

May 20, 2020
Nov. 4, 2020
Dec. 15, 2020
Dec. 30, 2020

SITE PLAN NOTES

PORT COLBORNE QUARRIES INC. PIT 3 EXTENSION

Sources used for the preparation of the Site Plans:

- The City of Port Colborne Official Plan.
- The Region of Niagara Official Plan.
- Niagara Region Navigator, Interactive Mapping Portal.
- The City of Port Colborne Zoning By-Law 6575/30/18.
- Topographic information obtained from Lanthier & Gilmore Surveying Ltd., 2019.
- Property Legal Boundary Information obtained from Plan 59R-8010 prepared by Andrew Cameron, OLS, dated April 8, 1992 and Plan 59R-16702 prepared by Lanthier and Gilmore, May 2020.
- Boreholes and monitoring wells location has been provided by the Level 1 / Level 2 Hydrogeological Assessment Report prepared by Golder Associates Ltd., dated October 2020.
- Ecological Land Classification information has been provided by Level 1 and Level 2 Natural Environment Report prepared by Golder Associates Ltd., dated October 2020.
- Archaeological Find Spots have been provided by the Stage 2 Archaeological Assessment prepared by Golder Associates Ltd., dated July 2020.
- Site visits conducted 2018, 2019 and 2020 and the location of site features was augmented by Google Maps (2018).

Note:

The groundwater elevation across the site has been determined by Golder Associates Ltd. to be 178.0 masl.

GENERAL OPERATIONAL NOTES

1. Tonnage: It is a condition of this Licence that no more than 1,815,000 tonnes of material shall be removed from this property annually and no more than 1,815,000 tonnes of material annually combined with Licence 4444, which is also operated by Port Colborne Quarries Inc. The area to be extracted is 64.9 hectares.
2. Hours of Operation:
 - a. The hours of operation shall be from 7:00 a.m. to 7:00 p.m. Monday to Friday excluding statutory holidays and 8:00 a.m. to 3:00 p.m. on Saturdays. At no time shall crushing, rock breaking or blasting take place on a Saturday, Sunday or Statutory Holiday, nor any blasting between the hours of 6:00 p.m. and 8:00 a.m. Maintenance operations may take place outside of normal operating hours.
 - b. Refer to the Recommendations from the Dust Study (Sheet 5 of 8) regarding further restrictions to the operational hours for drilling/blasting.
 - c. The hours of operation may be extended to the extent necessary to address exceptional circumstance due to:
 - i) an emergency situation that is beyond the reasonable control of the operator or
 - ii) a special contract that requires material to be produced and/or delivered on an urgent basis, making it necessary to operate outside of normal operating hours, In such an event, the Licensee shall make a record of the exceptional circumstance that gave rise to the need to operate outside normal operating hours.
 - d. Except where the operator is requested by a public authority to respond to an emergency, any operations outside of normal operating hours are not exempt from compliance with MECP noise guidelines.
3. Fencing and Gates:
 - a) Prior the stripping and extraction, a minimum 1.2-metre-high post and wire fence shall be in place along all external boundaries to ensure the site is secure. Site Plan Variance of Operational Standard 5.1 provides that the west boundary abutting ARA Licence 4444 will not be fenced since those lands are also owned by Port Colborne Quarries Inc.
 - b) A gate will be erected at the main quarry access onto the Highway 3 entrance/exit and be locked at all times when the quarry is not operational.
 - c) The existing entrance/exit at:
 - a. Humberstone Speedway onto Highway 3 will be permanently closed.
 - b. Former Carl Road onto Second Concession Road will be permanently closed.
 - d) Access to 1252 Main Street (Hwy 3) and 1326 Main Street (Hwy 3) and 1645 Second Concession Road will remain un-gated subject to the construction of additional perimeter fencing the secure the quarry lands.
 - e) Refer to Note 5 for farm equipment access and gates.
 - f) Tree Protection Fencing shall be installed around the northern woodlots, (SWD-2 and SWD3-2) as per the Recommendations from the Tree Preservation Plan (See Sheet 5 of 8).
4. Existing Buildings: Existing buildings on-site include:
 - i. House at 1252 Main Street (Hwy 3) to remain as it will be outside the Limit of Extraction.
 - ii. House at 1326 Main Street (Hwy 3) to remain as it will be outside the Limit of Extraction.
 - iii. House at 1645 Second Concession Road to remain as it will be outside the Limit of Extraction.

The timing of the removal of the following buildings will occur during Phase 1A:

 - iv. Spectator viewing stand at the Humberstone Speedway.
 - v. All ancillary buildings and structures at the Humberstone Speedway.

5. Site Access:
 - a) Extraction Stage 1A: Haul truck access will be routed internally being west via the Port Colborne Quarries Inc. Licence 4444 (Pit 2 and 3) to the Pit 1 entrance/exit onto Ramey Road and to Highway 140.
 - b) Extraction Stage 2: During Phase 1A extraction and upon a new aggregate processing plant / wash plant being located within Licence 4444 (Pit 3), a new quarry entrance/exit will then be established directly onto Highway 3. All applicable entrance permits and design approvals for a deceleration lane shall be secured from the Ministry of Transportation prior to the construction and use of this access.
6. Entrance/Exit: Once the Highway 3 entrance/exit has been established:
 - a) A road sweeper will be maintained on-site (or within Licence 4444) and used on a year-round basis as required. The entrance and associated paved shoulders will be swept to pick up and dispose of quarry related debris at least once per week, and as frequently as conditions warrant.
 - b) A steel grating system will be installed at the weigh scale area and cleaned regularly.
 - c) The scale entry and exit areas will be paved for a minimum distance to the weigh scale to minimize dust/mud drag-out on truck tires.
7. Farm Access Farm equipment will access the site as follows:
 - a) Phase 1A through a 4.0-metre-wide maximum gap in the Miller Road berm. The gap will be located generally at the mid-frontage point of Miller Road. The farm access will be gated and locked except when required for use by quarry employees or farming use. The berm gap will remain until farming ceases in Phase 1A and then the gap will be backfilled to match the height and slope of the remainder of the Miller Street berm.
 - b) Phases 1B, 2 and 3 via 1645 Second Concession Road, a locked gate will be erected at the west end of the Berm 1.
8. Internal Haul Road: Internal haul routes will be constructed and disbanded as required to access the active quarry face. The location of the internal roads shown on the Site Plans are general and anticipated but will vary depending on changing site conditions and truck traffic flow requirements.
9. Weigh Scale: The weigh scale to be used for this Licence will initially be located off-site at the Port Colborne Quarries Inc. Pit 1. During Phase 1A extraction, once a new processing plant is relocated to Licence 4444 (Pit 3), a weigh scale and scale house will be established near the Highway 3 entrance/exit generally as shown on the Site Plans.
10. Groundwater Status: The groundwater elevation across the site has been determined by Golder to be approximately 178.0 masl.
11. Scrap: No scrap will be stored on-site but will be stored either in the Port Colborne Quarries Inc. Pit 1 or within Licence 4444 (Pit 3).
12. Fuel Storage: Fuel storage will continue to be in the Port Colborne Quarries Inc. Pit 1. Portable equipment within the quarry (i.e., crushers, screeners, generators, etc.) will be refueled by a mobile fuel truck or equivalent and follow all applicable Gasoline Handling Act requirements.
13. Equipment: Site preparation, extraction and rehabilitation on the site will be undertaken using scrapers, front-end loaders, haul trucks, dozers, excavators, drill-rigs etc. as necessary. As well, portable crushers, screener may be used on occasion at the quarry face.
14. Tree Removal: Any trees removed within the Limit of Extraction will be either:
 - a) Chipped with the material distributed within proposed vegetation zones,
 - b) Burned on-site subject to an applicable municipal burn permit,
 - c) Cut and re-located to the quarry side slopes within the aquatic habitat littoral zones to facilitate post-extractive fish habitat.
15. Topsoil/Subsoil/Overburden Stripping:

