve an artificial condition that has altered a natural system? (This requires input from a natural heritage and fisheries habitat perspective.)	Page 326 Section 11.4. Conclusions, 2nd Paragraph	Norbert M. Woerns	We have analyzed the likely flows in Willoughby Creek and its tributaries under RHB1 conditions. These results were transmitted to other team members to analyze potential impact on hydrologic and natural heritage features. We recognize that quarry discharge has modified the pre-development conditions, but there may now be ecological features (e.g., fish populations) that developed over the 70 years of operations that have adapted to or require these flow conditions.	

Proposed Burlington Quarry Expansion
JART COMMENT SUMMARY TABLE – Natural Heritage

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	JART Comments (February 2021)	Reference	Source of Comment	Applicant Response (July 2021)	JART Response
Report/Date: Level 1 and Level 2 Natural Environment Technical Report, April 2020			**Author: Savanta**		
1.	An acknowledgement/assessment of Section 2.2 of the PPS (2020) – Water, does not appear in Section 2.1.1 of the Report. NEC Staff are of the opinion that Section 2.2 of the PPS contains a number of policies linked to natural heritage that should be assessed and incorporate findings from the Hydrologic and Surface Water reports.	General	Niagara Escarpment Commission	Section 2.2 of the PPS identifies the following water- related policies: "Planning authorities shall protect, improve or restore the *quality and quantity of water* by: a) using the *watershed* as the ecologically meaningful scale for integrated and long-term planning, which can be a foundation for considering cumulative impacts of development; b) minimizing potential *negative impacts*, including cross-jurisdictional and cross-*watershed* impacts; c) evaluating and preparing for the *impacts of a changing climate* to water resource systems at the watershed level; d) identifying water resource systems consisting of *ground water features*, *hydrologic functions*, *natural heritage features and areas*, and *surface water features* including shoreline areas, which are necessary for the ecological and hydrological integrity of the *watershed*; e) maintaining linkages and related functions among *ground water features*, *hydrologic functions*, *natural*	

				heritage features and areas, and *surface water features* including shoreline areas; f) implementing necessary restrictions on *development* and *site alteration* to: 1. protect all municipal drinking water supplies and *designated vulnerable areas*; and . protect, improve or restore *vulnerable* surface and ground water, *sensitive surface water features* and *sensitive ground water features*, and their *hydrologic functions*;) planning for efficient and sustainable use of water resources, through practices for water conservation and sustaining water quality;) ensuring consideration of environmental lake capacity, where applicable; and ensuring stormwater management practices minimize stormwater volumes and contaminant loads, and maintain or increase the extent of vegetative and pervious surfaces. *Development* and *site alteration* shall be restricted in or near *sensitive surface water features* and *sensitive ground water features* such that these features and their related *hydrologic functions* will be protected, improved or restored. Mitigative measures and/or alternative development approaches may be required in order to protect, improve or restore *sensitive surface water features*, *sensitive ground water features*, and their *hydrologic functions*." The water policies that are relevant to natural heritage are indirectly addressed throughout the NETR, specifically in the sections regarding fish and fish	

				habitat, given the importance of water quality and quantity to maintaining fish and fish habitat. Relevant water policies are also indirectly addressed in other technical reports (i.e., Surface Water Assessment and Hydrogeological and Hydrological Impact Assessment Report).” The overall policy analysis is found in the Planning Report, which includes a review of Section 2.2 of the PPS.	

2.	Drainage and surface outflows of the existing quarry operations extend beyond the quarry footprints and are maintained through pumping operations, which are recommended to continue in perpetuity, long after the license for extraction has been surrendered. As long-term plans for the quarry contemplates changes to drainage conditions, along with the changes associated with climate change, understanding the effects on the surrounding fisheries habitat within the Niagara Escarpment is a key consideration in the proposed quarry expansion. The rationale for continued pumping operations should be supported by more detailed information on how fish habitats and linkages are to be maintained. Discussion on the existing flow regime and the form and function of watercourses and linkages should be included to determine how future changes with pumping and drainage will impact these watercourses. Hydrograph information and hydroperiods in relation to the surrounding fish habitat should also be included in the discussion.	General	Matrix Solutions Inc.	Continued pumping after the operational period has ceased has been identified in the NETR as a key mitigation measure to prevent long term impacts on fish and fish habitat in Willoughby Creek and the West Arm of the West Branch of the Mount Nemo Tributary of Grindstone Creek (as well as further downstream reaches). Pumping from the existing quarry sumps 0100 and 0200 has been occurring since construction of the original quarry and fish communities in these watercourses, as well as the habitat within the watercourses (i.e., stream form and associated function, such as channel size and biophysical processes such as erosion and sedimentation) are expected to be accustomed to, and reliant upon, the pumped discharge. Elimination of pumped discharge would be expected to have negative impacts on the form and function of these watercourses as they revert back to pre-quarry	

