



Proposed Norval Quarry, Applicant
Brampton Brick

**SECOND PEER REVIEW OF
*LEVEL 1 / 2 NATURAL ENVIRONMENT REPORT***

Prepared for:
City of Brampton



March 2013



**Second Peer Review of *Level 1/2 Natural
Environment Report***

Proposed Norval Quarry, Applicant: Brampton Brick

March 2013

Prepared For: The City of Brampton



TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 DATA COLLECTION AND EXISTING CONDITIONS INFORMATION.....	2
3.0 PROJECT SCOPE AND IMPACT ASSESSMENT.....	4
3.1 General	4
3.2 Rehabilitation	5
3.3 Groundwater and Surface Water	5
4.0 MITIGATION MEASURES.....	7
4.1 Quarry Water Management System and Main Tributary	7
4.2 Wetlands and other Terrestrial Aspects.....	9
4.3 Rehabilitation	9
5.0 MONITORING MEASURES	10
5.1 Main Tributary.....	10
5.2 Wetlands - Groundwater and Surface Water	12
5.3 Ecological Aspects	13
5.4 Rehabilitation	14
6.0 CONTINGENCY MEASURES AND RESIDUAL EFFECTS	15
6.1 Contingency Measures	15
6.2 Residual Effects.....	16
7.0 COMPLIANCE WITH ENVIRONMENTAL LEGISLATION AND POLICIES	16
8.0 SUMMARY AND CONCLUSION	17

LIST OF APPENDICES

Appendix A: Policy Review Table

1.0 Introduction

This report and appended policy review table present Ecoplans' follow-up peer review of the information provided by Beacon Environmental (Beacon) on behalf of Brampton Brick in August 2012 in response to the initial Peer Review of their 2010 *Level 1 / 2 Natural Environment Report Proposed Norval Quarry City of Brampton* (NER). Ecoplans initial Peer Review of the above-noted report was submitted in June 2011. Ecoplans and Beacon staff met to discuss the comments on November 28, 2011. Beacon's responses to the peer review comments and supporting information dated May 11, 2012, were provided to Ecoplans for review in August 2012.

The supporting information included the water resources documents prepared by Golder Associates (Golder) in response to the peer review undertaken by Genivar on Golder's (July 2010) *Level 1 / 2 Hydrogeological Technical Report Norval Quarry Brampton Brick Limited* (HTR). Part way through our review process, Ecoplans was provided with the *Adaptive Management Plan (AMP) Version 1.0 Water Resources and Ecological Features Proposed Norval Quarry Brampton, Ontario* (Beacon and Golder September 19, 2012 Draft); our comments and conclusions were updated accordingly.

The additional natural environmental and water resources information was very helpful in providing a better understanding of water-natural feature linkages/inter-relationships. However, there are still some remaining technical questions and uncertainties, which are not yet fully addressed by the AMP. Post-rehabilitation conditions and any associated potential residual effects remain vague.

Ecoplans reviewed Todhunter's (2012) updated Vegetation Management Plan (VMP) briefly, in order to provide some context since little additional detail was provided in the responses to our rehabilitation plan questions. While Ecoplans can rely on Beacon's assurance that the terrestrial communities are compatible and appropriate with the site conditions and settings, questions remain regarding the nature and functions of the aquatic communities associated with the pond. Basically, there was no new information provided regarding the latter in the response submission. Other than the planting list (about which we have some questions) and zonation provided on the VMP, no new information regarding the aquatic components of the rehabilitation plan was provided.

Ecoplans has not reviewed Long Environmental's (July 2010) *Norval Quarry Site Plan Report* (SPR), however the main questions revolving around the haul route analysis were addressed in Appendix C of Beacon's response report.

Our comments integrate some limited inter-disciplinary discussion with Genivar. It is our understanding based on that discussion that while Golder's assessment of groundwater-surface water interactions is reasonable, however we still have some water-related technical questions

that pertain to natural features specifically. Furthermore, the AMP introduces questions regarding the determination and rationale for the proposed monitoring targets and how they relate to existing conditions and in some cases to predicted impacts. It remains difficult to interpret some of the new water resources analysis work in a manner that is really helpful to understanding the existing water inter-relationships *in an ecological context* fully enough to properly assess the implications of the predicted changes on natural features.

The AMP answers many of the outstanding questions regarding mitigation and monitoring aspects. The structure and various components appear to be appropriate and provide a solid framework for comprehensive protection of the water-related functions that support the natural features. However, there are several gaps that flow from those identified in the impact assessment and mitigation measures, and several related questions and uncertainties that arise in the new information. These questions pertain to the water resource protection mechanisms and just how they are linked to protection of the ecological features.

In addition to the new questions raised by the AMP in relation to the monitoring and target setting approaches, we have questions regarding the comprehensiveness and feasibility of the proposed contingency measures. The ecological monitoring aspects appear to require augmentation to support the underlying reliance of the AMP on the conclusion that potential impacts of the proposed quarry on natural features are nominal.

Our comments have been prepared independent of any consultation with agency reviewers or the authors of the NER. It is noted that in some cases, questions are addressed by deferring to agency consultation/processes, which is reasonable, however some discussion in the updated NER is warranted. It must also be assumed that due agency process will be followed in addressing respective policy and legislative requirements.

We note that: The opinions expressed in this peer review (including Appendix A) may be supplemented, reconsidered or otherwise revised by the author(s) based on new or previously unknown information.

2.0 Data Collection and Existing Conditions Information

For the most part, the comments related to background data collection and field investigation methods and the associated descriptions of existing natural features have been addressed in the text and figures provided in Beacon's response. The additional vegetation and wetland information is particularly helpful. The occasional remaining ecological gaps and questions are generally minor. Of note however, the three Forb Mineral Meadow Marsh/seep communities identified in the valley require description and some comments are provided regarding mapping.

There is still some concern that some of the natural feature descriptions and analysis lack detail or are overly simplified, in turn leading to weakly or poorly substantiated conclusions. The main concern in this regard remains the Main Tributary. Most of the tributary questions are addressed adequately (subject to water related questions), and some additional fisheries information was provided. The flow assessment components provided by Golder are helpful. However, no real additional information was provided in the ecological responses regarding specific habitat functions in the Main Tributary.

The lack of any specific detail regarding habitat features along the length of the Main Tributary remains of some concern given that groundwater-surface water interactions vary along the tributary and some impacts are predicted. While not necessarily critical, it is difficult to review the impact assessment without some additional detail. The extent of the assessment along the reaches downstream of the property and any information about the habitat conditions along those reaches also remain unclear. For example, reference is made to fish moving downstream for overwintering but it's unclear if that refers to downstream of the site or downstream of Boivard Drive. If there are deeper pools along the reaches downstream of the site, might groundwater loss or reduction affect associated pool functions?

The information provided in conjunction with the series of Golder's memos goes a long way to demonstrating inter-disciplinary integration, particularly in the key area of water resources. However, there are several outstanding questions and uncertainties regarding the related functional analysis. In addition to our questions, we understand that there are also several technical questions raised by Genivar that could potentially have a bearing on the ecological assessment (e.g., operational aspects pertaining to water quality and temperature).

We note that the AMP has not recognized what we understand to be a refinement in the location of the FOD 7-4 community to the floodplain rather than including the slope vegetation as well (i.e., regarding contingency watering, as discussed further below).

Other generally minor gaps, which may be addressed in the updated NER, include:

- inconsistent recognition of the overall zone of influence extending beyond the predicted 1m drawdown line and in relation to the Study Area
- weak or missing discussion of non-water based off-site features (e.g., west of Winston Churchill and south of property along valley) and limited mapping, and associated weak assessment of landscape connectivity
- weak recognition of valley linkage functions even at a local level
- lack of specific identification, definition and mapping of Key Hydrologic Features (KHF). As we now understand from Beacon, the intention is that the KHF overlap generally with water-related ecological features, however these features should be specified.

- lack of discussion of functional connectivity between KNHF and KHF (or recognition of groundwater discharge as a function of KNHF)
- contention that breeding bird surveys are not required in off-site wetlands as habitat will not be affected; while unlikely, it is possible that some habitat related changes could occur to off-site wetlands in relation to loss of groundwater in which case the bird communities they support could in fact change
- description of the Forb Mineral Meadow Marsh communities, and we note inconsistent comments regarding the location of all three features on the west slope (i.e., Figure 3b appears to map unit #8 along the base of the east slope).

While the database has been augmented substantially and most of the gaps have been addressed, a few key gaps and the water-related questions and uncertainties continue to affect the overall comprehensiveness and in some cases accuracy of the impact assessment.

3.0 Project Scope and Impact Assessment

3.1 General

Figure 4 provides a good summary of the quarry footprint and operational impacts however the updated NER would still benefit from a clear description of these impacts to all features ('sensitive' and 'non-sensitive'). The location and extent of the specific setback reductions are addressed generally by the figure and feature descriptions provided. However, it should be recognized that the rationalization for the reductions is that they are required for operational reasons, which is considered acceptable given the nature and sensitivity of those specific portions of the vegetation system. We note that the characteristics of the vegetation should drive the determination of appropriate setbacks, and not vice versa.

There are still some operational aspects that are not identified or only partially identified, including:

- noise and dust, and related potential impacts to natural features
- haul route construction and operation/traffic, and related potential impacts to natural features, including potential wildlife mortality and interference with local valley linkage functions.

While we understand that the details around the haul road, berms and drainage diversion designs will not be prepared until after licensing, there are some aspects that could be more fully addressed with the available information, or it would seem that information could be developed further relatively easily to address specific gaps. Several questions also remain regarding the operation of the stream flow augmentation system, as discussed further in the mitigation comments below.

3.2 Rehabilitation

The rehabilitation information remains weak and little new information was provided in the responses. The reader is forced to go to other reports to see the Rehabilitation Plan, and without inclusion of more information in the NER, is left to conclude that the ecologists had little input into its development. In particular, reference to aquatic features and fish habitat is limited to single words and mapping of the pond on Figure 5. Our recommendation remains that the updated NER include a clear description of the rehabilitation plan, outline the role the ecologists had in developing the plan, provide a discussion of the rehabilitation plan from an ecological perspective (e.g., ecological objectives, various vegetation communities and habitat components, how they were selected, how they are intended to function), address specific habitat/non-vegetation design aspects (e.g., cover/structural elements, aquatic substrates, depths etc.), as well as diversity, landscape connectivity and compatibility etc., and specifically address aquatic habitat components.

Although there is some information provided in Golder's memos in relation to water aspects, the implications of returning to *near pre-quarrying water conditions* are not yet clear. While we accept that the 1m drawdown contour does not extend under the wetland or Main Tributary, some localized drawdown influence does extend beyond the 1m line. Therefore, potential for residual effects on natural features following rehabilitation (and during 'lake filling'), as minor as those effects may be, requires discussion. There is some question regarding the role of the pond is providing some support to Main Tributary flows, and related seasonality.