- a) In advance of extraction, a sufficient area of topsoil, subsoil and overburden will be stripped to allow for approximately 2-3 years of extraction. The stripped topsoil, subsoil and overburden will be used for:
 - i. Berm construction
 - ii. Rehabilitation of final quarry slopes
 - b) Topsoil or subsoil originating from the former Humberstone Speedway shall not be removed from the site.
16. Perimeter Berms: Perimeter berms will be constructed to provide attenuation for noise, dust and visual impacts. The core of the berms will be constructed of overburden clay from the site and then a veneer of subsoil and topsoil applied to the berms. The berms will then be vegetated as specified in General Operational Note 18. If moderate or extensive erosion or gullying occurs during the life of the quarry, that portion is to be re-graded and reseed as necessary. The external (public) side of the berms fronting onto Highway 3 and Miller Road will be constructed with a 4:1 slope to and maintained (cut) on a regular basis. The berms will be constructed to the heights noted on the Plan. Refer also to Berm Sketch – Detail 2 and 3 on Sheet 5 of 8.

In locations within the 'blast monitoring zone', perimeter berms will be constructed with a 2.5m flat top to accommodate additional local barriers as determined by the Blasting Monitoring Program and if required.

17. Quarry Side slopes:

- a) Quarry side slopes will vary from a maximum 2:1 slope and increase to 3:1 – 4:1 slope generally within those areas shown on the Plan.
- b) The Licensee will create the side slopes by:
 - i. Angled blasting,
 - ii. Use of broken shale,
 - iii. On-site overburden,
 - iv. Clean inert fill may be imported to facilitate the establishment on the quarry faces of slopes as shown. The Licensee must ensure that the material is tested at the source, before it is deposited on-site, to ensure that the material meets the MOECC criteria under Table 1 of MOECP Soils, Groundwater and Sediment Standards for use under Part XV.1 of the *Environmental Protection Act*. Sampling results will be provided to MNRF upon request.

18. Vegetation:

- a) All berms shall be seeded as per the Level 1 and 2 Natural Environment Report Recommendations (See Sheet 5 of 8).
- b) All rehabilitated side slopes are to be vegetated with a seed mixture capable of:
 - Rapid germination and growth,
 - Controlling erosion.
 - Maintaining or enhancing soil fertility.
- c) The seeding is to be established in a timely manner and if necessary, facilitated by the application of fertilizer, water and/or additional seeding.
- d) During the start-up stage of Phase 1 the Licensee will plant a mixture of native deciduous and coniferous trees (red maple, sugar maple, elm, black oak, white pine, black walnut, white pine and black spruce) along the Highway 3 frontage and Miller Street frontage to create a long-term shade canopy. The tree stock at the time of planting shall be:
 - for coniferous a minimum of 1.5 metres in height and
 - for deciduous trees, a minimum of 55 mm cal.
- e) Monitoring of all vegetation within the setbacks and on berms will continue throughout the life of the quarry and if any vegetation dies, it will be replaced immediately (during the proper planting season).

19. Benching: The maximum blasting depth will be approximately 8.0 metres resulting in two (2) excavation benches. In locations where the rock continues deeper, a shallower third bench may be required.
20. Direction of Extraction: Extraction of each phase shall be generally in the direction as shown on the plan, with an intent to be working towards the nearest sensitive receiver.
21. Aggregate Processing: Aggregate processing will initially occur off-site in the Port Colborne Quarries Inc. Pit 1. During Phase 1A extraction, the processing plant and wash plant will be relocated to Licence 4444 (Pit 3) and to accommodate this, a Site Plan amendment for Licence 4444 will be initiated. A conveyor system may be used to transport material within the subject lands to Licence 4444. As well, a portable crusher / screener may be used on occasion at the quarry face but any such equipment and/or stockpiles shall be located a minimum of 30.0 metres from all property boundaries.
22. Stockpiles: Aggregate stockpiles will be located primarily off-site however, when limited processing does occur at the quarry face, it shall occur on the lowest quarry floor available and be adjacent to the active quarry face and not exceed 20.0 metres in height.
23. On-Site Equipment: Proposed extraction equipment to be used on site is defined by the Noise Assessment as noted under the Technical Recommendations.
24. Recycling: Recycling of asphalt and concrete will not be permitted on this site.
25. Dust Control: Dust will be mitigated on-site as per the Air Quality Assessment as noted under the Technical Recommendations.
26. Blasting: Blasting impacts will be mitigated as per the Blast Impact Analysis as noted under the Technical Recommendations. Blasting will occur as required to provide a suitable inventory, but on average approximately twice per week.
27. Final Quarry Elevation: The final quarry floor will vary from 162.0 masl at the south limit to 169.0 masl at the north. The quarry floor will blend in with the quarry floor for Licence 4444 which will be at approximately 166.0 masl.
28. Extraction Area: The total area to be extracted is 71.1 hectares.
29. Refer to Sheet 6 of 8 and 7 of 8 for cross sections.
30. Refer to Sheet 4 of 8 for progressive extraction and progressive rehabilitation details.

RECOMMENDATIONS FROM TECHNICAL REPORTS

Noise (Acoustical) Impact Study, Golder Associates Inc., dated December 2020

1. The following minimum perimeter berms (or acoustically equivalent measures/barrier) will be implemented prior to extraction:
 - A 4 metre high (above existing grade) berm along the south property line.
 - A minimum 2 metre high (above existing grade) berm along the east and north property lines of the extension area.
2. The location of the berms is shown on the Operational Plan. In addition to 1 above, specific berm requirements, including additional required berm heights, will be determined through both noise and blast monitoring as the areas of extraction move towards the Points of Reception (PORs) as shown on the Operational Plan within the 'Increased Blast Monitoring Zone'.
3. Areas requiring additional and/or specific noise controls and/or quieter types of equipment are shown on the Operational Plan as Noise Zone 1, Noise Zone 2 and Noise Zone 3. The local barrier height and alternative controls required to achieve compliance with applicable noise limits within the identified areas are noted below;

Noise Zone	Equipment Specific Noise Controls
1	Drill – local barrier extending 2.0 m above major noise source associated with the drill.
2	Drill – local barrier extending 3.0 m above major noise source associated with the drill.
3	Drill – attenuated equipment (i.e. reduced noise emissions or replace with quieter equipment)

4. Extraction and processing operations will occur only during the daytime period (7:00 am – 7:00 pm).
5. The general extraction progression to be followed is shown on the Operational Plan.
6. Setback distances between the drilling rig / blasting and receptors will be determined/confirmed through the blast monitoring program.
7. All existing on-site/ external perimeter berms shall remain in place for the Port Colborne Quarries Inc.: Pit 1, Pit 2 and Pit 3 lands.
8. Extraction equipment will not exceed the following Overall Sound Power Levels Equipment list.