				pumping hydrological regime (recognizing that the rehabilitated quarry will be remaining), which, in the case of the West Arm of the West Branch, would be intermittent and in the case of Willoughby Creek, would involve substantially less flow downstream from the current discharge outlet at the mouth of the Unnamed Tributary. The comment has requested more detailed information on “how fish habitats and linkages are to be maintained”. Essentially, the proposed pumping regime will continue the current flow rates supplied by pumping indefinitely to avoid the substantial change in hydrology that would occur if pumping were to cease after operations are done (as permitted by the current approvals for the existing quarry). Pumping will continue indefinitely to the current outlet locations and at the same general discharge rate regime as currently occurring and will be occurring through the operational scenario. This has been modelled in Rehabilitation Scenario 1 in the integrated stream flow model in the Hydrogeological and Hydrologic Impact Assessment Report. Hydrological changes in Willoughby Creek and the West Arm of the West Branch are predicted to be minimal relative to existing conditions. Further, the predicted impacts on stream flows outlined in Rehabilitation Scenario 2 depict much more substantial changes in flow relative to current conditions and would be expected to have substantial impacts on fish and fish habitat in these watercourses.	

3.	As extraction proceeds to its later stages and progressive rehabilitation takes place, it is unclear how this impacts fish habitat. It is not fully explained how the quality and quantity of discharge water will be maintained. It is anticipated that there will be a lowering of local groundwater and surface water levels from quarry operations and quarry dewatering. It would be good to understand how water quantities will be balanced and water quality will be maintained at various stages during blasting and quarry operations. Furthermore, it is uncertain if ground water conduit flow paths will be interrupted during quarrying operations.	General	Matrix Solutions Inc.	Changes in water quantity through the P3456 and Rehabilitation scenarios have been assessed in the integrated flow model. This has accounted for the predicted lowering of localized groundwater table in vicinity of the quarry as well as predicted increases in some phases as a result of shifting the groundwater volume to the surface water level (i.e., through discharge of intercepted groundwater through sump 0100 into the Unnamed Tributary of Willoughby Creek). Discharge of water will be consistent with current operations and potential impacts to water quantity and quality will be addressed through the provisions of the AMP and MECP approvals. More details are provided in the attached Watercourse Characterization Summaries.	
4.	Effects from pumping and lake creation, including shutdown of the pumps, malfunctions or spills at the quarry should be included in the discussion. Furthermore, temperature impacts from the creation of the lake, and other potential effects such as exotic species invasion/blue green algae should also be included in the discussion.	General	Matrix Solutions Inc.	The AMP includes appropriate mitigation and monitoring measures to ensure the effects from pumping and lake creation will not negatively impact the surrounding environment. The AMP includes monitoring, mitigation and reporting requirements during operations and lakefilling. If there are additional requirements that the agencies would like included in the AMP please provide these for Nelson’s consideration.	

5.	Please include a more detailed discussion on net gain as per Halton Region's Aggregate Resources Reference Manual. Currently direction is to refer to the Site Plan and AMP, which does not give enough detail to ensure that net gain is achieved.	General	Conservation Halton	Limited natural heritage features are proposed for removal and substantial natural heritage features are proposed for creation and enhancement. For example, woodland cover will have a net gain of 28 ha. Wetland cover will have a net gain of 3.6 ha. The native diversity and composition of habitat will increase greatly from that which is golf course and agriculture. We disagree that the site plans do not provide sufficient detail for the creation of these habitats. In addition, MNRF has to be satisfied that these habitats are created prior to the surrender of the license.	