3.3 Groundwater and Surface Water

The impact assessment is improved considerably through provision of the specific water resources analyses describing the functioning of the water systems that support the streams and wetlands. However, a number of questions remain, particularly with respect to the presentation of water-related data and associated interpretation of changes from an ecological perspective. Use of average annual numbers makes it difficult to understand these changes in relation to functioning of the natural features. While we recognize that steady state modeling does not lend itself to addressing seasonal changes, some at least qualitative interpretation of the modeling outputs should be attempted to provide sufficient understanding of the changes to enable assessment of the actual implications on the natural features.

Furthermore, small impacts are frequently justified on the basis that the average numbers presented by the modeling exercise are conservative. Whereas, as we understand it through discussion with Genivar, the reverse is true; use of average annual numbers is not a conservative approach and may obscure potential impacts. Similarly, several of the definitions and assumptions used in the modeling do not appear to provide a good basis for interpretation of potential ecological effects.

For example, defining dry conditions in wetlands as occurring when water volumes divided by the total wetland area are less than 5 mm deep implies that the wetlands have 5 mm of standing water much of the time. We note also that this description suggesting presence of standing water in W42 for several months of the year, while also supported by Golder's data, is inconsistent with Beacon's descriptions of wetland habitat and biotic conditions and particularly the absence of any evidence of amphibians during their surveys. Further, we note that wetland soil conditions require only that they are saturated through the root zone for a reasonable portion of the growing season, and we are uncertain whether or not the hydroperiod measure as defined is sensitive enough to address this aspect fully.

Conversely, although we are not clear exactly how this parameter is used in modeling water changes in relation to the watercourses and wetlands, the concept of *meteorologically dry conditions* would appear to represent overly extreme conditions. It would be of little value in assessing impacts on natural feature. Drying at a less extreme level (e.g., water levels below the root zone for one or two months longer during the growing season for even two consecutive years) could elicit changes in the plant community.

Potential impacts to some features have only been weakly recognized (e.g., off-site reaches of Main Tributary downstream of the property) or are assumed to be nominal based on existing conditions (e.g., reaches upstream of property). The impacts to stream temperature remain somewhat confusing following the AMP review, and there is no real recognition of any potential for implications to coldwater habitat downstream of Boivard Drive. We have not seen the updated water quality analysis in relation to Silver noted in Beacon's response document; however we note that the AMP does not mention it as outstanding.

Potential for impacts to the Forb Mineral Meadow Marsh communities that we understand are supported by local groundwater seepage does not appear to have been recognized fully or addressed. In general, the loss of groundwater discharge should be recognized as a functional impact to the wetlands.

While our previous question regarding whether or not the potential for increased or induced recharge under drawdown conditions was considered was not answered, we understand from discussion with Genivar that they infer this was the case. We understand that the 'tight' low permeability Halton tills indicate the natural features are supported in large part by surface water, and the tills provide some measure of protection of natural features from underlying groundwater drawdown effects.

However, we have some remaining questions regarding potential impacts to water-related functions of certain natural features. For example, we are still not clear how exactly the sand lens under Wetland #42, which would be more permeable than the tills, is affected during drawdown conditions. Will it continue to 'overflow' via Tributary C at least seasonally? Is it related to the small seepage communities? If local groundwater discharge function is lost at least during Stage

2, would the potential loss of seepage indicator species and communities in Wetland W42 and in the valley not warrant recognition from a policy perspective (including loss or reduction of biodiversity)? We note also that it does not appear possible to maintain functional connectivity between KNHF and KHF during at least Stage 2 if groundwater discharge is completely lost.

Similarly, we are not certain if the differential permeability and associated recharge of the exposed shale along the section of the Main Tributary mid-way through the site was fully recognized in the impact assessment. Our concerns regarding the lack of detail in the existing conditions descriptions raise questions as to whether or not the implications of flow changes even with the flow mitigation have been comprehensively addressed (e.g., location of refuge pools or other habitat features that might be affected by flow loss).

Ultimately, the overall uncertainty underlying the potential impacts analysis in light of the use of modeled outputs is appropriately recognized in the response information, and we agree that the AMP is the appropriate tool to identify and address these uncertainties. However, as outlined below, the monitoring measures outlined in the Draft AMP do not provide sufficient certainty that the questions raised regarding the impact assessment will be identified.

4.0 Mitigation Measures

There is little additional information provided in the responses regarding ecological mitigation measures, based on the conclusion that impacts to natural features are nominal or minor. While the additional water-related analysis helps to support this conclusion, the remaining uncertainties and questions need to be addressed first. We note that the contention that no impacts to key ecological receptors are anticipated is frequently presented as an underlying basis for the AMP mitigation measures. However, this conclusion not yet fully supported, and, is itself reliant on the AMP.

4.1 Quarry Water Management System and Main Tributary

A number of questions remain regarding the operation and effectiveness of the Quarry Water Management System (QWMS) in maintaining stream flow and related water functions. Regarding operation, we note the contention that: *Because the QWMS will return intercepted groundwater to the Main Tributary at the upstream property boundary, it is expected that the net Main Tributary flows will remain sufficient irrespective of the amount of groundwater intercepted by the quarry* is somewhat simplistic. While we understand the general basis for this conclusion, it does seem to consider potential for losses as water is conveyed through the settling and storage ponds, particularly during dry summer or frozen winter conditions. Further assurance regarding water availability to maintain stream features and functions is warranted. We note also that the discharge point has shifted slightly downstream, however this is not discussed in the follow-up information.

Other possible operational issues include:

- recirculation issues associated with the pond system and potential water quality and thermal implications (See Genivar’s comments)
- winter operation, and potential issues associated with freezing of the outfall, flow of water over a potentially frozen stream surface, and possibly unrealistic expectations that surface water will contribute to stream flow and habitat (and the above-noted floodplain functions) well downstream of the discharge point.
- related questions regarding whether groundwater may contribute locally to maintaining local refuge habitat (winter and summer), the loss of which during Stage 2 quarrying might result in loss of the refuge function.

Regarding effectiveness of the QWMS, no further information has been provided to alleviate our concerns regarding release of water to support the Main Tributary at a single point at the upstream end of the system. Golder’s stream flow information shows apparently groundwater-related changes along the length of the tributary, specifically local influx through the upstream reach and again downstream of the site, and recharge through the mid-site reaches at and downstream of the access lane. It is not clear that the proposed QWMS approach of discharging at a single upstream point takes these local groundwater-surface water interactions- including thermal as well as flow and habitat volume considerations- into account. Therefore, questions regarding whether or not the mitigation system will in fact protect local fish habitat conditions and functions along the length of the tributary on and off-site have not been fully addressed.

Nor is any more detailed information provided regarding potential for impacts to fish habitat features that might be more sensitive to the water-related changes and important to sustaining the local fish populations (e.g., refuge pools). Although the AMP incorporates recognition of seasonality in the groundwater component of the wetlands, there is no apparent recognition of seasonality in the Main Tributary flow management system.

Furthermore, it is not clear how the QWMS/stream flow augmentation will support the Fresh-Moist Black Walnut Lowland Deciduous Forest (FOD 7-4) through the floodplain zone (or drainage feature B3). Section 4.2 of the NER response document describes this vegetation feature as being *proportionately a surface water dependent feature*, which appears to provide the basis for linking its mitigation to the stream flow augmentation. This linkage requires further explanation. Is it possible that high water table conditions at least seasonally also support this community through the floodplain? More importantly though, if the implication is that surface water feeds the community during episodic flooding events over the floodplain, will the proposed QWMS discharging at the far upstream end of the tributary maintain this function?

4.2 Wetlands and other Terrestrial Aspects

There is no specific mitigation of potential wetland impacts based on the underlying conclusion that the impacts of the drawdown on the hydroperiods will be nominal. We defer to the water resources experts to support this conclusion, however as outlined in the impact section, further discussion of the specific natural feature linkages would be helpful to justify that the measures (e.g., modeled hydroperiods) are appropriately linked to and reflective of wetland functions.

As noted, in specific cases it should be recognized that there may be some residual impacts (e.g., loss of seepage indicator species and communities in Wetland #42, loss of small Meadow Marsh/seep communities in valley) that will not be mitigated. In other cases, mitigation is still dismissed as not being required (e.g., for off-site wetland W43) or as being impractical without any substantive rationale (e.g., with respect to local wildlife movement function along valley).

Although generally minor, no or incomplete responses were provided to the comments pertaining to specific mitigation measures, including:

- protection of retained vegetation within the wooded valley in relation to the haul road crossing
- protection of off-site features and functions
- protection of nesting by migratory bird species
- protection of aquatic resources from contaminant spills
- mitigation of potential dust or noise impacts
- management of wildlife encounters (including the possibility of SAR) during operations
- wildlife movement.

4.3 Rehabilitation

Continued provision of mitigation during the period of ‘lake’ filling, which we understand from Golder’s memo will occur, should be recognized in the NER. Potential for residual effects following rehabilitation also warrants some discussion, given that conditions are only returned to *near pre-quarrying conditions*. There appear to be uncertainties associated with the specific pond water level and its seasonal fluctuation, and the permeability of the backfill in terms of the extent of the residual groundwater drawdown.

Therefore, as the ultimate long term mitigation measure and while recognizing the long period to implementation, further discussion and detail around the design and operation of the rehabilitation plan in relation to natural features is warranted to demonstrate ecological integration. Were the anticipated seasonal fluctuations in the pond level considered in the rehabilitation plan design (e.g., plant communities, habitat zones)? We are not clear regarding the extent of the reliance on

outflow from the quarry pond to support the tributary, or whether there are seasonal implications (e.g., Will baseflows be maintained following rehabilitation? What supports the increased flow prediction if groundwater levels are still slightly below pre-quarrying levels?).

5.0 Monitoring Measures

Similarly, there was little to no additional information provided regarding monitoring measures in the NER responses. Comments regarding the Monitoring column of Table 7 in the NER were not addressed. There are no clear monitoring measures identified specific to wildlife, SAR, significant wildlife habitat, or terrestrial resources in general.

The AMP does provide new monitoring information, however the proposed monitoring measures raise several questions. The monitoring plan is premised on the acceptability of water-related impacts to natural features. Therefore, monitoring should first demonstrate those links and determine if those impacts are as predicted and are acceptable. Therefore, it is not entirely clear that the direct ecological monitoring aspects are sufficient to identify if there are residual effects to natural features. For example, further discussion of the basis for the water-related monitoring measures and associated targets would be helpful to demonstrate that they address ecological linkages appropriately. In general, the proposed trigger monitoring appears inadequate as discussed below. The integration of the non-trigger monitoring information requires discussion.

