March 5, 2021

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Environmental Assessment Branch

Ministry of the Environment, Conservation and Parks

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Thank you for the opportunity to comment on ERO Notice Number 019-2876 “Project-specific proposal to designate and exempt the proposed Reid Road Reservoir Quarry in Milton under the Environmental Assessment Act”.

The comments provided below are based on my review of the documents provided to date by James Dick Construction Limited (JDCL) in support of their license application for an open pit mine in our community. The level of risk, uncertainty, impact to both the human and natural environment, and potential for liability to my community, while at the same time providing no direct tangible benefit to the community, is unacceptable. In addition, my concern related to this mine stems not only from what is provided in JDCL’s supporting documentation, but as importantly, what is not provided along with the uncertainty this presents. In our evaluation of the project, we must all remember that it is impossible to make good decisions on bad or incomplete information. In the spirit of fairness and transparency, my concerns are summarized below.

**Terms of Reference for the Environmental Assessment**

My most important request related to the EA process is the formulation of a comprehensive Terms of Reference to properly direct the assessment. Defining the Terms of Reference MUST be open, transparent, and allow the full participation of the public, as well as key stakeholders including ACTIONMilton, Region of Halton, Town of Milton, Conservation Halton, James Dick Construction Limited and the MECP. Nothing less is acceptable. An open process would also help address the apparent lack of transparency in the process to date, where the public has had little to no input into the formal review process, other than what individual residents with scientific expertise have provided in their Notices of Objection. During this process, even simple communication with the MNRF as lead agency has been spotty, with emails consistently going unanswered. Even the current ERO posting has had 2 contact people in the first 7 days of the posting, neither of which has been overly diligent in responding to emails or phone calls when asked by the public for additional information on the EA process.

Having all parties participate in defining the Terms of Reference would help ensure the environmental assessment is complete and addresses ALL outstanding technical concerns. It is impossible to conduct a fair and complete assessment of the project using information provided only by the proponent – or perhaps not provided at all.

Major categories of concern to be included in the Terms of Reference include, but are not limited to, the issues outlined below.

1. **Underwater Blasting**

Underwater blasting is NOT used for aggregate production in Canada, and this proposed mine site should not be used as an experiment. JDCL states they use this method at the DoLime Quarry in Guelph, and on pg. 4 of their August 29, 2018 Public Information Session Handout for the proposed mine, state that “James Dick is a leader in this area and has been using the technique at a quarry in Guelph for 8 years …”. However, in the Hidden Quarry OMB Hearing, JDCL VP Greg Sweetnam accepted that JDCL has never blasted more than 4m below the water table, while both the Hidden Quarry and the Campbellville mines are proposed to be 23m deep. Also at the Hidden Quarry OMB Hearing, hydrogeologist Daryl Cowell, who specializes in karst, responded to the Chair that he had not looked at other subaqueous blasting sites in Ontario because there were none. Dolime is mining in a shallow pond of water at the bottom of the pit. Hidden Quarry and the proposed mine at Campbellville are both experiments, and should not be allowed to proceed using untried technologies.

It is my understanding that uncertainties related to using this blasting method at the proposed Campbellville mine include:

* JDCL’s lack of familiarity with the geology of their mines, as shown at DoLlime in Guelph, where the top of the aquitard is an undulating surface, which they mined into unexpectedly. There is no opportunity for visual confirmation of reaching the aquitard at Campbellville, as the mine is not dewatered. This creates the same risk to the aquifer as at DoLime, where JDCL compromised the aquitard due to incomplete geologic knowledge and duty of care.
* JDCL’s statement that “The geology of the RRRQ site is in different rock formations, so there is no similarity.” when responding to issues of concern regarding the DoLime Quarry further underscores the geologic uncertainty, and the need to peer review the appropriateness of underwater blasting at the Campbellville mine, and JDCL’s history using this technique
* Underwater blasting is a well-known technique for aggregate production in Florida. However, there is uncertainty around its applicability at the Campbellville mine as no scientific comparison has been presented between the aggregate blasting characteristics for the Miami Oolite in Florida compare to Amabel dolostone in Ontario, given the differences in the rock being mined. Underwater blasting of 2 million year old material in Florida aggregate mines is not comparable to underwater blasting in 400 million year old Amabel Fm, which is hard enough to provide the cap to the Niagara Escarpment
* on pg. 3 of Explotech’s 2018 blasting report, it is stated that with no site-specific blast data available, they “applied data generated at a variety of quarries across Ontario”. This increases the uncertainty about using this technique, as:
	+ there is no discussion of how many of these mines were in Amabel Dolostone, and if they were not, how applicable the data is from a different rock type
	+ there is no discussion of how many sites employ underwater blasting techniques similar to what is proposed at the Reid Road Reservoir mine
* uncertainties exist around the potential for impacts from underwater blasting on the aquifer as well. Austin Powder, JDCL’s blasting contractor at Dolime Quarry, states in their own documents that there are chemicals in their explosives that could impact water quality. And yet, evaluation of potential impacts on the environment or human health from these chemicals appears inadequate, or is not provided by the proponent.