JART COMMENT SUMMARY TABLE – Noise

Please accept the following as feedback from the Burlington 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 (May 2021)	Reference	Source of Comment	Applicant Response	JART Response
Report/Date: Noise Impact Assessment, April 2020 Report/Date: Acoustic Assessment Report – Halton Asphalt Supply, February 2020				**Author: HGC Engineering Author: HGC Engineering**	
1.	Provide a copy of the HGC report for MECP environmental compliance approval to confirm how the height of the berms was determined and what mitigation they provide to the nearby residential noise sensitive receptors.	General	City of Burlington	An updated Acoustic Assessment Report dated April 27, 2021 was submitted to the MECP in support of an ECA amendment application for the Halton Asphalt Supply hot-mix asphalt plant located on the quarry lands. A copy of the updated AAR is included as an Appendix to the updated Noise Impact Study (NIS) enclosed with this response. Determination of existing berm heights is detailed in Section 6 of the AAR and Section 5 of the NIS.	
2.	Provide a clear figure/map summary of stationary source noise levels for each receptor and sample calculations.	General	City of Burlington	The updated NIS includes sound level contours for worst-case operating scenarios in Figures 4a through 4i, and detailed source sound level contributions at points of reception, included as Appendix D.	
3.	MHBC Burlington Quarry Extension Drawing 2 of 4 dated September 2020, Note I, items 1 to 6, reference “complete a noise audit to ensure the site is meeting NPC-300 Noise Guidelines” with each phase. The HGC Noise Impact Assessment Nelson aggregate Quarry Extension dated April 22, 2020 does not reflect this requirement in their summary or recommendations. The noise report will need to be updated to reflect these statements.	General	City of Burlington	Appendix C of the updated NIS includes a recommendation for periodic noise surveys to confirm that extension operations comply with the limits stipulated in NPC-300.	
4.	The asphalt plant horn, use of Jacobs brakes, working hours, and low-frequency noise from the asphalt plant burners remain to be dealt with and should be dealt with by direct talks with the quarry owners. *JART Comment:* These issues will be raised in discussions with the quarry operator.	General	J.E. Coulter Associates Limited	Comment only, no response required.	
5.	Section 4 references Appendix B, which outlines on-site operations. Appendix B provides Sound Power Levels for equipment/trucks and estimates of truck haul movements, but does not reference noise levels on adjacent receptors. i.e. the proposed entrance for the No. 2 Side Road south quarry expansion could impact existing residential lots, typically the house can provide protection for rear yard outdoor living areas from road/traffic noise, but if the Quarry and associated vehicles/equipment is operating at the side or rear of existing homes what is the effect on the houses outdoor living areas? Please assess each house in the area on all sides. Specifically, comment if noise/acoustical barriers are required for adjacent/nearby existing residential properties. Please also provide comment in this regard for the other adjacent existing residential properties on the west expansion, i.e. without a new access proposed, combined with the construction of new berms and difference in elevation, the noise from the West expansion may be very different from the noise on the South expansion.	Section 4 (Appendix B)	City of Burlington	The updated NIS includes noise from haul trucks crossing the 2 Side Road to access the South Extension and assesses the sound levels of the quarry at all façades and in outdoor amenity areas of neighbouring homes. Multiple operating scenarios are presented, representative of “worst-case” impacts at each point of reception.	

Report/Date: Acoustic Assessment Report – Halton Asphalt Supply, February 2020				**Author: HGC Engineering**	
6.	The executive summary states the purpose of the report is to support an application to the Ontario Ministry of Environment Conservation and Parks for an Environmental Compliance Approval for a Hot Mix Asphalt Plant. Is this for a renewal of an existing MECP Compliance Approval? The Halton Asphalt Supply Ltd. (Steed & Evans) is existing. Has the Compliance Approval from the MECP been received? Is this report also in support of the OPA?	General	City of Burlington	The AAR was prepared in support of an ECA amendment application for the hot-mix asphalt plant. A copy of the existing ECA for the hot-mix asphalt plant is enclosed with this response. The amended ECA has not yet been issued by the MECP. However, as noted in Section 1 of the NIS, the MECP Senior Noise Engineer assigned to the application has confirmed the noise review is complete. The NIS enclosed with this response has been prepared in support of the OPA.	
7.	Please confirm in the report who is responsible for the implementation and maintenance of the required noise measures.	Section 3.2	City of Burlington	The implementation of noise control measures at the hot-mix asphalt plant will be the responsibility of Halton Asphalt Supply, which will be stipulated in the ECA upon issuance.	

Proposed Burlington Quarry Expansion
JART COMMENT SUMMARY TABLE – Progressive and Final Rehabilitation Monitoring

Please accept the following as feedback from the Burlington 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 (February 2021)	Reference	Source of Comment	Applicant Response (June 2021)	JART Response
Report/Date: Progressive and Final Rehabilitation Monitoring Study, April 2020				**Author: MHBC**	
1.	Among other impacts, the proposed after-use should address whether the use generates vehicular traffic impacts, demands for additional water and wastewater services, and demands parking on site or nearby.	General	City of Burlington	The proposed Burlington Quarry Extension application only proposes to create a land form as part of the rehabilitation plan for the site. The rehabilitation plan does not permit any after uses, however the site has been designed to be suitable for recreation, conservation and water management after uses. Any future after uses would be determined after the Aggregate Resources Act license is surrendered. The proposed after use would be proposed by the owner of the site following surrender of the license. As required by the Niagara Escarpment Plan, Region of Halton Official Plan and City of Burlington Official Plan future approvals will be required to permit after uses on the site (e.g. NEPA, ROPA, LOPA and NEC DP). As part of these applications any potential impacts will be evaluated as part of that process.	
2.	Whether or not the proposed after-uses are appropriate or possible will be predicated on the effectiveness of the progressive rehabilitation program. As the report notes once a quarry license is surrendered it must be re-designated through a subsequent NEPA application. It is at this time that the lands are assessed against the criteria for designation found under Part 1 of the NEP and an appropriate designation applied.	General	Niagara Escarpment Commission	Comment noted. Also see response # 1.	
3.	The report notes that it is anticipated by the applicant that the lands resulting from the rehabilitation would achieve a mix of land uses designations (ENA, EPA, ERA). It is noted that a number of uses proposed within the after-use plan would not be permitted within these designations. While inclusion within NEPOSS and the submission of a Park Management Plan could be a path to address this, it is noted that NEPOSS lands must be within the public realm necessitating ownership of the lands by a public body. On-going discussions and assessment of the rehabilitation would be required throughout the foreseeable future; the after-uses will be reasonably considered through this work and once the license has been abandoned.	General	Niagara Escarpment Commission	Comment noted. Also see response # 1.	
4.	Staff recommends the Progressive and Final Rehabilitation/Monitoring Study be revisited and updated once significant issues with the Level 1 and Level 2 Natural Environment Technical Report, Surface Water Assessment, Phase 1 and 2 Hydrogeological and Hydrological Study, other reports and After Use have been resolved.	General	Conservation Halton	Comment noted. If changes are required to the monitoring program or proposed rehabilitation land form these revisions will be reflected on the ARA Site Plans and the AMP since these documents will ultimately govern montoring and rehabilitation of the site.	