Source Description	Overall Sound Power Levels (dBA)
Screen 115E - Upper deck west	127
Screen 115E – Lower deck west	127
Screen 115E – Upper deck east	123
Screen 115E – Lower deck east	123
Impact Crusher 177 - west	104
Impact Crusher 187 - east	104
Jaw Crusher Norberg	110
Impact Crusher 154	104
Wash plant 155E – west screen top	111
Wash plant 155E – west screen walls	107
Wash plant 155E – east screen top	111
Wash plant 155E – east side walls	107
Drill	121
Loader Extraction	107
Haul Truck empty	112
Haul Truck full	116
Highway truck	102

9. On-site haul trucks will not exceed 35 km/h.
10. Equipment will be maintained in good condition.
11. On-site roadways will be maintained to limit noise resulting from trucks over ruts and pot-holes.

Agricultural Impact Assessment, Colville Consulting Inc., dated September 2020

1. Excess topsoil not required for berm construction or post-extractive rehabilitation and which would be otherwise displaced, should be available for re-use to improve the agricultural conditions for cultivation at other locations where opportunities exist.
2. Lands not immediately required for extraction shall remain available for agricultural production when possible.
3. The licensed boundary area should be aligned with existing property boundaries where possible.
4. Appropriate buffering abutting agricultural lands shall employ such things as:
 - a. Vegetated berms, which can offer both visual and physical buffers,
 - b. Dust suppression techniques and noise management according to appropriate regulations.

5. When agricultural vehicles utilize interior quarry roads to access agricultural lands, a safety protocol will be developed to ensure the safety of all farm traffic through the licensed area, or alternate access should be provided.
6. The proposed quarry entrance onto Highway 3 shall be designed and constructed to accommodate existing land uses in the vicinity.
7. Perimeter fencing shall be established to minimize the potential for trespass and vandalism.
8. Monitoring of all vegetation within the setbacks and on berms will continue throughout the life of the quarry and if any vegetation dies, it will be replaced immediately (during the proper planting season).
9. Erosion/Vegetation Monitoring: If there is any substantial areas of erosion that would result in increased levels of sedimentation either during the quarry operation or during the progressive rehabilitation stage, those areas shall be regraded and reseeded immediately. If there is any substantial vegetation die-out, including berm vegetation, upland trees/shrubs, aquatic vegetation, it shall be replaced immediately and/or during the next appropriate planting season.
10. The groundwater monitoring program shall identify and monitor any changes related to ground water resources surrounding the quarry operation to ensure farm operations dependent on ground water are not impacted. If any well interference issues are identified, the Licensee shall ensure that adequate water supply is available for adjacent farm operations.
11. The Licensee shall ensure that quarry signage on Main Street (Highway 3) includes a phone number for neighbours to call if any issues should arise.
12. The Licensee shall ensure that all MOECC standards regarding blasting, noise and dust emissions are met.
13. The Licensee shall use non-invasive, native plant species for berm plantings and other landscaped features surrounding the quarry operation.

Air Quality Impact Assessment, Golder Associates Inc., dated December 2020

1. The amount of explosive used will be reduced to less than 6,160 kg when meteorological conditions require it, such as wind gusts exceeding 40 km/hr, and/or when the extraction face approaches the property line and/or sensitive receptors. The actual reduced amount of explosive will be determined through the blast monitoring program.
2. The amount of material handling at the extraction face will be reduced to less than 4,500 kg per day when meteorological conditions require it, such as wind gusts exceeding 40 km/hr, and/or extraction face approaches the property line and/or sensitive receptors.
3. The licensee shall use water as a dust suppressant to control fugitive emissions as necessary and during dry periods.
4. The Best Management Practices Plan for the Control of Fugitive Dust (BMPP) prepared by Golder Associates Ltd. dated December 2020, and as amended, shall be posted in the on-site pit administration office. Compliance with the BMPP is deemed to be a Site Plan condition.

Archaeological Assessment, Stage 1 and 2, Golder Associates Inc., dated July 2020

1. The archaeological sites on the attached Site Plan identified as Location 1 (AfGt-296), Location 17 (AfGt-305), Location 25 (AfGt-307), Location 30 (AfGt-308), Location 31 (AfGt-309), Location 32 (AfGt-312), Location 33 (AfGt-313), Location 35 (AfGt-314) and Location 36 (AfGt-315) and Location 38 (AfGt-316) have been determined to have further cultural heritage value or interest. As such, they have been recommended to undergo Stage 3 archaeological assessment prior to any intrusive activity that may result in their destruction or disturbance. The Stage 3 assessments must be conducted in accordance with the Ministry of Heritage, Sport, Tourism and Culture Industries' (MHSTCI) *Standards*

and Guidelines for Consultant Archaeologists to define the extent of each site, gather a representative sample of artifacts, and aid in determining the need for Stage 4 mitigation of impacts.

2. Until such time that Location 1 (AfGt-296), Location 17 (AfGt-305), Location 25 (AfGt-307), Location 30 (AfGt-308), Location 31 (AfGt-309), Location 32 (AfGt-312), Location 33 (AfGt-313), Location 35 (AfGt-314), Location 36 (AfGt-315), and Location 38 (AfGt-316) can undergo the recommended Stage 3 assessments, the sites should be avoided and protected by establishing “no-go” zones consisting of the sites plus a 70 metre protective buffer as shown in the attached Site Plan.
3. The protected sites must be fenced (post and wire) prior to commencing extraction.
4. All alterations are prohibited within the limits of the protected areas of the sites until such time that the MHSTCI has entered a report(s) in the Ontario Public Register of Archaeological Reports where the report(s) recommends that the archaeological site is of no further cultural heritage value or interest.
5. Any archaeological site that is of further cultural heritage value or interest that remains within the licensed area at the time of surrender of the licence will be protected through a restrictive covenant on title.
6. Overall Quarry Site: Should previously unknown or un-assessed deeply buried archaeological resources be uncovered during the development, they may be a new archaeological site and therefore subject to section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological fieldwork, in compliance with section 48 (1) of the Ontario Heritage Act.
7. Any person discovering human remains must immediately notify the police or coroner and the registrar of cemeteries, Ministry of Government Services. All work in the vicinity of the discovery will be suspended immediately. Other government staff may be contacted as appropriate; however, media contact shall not be made with regard to the discovery.

Blast (Vibration) Impact Assessment, Golder Associates Inc., dated July 2020

1. The initial series of test blasts, occurring with approximately one month of the commencement of blasting shall be monitored at a minimum of five (5) locations at varying distances from each blast to refine the ground and air vibration attenuation characteristics and confirm that MECP – NPC 119 of the Model Municipal Noise Control By-Law is being met. This will entail establishing monitoring stations between the blast site and neighbouring receptors [residences], during the sinking cut and development of the initial bench face. The site-specific attenuation data developed during this monitoring period shall then be used to better define ground vibration and air concussion effects at the nearest receptors.
2. Routine monitoring of all blasting operations shall be carried out in the vicinity of the closest receptor to the proposed blasting operations. As extraction continues with the quarry and blasting operations move, the actual monitoring site shall be routinely and regularly reviewed so that the closest receptor is always being monitored for ground and air vibration effects.
3. Maintained a record of all blasting details including a seismic record of the ground and air vibration monitoring results. The blast details and monitoring results shall be made available to the Ministry of Natural Resources and Forestry (MNRF) and the Ministry of Environment, Conservation and Parks (MECP) upon request.
4. Prohibit blasting on Saturdays, Sundays and Statutory holidays.
5. When blasting within approximately 300.0 metres of adjacent residences, the quarry shall regularly review their blast procedures in conjunction with the blast monitoring results to assess when it is necessary to reduce the maximum explosive weight detonation per delay period with the blast. The termination point for the blasting operations will be governed by the results of the on-site monitoring program.
6. Detailed blast records shall be maintained and shall include the following:

- a) Location, date and time of the blast;
- b) Dimensioned sketch including photographs, if necessary, of the location of the blasting operation, and nearest point of reception;
- c) Physical and topographical description of the ground between the source and the receptor location;
- d) Type of material being blasted;
- e) Sub-soil conditions, if known;
- f) Prevailing meteorological conditions including wind speed in m/s, wind direction, air temperature in °C, relative humidity, degree of cloud cover and ground moisture content;
- g) Number of drill holes;
- h) Pattern and pitch of drill holes;
- i) Size of holds;
- j) Depth of drilling;
- k) Depth of collar (or stemming);
- l) Depth of toe-load;
- m) Weight of charge per delay;
- n) Number and times of delays;
- o) The results and calculated value of Peak Pressure Level in dBL and Peak Vibration in mm/s;
- p) Applicable limits; and
- q) The excess, if any over the prescribed limit.

Hydrological Study by Golder Associates Inc., dated October 2020

1. All monitoring requirements with respect to the quarry discharges and the receiving system will be regulated by the Industrial Sewage Works Environment Compliance Approval, (MECP) to be amended prior to the dewatering of Pit 3 Extension.
2. The increased runoff under operational and rehabilitated conditions will be directed to the east and west branches of the Wignell drain, increasing the annual flows within these water features.

Hydrogeological Study by Golder Associates Inc., dated October 2020

1. The following existing on-site monitoring wells shall be monitored with groundwater levels taken monthly and water quality samples taken every five years. Groundwater quality parameters to be tested for include;

General Chemistry:	pH, EC, TDS, Hardness
Nutrients/Organic Indicators:	Total ammonia, Nitrate, Nitrite, DOC, Orthophosphate
Major and Minor Ions:	Alkalinity, calcium, chloride, magnesium, potassium, sodium, sulphate, anion sum, cation sum.
Dissolved Metals:	aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, phosphorous, selenium, silicon, silver, strontium, thallium, titanium, uranium, vanadium, zinc.

Monitoring Well Number

MW17-1S,	MW17-1D,
MW17-2S,	MW17-2D
MW17-3S,	MW17-3D
MW17-4S,	MW17-4D
MW17-5S,	MW17-5D,
MW17-6S,	MW17-6D
MW17-7S,	MW17-7D
MW17-8S,	MW17-8D
MW17-9S,	MW17-9D,

MW17-10S, MW17-10D

2. Three additional monitoring wells are to be installed prior to quarrying and are shown on the Site Plans and include; i) on the Second Concession Road frontage mid-way along the northern limit of extraction, ii) mid-way along the eastern property boundary and iii) at the northern extent of the Miller Road frontage. These wells will be also be monitored at the same frequency as the existing wells.
3. The results of the Groundwater Quality Monitoring will be used to evaluate potential changes in water quality as the proposed quarry expands. The groundwater level monitoring will be used to assess the groundwater level drawdown associated with quarry dewatering as the quarry expands. The monitoring program will be used to evaluate potential impacts on surrounding wells and used as part of the hydrogeological and ecological disciplines to confirm no unanticipated effects on the natural environment.
4. In order to implement appropriate response actions in a timely manner, the Licensee will retain qualified personnel in the areas of hydrogeology and will have water well contractors and a plumbing contractor on retainer in the event that the need for these services arises.
5. The monitoring program will be discontinued one the quarrying is completed and the quarry will be allowed to flood through natural surface water and groundwater inflows, and the groundwater will recover to static conditions.

Private Well Complaints Response Program

The following description provides the decision process to be followed when a well interference complaint is received.

1. The well will be inspected by a Hydrogeologist and/or a Licensed Well Contractor to initially evaluate the complaint. An analysis and impact assessment will then be conducted by a Hydrogeologist to evaluate potential impacts for groundwater level drawdown to affect the water supply of the well. An assessment of the well system performance will then be carried out by the Hydrogeologist and Contractor.
2. If it is determined by a Hydrogeologist that there is a significant potential for interruption of the water supply of the well or the water supply of the well has been interrupted, then the water supply restoration program will be initiated. If the initial measures are not successful, then mitigation measures will be implemented in the interim until a successful response is achieved. This could involve the implementation of additional contingency measures until a successful result is achieved.
3. If there is no significant potential for the interruption of water supply, then no restoration action will be undertaken, and the temporary water supply will be discontinued. The actions and responses undertaken, as determined by a Hydrogeologist, will be documented for the annual report, and reported to the agencies as required.

Potential Mitigation Options

There are several mitigation strategies that could be implemented to affect the supply of surrounding water wells, to counteract the effect of quarry-related groundwater level drawdown, if required, based on the results of the monitoring and complaints response program.

1. Well Deepening: This would be effective, for example, for shallow bedrock wells that no longer have a sufficient water column due to quarry-related groundwater level drawdown. The results of the hydrogeological program indicate that well deepening is feasible, since water supply is obtained from duplicate private water wells and municipal wells.
2. Well Replacement: This measure could be introduced for wells where well deepening was not sufficient and could also be positioned further from the quarry.
3. Additional Wells: Additional wells could be installed and connected by plumbing into the residence by piping as such that there is a common feed of water from multiple wells.
4. Trickle Wells: This would involve the pumping of the well into a storage system such as a subsurface cistern.

5. Grouting: The bedrock along the quarry wall could be grouted to seal the fractures and remove the hydraulic connection to adjacent wells.
6. Low Permeability Sid Slopes: The quarry walls could be sloped with low permeability clayey materials to line the fractures on the quarry wall.
7. Recharge Wells: Recharge wells could be installed to maintain groundwater levels in areas affected by groundwater level drawdown.

The requirement for any of these mitigation measures would be determined based on the results of the groundwater monitoring program. The results of the monitoring and response program will be incorporated into a report that will be submitted to the MECP on an annual basis as part of the future requirements for a site-wide Permit to Take Water (PTTW).

Natural Environment Report, Golder Associates Inc. dated October 2020

1. Setbacks: All extraction setbacks for Phases 1B, 2 and 3 shall be clearly demarked where they are contiguous to environmental features and specifically those identified as CVR4, FOD7, CUM1-1, FOD7--2, SWD3-2.
2. Bird Breeding Habitat: The Licensee shall avoid vegetation removal including agricultural fields during the active breeding season for birds between April 15 and August 15 unless construction disturbance is preceded by a nesting survey. If nests are found, a buffer will be installed around the nest and not removed until young have fledged the nest.

Prior to removal of vegetation in agricultural fields, the Licensee shall confirm that there is no suitable habitat for bobolink or eastern meadowlark present. If present, permitting under the ESA may be required to remove the habitat.