**Austin Powder SAFETY DATA SHEET**

|  |
| --- |
| **Hydromite 100, Hydromite 70, HEET 30**  |
| Print date: 27.09.2018;  |

**MATERIAL SAFETY DATA SHEET Product Trade Name: HYDROMITE**

**Revision Date:** 20-Dec-2012

**Environmental Precautionary Measures**

Prevent from entering sewers, waterways, or low areas.

6.2 Environmental precautions

Do not allow product to reach sewage system or any water course.

**Solubility in / Miscibility with**

**Water: Soluble**

**Additional ecological information:**

General notes:

Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water.

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

**Austin Powder SAFETY DATA SHEET**

|  |
| --- |
| **Hydromite Emulsions: 600 to 4000 series**  |

Under “Hazardous Ingredients”, states aluminum content can be up to 10%

It is also uncertain whether the effect of blasting activities to either alter or create groundwater pathways between the West Pond and Kilbride Creek has been fully addressed, or that the potential for additional TSS movement to adjacent wetlands and Kilbride Creek through these enhanced pathways has been evaluated, in spite of proponent statements such as “Blasting is not designed to produce silt and clay sized particles and according to the Blaster's Handbook, none are created.”

It is uncertain why the proponent has presented no alternative to their plans for underwater blasting. They propose to drill, blast, and remove the entire 100 ft thickness of Amabel Fm at once. As the November 2020 Site Plan 2 of 6 states under S1.2.3 Lifts: “…. dolostone extraction will occur in one lift”, as opposed to “generally in one lift” as stated on the previous site plan. In order to blast the entire 100 ft thickness, small diameter drill holes must be used to maintain the volume of explosives used below a certain threshold, or risk exceeding ground vibration limits during the blast. Small diameter holes are more prone to deflection or collapse if they encounter a fracture zone or rock of different physical properties, which means the proponent will have more difficulty controlling where the holes are located at the 100 ft depth, and thus their blast effects. Finally, the ultimate question will be: what is their alternative if the proposed technique does not work as planned, seeing as how this is an unproven technique at these depths. They cannot:

* drill multiple benches to the 100 ft depth, as the pit is not dewatered
* drill larger diameter holes to maintain hole integrity, as this changes the explosion parameters, potentially increasing ground vibration
* dewater the pit, as the Provincially Significant Wetland is immediately adjacent to the pit, and cannot be protected sufficiently from water loss if the mine is dewatered

With respect to the wider effects of blasting on local infrastructure, an MTO review of the project was restricted to the potential impact at the Highway 401 interchange at Guelph Line, approximately 1.5 kms away from the proposed mine, as outlined in a Jan 7, 2019 email which states: “Typically, MTO would only have an interest if the Quarry were to encroach MTO lands or if the Quarry is located within 400m of an interchange.” It is uncertain whether an evaluation was undertaken by MTO of the effects of blasting on the bridge over Hwy 401 at First Line (600 m from proposed mine) or the bridge carrying Hwy 401 over the Guelph Junction Railway, located only 215 m from proposed mine, and carrying over 100,000 vehicles per day.

**1a) Flyrock**

There are potentially two sources of flyrock from explosive blasts – horizontal throw from the vertical face of the open pit, or vertical throw from the top of the hole hosting the explosives, due to surface cratering or improper stemming of the hole. The proponent’s reports concentrate on the issue as it relates to the vertical face, indicating that flyrock will be contained by the pit lake. Although true, this appears to ignore the possibility of material being ejected vertically from the top of the drilled holes, begging the question of why blasters routinely place blast mats out on the ground surface prior to a blast, if not to contain potential flyrock? This possibility is illustrated in the proponent’s December 3, 2019 Blast Impact Analysis report, where the maximum horizontal throw for the flyrock is often over 100 metres for cratering and stemming ejection, NOT from the face of the mine which would eject rock into the pit lake. It is uncertain why the implications of this have not been adequately addressed.

The proponent responded to a resident’s Notice of Objection outlining their concern about flyrock by stating “no flyrock is permitted to leave the property at any time.” Permitted or not, flyrock happens, and it is a real safety concern at this proposed mine. Safety issues at this site are magnified, given that two major transportation corridors are located within 100m of the proposed open pits. Hwy 401 (prior to its planned expansion from 6 lanes to 10 lanes) is already within 50m of an open pit and carries more than 100,000 vehicles per day, many of them transporting fuels and chemicals. CP Rail’s mainline through this part of Ontario is within 85m of a proposed open pit, and also carries large numbers of tank cars with fuel and chemicals. The proponent states that the operational plan for the quarry is designed to retreat towards the closest receptors thereby projecting flyrock and overpressures away from the receptors. It is uncertain how retreating towards closest receptors reduces the likelihood of flyrock from the TOP of the hole.

Flyrock is also becoming more of a concern within the Ontario government. Proposals to amend O.Reg 244/97 and the Aggregate Resources of Ontario Provincial Standards under the Aggregate Resources Act, February 2020 states in S3.1.3: The ministry is also proposing that all new and existing quarry sites (private and Crown land) that are approved to blast would be required to:

* + Implement measures to prevent fly rock from leaving the site during blast events if a sensitive receptor is within 500 metres of the boundary of the site.

In addition, according to the Supreme Court of Canada, in its interpretation of Ontario’s EPA, the adverse effects of “flyrock” occasioned by blasting are not trivial. Given that the MECP has jurisdiction over airborne contaminants, now is an opportunity to show leadership by better addressing the flyrock issue in open pit mines within Ontario.