5.	Recommended rehabilitation option RHB1, as shown on the Site Plan, requires perpetual pumping to maintain artificially low groundwater levels. An alternative (RHB2) has been proposed with resulting fish habitat impact concerns. No cost benefit analysis of impacts of the alternative rehabilitation scenario has been provided. The overall impact of the two rehabilitation scenarios on the subwatershed does not appear to have been considered in this analysis nor has the cumulative impact of the existing quarry been considered.	General	Norbert M. Woerns	Disagree. The overall impact of the two rehabilitation scenarios on the watershed have been considered. Based on this impact analysis RHB1 has been recommended to maintain discharge off-site since the existing approved rehabilitation plan discontinues off-site discharge. As part of the Burlington Quarry Extension application, Nelson has agreed to modify the existing quarry rehabilitation plan to maintain off-site pumping to improve conditions for surrounding lands compared to existing approvals.	
6.	No discussion on the need to integrate the rehabilitation and closure plan of the proposed expansion with that of the existing quarry. The Progressive and Final Rehabilitation Monitoring Study provides detailed information on the rehabilitation of the proposed extension. Information is lacking on the relationship of the proposed extensions to the approved rehabilitation plan for the existing quarry.	General	Norbert M. Woerns	As noted in the application an amendment to the existing quarry rehabilitation plan will be required to integrate the proposed extension. Nelson has now submitted this application to MNRF. Attached is a copy of the revised rehabilitation plan that has been submitted to MNRF.	
7.	There is no discussion of the maintenance requirements of the proposed land use for the preferred recommended rehabilitation option and the potential affects on surface water and groundwater quality.	General	Norbert M. Woerns	See response to Comment # 1.	
8.	The rehabilitation plan does not explain how the West Extension area will be integrated with the existing quarry to achieve the preferred rehabilitation Scenario 1 (RHB1).	General	Norbert M. Woerns	See response to Comment # 12. A revised rehabilitation plan for the existing quarry has been submitted to MNRF to achieve the preferred rehabilitation scenario.	
9.	The rehabilitation monitoring plan includes only monitoring of surface and ground water – no terrestrial monitoring of habitat or monitoring of wildlife to determine if the rehabilitated wildlife habitat features are functioning according to their specified purposes. Monitoring of biota should be included.	General	North-South Environmental Inc.	Monitoring of the site will be completed in accordance with the AMP until rehabilitation is complete and the license is surrendered. The license cannot be surrendered until MNRF is satisfied that the proposed land form as shown on the ARA Site Plans have been created which includes the required terrestrial habitat. The monitoring being referenced by North-South Environmental Inc. is not typically required for rehabilitated aggregate sites. If there are any monitoring requirements that the agencies would like included please provide the specific monitoring note for Nelson's consideration and an example where it has been included on other sites. If appropriate, these monitoring requirements can be included on the ARA Site Plan and / or the AMP since these documents will ultimately govern the monitoring of the site.	