We defer to Genivar's comments regarding the groundwater monitoring measures, however, again we note the underlying basis that the drawdown impacts will be as predicted and the related effects on natural features are acceptable. We have questions regarding the rationale for the determination of the seasonal breakdown for wetlands. However, again we defer to Genivar to determine if this breakdown reflects existing seasonal groundwater patterns. The monitoring component triggers do not consider seasonality in the stream flow regime.

5.1 Main Tributary

We have several questions regarding the stream flow monitoring program:

- It would be helpful to provide some rationale regarding the selected flow monitoring trigger stations. We assume the basis may be monitoring of flows entering and exiting the property, but this should be explained, and the limitations of using only three sites considered. For example, if flow is lost through accelerated recharge in the lower portion of the on-site reaches, monitoring data from CRT-2 may provide advance warning regarding the ability of the QWMS to sustain flows downstream of the site in the absence of groundwater discharge. At a minimum, an explanation of how the other flow monitoring data (and groundwater data) will be integrated with the trigger location monitoring should be provided, particularly given the variable pattern of discharge-recharge-discharge along the tributary length. Again, the lack of detail in the

documentation of habitat features and functions extending through and downstream of the site elevate concerns regarding the very limited ‘trigger-monitoring’ proposed for the Main Tributary.

- The basis for the use of existing *extreme low flow conditions* for monitoring impacts to the Main Tributary requires further explanation. The ecological basis provided is that the very low seasonal flow conditions increase the tolerance of the stream habitat to negative impacts, provided adequate conditions are maintained in various refuge pools. However, the reverse may be true in that the stream habitat may be more sensitive to incremental flow loss during low flow periods. Further, the NER responses indicate that there are very few good refuge pools. Therefore, an incremental reduction from low seasonal flows could result in no flow and inadequate refuge habitat volume or accessibility to sustain fish at least locally during stressful periods.
- Furthermore, the AMP states: *The Main Tributary will be monitored for water levels ...in order to demonstrate that net flow volumes remain within target limits as predicted during the impact assessment.* The trigger targets do not include water level targets. The predicted impacts are presented in terms of baseflow changes. Further explanation as to how the trigger targets relate to predicted changes and existing conditions, and to demonstrate that they will be protective, is required.
- We note that the minimum flow targets are significantly lower than what appear to be baseflows measured by Golder during July 2011. The up to 4 day duration proposed for the minimum flow target would also appear likely to potentially exacerbate stressful *extreme low flow conditions*. Further rationale should be provided for the proposed targets.
- Similarly, the up to 4 day duration proposed for the thermal trigger targets, in combination with the very low flow volume targets, should be rationalized based on existing conditions. As well, the implications of using thermal trigger monitors only at the upstream edge of the property and from the QWMS discharge should be considered in relation to potential for impacts downstream. What are the expected downstream temperatures based on the proposed targets upstream, especially during quarrying periods when groundwater discharge will potentially be entirely lost? Is the coldwater habitat status in the reaches downstream of Boivard Drive to (and in) the river considered? Again, at a minimum, an explanation of how the other flow monitoring data (and groundwater data) will be integrated with the trigger location monitoring should be provided.
- Why is the flow target at the Credit River outfall station (0.4 L/s <4 days) lower (considerably) than that upstream at CRT3 (1.1 L/s <4days)?
- There does not appear to be any consideration of seasonal fish habitat functions that might be sensitive to the extreme low flow target triggers (e.g., refuge pools, access to those pools or other features like riffles during the late spring for spawning). Given the reliance of the proposed extreme low flow monitoring targets on availability of refuge

pools, would monitoring of those pools not be advisable (e.g., staff gauge/water level)? As noted, specific habitat features that may be important to the broader system and their relationship with groundwater are not well documented in the existing conditions assessment, making it difficult to determine whether specific features might warrant inclusion in the monitoring framework.

- We assume that the absence of seasonal targets for stream flow is related to the use of minimum flows, or possibly assumed to be unnecessary given the linkage of the QWMS water supply to groundwater influx, which will vary seasonally. However, further information should be provided as to just how the QWMS and the proposed extreme low flow target system are intended to operate to protect the Main Tributary functions, during all flow periods.
- There is no mechanism in place to prevent operation near the minimum target levels year-round. Nor is there a mechanism in place to prevent continuous operation at those minimum flow levels during dry, potentially stressful periods in the summer or winter, or regular operation below the minimum level as long as the minimum is reached at least one every 4 days.
- While we accept that the volumes discharged to the Main Tributary by the QWMS are not large, some indication that potential for fluvial geomorphic impacts- either depositional during low flow periods or erosive if there are periods of greater surplus- was considered should be incorporated in the AMP. We note that the focus on low flow monitoring triggers will not capture any potentially erosive discharges in the outfall reach.

5.2 Wetlands - Groundwater and Surface Water

Provision of the rationale for the proposed location of the wetland surface water monitoring points would be helpful in relation to specific ecological features and functions, and to explain/justify the use of only four monitoring locations (two in W42) would be helpful. A description of the wetland and water characteristics at the monitoring sites should be included in the NER or AMP.

We understand that there are limitations as to what the groundwater monitoring (wells and piezometers) can assess in terms of wetland hydrology, and that the low permeability tills should, assuming the characterization is accurate, limit impacts from the groundwater drawdown. Therefore, we understand the rationale for monitoring of hydroperiods.

However, as outlined in the Existing Conditions section, and again deferring to the water resources experts, we have questions regarding the derivation of wetland hydroperiods and whether the underlying assumptions reflect wetland functions appropriately, or sensitively enough. These questions carry forward to the proposed AMP surface water monitoring targets, and specifically, whether these broad based hydroperiod targets, measured in months, are appropriate as the only trigger monitoring item to identify potential for impacts to the wetlands.

At a minimum, discussion as to how the other ‘non-trigger’ monitoring information will be incorporated in the analysis would be helpful.

While we recognize the issues associated with lack of access permission, is there a viable alternative for monitoring potential for impacts to Wetland W43?

5.3 Ecological Aspects

We understand that the ecological monitoring components of the AMP are ‘indirect’ (e.g., via trend analysis) relative to the direct quantitative monitoring of the specific groundwater and surface water targets. However, as noted, the underlying basis of the AMP is that the predicted water-related impacts on natural features are small and acceptable. Therefore, inclusion of sufficient monitoring of natural features is warranted to demonstrate linkages with the water-related trigger monitoring, and that ecological impacts are consistent with the predictions and acceptable.

We understand the basis for deleting macrobenthic monitoring is the provision of direct monitoring of water quality and thermal conditions; however the adequacy of those monitoring programmes to identify impacts requires further review. Ultimately, we expect the review agencies will determine whether or not macrobenthic monitoring should be included.

Provision of additional explanation regarding the fish-related monitoring (e.g., what specifically is being monitored and why) would be helpful. Composition/species presence and absence may be useful to identify loss of a species. Will relative abundance be monitored? We note that fish, like benthics, are affected by a range of other factors unrelated to quarrying. While fish community monitoring may be helpful to identify possible issues, consideration of more direct monitoring of key features like refuge pools might provide more useful information.

Considering our questions regarding the suitability of the broad based hydroperiods as the single surface water monitoring trigger for wetlands, why are soil moisture probes and vegetation monitoring plots recommended for use in FOD 7-4 community not also proposed for monitoring in the wetlands? The probes might also enable tying a quantitative and direct water-based target to the vegetation feature.

As also outlined previously, potential impacts to the small seep communities in Wetland W42 and on the valley slopes do not appear to have been explicitly recognized. It is noted that Vegetation Monitoring plot V4 is located near a seep; if the intent is to monitor for impacts to vegetation in the seep, this should be recognized, or otherwise considered.

Regarding monitoring of vegetation Unit FOD7-4, further explanation should be provided as to how the arborist determines if the features are adversely affected and whether this effect is attributable to the quarry operation. It appears that the condition of trees (which we assume to

include signs of drought stress but which requires further clarification) will only be assessed in the monitoring plots, which all appear to be located near the base of the valley. We agree it is appropriate to monitor the provincially ‘rare’ community FOD7-4, which we now understand has been re-mapped to the floodplain, given the potential for its hydrologic regime to be altered. It may also be appropriate to monitor the slope vegetation (which we note is consistent with the AMP contingency mitigation for drought stress per section 4.5.4) given that the slope trees may be more prone to drought stress if the slope hydrology is changed as well. However, the intent of the monitoring and the link to the response contingency mitigation require clarification.

We also assume that the annual inventory of vegetation plots includes groundcover and understory species/strata, which are part of the overall community. Further, we note that changes may be more readily observed in the ground flora than in other strata; water-related effects could persist for some time before they become evident in the trees.

Further monitoring detail (e.g., how, where, when and frequency of monitoring for drought stress) would be helpful; we note that annual monitoring may not be sufficient or target the most susceptible periods. The frequency of the vegetation monitoring requires specific clarification. Section 4.3.2.4 states that vegetation monitoring plots will be monitored annually, however Table 4-1 identifies monthly monitoring for vegetation condition parameters under Green Zone conditions. It is unclear which vegetation condition parameters will be monitored monthly.

5.4 Rehabilitation

As outlined at the end of the mitigation section, the proposed long term monitoring of the ultimate lake-based rehabilitation plan is weak, and there is no monitoring proposed for natural features. At a minimum, potential for residual impacts requires recognition given the potential implications of only returning to *near pre-quarrying conditions*. We understand that the predicted 1m drawdown does not overlap with the Main Tributary or wetlands. However, the ‘predicted’/modeled basis of the long term drawdown effects and the potential for residual effects of localized drawdown to extend beyond that 1m line warrant at least consideration of the potential need for continued monitoring to assess residual impacts to natural features (e.g., seasonal pond level fluctuation if outflow required to sustain the Main Tributary, reduced groundwater discharge to seepage communities).