1. **Provincially Significant Wetland (PSW):**

A PSW directly abuts much of the proposed mine area, and there remains uncertainty around the direct impacts to the PSW from various aspects of the mining operation. The Halton Region Environmentally Sensitive Areas Consolidation Report, ESA #20, April 2005: Guelph Junction Woods states this PSW is among the top ten botanical sites in the Region. The PSW is an area that contains plant and/or animal species that are rare provincially or nationally; an area that contributes to maintaining surface water quality; and an area that contains regionally rare plants such as wood horsetail, interrupted fern, northern beech-fern, black spruce, pondweed, sedge, black willow, great water-dock, yellow water-crowfoot, avens, mountain-holly, fireweed, sweet cicely, speedwell, lobelia, goldenrod. If the PSW is not protected IN ADVANCE, chronic annual impacts and damage to the ecosystem could make it unviable over the life of the mine. This is the Shifting Baseline Syndrome, where the continuous lowering of standards of nature and the acceptance of degraded natural ecosystems are allowed to become the new normal.

It is my understanding that uncertainties around potential impacts to the PSW that could degrade its function, thus making it a “provincially INSIGNIFICANT wetland” over time, include:

* The proponent’s hydrogeology report states that: “Temporarily lowering the water level in the main ponds during active extraction periods does not present an environmental challenge within the ponds, however, the drawdown in the three existing ponds will result in the lowering of the water table in the adjacent wetlands thus potentially affecting flora and fauna.” These impacts must be better understood, and not simply addressed through simple mitigation measures as proposed; if no environmentally safe mitigation is possible, then lowering of water levels must not occur. Once the damage is done, the PSW could be permanently degraded.
* The existing haul road passing through the PSW. This haul route is not part of the existing license area of the mine and thus has not be assessed related to potential impacts from its use during mining.
* Dust, noise, vibrations from blasting and vehicles, flyrock, etc. impacting both the flora and fauna of the PSW
* Active pumping to maintain water levels is proposed. Trigger water levels have been determined using information from abnormally dry years, potentially endangering ecologic features that will be repeatedly too dry, resulting in loss of function of the PSW.
* the approach of pumping water from ponds into dispersion trenches to maintain groundwater and surface water conditions within on-site and adjacent wetlands for the protection of amphibian habitat has not been proven effective, nor is there an approach proposed to verify its effectiveness prior to extraction initiation

### The proponent’s report Environmental and Water Management Implementation Guide, Feb. 2020 (Potential Changes to Physical Hydrogeology) states: “Turbid conditions will temporarily occur in the ponds during extraction, however, only low turbidity (<5 NTU) water will be used in the mitigation system.” It is uncertain as to how the turbidity will be determined on an on-going basis, or whether mining will cease should turbidity be too high.

* From the November 2020 Site Plan 2 of 6: flooding the PSW with water from a truck is proposed, but it is questionable that this is an approved method of maintaining water levels in a wetland. Potential physical, chemical, and biological impacts from using a water truck have not been assessed. The simpler approach of halting mining to let water levels recover has not been included as a mitigation measure, and should be.
* The November 2020 Site Plan 4 of 6 states:
	+ Under 1, point vi: Mitigation measures must be clear, and not simply to “strive” to be reached.
	+ Under 5D: “The operator is encouraged not to allow the water level in wetlands to fall below the minimum water level thresholds.” It is uncertain why being encouraged is appropriate, as the wetlands may be irreparably damaged if their water level remains low for too long. There is a concern that once the wetlands are damaged and (perhaps) no longer function as wetlands, they will be lost forever.
1. **Potential for Groundwater Contamination**

It is my understanding that uncertainties and concerns related to the potential of the mine to contaminate the aquifer include:

* aluminum concentrations of up to 10% are noted in the MSDS of Austin Powder for explosives typically used in quarries, making it uncertain as to whether this is an additional potential source of contamination to the aquifer. No evaluation of this contaminant source was undertaken by the proponent.
* The 2018 groundwater model shows the Eramosa Formation underlying all ponds, although the geologic description in the main report indicates it is not present. The associated report also states that the Eramosa may be a source of dissolved metals in groundwater, although the potential for dissolved metals being released to the aquifer from blasting is not addressed. These inconsistencies must be resolved.
* The processing plant for the proposed mine is required to be within the area to be licensed for extraction, as shown on the original Plan 5. This requires part of an existing lake to be filled in to build the plant, the plant being used to process material for Phases 1 to 4, followed by removal of the plant and excavation of the fill material prior to aggregate removal in Phase 5. There is no room within the licensed area to locate a processing plant, or store and process recycling material brought to site, once Phase 5 is being mined. The Executive Summary states that areas outside those to be licensed for aggregate extraction will be maintained in their current conditions. This leads to uncertainty as to where the processing plant will be located when it is moved to take aggregate from Phase 5, and where stockpiles of material brought onto the site will be located during this phase of the mining operation. These uncertainties must be addressed to ensure all operational aspect have been assessed for potential impacts to human health & safety, and the environment.
* The Site Plan is the ONLY place that a proposed industrial facility designed to recycle concrete and asphalt is mentioned for the mine site. There is NO study of the potential for impact to residents or the natural environment including water, from this industrial facility in ANY supporting report, including MHBC’s Summary, hydrogeology, dust, etc. A thorough assessment of this aspect of the industrial operation must be conducted, including cumulative impacts from this combined with the mining operation.
	+ Uncertainty also exists as to how “Recyclable asphalt stored on site will be a minimum of 30 meters from any water body or man-made pond.” when the entire license area consists mainly of the area of existing or proposed ponds, with little room remaining within the license area for stockpiles.
	+ If stockpiles are to be located in the Phase 5 area, it must be taken into account that this area is currently a pond, to be infilled to house the processing plant. Clarity is needed along with an assessment of potential impacts to the underlying aquifer.
	+ the need for recycled concrete aggregate (RCA) to be evaluated for potential heavy metal leaching and high alkalinity that has been reported surrounding its use as a road base coarse material. No evaluation of this contaminant source was undertaken by the proponent.
	+ The November 2020 Site Plan 2 of 6, S1.2.11 does not address the requirement for storage of recyclable materials at least 2m above the established water table, as in previous versions. It is uncertain whether recycled concrete and asphalt are now allowed to be stored at distances less than 2m above the water table, especially if such storage is to occur on sites of infilled lakes. The potential health and environmental implications of this have not been addressed.