10.	Unclear on why the revision of the current rehabilitation plan is contingent on the approval of the extension- further details regarding this connection would be appreciated. Neither the current nor the proposed rehabilitation plans include any agricultural lands- please provide an explanation. For example, there are 162.0 hectares of grasslands proposed- why isn't this proposed for agricultural use? A number of the uses proposed in the after-use vision in Figures 6 to 9 are active, not passive, recreational uses (i.e. soccer/baseball fields, amphitheatre, volleyball courts, skate park etc.) and would not be considered compatible with the City's land use objectives for the Rural Area. For example, subsection 2.1.2 e) of the Burlington Official Plan, 1997: To allow only passive recreational uses that are compatible with rural land uses and the preservation of natural features and prime agricultural areas.	Page 4 Section 2.0. Overview of the Burlington Quarry Extension, Last 2 Paragraphs	City of Burlington	The existing approved quarry has an approved rehabilitation plan (e.g. lake with no off-site discharge). If the Burlington Quarry Extension is not approved Nelson will be completing rehabilitation in accordance with the approved rehabilitation plan. As per our recent meeting with JART, Nelson is exploring the possibility of restoring a portion of the existing quarry to agricultural with the agricultural soils from the proposed South Quarry Extension. This will be confirmed as part of Nelson's response to JART's agricultural comments. Regarding potential after uses please see response to Comment # 1.	
11.	The report notes that the 4.0 hectares proposed for an off-site ecological enhancement plan are currently in active agricultural production. Are these lands within a prime agricultural area? If they are to be permanently taken out of production through the creation of habitat for endangered species, these lands should be included within the Agricultural Impact Assessment. Given the lack of proposed agricultural uses within the rehabilitation plan, why are there no proposed off-site agricultural enhancements to mitigate the adverse impacts to the Agricultural System?	Page 17 Section 4.0. Rehabilitation and After Use Policy Analysis, 2nd Bullet	City of Burlington	Map 1 of the Region of Halton Official Plan designates the 4.0 ha area as part of the Regional Natural Heritage System and the area is also mapped by MNRF as habitat for Jefferson Salamander. While the area is also considered a prime agricultural area, the lands have a planned function to provide for natural heritage uses. In addition the ecological restoration does not remove the agricultural soils within this area and there are numerous areas mapped as prime agricultural area that also contain key natural heritage features. As per our recent meeting with JART, Nelson is exploring the possibility of restoring a portion of the existing quarry to agricultural with the agricultural soils from the proposed South Quarry Extension. This will be confirmed as part of Nelson's response to JART's agricultural comments.	
12.	The rehabilitation plan notes that rehabilitation back to an agricultural use is not required based on the applicable policies, but does not speak to the following Niagara Escarpment Plan policy: in prime agricultural areas, where rehabilitation to the conditions set out in (g) and (h) above is not possible or feasible due to the depth of planned extraction or due to the presence of a substantial deposit of high quality mineral aggregate resources below the water table warranting extraction, agricultural rehabilitation in the remaining areas will be maximized as a first priority. The report only quotes the amount of prime agricultural land in production (12.7 hectares). The policy framework for the protection of prime agricultural lands is not contingent on whether the lands are in active production. In the absence of a refinement to the Provincial and Regional prime agricultural area mapping, the City continues to consider the golf course lands in the Western Extension as prime agricultural, regardless of their current use. Further, it has not been established that the golf course lands are beyond rehabilitation to an agricultural use in future. The full amount of prime agricultural lands being removed should also be referenced here, for complete context	Page 17 Section 4.0. Rehabilitation and After Use Policy Analysis, 1st Paragraph (after bullets)	City of Burlington	As per our recent meeting with JART, the agencies do not dispute that rehabilitation to agricultural in the West Extension and South Extension is not feasible based on the policies of the Niagara Escarpment Plan. The agencies determined that rehabilitation in the "remaining areas" refers to rehabilitation to agricultural in the existing quarry since the rehabilitated land form is proposed to change from a lake to also include areas of terrestrial habitat. As per our recent meeting with JART, Nelson is exploring the possibility of restoring a portion of the existing quarry to agricultural with the agricultural soils from the proposed South Quarry Extension. This will be confirmed as part of Nelson's response to JART's agricultural	

				comments. Regarding the West Extension it is Nelson position that the West Extension does not contain prime agricultural land and therefore that portion of the application does not remove prime agricultural land.	
13.	It is also noted that Streamflow and Water Temperature Thresholds (AMP's Table 7) Section 7 - Compliance Monitoring and Assessment or Section 6.2 of this study.	Pages 27-28 Surface Water Monitoring Program Tables 4, 5, 6	Halton Region	Comment noted. If changes are required to the reflected in the AMP since this document will ultimately govern monitoring of the site.	
14.	Information contained in Section 6.3 in this study corresponds to Section 7.3 – Post-Extraction Monitoring Program in the AMP (April 2020). Any comments related to post-extraction monitoring program in the assessment studies, AMP, and site plan should be addressed and applied accordingly to respective text in this study.	Page 29 Section 6.3 Post-Extraction Monitoring Program Page 29	Halton Region	Comment noted. If changes are required to the monitoring program or proposed rehabilitation land form these revisions will be reflected on the ARA Site Plans and / or the AMP since these documents will ultimately govern monitoring and rehabilitation of the site.	