6.0 Contingency Measures and Residual Effects

6.1 Contingency Measures

We have various questions (some of which are recognized as uncertainties in the AMP) regarding many of the contingency measures that have been proposed for implementation in the event impacts are identified:

- The AMP indicates that the contingency mitigation measures will be tested/demonstrated up front; however, testing of many of the measures proposed would not appear possible (e.g., wetland berms, setback increases, advance backslope filling).
- More specific detail regarding implementation of the increased setbacks and accelerated slope rehabilitation measures is warranted, for example, whether there is sufficient lag time between identifying an impact and applying the measure.
- Similarly, the feasibility of and lag time associated with construction of the secondary pond as a contingency for the QWMS water supply for the Main Tributary requires elaboration. Will it always be possible to construct this pond somewhere in the operating quarry, near enough to the discharge point? Will there be an adequate water supply to it? What is the lag time between identifying an impact and bringing the pond into operation? Adding a second pond will not address any potential issues that may arise related to the single upstream point of discharge unless that discharge point can be moved downstream.
- This secondary pond is also the only contingency measure provided to address thermal and water quality aspects. The single discharge point at the far upstream end of the property provides little flexibility to manage potential impacts to flow, temperature or water quality in downstream reaches. There is no consideration of a contingency to introduce flow at additional points along the Main Tributary. Will the secondary pond utilize the same outfall point as the main pond?
- The response information indicates that the option of discharging surface water to wetlands as a contingency measure if monitoring identifies an impact, which was briefly mentioned in the NER, has now been dismissed. The AMP introduces the contingency of constructing low berms at the outfalls of the wetlands (where feasible) to retain water. Construction of these berms in the wetlands requires resolution of several questions (some of which are identified in the AMP), including the implications on *downstream flow conditions and changes in wetland characteristics* (e.g., we assume due to deeper or longer duration ponding at the berms). Ultimately, the agencies will determine the acceptability of the berm construction in the wetlands. There is no alternative provided if the berms are not considered acceptable or do not work.
- The berm construction is not feasible in W43 or W44. No alternative contingency is identified based on the conclusion that the predicted impacts will be negligible and

therefore contingency mitigation is not required regardless. This basis should be clearly stated, the assumptions clarified, and the potential for residual impacts identified.

- As outlined in the monitoring section, it appears that Unit FOD 7-4 is being monitored based on the location of the vegetation monitoring plots, as appropriate given its provincially ‘rare’ status. However, the contingency mitigation proposed in the AMP is watering of the trees on the slope. We are not sure if this reflects the need to update the AMP to be consistent with the updated boundaries of FOD7-4, or some other monitoring intent. Assuming the former is correct; will the contingency measure be modified to target watering of the vegetation in the floodplain in addition to that on the slope? Is it feasible to use a watering truck from the top-of-slope to address impacts to the floodplain community? In addition, while we accept that watering may only be required during *severely dry conditions*, we assume the need for this contingency will be determined based on the monitoring findings (which as appropriate, will incorporate other community strata in addition to only the trees) rather than be initiated only during *severely dry conditions*.

6.2 Residual Effects

As noted, while they may be acceptable as predicted, the residual impacts on natural features following implementation of the proposed contingency mitigation should be recognized clearly at each stage. While we recognize that it may not be reasonable to identify specific natural feature contingency measures for the post-rehabilitation phase at this stage of the project proposal, the possibility of residual changes should be identified. Where contingency measures are not identified or may not be feasible, the potential residual effects and their policy implications should be identified.

7.0 Compliance with Environmental Legislation and Policies

While much more fully discussed in the response document, policy aspects do not receive full closure (recognizing that the updated NER may address this). While the AMP addresses some residual impacts and provides some contingency mitigation measures, there are also a number of outstanding questions that could have policy implications that require resolution.

Therefore, some questions pertaining to protection of natural features require resolution to fully substantiate the conclusion that all of the legislative requirements have been addressed. Although some additional discussion and clarification of comments regarding policy aspects was provided in the initial sections, specific closure on a number of policy aspects is still missing.

There appear to be some specific policy aspects that, while not necessarily substantive in terms of overall impact, require recognition (e.g., loss of groundwater discharge functions, maintenance of

KHF and KNHF connectivity during quarrying, loss of biodiversity through loss of seepage indicator species and communities).

While we accept that related policy adherence will be addressed by respective agencies, the reviewer is often forced to assume that this will be the case (e.g., ESA, Fisheries Act). It is assumed that some additional discussion and closure will be provided in the NER.

8.0 Summary and Conclusion

Overall, the additional response information provided, and specifically as it relates to water-related issues, goes a long way to resolving most of the reviewer's initial comments. A much more comprehensive understanding of existing conditions and groundwater and surface water relationships is provided. However, some specific deficiencies are still noted (e.g., in relation to the Main Tributary habitat information), and in some cases specific comments have not been or only partially been addressed. As outlined, there are some remaining as well as new (stemming from the new information) uncertainties and questions. In general, it is also difficult to determine if the reviewer's comments have been fully addressed without seeing the updated NER.

Key points include the following:

- The integration of water resources (surface water and groundwater) information and related functional analysis is much enhanced. However some of the linkage and connectivity aspects would benefit from more detailed discussion and explanation.
- The comprehensiveness of the habitat description of the Main Tributary and the function of the valley corridor (at least at a local level) for wildlife movement etc., remain general points of contention. A good general description of landscape connectivity is provided, however there are some features that are still not mapped or discussed, at least some of which appear to be within the zone of potential influence.
- There are still a few gaps in and questions around the impact assessment that arise from the above points and/or the new water resources analyses and related ecological interpretation. These gaps carry through the AMP. For example, the seep communities in the valley are not assessed. Some questions remain around the specific implications of loss of groundwater to Wetland #42. Uncertainties regarding the operation and effectiveness of the proposed surface water augmentation system in maintaining the Main Tributary habitat and the hydrological regimes of the Fresh-Moist Black Walnut Lowland Deciduous Forest (and drainage feature B3) remain. Other operational aspects such as noise and dust and valley crossing implications are not well addressed.
- Although we realize that information is contained in the Todhunter report and responses, no additional discussion of the Rehabilitation Plan from an ecological perspective was provided. Information about the aquatic components is specifically lacking.

- Clear recognition of potential residual effects and transference into monitoring measures remain weak or in some cases lacking. Some of the contingency measures may not be feasible, and the proposed measures are not comprehensive. Ultimately, residual effects that may not be possible to mitigate even through contingency measures should be recognized and their potential policy implications identified.
- Detailed evaluation with respect to policy requirements remains lacking, although this may be addressed through the process of updating the NER. Ultimately, final policy closure is also tied to resolution of the remaining questions and uncertainties.

As highlighted, little additional information is provided in the NER responses around mitigation. The basis appears to be that the more fully substantiated impact assessment indicates that the predicted impacts to natural features will be minor, and any discrepancies in those predictions or in operational realities will be addressed through the AMP. However, the AMP does not address some of the specific questions in relation to the existing conditions assessment and impact analysis, and new questions arise in relation to the proposed monitoring, and triggers in particular.

Ultimately, the underlying premise of the AMP that the predicted water-related changes will not have any negative effects on the ecological features remains a prediction, around which there are a number of uncertainties and modeled inputs. The AMP should integrate measures to first establish/demonstrate that observed ecological effects are as predicted and that those effects (i.e. operating in the green) are acceptable. While some ecological monitoring is included in the AMP, it is typically not linked specifically to the water related monitoring. Overall, questions remain as to whether the combined monitoring will be adequate to identify and allow timely resolution of effects to natural features.

We understand the challenges associated with setting specific ecologically based targets, and therefore the basis for using trend analysis. However, the proposed trigger-based monitoring components are somewhat simplistic and minimal. Additional measures and detail are recommended. Monitoring tools such as the soil and temperature probes that might lend themselves to setting quantitative targets and may more appropriately reflect wetland saturation than the broad based modeled hydroperiod durations are not being used. At a minimum, more explanation is required as to how the other monitoring data will be integrated to provide a better/broader basis for identifying impacts.

In summary, the AMP framework is appropriate and relevant components are identified, however:

- The AMP does not enable clear demonstration of predicted water-related effects on ecological features.
- Mitigation measures and questions are not fully addressed.
- Uncertainties and/or gaps remain regarding:

- assumptions and ecological interpretations (e.g., use of averages, definition of dry conditions, derivation and monitoring use of wetland hydroperiods, determination of baseflow, recognition of seasonality, use of *extreme low flow conditions* for monitoring Main Tributary)
- appropriateness and comprehensiveness of monitoring approaches
- monitoring of some ecological components (e.g., off-site monitoring-specifically downstream reaches of Main Tributary, seeps)
- response triggers/basis for identifying impacts
- response actions/contingency measures in relation to ecological features and functions
- integration of other monitoring data.

Most of the identified deficiencies appear for the most part to be resolvable with additional discussion/explanation and/or inclusion of additional or augmented monitoring and possibly contingency mitigation. However, at present, the combined documents do not provide sufficient closure on potential residual effects and any associated policy implications. Further, there remain some existing conditions and impact assessment questions that affect the AMP measures. Detail regarding the intended ecological features and functions of the rehabilitation conditions remains lacking.

As a result, even in conjunction with the responses, additional information and the AMP, the main conclusion of the NER that *the quarry operations as proposed, subject to approvals and permits required as part of the operation, can proceed in a manner that is consistent with the relevant policies of the” PPS, Greenbelt Plan, ARA, Region and City OPs and CVC* is not yet fully substantiated.