In general, it is uncertain how the surface water regime is adequately protected when the proponent proposes only annual water quality monitoring, and no off-site monitoring. This does not appear adequate to protect the environment, or residential water quality. They state: “It is our opinion that off-site water quality sampling is not necessary as no water quality changes are anticipated. In response to water quality concerns, JDCL will obtain an annual water sample following the last blasting event of the year will be obtained from the active extraction area.”

### As documented in the proponent’s report Environmental and Water Management Implementation Guide, Aug 2020, surface water quality monitoring will be conducted on an annual basis only, in the East, Central, and West ponds. It is uncertain why this is an adequate program, as it does not appear to include the new pond located in Phase 1, in the southwest portion of the property.

1. **Physical Hydrogeology Regime**

JDCL has stated that the aquifer in the area of the proposed mine is hydraulically connected to that of supplying water to Milton’s Kelso wellfield, although not necessarily within the Kelso WHPA. Thus, any impacts from the mining operation that reach the Kelso wells could impact 20,000 people who use the Kelso water. Impacts to the aquifer at the mine site could be irreparable. Specific concerns and uncertainties related to the assessment of the physical hydrogeological regime, and based on my understanding, include:

* Section 7.1.3.3 of the hydrogeology report states that “it is our determination that recharge will exceed this threshold (302mm recharge value as a minimum) and therefore the site is considered to be within the SGRA (Significant Groundwater Recharge Area) for Halton Source Protection Area.” However, Table 4.6 which details the pre-extraction water balance, estimates 174,917m3 of infiltration over 829,510m2 of area, which only provides 211mm of infiltration. Thus, even under present conditions, the site does not appear to meet the minimum recharge value of 311mm.
* the site is at least partially within a significant groundwater recharge area and a highly vulnerable aquifer as reported in Section 7.1.3 of the proponent’s hydrogeology report. However, there is no discussion on the implications of this and possible negative impacts on the quantity or quality of the drinking water source based on proposed site activities.
* In the Harden report, it is stated that mitigation measures would be required to address anticipated impacts to the groundwater system from the proposed quarry operations. These measures are intended to maintain groundwater and surface water conditions within on-site and adjacent wetlands primarily, and to be undertaken by pumping water from the main ponds into constructed buffer ponds and dispersion trenches. It is uncertain whether this is a proven approach, or has been proven effective elsewhere.
	+ small variations in water level elevation may result in a significant difference in the degree and extent of saturation of the wetland areas, which could result in significant ecological impacts that have not been thoroughly assessed.
	+ The proposed measures assume that the pumped water will be distributed throughout the wetlands. The analysis does not consider the possibility of disproportionate distribution of the pumped water due to the underlying pervious materials.
	+ The proponent’s hydrogeologist has stated “*Direct pumping into wetlands may occur with approval of MNRF and Halton Conservation”.*  It is uncertain how this approval will be achieved if the mine is licensed, as it is my understanding that the Conservation Authorities Act is not applicable to the site at after licensing, and only approval from MNRF would be required.
* It is uncertain why statements made by the proponen’ts consultants such as “There are too many off-site variables to create targets for stage or streamflow in Kilbride Creek” are a substitute for conducting proper studies.

Based on my understanding of the issues, uncertainties and concerns about modelling of the physical hydrogeology of the site conducted for the license application include:

* that the Earthfx groundwater model is based upon an equivalent porous media, which does not adequately account for fracture flow through the aquifer. This could result in errors in the results and conclusions, and thus the potential for impact to the environment. The implications of this are potentially serious, given the nearby community is totally dependent on local aquifers for their water supply. In general it appears the proponent is using a regional groundwater model to determine local conditions around the quarry.
* It appears that the Earthfx report shows the Eramosa/Upper Amabel Formation as layer 7 in the hydrostratigraphic model of the property, although reports elsewhere indicate the Eramosa Formation does not exist within the area of the Reid Road Reservoir Quarry property.
* whether there was a comparison made between the groundwater model and the water balance from the hydrogeological report. Are water volumes for aggregate processing and dust control included in seasonal water balance calculations and potential wetland impacts?
* It is uncertain how the groundwater modelling accurately reflects the proposed sequence of extraction when the proponent’s consultants make statements such as “We acknowledge that the model does not account for the temporary loss of storage in the East pond during construction of the processing area. This will likely reduce the ability of the east pond to buffer itself against extraction and supplementation driven drawdowns, particularly during Phase 2-4.” What affect may this have on the adjacent PSW?
* Results of hydraulic conductivity testing for dolostone, as presented in the Harden report Tables 2.5 and 2.6 are as high as 6.29E-04 m/s, while those presented in Table 7.1 of the modelling report for model layer 7 through 9 are 3.00E-05 m/s; this would appear to be a large discrepancy for such an important parameter in the model. The proponent states that they were able to improve the match to observed conditions by increasing the hydraulic conductivity between the ponds allowing for better connectivity. In addition, they state that there is some anecdotal evidence of interconnection, increased weathering or perhaps even an increase in conductivity related to railway operations. It is uncertain how reliable this anecdotal evidence is without confirmatory geologic data, and thus its applicability in the groundwater model. In addition, if railway operations on an intermittently used rail line such as the one in question can significantly affect the rock’s hydraulic conductivity, how was this effect used in the model to account for the effects of constant use of CP Rail’s main line, less than 100m from Pit 1, or the constant movement of heavy trucks along Hwy 401? Have such anthropogenic increases in hydraulic conductivity been seen elsewhere, and have they been successfully incorporated into groundwater models before?
1. **Natural Environment**

JDCL’s Response to the Halton Region Notice of Objection was: “Given the simplicity of the proposal there is no need for an adaptive management plan.” Although the proposal might by simple, the environment and its interactions with the proposed mine are not. It cannot be assumed nothing will or could go wrong, nor that simple monitoring plans are enough. Section 14 of the report does not contain details on monitoring for impacts to the natural environment, or associated mitigation strategies, should impacts be observed where not predicted.

Uncertainties and concerns around the surveys conducted and conclusions reached in the Natural Environment report, given my understanding of the surveys methods used, include:

* The use of outdated information, such as using the Significant Wildlife Habitat Technical Guide (2000) rather than the Significant Wildlife Habitat Ecoregion Criteria Schedule; using the Natural Heritage Information Centre (NHIC) as a source for plant names/taxonomy, as opposed to Newmaster et al. (1998). Names of numerous species listed in Appendix B are noted as being out of date
* Improper survey techniques. Fish surveys conducted for the study did not follow generally accepted protocols
* Kilbride Creek flows through the most westerly portion of the property, and is a tributary of Bronte Creek and supports a coldwater fishery (Section 3.1.1.)

### The proponent also recognizes that significant wildlife habitat occurs on the property. This is

### documented in the proponent’s report Environmental and Water Management Implementation

### Guide, Aug 2020 states in S2.1 Wetlands and S2.2 Streams, as follows:

* Pond #5: supports the eastern ribbonsnake, a species of concern, and is considered significant wildlife habitat.
* Pond 7A: supports full choruses of some frog species including those that require longer hydroperiods or permanent water such as gray treefrog and green frog; considered significant wildlife habitat for breeding amphibians
* Pond 7B: Fewer amphibians breeding than in P7A due to the lack of emergent vegetation that functions to protect amphibians from predatory fish; considered significant wildlife habitat for breeding amphibians nonetheless. Appears to support a large population of snapping turtles and is considered significant wildlife habitat for this function
* Pond 12: appears to be a wintering area for turtles along with P13; no other ponds appeared to support turtles early in the spring and they all probably originated from these two ponds after winter; considered to be a significant winter hibernaculum for turtles
* Pond 13: considered to be a significant winter hibernaculum for turtles
* Eastern Wetland Complex: the wetland south of the road is of high quality
* the wetland north of the haul road supports several significant species. These include the provincially significant eastern ribbon snake (presumably), and the locally significant whorled loosestrife, swamp black currant, and snowshoe hare; the wetland is considered significant wildlife habitat for these functions
* the cattail marsh is the only location in the study area that supports the obligate marsh-nesting Virginia Rail
* the wetlands north and south of the road support an assemblage of area-sensitive breeding birds and is considered significant wildlife habitat for this function
* the swamp south of the road supports several locally significant species (Labrador tea, leatherleaf, black spruce, swamp dock, Nashville Warbler, and snowshoe hare) and is considered significant wildlife habitat for these functions
* the swamp south of the road supports some plant species with a very high Coefficient of Conservatism score (9 or 10 on a scale of 10). These include Labrador tea, leatherleaf, three-leaved false Solomon’s seal, and bog sedge

It is uncertain how, or even if, these significant habitat features will be properly protected.