Proposed Burlington Quarry Expansion
JART COMMENT SUMMARY TABLE – Surface Water

Please accept the following as feedback from the Burlington 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 (February 2021)	Reference	Source of Comment	Applicant Response (July 2021)	JART Response
Report/Date: Surface Water Assessment, April 2020		**Author: Tatham Engineering**			
1.	An assessment of the existing roadside ditches will be required to confirm enough capacity, or the existence of potential capacity to carry flow during design events.	General	City of Burlington	An assessment of the existing roadside ditches downstream of the discharge locations is enclosed for reference. The assessment confirms the roadside ditches have adequate capacity to convey the proposed flows.	
2.	It is recommended that the proponent take another look at the proposed rehabilitation plan towards the end of the extraction operation and to make any modifications to the rehabilitation plan to accommodate any hydrologic changes encountered during the extraction period.	General	City of Burlington	The design of the rehabilitated landform needs to be completed now since progressive rehabilitation is required during operations and the work includes significant grading. Mitigation, monitoring and annual reporting of hydrologic conditions will be completed throughout the operations and during rehabilitation to prevent adverse impacts to adjacent key hydrologic features. If the pumping regime requires any future adjustments this can be accommodated based on the proposed rehabilitated landform for the existing quarry and proposed extension.	

3.	Drainage to the South Extension is anticipated to be reduced in size as open extraction will intercept rainfall, groundwater, and surface runoff. To alleviate the reduced drainage, discharge to the West Arm from the Quarry Sump 0200 is proposed to continue throughout its operations in accordance with Nelson's Permit to Take Water (PTTW) and Environmental Compliance Approval (ECA) that will require an amendment to include the discharge from the south extension. For the West Extension, extraction activities will reduce the size of the sub catchments draining to several of its existing outlets. Extraction and quarry dewatering are predicted to lower groundwater levels surrounding the west extension within 350.0 metres of the extraction face. Similar to the West Arm discharges, discharge to the Colling Road roadside ditch and Willoughby Creek will be maintained from the Quarry Sump 0100 and is proposed to continue throughout the duration of quarry operations in accordance with Nelson's PTTW and ECA that will require an amendment to include the discharge from the west extension. The runoff regime to the discharge outlets requires further detail. For example, how is the reduced drainage from quarrying balanced by the pumping? As it is understood that the Assessment of impact to Willoughby Creek is based on computer simulations and not real field measurements to verify existing conditions, how is the flow to the downstream reaches validated? If the discharge regime is set to mimic existing conditions, how will this be operationalized in terms of pumping rate?	General	Matrix Solutions Inc.	Continuous streamflow monitoring data has been collected at three locations (SW14, SW7 and SW2) along Willoughby Creek and at SW1 at the upstream end of the Unnamed Tributary of Willoughby Creek since 2014. The integrated surface and groundwater model has been calibrated to the streamflow monitoring data from these monitoring stations. The streamflow data collection effort was a key part of the study as it provides targets for calibrating the model to ensure it represents current conditions regionally and in the quarry vicinity. The calibrated integrated surface and groundwater model has been used to predict the impacts the proposed quarry expansion will have on surface and groundwater features. As mentioned, the primary source of flow into the Unnamed Tributary of Willoughby Creek and Willoughby Creek is quarry discharge. As mentioned, the reductions in streamflow are predicted to be minor and quarry discharge is proposed to occur long-term to maintain streamflow in these features. Additional rationale and details regarding off-site discharge will be provided as the AMP is refined in consultation with the agencies moving forward.	
4.	The approved rehabilitation plan envisions that the existing Burlington Quarry will be rehabilitated into a lake upon completion of extraction activities, which will result in no further discharges to both Willoughby Creek and West Arm unless water levels in the lake rise in response to wet conditions. This scenario is anticipated to reduce or eliminate baseflows to these systems. As this scenario is considered a negative effect, a new proposed rehabilitation plan proposes rehabilitation of the west extension into a lake (mentioned originally as part of the adaptive management plan) but in the surface water management plan, this has been changed to a conversion of the lands to a landform suitable for recreational, natural heritage and water management purposes. This scenario also includes maintaining the long-term offsite discharge from Quarry Sump 0100 and Quarry Sump 0200 to the tributary of Willoughby Creek and West Arm as part of the new rehabilitation plan for the Burlington Quarry and West Extension. The discussion of continual pumping and controlled release of water coming from the lake should be explored further as there may be some benefit to having the lake discharge provide a more stable flow regime that is less susceptible to mechanical failure or disruptions. There is also a diversion from Colling Road that has been proposed and the resultant effects on downstream fisheries habitat along Willoughby Creek should also be discussed.	General	Matrix Solutions Inc.	If the existing quarry is rehabilitated as currently approved (into a lake), the predicted lake water level is expected to fluctuate from approximately 268.75 m to 269.30 m, with an average water level of 269.05 m. The existing weir discharging water to the Unnamed Tributary of Willoughby Creek at Collings Road has a sill elevation of 269.08 m and upstream wetland average water level is 269.27 m. As such, a rehabilitated quarry lake will not drain into the wetland via gravity flow. To achieve gravity flow into the Unnamed Tributary of Willoughby Creek, the existing weir will have to be lowered, adversely impacting the wetland upstream. The existing culvert crossing Collings Road downstream of the weir has an invert elevation of 268.85 m and a weir or outlet elevation below 268.85 m cannot be achieved. Its noted, even if the weir and wetland are removed and the rehabilitated lake outlet set to 268.85 m, there will be periods when discharge to the Unnamed Tributary of Willoughby Creek ceases. The proposed Colling Road diversion will direct surface runoff generated north of Colling Road to the Unnamed Tributary of Willoughby Creek, its current and historic outlet, by-passing the quarry settling ponds and quarry sump.	