APPENDIX A

Policy Review Table

APPENDIX A POLICY REVIEW TABLE

PLANNING ACT AND PROVINCIAL POLICY STATEMENT

Relevant Policies	Ecoplans Comment	Beacon Comment/[Response]	Ecoplans Follow-up Response
<p>2.1 Natural Heritage</p>	<p>The NER does not specifically address the PPS natural heritage or water policies; however, this may be in large part because the assessment defaults to the Greenbelt Plan (and supporting technical guidelines). The NER states that “Under the PPS (2005), the identification of significant woodlands, valley lands and wildlife habitat is the responsibility of the planning authorities (in this case, Region of Peel or City of Brampton). However, because the subject property falls within the Natural Heritage System of the Protected Countryside designation of the Greenbelt, the identification of these features is guided by a series of technical Papers recently issued in draft form by the OMNR (2008a, 2008b, 2008c).” While we accept that it is appropriate for the NER to assess the status of the features based on these Technical Guidelines, we assume that verification as to the conclusions of the analysis will ultimately be sought from MNR.</p> <p>Conformity: Considering the conclusions below regarding the Greenbelt Plan policies, related PPS policies are also not addressed based on the information and analysis provided.</p>	<p>The identification and verification of Natural Heritage Features has been determined through the application of the relevant policies of the Greenbelt Plan, as the subject property is within the NHS of the Protected Countryside of the Greenbelt Plan. It is agreed that, as a result of this designation, MNR will ultimately be responsible for accepting the conclusions regarding the Natural Heritage System that are reached by the NER.</p> <p>The natural heritage and water resources policies of the Greenbelt Plan are more specific than those in the PPS and it has been our interpretation that the policies of the Greenbelt plan should be applied. This is based on our interpretation of the policies of Section 5.4 of the Greenbelt plan.</p>	<p>Conformity question (regardless of PPS or Greenbelt) not yet fully addressed per outstanding comments.</p>
<p>2.1.1 Natural features and areas shall be protected for the long term.</p>	<p>Difficult to verify conformity with information provided even pertaining to during excavation given limitations in scope and detailing of impact assessment, mitigation and monitoring measures. Cannot assess conformity after rehabilitation (and during period between completion of excavation and completion of final rehabilitation conditions) given the very limited description of the rehabilitation plan and or lack of assessment of any potential implications on natural features. Therefore policy not addressed based on information provided</p>	<p>The NER has identified all natural heritage features and confirmed which features are considered key natural heritage features in accordance with the Greenbelt Plan. All key natural heritage features will be maintained on site both during construction and as part of the final rehabilitation of the site. A small intermittent drainage feature (designated B1) is considered indirect fish habitat. This stream will be modified to accommodate the placement of the stockpile area. This may entail piping of the drainage feature through a culvert where it passes under the stockpile area. The location and design of the stockpile is still under active discussion with the MNR. As provided for under section 4.3.2 of the Greenbelt Plan the design will maintain hydrologic functions where it enters the tributary of the Credit located on-site.</p> <p>The Vegetation Management Plan and Final Rehabilitation will provide for the long-term protection and enhancement of key natural heritage features. The Vegetation Management Plan has undergone revisions to reflect ongoing discussions with the Credit Valley Conservation Authority, MNR and the City of Brampton. Rehabilitation will occur throughout the duration of quarry operation and post-excavation.</p> <p>The natural features on site (including aquatic features and</p>	<p>There are still some outstanding questions regarding impacts during operation and following rehabilitation/in the long term.</p> <p>We trust the agency review in relation to B1 will address respective policy requirements. We understand per the AMP that it will be daylighted as part of the rehabilitation plan.</p> <p>There is still some minor uncertainty as to how exactly the proposed QWMS will work to maintain drainage feature B1 functions.</p> <p>There was little additional information provided in the responses regarding the Rehabilitation Plan. Even with the review of the Todhunter report, there are outstanding questions and details pertaining to NE aspects.</p> <p>We assume the agency and City input will be documented in the updated NER.</p> <p>The AMP provides a solid framework for monitoring of water resources functions that support natural features,</p>

Relevant Policies	Ecoplans Comment	Beacon Comment/[Response]	Ecoplans Follow-up Response
		<p>vegetation) will be monitored through an on-going and adaptive process to ensure their protection during quarry operations and post rehabilitation.</p> <p>Once the quarry has reached fully flooded conditions, water levels will rebound to near pre-quarrying conditions. Therefore, no long-term impacts are expected.</p>	<p>however we have a number of questions that require resolution to demonstrate its effectiveness in protection features during quarrying (e.g., monitoring target triggers, QWMS operation and effectiveness, feasibility and comprehensiveness of contingency measures).</p> <p>The implications of returning water levels post-rehabilitation to “near pre-quarrying conditions” still require elaboration, and discussion of potential for residual effects on natural features.</p>
<p>2.1.2 The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.</p>	<p>See 2.1.1</p> <p>Neither connectivity/linkages (among natural features or between natural features and water) nor diversity are well addressed. Absence of any thorough assessment of inter-relationships between natural features and water is a concern, given that one of key impacts of project is drawdown in water table. Inadequate detail in impact assessment and mitigation measures, and very weak supporting monitoring component. Lack of any detail around rehabilitation plan and implications.</p> <p>Not addressed based on information provided.</p>	<p>Impacts were assessed within 120 m from site boundary and from the predicted 1.0 m drawdown cone. This study area includes several off-site wetlands and Credit River tributaries.</p> <p>As noted above (Section 2.1.1) the Vegetation Management and Rehabilitation Plan have been revised based on predicted conditions and latest rehabilitation design.</p> <p>We also recognize that there are opportunities to reconnect several fragmented natural features and functions within the surrounding landscape. In this regard the site will be operated and rehabilitated in a manner that will accommodate the creation of these connections if and when a comprehensive natural heritage system is developed by the City, the CVC and surrounding landowners.</p>	<p>As Beacon has recognized in some responses, the zone of influence does extend beyond the “1.0 m drawdown cone”, as reflected in the prediction of impacts at features beyond the 1m drawdown line. Per technical comments, there are still some uncertainties and inconsistencies regarding the water-related connectivity that may in turn affect the impact assessment and related policy implications (e.g., potential loss of groundwater function and seep communities and species in terms of biodiversity), and there is no assessment of post-quarrying conditions provided.</p> <p>The responses provide little information in regard to the rehabilitation plan, and particularly w.r.t. the aquatic components. We are not clear whether the predicted conditions consider seasonal fluctuations in the pond level. We have some questions regarding the expected conditions in the ‘littoral zone’ based on the species mix.</p>
<p>2.1.3 <i>Development and site alteration</i> shall not be permitted in:</p> <ul style="list-style-type: none"> a. significant habitat of endangered species and threatened species; b. significant wetlands in Ecoregions 5E, 6E and 7E1; c. significant coastal wetlands. 	<p>2.1.3 Development and site alteration shall not be permitted in:</p> <ul style="list-style-type: none"> a. significant habitat of endangered species and threatened species; b. significant wetlands in Ecoregions 5E, 6E and 7E1; c. significant coastal wetlands. 	<p>All SAR are being dealt with accordingly. A memorandum detailing all SAR observed on the subject property has been sent to MNR to facilitate discussion of these issues</p>	<p>While we accept that SAR issues will be dealt with by MNR, this memo would have been helpful as part of the additional information supporting the responses. We assume this information and response will be incorporated in the updated NER.</p>
<p>2.1.4 Development and site alteration shall not be permitted in:</p> <ul style="list-style-type: none"> a. significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E; b. significant woodlands south and east of the Canadian Shield; c. significant valley lands south and east of the Canadian Shield; d. significant wildlife habitat; and e. significant areas of natural and scientific interest 	<p>See Greenbelt Plan policy 4.3.2.3 a) iii and b).</p>	<p>Development and site alteration are consistent with Greenbelt Plan policies. See Section 4.3.2.3 a) iii and b) below.</p> <p>Beacon believes it has identified and provided for the protection all Key Natural Heritage Features and functions. Specifically no removal of KNHFs will occur in the excavation or stockpiling of shale materials other than minor disturbances where the haul rout crosses the main tributary and in some of the associated Vegetation Protection zones. These encroachments are provided for in policies 4.2.1 and 4.3.2 of the Greenbelt Plan. The applicant is prepared to undertake the mitigation works</p>	<p>Accepted subject to minor qualifier noted in Section 4.3.2.3 a) iii and b) below, and subject to questions regarding to maintenance of water-related functions.</p>

Relevant Policies	Ecoplans Comment	Beacon Comment/[Response]	Ecoplans Follow-up Response
<p>unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions..</p>		<p>required to minimize the impacts of these encroachments.</p> <p>Also, it is worth noting that final rehabilitation not only provides for the compensation of these temporary encroachments by increasing the size of KNHF, increasing Vegetation protection zones widths and introducing new habitat types that will increase overall site and diversity of the site.</p>	
<p>2.1.5 Development and site alteration shall not be permitted in fish habitat except in accordance with <i>provincial and federal requirements</i></p>	<p>The report commits to obtaining necessary approvals/permits, which will have to include clearance from DFO (as the ultimate regulatory authority). However, we note that CVC will review the project initially in relation to its potential risk to fish habitat/potential to cause "HADD" in relation to impacts on fish habitat as a result of removal of minor drainage features and enclosure of a more substantial drainage feature. The NER does not present any clear analysis regarding the risk to fish habitat/potential for HADD of the project. However, conformity ultimately addressed through agency review process. No significant issues identified to achieving clearance (although expect resolution of details of mitigation/monitoring for Main Tributary will require prior resolution).</p>	<p>The NER concludes that the excavation and subsequent rehabilitation of the site will not impact the quality or health of fish habitat located in the tributary stream located on site and therefore will not result in a HADD.</p> <p>Consideration has been made regarding permitting requirements from CVC, and will be addressed at a future date with the Conservation Authority</p>	<p>While we accept that the changes/effects during and possibly following quarrying may not be considered 'HADD'/require authorization, insufficient information and analysis is provided to definitively support the conclusion that the quality and health of fish habitat will not be impacted in some way. Several questions remain regarding the operation and mitigation effectiveness of the proposed stream flow augmentation system.</p> <p>We accept that CVC will be completing this risk analysis and ultimately making this determination (however again assume that additional information regarding this process will be provided in the updated NER).</p>
<p>2.1.6 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.3, 2.1.4 and 2.1.5 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.</p>	<p>See 2.1.1 and 2.1.2</p> <p>The report does not provide sufficient evaluation of the ecological function of the adjacent lands to the natural heritage features and areas identified in policies 2.1.3, 2.1.4 and 2.1.5, nor an adequately detailed impact assessment of the proposed excavation on adjacent lands in relation to natural features to demonstrate that there will be no negative impacts on those natural features or on their ecological functions.</p>	<p>Impacts to Natural Heritage Features and adjacent lands have been addressed.</p> <p>Beacon has identified all KNHFs and Key Hydrological Features and has detailed how these features and related functions will be protected during the operation of the shale quarry and how the features and functions will be enhanced through rehabilitation.</p> <p>Further information regarding ground and surface water is presented in Peer Review Response by Golder Associates Ltd., 2012.</p>	<p>Per comments, KHF have not been specifically identified (although we now understand the intention), impacts to/protection of KNHFs and KHF's have not been fully addressed, and some outstanding water-related questions and uncertainties remain both during excavation and following rehabilitation. (See also other comments).</p> <p>We have some questions regarding this information and the related interpretation from a NE perspective.</p>
<p>2.2: Water</p> <p>2.2.1 Planning authorities shall protect, improve or restore the quality and quantity of water by:</p> <p>a. using the watershed as the ecologically meaningful scale for planning;</p> <p>b. minimizing potential negative impacts, including cross-jurisdictional and cross-watershed impacts;</p> <p>c. identifying surface water features, ground water features, hydrological functions and natural heritage features and areas which are necessary for the ecological and hydrological integrity of the watershed;</p>			
<p>d. implementing necessary restrictions on <i>development and site alteration</i> to</p> <p>i. protect all municipal drinking water supplies and designated vulnerable areas; and</p>	<p>d. These aspects are not identified comprehensively. See 2.1.2 and 2.1.6.</p>	<p>A total of 13 domestic wells will likely experience a drawdown of 1.5 m during quarry operation. This is well within the range of groundwater fluctuation in the area. Further, once the quarry is fully flooded during final rehabilitation, water levels in these wells will return to near</p>	<p>Defer to Genivar regarding domestic well comments.</p> <p><i>Near pre-impact conditions</i> requires definition and subsequent assessment of any implications on natural</p>