3. Fish Habitat: The ponds within the former Humberstone Speedway lands may contain fish, and if present, they shall be removed prior to dewatering and/or destruction of the ponds. This will require a MNRF permit to collect fish and it shall be obtained prior to relocation to avoid contravention of the federal Fisheries Act. Any native fish present are to be relocated to suitable nearby habitat and non-native fish are to be euthanized.
4. Sediment/Erosion Control: Sediment and erosion control measures shall be implemented prior to and during construction. This may include the use of silt fencing, check dams, straw bales, rip-rap and/or other techniques when and where as required.
5. Noise and Dust Mitigation: Appropriate noise and dust mitigation measures shall be implemented during both site preparation and during the extraction operation.
6. Wetland Vegetation Monitoring Program: A 'Wetland Vegetation Monitoring Program' shall be implemented to monitor the deciduous swamp to accurately monitor any changes in the wetland community over time and to measure the success of management actions. These long-term monitoring plots and/or monitoring transects shall be established to include a count of the number of stems and percent cover for all plant species present. Baseline monitoring shall be conducted in the year prior to the commencement of extraction of Phase 1B or 2, whichever occurs first. Monitoring shall be conducted annually at a similar time of year (i.e., late July) for the duration of extraction of Phases 1B, 2 and 3.

For all plants identified as part of Wetland Vegetation Monitoring Program, they shall be categorized by the wetness index based on the Floristic Quality Assessment System for Southern Ontario.

The groundwater monitoring program results and specifically the groundwater drawdown levels and surface groundwater monitoring results will be aid in demonstrating any potential impacts to the wetland function.

Annually, the results of the Wetland Vegetation Monitoring Program will be a submitted to MNRF prior to December 31 and available to the Region of Niagara, NPCA and City of Port Colborne upon request.

7. Proposed Vegetation:

- i. Wetland and aquatic plants that may be planted in the nearshore or shoreline areas will include shrubs such as red-osier dogwood (*Cornus sericea*) and slender willow (*Salix petiolaris*), and herbaceous plants such as water plantain (*Alisma plantago-aquatica*), lake sedge (*Carex lacustris*), swamp milkweed (*Asclepias incarnata*), softstem bulrush (*Schoenoplectus tabernaemontani*), and common cattail (*Typha* spp.). Shallow wetland habitats will be created through construction of submerged benches, approximately 0.25 to 0.75 metres deep. Shallow emergent marsh vegetation (i.e., herbaceous species listed above) will be planted in water ± 0.15 metres deep and extend ± 5 metres from the shore and be interspersed with cover structures (e.g., boulders and root wads) in the shallow shoreline wetland areas. Organic material and topsoil will be added to the shoreline areas to promote shoreline vegetation. Basking logs, nesting platforms and boxes will be created for turtle, waterfowl and swallows respectively. This habitat will be designed to be suitable as snapping turtle aquatic habitat and bullfrog breeding habitat.
- ii. Upland areas will be seeded with a mix of grasses and legumes consisting of native, non-invasive species. It is recommended that common milkweed be planted in upland areas to provide host plants for monarch caterpillars. Where terrestrial nodal plantings are included on the side slopes, they will include a mixture of coniferous and deciduous tree species to promote species diversity and provide a variety of species to compensate for any substrate deficiencies. The species may include white pine, sugar maple, red oak, trembling aspen, and white birch, with a secondary focus on species such as choke cherry (*Prunus virginiana*), alternate-leaved dogwood (*Cornus alternifolia*), highbush cranberry (*Viburnum opulus*), nannyberry (*Viburnum lentago*) and serviceberry (*Amelanchier* spp.). It is recommended that ash (*Fraxinus* spp.) species in rehabilitation plantings be avoided due to the invasion of emerald ash borer.
- iii. The segment of Carl Road that bisects the deciduous swamp is to be rehabilitated following the decommissioning of the road. Excavations in three or four areas along the length of the road should be created to improve surface water drainage. Plantings along this segment of Carl Road should include the dominant tree and shrub species found in the deciduous swamp including silver maple, pin oak, swamp white oak, bur oak, red maple, and spicebush.

Invasive shrub species including multiflora rose, common buckthorn, and Tartarian honeysuckle have become established in this area and may prevent the successful establishment of the native plantings. These invasive shrubs should be removed prior to the planting of Carl Road.
- iv. The setback area at the north end of extraction area 3 and east of the deciduous swamp (Licence 4444) be supplemented with additional plantings to enhance connectivity and wildlife movement opportunities between the deciduous swamp and the hedgerow located east of the site woodland located northeast of the site across 2nd Concession Road. This area currently consists of a cultural meadow. The establishment of a wooded area will create a corridor linking the north end of the deciduous swamp with the forested areas offsite, including the significant woodland located between Carl Road and Babion Road. These additional plantings will also enhance ecological connectivity and facilitate wildlife movement between these features. Native tree and shrub species plantings should be selected based on their suitability for the soils and moisture regime in those areas and may include: red oak, trembling aspen, eastern white cedar, red maple, basswood, bur oak, white pine, serviceberry species, gray dogwood (*Cornus racemosa*) and staghorn sumac (*Rhus typhina*).
- v. The area north of the existing quarry (Pit 3) and west of the northern end of the deciduous swamp is to be rehabilitated to enhance connectivity and wildlife movement between the deciduous swamp and the significant woodland located north of 2nd Concession Road between Carl Road and Babion Road. These two significant woodlands are separated by 2nd Concession Road and distance of approximately 70 metres. The area recommended for rehabilitation consists of a berm vegetated with terrestrial grasses and forbs and a sparsely vegetated area north of Pit 3.
- vi. All plantings (i.e., nodal plantings) included in the rehabilitation plan will be locally native, non-invasive species that create habitat in the short term and promote natural succession processes. The sourcing of plantings should consider the regionally adapted genetics of the species.

Plantings from local sources are likely to be well adapted to the local climate and growing conditions and may have a higher likelihood of successful establishment. Therefore, plantings will be procured from local sources to the extent possible.

vii. All rehabilitated side slopes are to be vegetated with a seed mixture capable of:

- Rapid germination and growth,
- Controlling erosion.
- Maintaining or enhancing soil fertility.

The seeding is to be established in a timely manner and if necessary, facilitated by the application of fertilizer, water and/or additional seeding.

Traffic Impact Study, IBI Group, dated October 2020

1. Highway 3 Access Intersection: Construct a minimum 35-metre-long eastbound left-turn lane by 2039 (or upon completion of Pit 1 backfilling) to accommodate quarry-related traffic reassigned to the proposed Highway 3 access.

Tree Preservation Plan

1. All woodlands, forests, and hedgerows located beyond the defined proposed extraction limits shall be preserved and protected in their entirety. Tree Protection Fencing should be installed at minimum of the drip line plus one metre per the locations and extents noted on the Site Plans.
2. Tree Removal: Trees located within FOD7-2 are recommended for removal to permit the Phase 2 extraction work of the proposed quarry expansion. The presence of Emerald Ash Borer damage, high occurrence of Ash trees, pioneer species and possible restoration plantings, within the study area as well as the relatively young age of the trees present on site contribute to a low preservation priority for the FOD7-2 feature. All removals shall be in accordance with the following notes:

Construction Impact Mitigation

a) Potential Construction Impacts to Trees

Trees are living organisms that react to changes in their environment. Trees can be damaged during construction without showing signs of damage until some years later. Most of the impacts relate to the removal of roots that results in the slow death of the tree as a result of its inability to absorb sufficient water and nutrients. Contained within this section are descriptions of the potential impacts this project may have on the trees, and impact mitigation methods that are intended to aid in the mitigation of impact during construction.

Soil Compaction and Root Damage

The leading cause of construction damage to trees is compaction of the soil around the roots or within the Tree Protection Zone (TPZ). The TPZ is the area around the tree or group of trees in which no grading or construction activity may occur. Equipment entering into a TPZ compresses the air pockets around the roots inhibiting the tree from absorbing nutrients and water. This damage ultimately degrades the health of the tree. Accordingly, during the removal stage, equipment used within the preservation zones should be restricted to ensure that the tree's roots are not disturbed, thereby assisting in maintaining their continued health. The TPZ is protected and delineated by the Tree Protection Fencing.