5.	The Colling Rd. diversion seems central to future management of quarry water; additional background and status on this proposal is required including the potential for a back-up strategy in the event this is not ultimately feasible.	General	Wood Environment & Infrastructure Solutions	The Colling Road diversion is not central to the management of quarry water. If the diversion is not approved, the surface runoff from north of Colling Road will continue to drain through the quarry as it currently does. To accommodate the surface runoff from north of Colling Road, the on-site settling ponds will be reconfigured to provide sufficient on-site volume to store the additional water until it can be discharged off-site in accordance with the terms and conditions of the PTTW.	
6.	Details of impacts during remediation when the lake is filling are not provided; these need to be documented and considered in the assessment of impacts to surrounding systems.	General	Wood Environment & Infrastructure Solutions	Upon completion of extraction in the south extension, the discharge from the south extension will cease and the quarry will be allowed to fill with water forming a lake. However, the discharge to the West Arm of	

7.	Section 3.2.3 West Extension (Page 30) “It is noted, the drainage systems, specifically roadside ditches, downstream of the culvert crossings Cedar Springs Road are poorly defined or nonexistent. It is expected that any surface runoff draining through the culverts will either, evaporate, infiltrate or drain overland following the topographic low through the road allowance or across private property to the Medad Valley and Willoughby Creek.” Further investigation is needed to determine the baseline conditions in order to understand the flow regime.	Page 30 Section 3.2.2	City of Burlington	A summary of the drainage conditions established through additional field inspections and streamflow monitoring is as follows: 1) Surface water monitoring location M33 – culvert crossing No. 2 Sideroad is completely obstructed, the downstream end of the culvert could not be located and there is no define channel downstream of No. 2 Sideroad. It is expected surface runoff collects in the wetland upstream and infiltrates or evaporates. Based on monitoring of the wetland completed in 2020 and to date in 2021, little water accumulates in the wetland and the wetland is perched above the groundwater table. The shallow groundwater level increases rapidly during rain events indicating infiltration of surface runoff into the underlying soil. 2) Surface water monitoring location M34– appears to drain east under Cedar Springs Road onto the Quarry property and into Wetland 13201. During our rounds of surface water monitoring, we have not witnessed flow through this culvert. 3) Surface water monitoring location M35 - surface runoff drains west through a culvert crossing under Cedar Springs Road and a crossing under Cedar Springs Court. No defined outlet was identified downstream of Cedar Springs Court and surface runoff is expected to flow west overland as sheet flow to Willoughby Creek. During our rounds of surface water monitoring, flow has not been witnessed in this the Cedar Springs Road culvert. 4) Surface water monitoring location M36– surface runoff drains west through a culvert crossing under Cedar Springs Road and continues west to Willoughby Creek through a poorly defined channel across private property. During our rounds of surface water monitoring, flow has not been witnessed in this culvert. 5) Cedar Springs Road and Colling Road intersection – refer to earlier response.	