Relevant Policies	Ecoplans Comment	Beacon Comment/[Response]	Ecoplans Follow-up Response
<p>ii. protect, improve or restore vulnerable surface and ground water, sensitive surface water features and sensitive ground water features, and their hydrologic functions;</p>		<p>pre-impact conditions.</p> <p>Although not anticipated, in the event that interference with domestic water supplies occurs as a result of quarry activities, an alternate water supply solution will be provided.</p> <p>Recharge and stream flow functions will be maintained so that the current ecological and hydrological functions can be maintained both during and after extraction. Aquatic ecosystems and riparian habitat will be maintained both on site and downstream and water levels in the wetland and flow in the stream will be maintained at a level comparable to pre-development conditions.</p> <p>Function of wetlands and tributaries are maintained. Ongoing monitoring of these features will be included in the AMP. This plan will provide for the rapid detection of any deviation from anticipated results determined through predictive models. Rapid adjustment to mitigation measures can be implemented to correct any unforeseen impacts.</p>	<p>features.</p> <p>Per comments, some questions and uncertainties remain regarding the predicted water-related changes and their potential implications water-dependent natural features. For example, potential loss of groundwater discharge during Phase 2 could constitute a loss of function, and may result in loss of seep communities/species. There are a number of outstanding questions regarding the effectiveness of the QWMS in maintaining fish habitat and the fish community, as well as FOD7-4 and the B1 outfall.</p> <p>While the AMP provides a solid monitoring and response framework, a number of questions require resolution in order to demonstrate <i>rapid detection of any deviation from anticipated results ...</i>, and that <i>Rapid adjustment to mitigation measures can be implemented to correct any unforeseen impacts</i> (e.g., the relationship of the monitoring triggers to the wetland and particularly the Main Tributary functions, feasibility, effectiveness and comprehensiveness of the contingency/response measures).</p>
<p>e. maintaining linkages and related functions among surface water features, ground water features;</p>	<p>Not addressed. See 2.1.6 etc.</p>	<p>Function of wetlands and tributaries are maintained.</p>	<p>Per above comments, it does not appear based on the response information and the AMP that wetland and tributary functions are fully maintained. Questions remain regarding operational aspects and mitigation effectiveness. For example, while we accept the premise of maintaining stream functions generally through surface discharge, the variable groundwater functions along the Main Tributary within and downstream of the site do not seem to have been fully considered, nor is there any contingency provided that might address impacts if the single discharge point is not fully effective in maintaining downstream flow and functions. We do not understand how the QWMS will protect unit FOD7-4. The AMP does not fully address the outstanding questions and uncertainties.</p>
<p>f. hydrologic functions and natural heritage features and areas;</p> <p>g. promoting efficient and sustainable use of water resources, including practices for water conservation and sustaining water quality; and</p> <p>h. ensuring stormwater management practices minimize stormwater volumes and contaminant loads, and maintain or increase the extent of vegetative and pervious surfaces.</p>	<p>Not fully addressed. See above.</p>	<p>A small SWM facility is proposed for the west side of the tributary to handle runoff from the stock pile area. It will be designed and maintained as per MOE standards. Overall, water management for the site is thoroughly discussed in the HTR (Golder, 2010) and Peer Review Response (Golder, 2012).</p>	<p>Please see Genivar's comments regarding SWM pond functioning</p>
<p>2.2.2 Development and site alteration shall be restricted in or near sensitive surface water features and sensitive ground water features such that these features and their related hydrologic functions will be protected, improved or</p>		<p>The function of all KHF's (defined as "sensitive water features") will be maintained. The main tributary, tributaries B1 and C will have their function maintained during excavation. No negative effects are expected for</p>	<p>Per comments and responses above, maintenance of function is not yet fully addressed (and we note generally that loss of groundwater during stage 2 could be considered a loss of function). Some specific functions of</p>

Relevant Policies	Ecoplans Comment	Beacon Comment/[Response]	Ecoplans Follow-up Response
restored. Mitigative measures and/or alternative development approaches may be required in order to protect, improve or restore sensitive surface water features, sensitive groundwater features, and their hydrologic functions.		wetlands, although this will be ensured through the AMP. During the final rehabilitation stage, once the quarry reaches fully flooded conditions, baseflow will return to all local watercourses within the drawdown cone. Until such time, mitigation efforts, including supplementing flow to the Main Tributary will continue to maintain the function of all features.	the wetlands may be affected, we have questions regarding the monitoring measures and there are outstanding questions regarding the feasibility of the low berm construction as a contingency measure. It is not clear that baseflow will <i>return fully to all local watercourses following rehabilitation.</i>
GREENBELT PLAN POLICIES			
Schedule 4 of the Greenbelt Plan (MMAH 2005) identifies the subject lands as situated within the Natural Heritage System component of the Protected Countryside area. Infrastructure policies under S 4.1.2.2: 4.2.1.2 The location and construction of infrastructure and expansions, extensions, operations and maintenance of infrastructure in the Protected Countryside, are subject to the following:	The NER appears to accept that the Infrastructure policies are relevant to this application based on the statement in Section 5.6.5 that these policies “permit the construction of a new road in KNFH where there are no reasonable alternatives”. However, relevant policies are not comprehensively addressed in the NER as outlined below:	Yes we believe that Greenbelt infrastructure policies (Section 4.1.1) are relevant to this application. Section 4.2.1.2 is addressed below.	Accepted
a. Planning, design and construction practices shall minimize, wherever possible, the amount of the Greenbelt, and particularly the Natural Heritage System, traversed and/or occupied by such infrastructure;	a. Although this policy is not explicitly identified in the NER, the proposed use of the existing farm lane (and presumably the road system beyond although off site transport is not discussed in the NER) minimizes the amount of Greenbelt and Natural Heritage System traversed/occupied by the haul road, subject to commentary under d.	Use of the existing haul road and off-site transportation routes minimizes amount of NHS traversed and/or occupied by such infrastructure. The manner in which the project addressed this matter is addressed in Access Alternatives Memorandum (Long Environmental, 2012) in Appendix C for discussion of off-site transportation routes	Resolved
b. Planning, design and construction practices shall minimize, wherever possible, the negative impacts and disturbance of the existing landscape, including, but not limited to, impacts caused by light intrusion, noise and road salt;	b. Again, this policy is not explicitly noted in the NER. There is some discussion around minimizing effects of the haul road on the existing landscape, particularly by using the existing lane. However, the assessment of the effects of expansion and local re-routing of the laneway are not addressed in any detail, and potential effects pertaining to light intrusion, noise and road salt are not addressed. Conformity is not fully addressed;	Through operation design, vegetation screening and constructed berms, light pollution, visual impact and noise pollution will be mitigated. Refer to the Visual Assessment and Vegetation Management Plan for Norval Quarry prepared by Todhunter Associates (2012). The quarry will not be in operation during the winter months, thereby negating the need for the use of road salt on-site. Erosion and Sediment Control Plans will be included as part of the site preparation plans, and these measures will be in place prior to initiation of site grading and maintained until after final rehabilitation vegetation cover is established.	Accepted generally, although these aspects were not addressed from an NE perspective. Some additional detail regarding construction and operational impacts is warranted. Do the berms extend through the valley section of the road, thereby increasing the footprint further?
c. Where practicable, existing capacity and coordination with different infrastructure services is optimized so that the rural and existing character of the Protected Countryside and the overall urban structure for southern Ontario established by Greenbelt and any provincial growth management initiatives are supported and reinforced;	c. Probably best addressed in SPR.	Noted.	Accepted
d. New or expanding infrastructure shall avoid key natural heritage features or key hydrologic features	d. As outlined above, the NER relies on the use of the existing laneway to justify crossing the valley and	Many alternatives were assessed prior to decision of use of existing farm lane. No other route to the quarry or	Resolved

Relevant Policies	Ecoplans Comment	Beacon Comment/[Response]	Ecoplans Follow-up Response
<p>unless need has been demonstrated and it has been established that there is no reasonable alternative; and</p>	<p>associated KNHFs. However, there does not appear to have been any consideration of options that would not cross the valley and associated KNHF or rationale provided to demonstrate that there is no reasonable alternative (although we note that the end of Section 6.5 refers to the “route selected” implying that there may have been alternatives). While we recognize that use of the existing laneway minimizes effects to KNHF, this assumes that these KNHFs must be crossed by the haul road. Would it be possible, for example, to use the existing road network around the west and south edges of the site and access the proposed excavation area from the south, and thereby avoid the valley crossing?</p> <p>Therefore, policy conformity not fully addressed since no demonstration that there is no reasonable alternative.</p>	<p>stockpile has been deemed feasible.</p> <p>See Assessment of Access Alternatives Memorandum (Long Environmental, 2011) in Appendix C.</p>	
<p>e. Where infrastructure does cross the Natural Heritage System or intrude into or result in the loss of a key natural heritage feature or key hydrologic feature, including related landform features, planning, design and construction practices shall minimize negative impacts and disturbance on and where reasonable, maintain or improve connectivity.</p>	<p>The NER attempts to address this policy by briefly stating that the route selected involves the shortest distance, uses an existing trail to the extent practical and avoids the single living Butternut, and that design considerations can be developed at detail design. However, there are a number of questions and details outstanding around these conclusions as outlined in other sections. Although some mitigation efforts are outlined to minimize effects of the haul road crossing of KNHFs, the potential impacts are not fully identified or addressed in the NER (e.g., Butternut removal, potential impacts on hydrology and other functions of significant vegetation community, effects on wildlife movement function). See also Greenbelt Plan 4.3.2.3 below.</p> <p>Additional information and clarification is required to assess policy compliance.</p>	<p>No significant trees of FOD7-4 and FOD7-3 communities will be removed in construction of the haul road. Retainable</p> <p>Butternut seedlings will be addressed through the appropriate permitting process with MNR under the Endangered Species Act, as stated above (Section 2.1.3 of PPS).</p> <p>Connectivity along the stream will be improved through the main tributary when improvements (ie: new open bottom culvert) are made to the stream crossing. Detailed design will be discussed with CVC and all infrastructure adjacent to Tributary will be carried out in accordance with the Lakes and Rivers Improvement Act.</p> <p>Improvements will be made to protect the valley feature including plantings SW of the on-site wetland and a buffer to the excavation area.</p> <p>Overall improvements of site conditions are detailed in the Vegetation Management Plan.</p>	<p>The extent of the road (and berm?) footprint and associated grading requirements remain unclear, and therefore impacts on the vegetation communities are not fully addressed.</p> <p>Accepted</p> <p>Accepted, as supported by CVC review as design information not provided. Again, provision of information in the updated NER would be helpful.</p>
<p>4.3.2.3: Notwithstanding the Natural System policies of Section 3.2 of this Plan, within the Natural System policies of section 3.2 of this Plan, mineral aggregate operations and wayside pits and quarries are subject to the following:</p> <p>a. No new mineral aggregate operation and no wayside pits and quarries, or any ancillary or accessory use thereto will be permitted in the following key natural heritage features and key hydrologic features:</p> <p>i. Significant wetlands;</p>	<p>i. Addressed.</p>		
<p>ii. Significant habitat of endangered species and threatened species; and</p>	<p>ii. There is no clear demonstration or confirmation from MNR that significant habitat of endangered species and threatened</p>	<p>A memorandum detailing all SAR observed on the subject property has been sent to MNR to facilitate discussion of these issues.</p>	<p>Accepted that will be addressed through MNR, however per above, this memo would have been a useful inclusion in the response material and we assume that additional</p>