Mechanical Damage

Equipment can physically damage the trees through striking the trunk, limbs, and/or roots. Felled trees can also cause damage during the tree removal stage of construction. Some damage is unavoidable due to the proximity of adjacent trees; however, through the use of proper equipment and best management practices the damage can be minimized. The Contractor should be held responsible for all avoidable damage to the trees during all stages of development. Note: trees shall always be felled away from adjacent trees to be retained.

Root Damage

The success of tree preservation is dependent not only on protecting the root zone from compaction and damage; it is also contingent upon the ability to ensure that the structural roots within the root plate are not disturbed. Impacts to this area may result in the structural failure of these trees. Excavating soil 1 metre outside a tree's drip line, or within a drip line can damage roots by tearing and splitting back to the stem. This damage can later lead to rot that can kill the tree. All work within the drip line of an existing tree shall be approved by an Arborist. When excavating the top 30-60 cm of soil adjacent to trees, care must be taken. Excavation should cleanly sever the roots prior to stripping and removal of soil. Exposed roots with a diameter greater than 2.5 cm (1 inch) shall be pruned back to the soil face to prevent damage to the tree.

b) Protecting and Managing Trees During Construction

The following recommendations are presented to provide appropriate tree protection and management during the future development and construction of this project:

1. Tree Protection Fencing (TPF) should be installed to protect all trees identified for preservation. Tree Protection should conform to City of Port Colborne standards. Upon installation of the tree protection fencing, the Contractor should contact the Project Arborist to review and approve the fencing and its location prior to commencement of any site work. A written certification of the installed TPF will be provided to the City. The protection fencing should remain intact throughout the duration of the quarry extraction and rehabilitation works. The fencing should be inspected monthly and repaired as required. The fencing should be removed in its entirety at the completion of all rehabilitation works.
2. Upon receiving the necessary project approvals and prior to the commencement of tree removals, all trees designated for preservation must be flagged in the field. All designated preservation areas must be left standing and undamaged during site works. Removals are to be completed outside of migratory bird nesting season, generally from April 1 to August 31. If removals occur within the restricted activity period, they shall be in accordance with the Migratory Birds Convention Act, 1994. Due diligence measures, including pre-clearing nest sweeps can be employed to reduce risk to nesting birds and to comply with Migratory Birds Regulations. These surveys will be completed by a qualified person such as a wildlife biologist or ornithologist.

The following is the process that shall be carried out if tree removals are requested during the restricted time frame indicated in the Migratory Birds Convention Act:

- i. Contact a qualified individual (i.e., wildlife biologist or ornithologist), to determine if nesting birds are within the tree removal disturbance area.
 - ii. If the bird specialist has determined that there are nesting birds on site, there will be no tree removals/chipping conducted within the boundary set out by the specialist. Tree removals can resume within this once the migratory bird specialist has determined that the nest is no longer utilized.
 - iii. If the bird specialist determines there are no migratory birds nesting within the disturbance area, the contractor will have a predetermined clearance window to conduct removals (as determined by the specialist). At the end of the clearance window, if removals and chipping are not complete, the bird specialist will return to the site and proceed with another assessment/nest sweep. This process will continue until all removals and chipping is complete.
3. The TPZ is the area around a retained tree that is to be protected by tree protection fencing. The TPZ is not to be used for any type of storage (e.g. storage of debris, construction material, surplus soils, and construction equipment). No trenching or tunneling for underground services shall be located within the TPZ. Construction equipment shall not be allowed to idle or exhaust within the TPZ.

4. Trees shall not have any rigging cables or hardware of any sort attached or wrapped around them, nor shall any contaminants be dumped within the protective areas. Further, no contaminants shall be dumped or flushed where they may come into contact with the feeder roots of the trees. In the event that roots from retained trees are exposed, or if it is necessary to remove limbs or portions of trees after construction has commenced, the Project Arborist shall be informed and the proper actions conforming to City Policies and By-Laws shall be carried out.
5. Upon completion of the tree removals, refer to Operational Note 12. Any chipping, cutting or brush clean-up is to be completed outside the bird nesting season. If these activities are to occur within the restricted activity period, due diligence measures, including pre-clearing nest sweeps will be employed to reduce risk to nesting birds protected under the Migratory Birds Convention Act, 1994 and Migratory Birds Regulations. These surveys will be completed by a qualified biologist.
6. Excavation adjacent to trees to be preserved must be completed with due care and attention. Excavation should cleanly sever the roots prior to stripping and removal of soil. Should roots be encountered during excavation all exposed roots with a diameter greater than 2.5 cm (1 inch) shall be pruned back to the soil face to prevent damage to the tree. Roots smaller than 2.5 cm (1 inch) should be cleanly cut using a sharpened spade or bypass pruners at the limits of excavation.

Visual Impact Assessment, IBI Group dated December 2020

1. That Berm A: a 4.0 metre-high berm along the Second Concession frontage be built with a 4:1 slope on the external side and with vegetation plant between the berm and boundary fence as per Natural Environment Report Recommendation Note 7iv).
2. That Berm B: a 2.0 metre-high berm along the northern portion of the eastern property boundary be built with a 3:1 slope.
3. Berm C: a 2.0 metre-high berm along the northern portion of the 'eastern-tab' built with a 3:1 slope.
4. Berm D: a 4.0 metre-high berm along the Miller Road frontage and extending latterly for 100.0 metres along the northern and southern property limits of the 'eastern-tab' with a 4:1 slope on the external side and 2.5:1 on the internal side. Both coniferous and deciduous trees are to be planted between the berm and the Miller Road boundary fence.

Where the 4.0 metre gap is retained at the mid-frontage location in the berm for farm equipment / pit staff access, a temporary cross-over berm (minimum 2.0-metre-high berm and minimum 50.0 metres long) be constructed behind the gap.

5. Berm E: a 2.0 metre-high berm along the eastern boundary of the property extending south to Main Street and built with a 3:1 slope.
6. Berm E: a 2.0 metre-high berm along the eastern boundary of the property extending south to Main Street and built with a 3:1 slope.
7. Berm F: a 4.0 metre-high along the Main Street frontage built with a 4:1 slope on the external side with deciduous and coniferous trees planted between the berm and boundary fence.
8. Berm G: a 3.0 metre-high berm along the western property boundary associated with 1326 Main Street.
9. During the initial 8.0 m deep excavation lift, all stockpiles within 200.0 m of Miller Road and Highway 3 (Main Street), shall not exceed 10.0 m in height.
10. Both coniferous and deciduous trees are to be planted between the berm and the Highway 3 (Main Street) and Miller Road boundary fence.
11. Existing hedgerow vegetation is to be retained where possible.
12. That all berms be immediately vegetated with a grass type legume ground cover to avoid erosion, sedimentation and dust.

SEQUENTIAL EXTRACTION AND PROGRESSIVE REHABILITATION

Phase 1A

- a) Stripping: Prior to stripping any agricultural fields or other vegetation, refer to NEL 1 - 2 Note 2 regarding breeding bird habitat. The area to be stripped in advance of extraction will reflect approximately 2-3 years of anticipated extraction. The stripped topsoil and subsoil will be placed within the quarry setbacks to be used for perimeter berms and future rehabilitation of the quarry side slopes.
- b) Extraction: Extraction will commence eastward from the Pit 3 face (Licence 4444) and extend to the eastern setback limit. The extraction depth will vary from 162.0 to 166.0 masl generally following the resource which is deepest in the southwest portion of the site. Extraction occur primarily in two lifts / benches each not exceeding 8.0 metres in depth. A third partial lift may be required in the deepest portions of the quarry.