8.	Proposed Conditions should also document and consider impacts during north and south lake filling.	Pages 45-73 Section 4. Proposed Conditions – Operations and Section 5. Proposed Conditions - Rehabilitation	Conservation Halton	Refer to response to earlier comment. In addition, the integrated surface and groundwater model evaluated the impacts of both rehabilitation scenarios for the existing quarry which are included in the Level 1 and 2 Hydrogeological and Hydrological Impact Assessment Report. As noted in the Surface Water Assessment, allowing the existing quarry to fill and form a lake in accordance with the approved rehabilitation plan will cease all discharge from the quarry to the Unnamed Tributary of Willoughby Creek and	
9.	Section 4.1.3 – “Extraction and quarry dewatering will also lower groundwater levels surrounding the west extension within 350 m of the extraction face. As such, a series of mitigation measures are proposed to address any potential adverse impact that could result from extraction and quarry dewatering.” Did the study team identify any of the potential adverse impacts? Mitigation measures must ensure that any identified impacts are satisfactorily addressed when the replica pond is constructed.	Section 4.1.3	City of Burlington	The potential adverse impacts were identified in the Level 1 and 2 Hydrogeological and Hydrological Impact Assessment Report, the Surface Water Assessment, and the Level 1 and 2 Natural Environment Technical Report. Additional information regarding the potential impacts and mitigation measures are included in the Watercourse Characterization Tables enclosed.	
10.	Tatham indicates that a water level control is not proposed for the lake - can the reason and rationale be provided? It is suggested that without some form of control adaptive management opportunities may be compromised	Page 63 Section 5.3.2	Wood Environment & Infrastructure Solutions	Based on the results of the integrated surface and groundwater model, the lake will fill to an elevation of 271.0 m. Minimum existing grade around the proposed south extension lake is 272.0 m and the grade will be raised via earthworks to contain the pond water level. An overflow weir will be installed to discharge water from the lake to the West Arm of the West Branch of the Mount Nemo Tributary of Grindstone Creek, preventing failure of the lake banks in case of an emergency. Although, the overflow weir is not expected to be used. If streamflow mitigation is required in the West Arm, there are opportunities to construct an outlet to the watercourse. However, discharge from quarry sump 0200 to the WestArm is proposed long-term and may also be adjusted to mitigate adverse impacts in theWest Arm.	

Proposed Burlington Quarry Expansion
JART COMMENT SUMMARY TABLE – Visual Impact Assessment

Please accept the following as feedback from the Burlington 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**.

	NEC Comment on behalf of JART (December 2020)	Applicant Response (June 2021)	NEC Response on behalf of JART
1.	Recommendations: Supplementary visual screening is referenced in the recommendations but there is no indication of where small or large species are indicated. Vegetation retention is referenced but there is limited detail provided on the extent of tree protection. Future landscape plans and vegetation protection plans will be required to reflect the findings of the VIA.	Areas for large and small plantings has been clarified on the Mitigation Plan. See updated report dated June 2021.	This comment has not been sufficiently addressed. Section 9.0 discusses recommended mitigation measures which include retention of existing vegetation, berms and planting but there is insufficient information on how and where existing vegetation will be protected, monitored and managed during berm construction and quarry operation. Existing vegetation along Sideroad 2, Cedars Springs Road, and Colling Road is providing an important screening function. Should that vegetation be damaged by construction activities or otherwise impacted by disease, pests, storms, etc., the effectiveness of this screening may be impacted. Per NEP 2.9 policies, screen plantings should be properly maintained to ensure continued survival and good growth rates and natural screening is to be protected. How will this be addressed during implementation and in the long term? Detailed planting and vegetation protection plans are required for review. It is noted that a recommendation for detailed information is not included in the Natural Environment Report either.
2.	**NEC Supplementary Comments** **A comprehensive review of the second VIA submission (June 2021), including the review of some new information that was provided in this submission, has raised further questions and comments which are noted below.**		
3.	The VIA refers to an at-grade crossing on Sideroad 2 for the purposes of processing (in Section 4.0) but there is no information provided on what work will be undertaken on the north side of the road to accommodate this crossing. Visual impacts related to the construction of an intersection at this location, including the removal of berm and vegetation on the north side of the road have not been assessed. Further information on the proposed crossing and associated visual impacts is required. Additional photography and photo simulations should be provided for both the north and south side, and amelioration of the visual impact on the southern entrance to the south extension by gradation of berms. There is some lack of clarity in the Planning Justification Report and inconsistency between the PJR and the Traffic Study (2020 and 2021). The Traffic study recommends a crossing of No. 2 Side Road from the south extension to the north side of the road for processing (2020: pages 35, 38). The Planning Justification Report makes similar statements that aggregate from South Extension Phases 1 & 2) will be transported by this crossing, but also makes ambiguous statements (pages 1, 11, Figure 3) that “the extracted aggregate will be transported to the existing Burlington Quarry for processing and shipping to market utilizing the existing entrance/exit…”.This matter needs clarification by the provision of details in the VIA and Site Plan of the work proposed on the north side of No. 2 Sideroad.		
4.	Please note that any changes to the proposed Site Plan or Operations Plan (including berms, changes in extraction footprint, etc.) may have implications for the VIA. In the event of any		

	changes, the VIA should be reviewed to ensure that conclusions and recommendations remain applicable and that the most current plans are referenced.		
5.	The VIA describes future rehabilitation as including the removal of visual and noise berms and reestablishment of views into the quarried lands with a goal to 'enhance the existing open landscape character of the area' (see Section 8.0). Further study is required to demonstrate how this will be achieved. Please provide photo simulations showing proposed rehabilitation conditions for views of concern (Photo 22, 32, 43, and 50 - shown below with JART mark-up).		