Relevant Policies	Ecoplans Comment	Beacon Comment/[Response]	Ecoplans Follow-up Response
	<p>species (in this case Butternut) is not affected (e.g., as a result of removal of trees for the haul road, 3 of which appear to be retainable trees). We are not aware that OMNR may be "regarding" significant habitat of Butternut "as the individual tree and the land area that lies immediately beneath its canopy" as stated in the NER. This requires verification from MNR. The NER states that the single living Butternut is avoided (as rationale for the road crossing location), however Section 7.3 refers to removal and transplant of 3 retainable Butternut. There are also outstanding questions concerning Bobolink (proposed for addition to Threatened status) that require follow-up with MNR. Conformity is not fully addressed.</p>		<p>information will be provided in the updated NER.</p>
<p>iii. Significant woodlands unless the woodland is occupied by young plantation or early successional habitat (as defined by the Ministry of Natural Resources). In this case, the application must demonstrate that the specific provisions of policy 4.3.2.5 (c), (d) and 4.3.2.6 (c) have been addressed, and that they will be met by the operation;</p>	<p>iii. Portion of woodland removed by the haul road does not appear to meet the definition of early successional or young plantation</p> <p>Conformity is not fully addressed as outlined below in relation to referenced policies.</p>	<p>The haul road, which may nominally encroach into the FOD7-2 community, is subject to infrastructure policies of the Greenbelt Plan. Section 4.2.1.2d permits new or expanding infrastructure in key natural heritage features or key hydrologic features when need has been demonstrated and it has been established that there is no reasonable alternative. See Section 4.2.1.2d above (re: Haul Road location and design)</p> <p>See Assessment of Access Alternatives Memorandum (Long Environmental, 2011) in Appendix C.</p> <p>Sections 4.3.2.5 c) and d) and 4.3.2.6.c) are discussed below.</p>	<p>Accepted. It would appear however that the haul road construction as described generally (e.g., 10m wide) will encroach slightly (or possibly more depending on grading requirements) into the FOD7-2 community, the impacts of which should be recognized. The specific alignment through the valley remains somewhat uncertain based on the response information.</p>
<p>b. An application for a new mineral aggregate operation or new wayside pits and quarries may only be permitted in other key natural heritage features and key hydrologic features not identified in 4.3.2.3 (a) and any vegetation protection zone associated with such other features where the application demonstrates:</p>	<p>b. Excavation is proposed in the 30 m VPZ without verifying whether or not there could be an impact on the hydrology of the Significant Wildlife Habitat (Black Walnut Lowland Deciduous Forest). In addition, the conclusion that the setback to the Significant Valley land/Woodland/Wildlife Habitat is sufficient is not fully substantiated.</p> <p>The potential status of Drainage Feature B1 as a KHF (or its potential as direct fish habitat) is not assessed. Conformity is not fully addressed.</p>	<p>The valley feature has been reassessed and its hydrology has been thoroughly investigated. It is our opinion that quarry operations will not result in a negative impact to the lowland FOD7-4 area in terms of loss of features and functions.</p> <p>Overall improvements of site conditions are detailed in the Vegetation Management Plan, Todhunter Associates, 2012.</p>	<p>Agreed that much more thorough assessment has been undertaken, however some outstanding questions regarding the water analysis and whether or not surface water discharged upstream to the watercourse will in fact protect hydrology of the entire feature through the floodplain. Potential impacts to the seepage-supported Mineral Marsh pockets identified in the valley are not addressed.</p>
<p>i. How the Water Resource System will be protected or enhanced; and</p>	<p>i. Protection of the Water Resource System not fully addressed in relation to KNHF or potential KHF noted above. Impacts not fully identified or assessed and as a result mitigation and supporting monitoring measures are not provided.</p> <p>Policy conformity not addressed based on information provided in NER.</p>	<p>Potential impacts, mitigation and monitoring of all KNHFs and KHFs have been discussed. Targets, triggers, monitoring measures and mitigation will be fully addressed in the Adaptive Management Plan.</p> <p>Further information regarding ground and surface water will be presented in Peer Review Response by Golder Associates Ltd, 2012.</p>	<p>Please see previous comments. Some outstanding water-related questions and uncertainties remain regarding the details of the existing conditions and related functional analysis that then underlie the impact assessment and AMP. The <i>Targets, triggers, monitoring measures and mitigation</i> proposed in the AMP do not fully address potential for impacts.</p>
<p>ii. That the specific provisions in 4.3.2.5 (c), (d) and 4.3.2.6 (c) have been addressed, and that they will be met by the operation; and (c), (d)</p>	<p>See 4.3.2.5c, d and 4.3.2.6c, which are not fully addressed.</p>	<p>Sections 4.3.2.5 c) and d) and 4.3.2.6.c) are discussed below.</p>	

Relevant Policies	Ecoplans Comment	Beacon Comment/[Response]	Ecoplans Follow-up Response
and 4.3.2.6 (c) have been addressed, and that they will be met by the operation; and			
<p>c. Any application for a new mineral aggregate operation, or the expansion of an existing mineral aggregate operation shall be required to demonstrate:</p> <p>i. How the connectivity between key natural heritage features and key hydrologic features will be maintained before, during and after the extraction of mineral aggregates;</p>	<p>ii. Key hydrologic features are not identified. Connectivity between key natural heritage features and key hydrologic features is not fully assessed, and potential impacts during excavation are not fully identified or addressed. Connectivity following excavation is not addressed; very weak discussion and assessment of any implications of rehabilitation plan in relation to natural features.</p> <p>Policy conformity not addressed.</p>	<p>All KHF's have been identified on site, and have been protected through the establishment of Vegetation protection zones and comprehensive mitigation measures as part of the operation of the mineral aggregate operation. Function and connectivity of each of these features will be adequately maintained through mitigations efforts.</p> <p>The rehabilitation of the site recognize the need to support ecological connectivity both on site and in adjacent lands by:</p> <ul style="list-style-type: none"> • protection all key natural core features located on the property, • maintaining connection opportunities with adjacent lands • as part of final rehabilitation enlarging and increasing diversity of natural features on site that will increase the health and resiliency of a natural heritage system in the area if and when one is developed 	<p>While we now understand the general definition of KHF's as sensitive hydrologic features, clarification is required as to exactly what features are included.</p> <p>While function and connectivity may be <i>adequately</i> maintained through mitigation efforts, it may not be fully maintained, requiring further specification of potential residual changes. Per previous, some outstanding water related uncertainties and questions remain, which are then carried through the impact assessment and AMP.</p> <p>Vegetative connectivity and enhancements may be addressed, however aquatic aspects are not well addressed. Demonstration that connectivity between KHF's and KNHF's is maintained before, during and after the extraction is incomplete (and may not be fully possible if the groundwater discharge function is lost during some stages of quarrying).</p>
		<p>Appropriate plantings will be established southwest of the wetland to provide increased protection from the stockpile and compensate for the small amount of vegetation that will be displaced as a result of the haul road design. Also some lands currently used for agriculture next to natural areas will be restored to a natural vegetation cover wherever possible.</p> <p>Further information is provided in the Vegetation Management Plan (Todhunter Associates, 2012).</p>	
<p>iii. How the Water Resource System will be protected or enhanced.</p>	<p>iii. Protection of the Water Resource System not fully addressed in relation to any of KNHF or potential KHF (on or off-site wetlands, Main Tributary, etc.). Potential impacts are not fully identified or assessed. Incomplete mitigation and no substantive supporting monitoring or response actions.</p> <p>Policy conformity not fully addressed based on information provided in NER</p>	<p>Impacts to the hydrology of features have been fully addressed. These impacts are fully addressed in the Golder report.</p> <p>Monitoring and mitigation measures will be addressed in the Adaptive Management Plan.</p>	<p>Per comments, additional detail is required to fully substantiate this response. Various underlying water related uncertainties and questions remain, and the monitoring and contingency mitigation measures outlined in the AMP do not fully address potential for impacts.</p>
<p>4.3.2.5: When operators are undertaking rehabilitation of mineral aggregate operation sites in the Protected Countryside, the following provisions apply:</p> <p>b. The disturbed area of a site will be rehabilitated to a state of equal or greater ecological value, and for the entire site, longterm ecological integrity will be maintained or restored, and to the extent possible, improved.</p>	<p>b. Difficult to verify based on level of detail of description of rehabilitation plan components and associated ecological values. There is very little discussion and no real ecological" discussion of the rehabilitation plan, and therefore no analysis as to how the plan will return the disturbed areas of the site to habitats of equal or greater ecological value, or maintain, restore and to the extent possible improve long-term ecological integrity relative to the entire site.</p> <p>Policy conformity not assessed.</p>	<p>The Vegetation Management Plan and final rehabilitation plan provide for protection of key natural heritage features and the maintenance of hydrologic functions. The final rehabilitation will provide for increased natural cover, increased biodiversity and increased stability of the natural ecological processes on-site.</p> <p>The Rehabilitation Plan will :</p> <ul style="list-style-type: none"> • maintain and or enlarge all KNHF's • maintain and/or restore all minimum Vegetation 	<p>Little additional information was provided in the responses regarding the NE aspects of the VMP and rehabilitation plan. The reader should not be forced to rely solely on the Todhunter report, and NE aspects should be documented in the updated NER. The Todhunter report does now address specific NE aspects (e.g., community, esp. aquatic community, functions/fish habitat aspects, habitat function, structure and design elements). A review of the Todhunter report and VMP figure raised some additional questions, as outlined. It is not yet clear that the rehab plan will maintain hydrologic functions fully, and at least potential for</p>