As detailed in Archaeological Note 1 and 2, portions of Phase 1A include 'no-go zone' buffers which require Stage 3 assessments to be completed in order to clear the identified archaeological sites to permit extraction.

- c) Berms Construction: All berms will be constructed prior to any active extraction at the site. All berms will be constructed with a core of onsite clay overburden and be covered with a veneer of on-site subsoil and topsoil. Berm heights are noted on Sheet 3 of 8 and berm design detail sketches are shown on Sheet 5 of 8.
- d) Berm Vegetation: All perimeter berms constructed must be immediately vegetated with a native, non-invasive grass/legume to help prevent erosion, (refer also to General Operational Note 13 and NEL 1 - 2 Note 7) to augment fugitive dust and noise and to support grassland bird habitat.
- e) Processing Equipment: Although the majority of the processing equipment will be located off-site, any in-quarry portable processing equipment must be located on the lowest quarry floor or at a minimum elevation of 171.10 masl, whichever is lowest.
- f) Shipping off-site: Aggregate from Phase 1A will be initially hauled westward to the Port Colborne Quarries Inc. - Pit 1 for processing via an intra-pit road network through their Pit 2 and Pit 3 lands. Once processed, (crushed, screened, blended, washed and stockpiled), the material will be shipped to the market via Second Concession Road to Highway 140. Eventually that processing plant is planned to be relocated / rebuilt within the Port Colborne Quarries Inc. - Pit 3 lands, (Licence 4444), subject to MNRF approval. Once that occurs, aggregate from Phase 1A will be processed within Phase 3 then shipped to the market via a new entrance/exit onto Highway 3. To accommodate this, an access road from the quarry floor to the 'at grade' portion of Phase 1A will be constructed.
- g) Progressive Rehabilitation: As full extraction is progressively completed of portions of Phase 1A, the creation of side slopes will begin. Side slopes will range from the steepest permitted by the ARA being 2(v) : 1(h) to a shallower slope of 4(v) : 1(h) and will be designed generally as shown on the Final Rehabilitation Plan but subject to site conditions. To create the side slopes, the Licensee shall use:
 - i) Angled blasting,
 - ii) Broken shale,
 - iii) On-site overburden,
 - iv) Clean inert fill may be imported but the Licensee must ensure that the material is tested at the source before it is deposited on-site, to ensure that the material meets the MECP criteria under Table 1 of MECP's Soils, Groundwater and Sediment Standards for use under Part XV.1 of the *Environmental Protection Act*. Sampling results will be provided to MNRF upon request.
- h) Once the side slopes are created, on-site subsoil and topsoil will be reapplied and vegetated as per General Operational Note 13 and additional vegetation will be planted as per NEL 1/2 note 7 and as shown on the Final Rehabilitation Plan.

Phase 1B

- a) Stripping: Prior to stripping any agricultural fields or other vegetation, refer to NEL 1 - 2 note 2 re: breeding bird habitat. The area to be stripped in advance of extraction will reflect approximately 2-3 years of anticipated extraction. The stripped topsoil and subsoil will be used immediately for progressive rehabilitation of the quarry side slopes.
- b) Extraction: Extraction will commence northward from Phase 1A and extend north to the northern setback limit. The extraction depth will extent to 166.0 masl and generally following the resource depth and occur in two lifts / benches each not exceeding 8.0 metres in depth. As detailed in Archaeological Note 1 and 2, portions of Phase 1B include 'no-go zone' buffers which require Stage 3 archaeological assessments to be completed and which recommend that no further archaeological assessment is required, and then extraction may commence.
- c) Processing Equipment: Although the majority of the processing equipment will be located off-site, any in-quarry portable processing equipment must be located on the lowest quarry floor or at a minimum elevation of 171.10 masl, whichever is lowest.
- d) Shipping off-site: Aggregate from Phase 1B will be processed within Pit 3 then shipped to the market via the entrance/exit directly onto Highway 3.
- e) Progressive Rehabilitation: As progressive extraction is completed; the creation of side slopes will continue. Side slopes will range from the steepest permitted by the ARA being 2(v) : 1(h) to a shallower slope of 4(v) : 1(h) and will be generally as shown on the Final Rehabilitation Plan. To create the side slopes, the Licensee shall use:
 - i) Angled blasting,
 - ii) Broken shale,
 - iii) On-site overburden,
 - iv) Clean inert fill may be imported but the Licensee must ensure that the material is tested at the source before it is deposited on-site, to ensure that the material meets the MECP criteria under Table 1 of MECP's Soils, Groundwater and Sediment Standards for use under Part XV.1 of the *Environmental Protection Act*. Sampling results will be provided to MNRF upon request.
- f) Once the side slopes are created, on-site subsoil and topsoil will be reapplied and vegetated as per General Operational Note 13 and additional vegetation will be planted as per NEL 1/2 note 7 and as shown on the Final Rehabilitation Plan.

Phase 2

- a) Stripping: Prior to stripping any agricultural fields or other vegetation, refer to NEL 1 - 2 note 2 re: breeding bird habitat. The area to be stripped in advance of extraction will reflect approximately 2-3 years of anticipated extraction. The stripped topsoil and subsoil will be used immediately for progressive rehabilitation of the quarry side slopes.
- b) Extraction: Extraction will commence eastward from Phase 1B and extend east to the eastern setback limit. The extraction depth will extent to 166.0 masl and generally following the resource depth and occur in two lifts / benches each not exceeding 8.0 metres in depth.
- c) Processing Equipment: Although the majority of the processing equipment will be located off-site, any in-quarry portable processing equipment must be located on the lowest quarry floor or at a minimum elevation of 171.10 masl, whichever is lowest.
- d) Shipping off-site: Aggregate from Phase 2 will be processed within Pit 3 then shipped to the market via the entrance/exit onto Highway 3.
- e) Progressive Rehabilitation: As extraction is progressively completed, the creation of side slopes will continue. Side slopes will range from the steepest permitted by the ARA being 2(v) : 1(h) to a shallower slope of 4(v) : 1(h) and will be generally as shown on the Final Rehabilitation Plan. To create the side slopes, the Licensee shall use:
 - i) Angled blasting,

- ii) Broken shale,
 - iii) On-site overburden,
 - iv) Clean inert fill may be imported but the Licensee must ensure that the material is tested at the source before it is deposited on-site, to ensure that the material meets the MECP criteria under Table 1 of MECP's Soils, Groundwater and Sediment Standards for use under Part XV.1 of the *Environmental Protection Act*. Sampling results will be provided to MNRF upon request.
- f) Once the side slopes are created, on-site subsoil and topsoil will be reapplied and vegetated as per General Operational Note 13 and additional vegetation will be planted as per NEL 1 - 2 note 7 and as shown on the Final Rehabilitation Plan.