### The proponent also recognizes that the site is adjacent to coldwater stream habitats. This is

### documented in the proponent’s report Environmental and Water Management Implementation

### Guide, Aug 2020 states in S2.1 Wetlands and S2.2 Streams, as follows:

Kilbride Tributary Wetland:

* the Kilbride Tributary is a coldwater stream that probably supports Brook Trout. The seeps and springs within the wetland provide baseflow to Kilbride Creek which supports both coldwater and warmwater fish species

Kilbride Creek Tributary: the tributary is a coldwater stream

* the tributary is important in providing coldwater baseflow to Kilbride Creek
* no fisheries work has been undertaken in the tributary but there is a high probability that it functions as nursery habitat for Brook Trout
* the lower reach of the tributary has the potential to provide Brook Trout spawning habitat
* the tributary has been identified as significant wildlife habitat for Brook Trout

Kilbride Creek: the creek is a coldwater/coolwater system

* Kilbride Creek provides fish habitat for both coldwater and warmwater fish species
* Brook Trout are present within the creek and the creek has been identified as significant wildlife habitat for this function because this is a locally significant species
* spawning by Brook Trout has not been confirmed in this reach, but cannot be ruled out
* the reach of the creek within the study area not only supports fish habitat but is critical to maintaining high quality fish habitat downstream

It is uncertain how these cold water features will be properly protected during site operations.

**5a) Jefferson salamander**

It is my understanding that there is particular concern and related uncertainty around site investigations for Jefferson salamanders, including:

* The Natural Environment Report states that only two nights of salamander trapping were undertaken, which is less than that recommended by MNRF when ruling out presence, which requires five nights of survey effort and multiple years of trapping (e.g. up to 5 years). The reports also states that there are regulated Jefferson salamander breeding ponds present in the study area and the 120 m investigation zone.
* The MNRF Memorandum of Sept 17, 2018 (Review of RRRQ Application Documents) states:
	+ “MNRF recognizes the supporting documentation does not agree with MNRF’s interpretation of Jefferson Salamander habitat” and “areas with suitable conditions within 300 m of a suitable breeding pond as defined in section 28 iii of Ontario Regulation 242/08 qualifies as regulated habitat. Additionally, the report disagrees with the MNRF’s interpretation to consider all suitable dispersal habitat within 1 km of a breeding pond to qualify as regulated habitat.”
	+ One of the authors of the Natural Environment report (A. Sandilands) further states in a paper published on January 30, 2020 that critical habitat encompassing the entire annual cycle of *A. jeffersonianum* extends up to 400–450 m from breeding ponds indicating existing regulatory habitat protections in Canada do not currently protect sufficient habitat.
* As noted in an email obtained though the Freedom of Information process, Aurora MNRF’s response to Al Sandilands re: his email with the subject line “RRRQ Jefferson salamander habitat” states: “…. most of the forested area on the site within 1 km of the *known breeding pond* (emphasis added) would be regulated as habitat ….” . It is uncertain whether this is being adequately addressed by the proponent.
* The Natural Environment report states “There is no evidence that the Jefferson Salamander has ever bred in the study area ….” which is not the same as not having seen them or collected them in the study area. Also, the November 2020 Site Plan includes the following, point 3D, “Salamander Sampling”: “No tail-tip samples will be taken and no genetic analyses will be completed.” “In the event that Jefferson or suspected Jefferson Salamanders are found ….”. It is unclear how Jefferson salamanders are to be found OR PROTECTED without samples taken or genetic analyses completed. YOU WILL NOT FIND WHAT YOU DO NOT SAMPLE FOR.

### In addition, the proponent’s report Environmental and Water Management Implementation Guide, Feb

### 2020 states in S2.1 Wetlands the following with respect to Jefferson salamanders:

* Pond #4: will probably be mapped as regulated habitat for the Jefferson salamander
* Pond 8: will be regulated as Jefferson salamander habitat
* Pond 9: will be regulated as Jefferson salamander habitat
* Pond 10: will be regulated as Jefferson salamander habitat
* Pond 14: will be regulated as Jefferson salamander habitat
* Buffers: A 10m buffer will also be established along the northern edge of Pond 4 (SWT2-2) as this thicket swamp will probably be identified as regulated habitat for the Jefferson Salamander. It is uncertain whether a 10m buffer is sufficient, or adheres to regulations.
* Salamander Sampling: Conduct salamander sampling at Pond 5 every 3 years starting in the first year of quarry operation. This will be a simple presence-absence survey deploying 15 minnow traps during the period when salamanders are breeding. Surveying in any given year will be terminated as soon as presence of salamanders is confirmed. No tail-tip samples will be taken and no genetic analyses will be completed.
	+ It is uncertain how, with no samples taken or genetic analyses conducted, that Jefferson salamanders will be protected, if sampling is only undertaken every 3 years.

In light of the proponent’s own findings, confirmation is required as to whether Jefferson Salamanders are present on the site, including a complete evaluation of whether breeding ponds are located on the site, the extent of regulated habitat on the site, and the area around regulated habitat that requires protection.

1. **Human Health and Safety**

A major uncertainty regarding this project is why potential contamination from the mine should not be evaluated AT THE PROPERTY LINE, not just IF it reaches someone else’s water well or impacts adjacent private property; the promise of impact mitigation after the fact is not the best way to deal with issues of contamination. The mine operator MUST be required to mitigate these impacts before they reach the property line and hence move off-site, as this impacts private property without owners’ permission. Such potential impacts could include:

* Blast vibration or flyrock
* Water contamination of a regional aquifer
* Chronic and sustained noise, VISIBLE dust, fine particulate matter, etc.

As the mine owner is a private, for-profit company, they should be required to pay the full cost of its operations without forcing neighbours to effectively subsidize its business through the free use of their properties for attenuation. The current reliance on complaint based investigations is particularly troubling if possible violations have environmental implications. This is akin to the mine operator taking the property rights of nearby residents without compensation.

**6a) Noise:**

* The Aercoustics Noise Report does not include a portable crusher as part of the list of equipment (report s3.4).
* Acoustic barriers are proposed to be 5m high, while similar open pit mine license applications recommend barriers up to 9m high. This is particularly important as the open pit will not be dewatered and all of the processing equipment will be above current ground level, rather than below ground level at other pits. At what elevation above-ground is the crusher & processing plant noise generated, and are 5m high berms sufficient?
* There is no noise evaluation of recycling material coming onto the site, asphalt or concrete processing, or long-term aspects of recycling operations conducted after open pit mining is complete. This is a significant aspect of the site operation that has not been assessed.
* There are discrepancies between the noise levels for equipment at the proposed mine and those noise limits used in reports for other sites, some also written by Aercoustics
* It appears that the noise report also uses a subset of residences when evaluating noise issues, which is not stated in the report, but should be clarified for transparency, and expanded to include all impacted residences and businesses

**6b) PM2.5**

It must be recognized that in addressing health impacts of emissions from the proposed open pit mine, that existing levels of anthropogenic contaminants such as PM10 and PM2.5 are already at levels that could present a significant health risk in the region. Although it is not the responsibility of the proponent to rectify a problem that is clearly not of their making, it is also inappropriate to rationalize further deterioration of air quality simply because it is already impaired. It is the responsibility of the proponent to consider the cumulative effects of their proposed project.

The proponent states, with respect to fine particulate matter, that background levels in Southern Ontario are not very sensitive to the proximity of major roadways and vary relatively little from one monitoring station to another. However, it is my understanding that studies conducted within the Province and within Halton Region, show road transportation and the associated combustion of fossil fuels, is a significant source of PM2.5 particulate matter. With the proximity of both Hwy 401 to the north and the main CP Rail line to the south, there is uncertainty why on site air quality was not collected, but data from an air station in Guelph was deemed appropriate.

The Priority Substances List Assessment Report states: “Therefore, PM10 and particularly PM2.5 are considered to be “toxic” as defined in Section 64 of the Canadian Environmental Protection Act, 1999 (CEPA 1999).” In addition, Health Canada states that PM2.5 is considered to be a non-threshold substance. Non-threshold substances are those for which health effects may occur at any level of exposure.

Quarries (open pit mines) are considered to be significant sources of PM2.5 in Halton Region. The report titled “Halton Region Health Department, Air Quality, Human Health & the Built Environment: Protecting Air Quality through the Land Use Planning Process. Oakville, Ontario: 2007” states:

* There are five major sources of air pollution in Ontario: transboundary air pollution that is emitted in the United States; the transportation sector; fuel consumed for space and water heating in buildings and for the generation of electricity; industrial sources; and open sources such as road dust, quarries and general solvent use.
* Open sources such as quarries, road dust, and construction activities are the most significant source of directly emitted PM2.5 in Halton Region;

Appendix A of the proponent’s air quality report shows the processing emissions spreadsheet estimating 100% removal of particulate matter from the central processing plan because of the water spray bars, described under Best Management Practices. It is uncertain whether 100% efficiency is realistic to expect, or whether it has been achieved at other similar projects.

According to the document “Assessment of Influential Range and Characteristics of Fugitive Dust in Limestone Extraction Processes”in the Journal of the Air & Waste Management Association: “Examination of the air quality and Ca2 concentration in TSP at each monitoring site indicates that the impact of fugitive dust can extend almost as far as 7 km.” Therefore, impacts of PM2.5 and PM10 must be assessed throughout the village of Campbellville and beyond, and the cumulative effects of the PM2.5 and PM10 from the site added to other sources must be assessed.

Overall, given the proximity to Campbellville, the proponent’s air quality assessment appears inadequate.

**6c) Silica**

While acknowledged by the proponent to be an issue, the proponent’s dust study does not appear to adequately address the issue of silica in dust that may be created by the proposed mine. This oversight may be due to the nature of the material being mined, although other studies and analyses indicate that dolostone can contain a significant quantity of silica.

Material Safety Data Sheets (MSDS) from the aggregate industry itself confirm the presence and hazard of silica in carbonate strata:

* Prairie Creek Dolomitic Limestone – MSDS (January 1, 2017) states a concentration of silicon oxide of 10% to 15%
* Nelson Aggregate – MSDS (Mar 2, 2015) states crystalline silica naturally variable concentration of 10% to 30%
* Lafarge – MSDS (April 19, 2018) states the product limestone/dolomite can contain crystalline silica concentrations of < 15%;

Notes from “Comments” included with Table in App C of the proponent’s Air Quality report state: “The native aggregate at the site is expected to have a silica content of 2% or less”. RWDI has measured silica values in several pits and quarries in Ontario, with the maximum value being 17%. It is unclear why such a low silica content is expected, given their own data as well as the typical values from industry MSDS is more in the 15% range.

It also appears that only crystalline silica in the PM10 portion of dust was modelled as part of the proponent’s air quality assessment report. As PM2.5 material is most likely to enter a person’s lungs, why is silica in that dust component not evaluated?