Phase 3:

- a) Stripping: Prior to stripping any agricultural fields or other vegetation, refer to NEL 1/2 note 2 re: breeding bird habitat. The area to be stripped in advance of extraction will reflect approximately 2-3 years of anticipated extraction. The stripped topsoil and subsoil will be used immediately for progressive rehabilitation of the quarry side slopes.
- b) Extraction: Extraction will commence northward from Phase 2 and extend north to the northern setback limit at Second Concession Road. The extraction depth will extent to 166.0 masl and generally following the resource depth and occur in two lifts / benches each not exceeding 8.0 metres in depth.
- c) Processing Equipment: Although the majority of the processing equipment will be located off-site, any in-quarry portable processing equipment must be located on the lowest quarry floor or at a minimum elevation of 171.10 masl, whichever is lowest.
- d) Shipping off-site: Aggregate from Phase 3 will be processed within Pit 3 then shipped to the market via the entrance/exit onto Highway 3.
- e) Progressive Rehabilitation: As extraction is progressively completed, the creation of sides slopes will continue. Side slopes will range from the steepest permitted by the ARA being 2(v) : 1(h) to a shallower slope of 4(v) : 1(h) and will be generally as shown on the Final Rehabilitation Plan. To create the side slopes, the Licensee shall use:
 - i) Angled blasting,
 - ii) Broken shale,
 - iii) On-site overburden,
 - iv) Clean inert fill may be imported but the Licensee must ensure that the material is tested at the source before it is deposited on-site, to ensure that the material meets the MECP criteria under Table 1 of MECC's Soils, Groundwater and Sediment Standards for use under Part XV.1 of the *Environmental Protection Act*. Sampling results will be provided to MNRF upon request.
- f) Once the side slopes are created, on-site subsoil and topsoil will be reapplied and vegetated as per General Operational Note 13 and additional vegetation will be planted as per NEL 1 - 2 note 7 and as shown on the Final Rehabilitation Plan.

Progressive Rehabilitation

1. General: The subject lands will operate by dewatering in the same manner as the existing Pit 3 (Licence 4444) to allow for dry extraction. The depth of the existing quarry and the Extension will be approximately 8.0 to 16.0 metres below the groundwater level. Upon final quarrying, dewatering will cease and the entire property (Licence 4444 and the extension lands) will gradually fill with water and become 177 hectare lake.
2. Side Slopes:
The side slopes of the extraction area will be created as per General Operational Note 16 and generally as shown on the Site Plans, but by varying depending on site conditions.

The depth of topsoil and subsoil that is to be re-applied to the final quarry side slopes will be generally equal to the depth removed which ranges 20 to 50 cm.

3. Proposed Vegetation:

- a) Wetland and aquatic plants that may be planted in the final rehabilitated nearshore or shoreline areas will include shrubs such as red-osier dogwood (*Cornus sericea*) and slender willow (*Salix petiolaris*), and herbaceous plants such as water plantain (*Alisma plantago-aquatica*), lake sedge (*Carex lacustris*), swamp milkweed (*Asclepias incarnata*), softstem bulrush (*Schoenoplectus tabernaemontani*), and common cattail (*Typha* spp.). Shallow wetland habitats will be created through construction of submerged benches, approximately 0.25 to 0.75 metres deep. Shallow emergent marsh vegetation (i.e., herbaceous species listed above) will be planted in water ± 0.15 metres deep and extend ± 5 metres from the shore and be interspersed with cover structures (e.g., boulders and root wads) in the shallow shoreline wetland areas. On-site and imported organic material, tree stumps and topsoil will be added to the shoreline areas to promote shoreline vegetation as required. Basking logs, nesting platforms and boxes will be created for turtle, waterfowl and swallows respectively. This habitat will be designed to be suitable as snapping turtle aquatic habitat and bullfrog breeding habitat.
- b) Final rehabilitation of the upland areas will be seeded with a mix of grasses and legumes consisting of native, non-invasive species. It is recommended that common milkweed be planted in upland areas to provide host plants for monarch caterpillars. Where terrestrial nodal plantings are included on the side slopes, they will include a mixture of coniferous and deciduous tree species to promote species diversity and provide a variety of species to compensate for any substrate deficiencies. The species may include white pine, sugar maple, red oak, trembling aspen, and white birch, with a secondary focus on species such as choke cherry (*Prunus virginiana*), alternate-leaved dogwood (*Cornus alternifolia*), highbush cranberry (*Viburnum opulus*), nannyberry (*Viburnum lentago*) and serviceberry (*Amelanchier* spp.). It is recommended that ash (*Fraxinus* spp.) species in rehabilitation plantings be avoided due to the invasion of emerald ash borer.
- c) Invasive shrub species including multiflora rose, common buckthorn, and Tartarian honeysuckle have become established in this area and may prevent the successful establishment of the native plantings. These invasive shrubs should be removed prior to the planting of Carl Road.
- d) All plantings (i.e., nodal plantings) included in the rehabilitation plan will be locally native, non-invasive species that create habitat in the short term and promote natural succession processes. The sourcing of plantings should consider the regionally adapted genetics of the species. Plantings from local sources are likely to be well adapted to the local climate and growing conditions and may have a higher likelihood of successful establishment. Therefore, plantings will be procured from local sources to the extent possible.
- e) All rehabilitated side slopes are to be vegetated with a seed mixture capable of:
 - Rapid germination and growth,
 - Controlling erosion.
 - Maintaining or enhancing soil fertility.The seeding is to be established in a timely manner and if necessary, facilitated by the application of fertilizer, water and/or additional seeding.

4. Vegetation Maintenance: During the ongoing extraction of the site and during the progressive rehabilitation phase, the Licensee will continue to monitor and maintain all site vegetation, and if any dies, it will be replaced immediately (during the proper planting season).

5. Berm Removal: As much of the on-site berms as possible will be removed once quarrying is complete with the subsoil and topsoil used to rehabilitate the final quarry side slopes above the final water limit (178.0 masl). However, where planted vegetation has grown and become mature on the exterior side of the berms, those portions of the berms may be retained.

Final Rehabilitation

1. Fencing: All existing fencing and gates are to remain after quarrying is complete.

2. Haul Roads: All existing internal haul routes will remain as the quarry floor will be flooded.
 3. Buildings: All on-site buildings / structures used as part of the extraction operation, (i.e. scales and scale house), will be removed during the final rehabilitation stage.
 4. Dewatering Pumps: Upon the completion of the quarry, the dewatering pumps will be removed, and the final land use is proposed to be a passive lake in conjunction with the Pit 3 lands, totaling +/- 177.0 hectares.
 5. Final Contours: The final contours are interpolated from available geologic information at the time of preparation and actual grades may vary.
 6. Final Water Elevation: The final water elevation for the lake has been determined to be +/- 178.0 masl.
 7. Final Land Use: Once extraction ceases and the final quarry slopes are established, the dewatering pumps will be removed, and the final land use will be a 177-hectare lake in conjunction with Licence 4444.
 8. Final Lake Elevation: The final surface water on the final lake will be 178.0 masl.
 9. Rehabilitated Area: The total area to be rehabilitated will be 71.1 hectares.
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Site Plan Variances:

- 5.1 No fence will exist along the eastern boundary of the quarry adjacent to Licence 4444.
- 5.2 No gates will exist along the eastern boundary of the quarry adjacent to Licence 4444.
- 5.10 The 15.0 metre setback between the eastern boundary of the quarry and Licence 4444 will not be required.
- 5.13 Stockpiles may be placed within 15.0 metres of the property boundary adjacent to Licence 4444.
- 5.16 Displaced topsoil stripped from the site may be used on the abutting Licence 4444.
- 5.17 Displaced topsoil stripped from the site which is used on abutting Licence 4444, will not be used for on-site rehabilitation.