It is uncertain why the issue of silica being present in any recycled material processed on-site has not been addressed at all in the proponent’s air quality evaluation of the project.

The addendum to the proponent’s air quality assessment states “ …… provided that a mobile processing plant is operated below grade.” It is uncertain why any equipment operating below grade is being considered at this mine, as it is not being dewatered, and no below grade work will be conducted. Thus, there is uncertainty as to how this proposed project has been evaluated differently from a dust production or dust mitigation perspective because all equipment is located, and processing undertaken above grade, with no infrastructure or stockpiles located below the current ground elevation, as it is an underwater extraction operation. This will result in significantly more dust, silica, PM2.5, etc. reaching sensitive receptors. This must be evaluated.

**6d) Traffic Safety**

Issues of uncertainty and concern related to my understanding of the Road Safety Impact Study by Intus Road Safety Engineering Incorporated include:

* The report does not take into account any site-related traffic such as employee travel, explosives trucks, etc.
* The report assumes all aggregate is shipped east on Hwy 401 – this is unenforceable; trucks will travel where they need to travel once they leave the site
* Recycled material will arrive using the entire network of local roads, and this issue is not addressed. According to the proponent’s report Environmental and Water Management Implementation Guide, Aug 2020, “the 350,000 to 500,000-tonne extraction number represents only shot rock feed material extracted from below-the-water table in a year” and does not include recycled material entering or leaving the site.
* No evaluation of local residential street traffic safety appears to have been undertaken, for times when Hwy 401 is slow or stopped, which occurs frequently S9.10.3 states: “There is no reason to expect that RRRQ traffic will use the local road system to circumvent Highway 401 congestion.” This seems to ignore human nature, particularly when JDCL has no control over truck drivers once they leave the site
* Figure 4 of the report shows one of the currently most dangerous intersections in the area is Twiss & Reid Sideroad. An assessment is needed on how the increase in truck traffic, and other site-related traffic that is NOT evaluated in the report, will affect the public’s safety at this already dangerous intersection
	+ S6.14: In the end, the elevated crash risk at this location is not expected to be impacted by the proposed development. The RRRQ will be operational from 0600h to 1800h – which is outside of the times when crashes tend to occur at the Reid Side Road and Twiss Road intersection.
* S9.10.16 states that Campbellville Road is a truck route, with no significant pedestrian or cyclist generators from Guelph Line to Regional Road 25 and is a suitable and safe alternative for RRRQ trucks during times of congestion. If a complete study of the surrounding road network had been undertaken, it would be found that this is a major cycling route. Inaccuracies such as this one are unacceptable to a community where cycling is part of the culture, and pedestrians also walk these local roads.
* The original traffic study states in Section 2.1 that there is no visible pedestrian or cycling infrastructure along Reid Sideroad, which is the main route planned to access the mine site. However, the study was undertaken on Feb 7, 2018, when the high temperature at 6 am was -5°C and at 6 pm was -6°C. It is not surprising there was little pedestrian or cycling traffic; results would be different when the weather is a little warmer, which is when truck traffic from the quarry would be greater as well.
* Health impacts of noise, exhaust and dust from the trucks has not been assessed in any report.
1. **Project Alternatives**

It is uncertain why few if any project alternatives were investigated by the proponent. Such alternatives should include:

* alternative truck haul routes, as per the Official Plan for the Halton Planning Area, Regional Municipality of Halton, Office Consolidation - June 19, 2018 which states on pg 82:
	+ Require the proponent of a new or expanded Mineral Resource Extraction Area to demonstrate to the satisfaction of the Region that the transportation of aggregate and related products associated with the proposed extractive operation can be adequately accommodated by the transportation system in Halton. Any improvements to the Regional and Local transportation infrastructure to accommodate the transportation of aggregate shall be at the expense of the proponent. If applicable, alternative routes and alternative modes for transporting the products shall be considered and evaluated.
* Rail haulage of aggregate, even though a rail line bisects the property, and the CP Rail mainline connects to this rail line adjacent to the southern boundary of the property.
* A fully operational alternative plan for underwater blasting. The proponent proposes to drill, blast, and remove the entire 100 ft thickness of Amabel Fm at once. As the November 2020 Site Plan 2 of 6 states under S1.2.3 Lifts: “…. dolostone extraction will occur in one lift”, as opposed to “generally in one lift” as stated on the previous site plan. In order to blast the entire 100 ft thickness, small diameter drill holes must be used to maintain the volume of explosives used below a certain threshold, or risk exceeding ground vibration limits during the blast. Small diameter holes are more prone to deflection if they encounter a fracture zone or rock of different physical properties, which means the proponent will have more difficulty controlling where the holes are at the 100 ft depth, potentially affecting blast accuracy. Finally, the ultimate question will be: what is their alternative if the proposed technique does not work as planned, seeing as how this is an unproven technique at these depths. They cannot:
	+ drill multiple benches to the 100 ft depth, as the pit is not dewatered
	+ drill larger diameter holes to maintain hole integrity, as too much explosive will be used in larger holes, perhaps increasing ground vibration above regulated limits
	+ dewater the pit, as the Provincially Significant Wetland is immediately adjacent to the pit, and is unlikely to be protected sufficiently from water loss under this scenario

In summary, a FULL AND COMPREHENSIVE environmental assessment of this proposed mine is required.