Relevant Policies	Ecoplans Comment	Beacon Comment/[Response]	Ecoplans Follow-up Response
		<p>Protection Zones prescribed in the Greenbelt Plan</p> <ul style="list-style-type: none"> • create new habitat in the form of pond, littoral and shoreline habitat that will increase ecological diversity both on site and in the general landscape • increase ecological connectivity on site and provide opportunities for enhanced linkages with other natural features in the general landscape. 	some residual effects warrants discussion.
<p>c. If there are key natural heritage features or key hydrologic features on the site, or if such features existed on the site at the time of implication:</p>	<p>There are some uncertainties regarding the status of KHF since they are not mentioned in the NER or HRT. For example, Drainage Feature B1, which is enclosed under the stockpile, might be considered a KHF (intermittent tributary, potential springs and seepage areas [at least seasonal]. In addition, its potential to provide direct fish use seasonally is not assessed in relation to what appears to be a "restorable" barrier, if the boulders at the culvert were shifted/removed.</p>	<p>Drainage feature B1 should be considered a KHF. Its flow is a result of tile drainage to the north. Beacon does not believe the drainage system has the size or flow characteristics required to make B1 fish habitat. However, mitigation works can be introduced that can improve its hydrological function so that water entering the main tributary on site will be of a quality and quantity that will maintain or improve its contributions to fish habitat in the main tributary.</p> <p>Consideration has been made regarding permitting requirements from CVC, and will be addressed at a future date with the Conservation Authority.</p>	<p>Accepted as supported by CVC review (and assume NER will be updated accordingly), although we are not clear that the QWMS will maintain functions even along its outfall reach.</p>
<p>i. The health, diversity and size of these key natural heritage features and key hydrologic features will be maintained or restored and, to the extent possible, improved to promote a net gain of ecological health; and</p>	<p>i. There is some discussion around protection, maintenance and restoration/improvement of some of the <i>key natural heritage features</i>, primarily the main forested tributary valley (in relation to vegetation plantings and buffer enhancements). However explicit discussion in the policy context is not provided. Nor are other <i>key natural heritage features</i> such as the main tributary or on or off site portions of the PSW fully addressed, and there are some uncertainties that these features will be maintained or fully restored. There is no mention of <i>key hydrologic features</i>. Comments pertaining to the haul road are also relevant.</p>	<p>Based on the extensive responses we have provided to Ecoplans comments, we believe we have thoroughly addressed the issues raised in this comment.</p> <p>We believe we have described all relevant natural features and functions and have explained how the KNHFs and HSFs have been protected and how the functions related to them will be maintained or enhanced.</p>	<p>While the detailed responses to many questions go a long way to addressing our comments, some water-related uncertainties and questions remain, and information on the Main Tributary remains somewhat light. A number of specific questions were not or were only partially answered. (See also other comments).</p>
<p>ii. Any permitted extraction of mineral aggregates that occurs in a feature will be completed, and the area will be rehabilitated, as early as possible in the life of the operation</p>	<p>ii. Although not extracted, Tributary B is enclosed under the stockpile and there is no indication as to whether or not this feature will be rehabilitated at all. There is no mention as to whether or not the haul road might be removed following excavation (although it is still shown on the rehabilitation plan).</p>	<p>It is not the applicant's intention to remove the haul route since access to the eastern half of the site will still be required after extraction is completed.</p> <p>The restoration or "daylighting" of B1 will be discussed in further detail with CVC. Consideration has been made regarding permitting requirements from CVC, and will be addressed at a future date with the Conservation Authority.</p>	<p>Accepted, however retention of the road is therefore a residual impact, however nominal, that should be recognized as the road will not be removed or rehabilitated back to its original laneway condition. We note that this was not clarified in the responses and is not clear on the rehabilitation figures.</p> <p>Accepted in conjunction with CVC review (and we note in the AMP that the intent is not to daylight this feature).</p>
<p>d. Aquatic areas remaining after extraction are to be rehabilitated to aquatic enhancement, which shall be representative of the natural ecosystem in that particular setting or ecodistrict, and the combined terrestrial and aquatic rehabilitation shall meet the intent of 4.3.2.5 (c).</p>	<p>There is no mention or discussion of this policy in the NER, and based on the information provided about the rehabilitation plan, it is not clear that the aquatic areas will be rehabilitated to aquatic enhancement, which shall be representative of the natural ecosystem in that particular setting or ecodistrict. There do not appear to have been any aquatic components incorporated. See also 4.3.2.5.(c)</p>	<p>Policy 4.3.2.5.c) will be satisfied. The updated Rehabilitation plan details the aquatic enhancement post-excavation and lake filling.</p> <p>Overall improvements of site conditions are detailed in the Vegetation Management Plan, Todhunter Associates, 2012.</p> <p>Our basic strategy with respect to the ecological integrity</p>	<p>No additional information was provided in the responses to address these comments, particularly from an aquatic perspective. Nor does the Todhunter report address aquatic aspects (other than provide a species list, which in turn raises some questions, for the littoral zone). More detailed information regarding the ecological design and function of the various communities, and specifically the aquatic components, should be provided in the NER.</p>

Relevant Policies	Ecoplans Comment	Beacon Comment/[Response]	Ecoplans Follow-up Response
		<p>of the site is to:</p> <ul style="list-style-type: none"> • maintain those features (ie. KNHFs) which are essential to maintaining the natural diversity and ecological functions on site • enhance existing KNHFs by enlarging and enhancing protective vegetation protection zones next to the KNHF • create a pond and associated littoral and shoreline habitat to increase the overall size and diversity of the natural heritage footprint. <p>The end product is predicted to be a larger and healthier natural core area that is valuable in its own right but more importantly will be a major building block for a natural heritage system in Northwest Brampton that connects the subject lands with other riparian habitats and wetlands within the Northwest Brampton landscape that can serve as a key linkage in a comprehensive natural heritage system</p>	<p>Please also see prior comments.</p> <p>Is a pond <i>representative of the natural ecosystem in that particular setting or ecodistrict?</i></p>
<p>4.3.2.6: Final rehabilitation in the Natural Heritage System will meet these additional provisions:</p> <p>a. where no underwater extraction</p>	<p>4.3.2.6: There is very little discussion of the rehabilitation plan from an ecological perspective, and little detail to indicate that the ecologists had specific input into its objectives or to the selection, design and integration (on or off site) of various habitat elements.</p>	<p>Ecologists had substantial input to the Vegetation Management Plan and Rehabilitation plan. Overall improvements of site conditions are detailed in the Vegetation Management Plan, Todhunter Associates, 2012.</p>	<p>Accepted, however the response information provided does not address specific NE aspects nor clearly demonstrate that involvement in relation to ecological functions. Please also see prior comments.</p>
<p>b. Where there is underwater extraction, no less than 35% of the non-aquatic lands of each license is to be rehabilitated to forest cover, which shall be representative of the natural ecosystem in that particular setting or ecodistrict</p>	<p>b. According to the area calculations provided in Section 7.7, the forest cover area requirements are addressed. However, the interpretation that the total rehabilitation area includes the retained valley area based on its inclusion in the proposed License area requires verification from MNR. The actual replanted vegetation area is quite small in relation to this overall area. The NER does not specifically discuss whether or not the re-vegetation plan addresses this policy, nor does it provide any real detail about the re-vegetation plan. The NER does not provide any indication that the ecologists had a role in development of the rehabilitation plan in order to ensure that it shall be representative of the natural ecosystem in that particular setting or ecodistrict .</p> <p>Conformity requires further review and verification.</p>	<p>A memorandum detailing all SAR observed on the subject property has been sent to MNR to facilitate discussion of these issues.</p> <p>Details of the Vegetation Management Plan and Final Rehabilitation conform to all applicable Greenbelt Plan policies.</p> <p>In discussion with MNR, we are satisfied that our restoration plans will meet the 35% criteria contained in this Policy.</p> <ol style="list-style-type: none"> 1. The Maximum Disturbed Area (i.e excavation and stockpile area) is proposed at 20 ha; 2. The net "non-aquatic" area is 14.7 ha; and 3. The proposed new forest cover is 6.7 ha (45.6%) of the 14.7 ha non-aquatic. <p>Therefore, we will exceed the Greenbelt Plan requirement of 35%.</p>	<p>Please see prior comments.</p> <p>Accepted, based on author's assurance that species, communities and habitat functions are representative of the natural ecosystem in that particular setting or ecodistrict.</p>
<p>c. Rehabilitation will be implemented so that the connectivity of the key natural heritage features and the key hydrologic features on the site and on adjacent lands will be maintained or restored, and to the extent possible, improved.</p>	<p>c. There is no comprehensive analysis provided demonstrating that the rehabilitation will be implemented such that connectivity of the key natural heritage features and the key hydrologic features on the site and on adjacent lands will be maintained or restored, and to the extent possible, improved. There is no clear and comprehensive demonstration that the water resource system will be protected or enhanced,</p>	<p>Connectivity and existing functions of KNHFs and KHF's will be maintained or restored on and off-site. Improvements will be made to the main tributary and additional plantings will insulate the on-site PSW, valley land and newly designed aquatic ecosystems.</p> <p>Overall improvements of site conditions are detailed in the Vegetation Management Plan, Todhunter Associates, 2012.</p>	<p>Please see prior comments, particularly regarding maintenance of functional connectivity between KNHFs and KHF's during some stages of quarrying (and potential for residual effects, however nominal, following rehab) .</p>

Relevant Policies	Ecoplans Comment	Beacon Comment/[Response]	Ecoplans Follow-up Response
	<p>and some uncertainty based on the information provided that the characteristics of the key features will be maintained or restored and to the extent possible improved to promote a net gain of ecological health. There appears to be some potential for residual impacts based on the information provided. Further, there is no clear characterization or any real discussion of the existing/pre-quarrying connectivity between key natural heritage features and the key hydrologic features on the site and on adjacent lands to begin with, making it more difficult to assess whether or not connectivity will be restored. Given the lack of ecological detail around the rehabilitation plan, and the absence of any identified aquatic habitat components in the rehabilitation plan, verification that the aquatic areas remaining after extraction are rehabilitated to aquatic enhancement is not possible.</p>		
REGION OF PEEL			
<p>The subject site is located within the “Conceptual North-South Corridor/Bramwest Parkway Study Area on Schedule “E”.</p> <p>The subject site is not in a Core Area of the Greenlands System in Peel on Schedule “A”.</p> <p>With respect to the natural environment section 3.3.2.7 of the Official Plan requires that: “...all extraction and processing and associated activities be located, designed and operated as to minimize environmental, community and social impacts”.</p>	<p>Given the deficiencies and uncertainties in the impact assessment, and mitigation and monitoring plans presented in the NER, the project as presently detailed would likely fail to meet the general test of minimizing environmental impacts.</p>	<p>Greenbelt policies have been fully addressed. Development of a comprehensive monitoring and mitigation plan (AMP) will address impacts to the natural environment.</p> <p>For further details on community and social impacts, refer to the following companion reports:</p> <ul style="list-style-type: none"> • Visual Assessment and Vegetation Management Plan Norval Quarry, by Todhunter Associates (2012) • Heritage Impact Assessment 10314 Winston Churchill Blvd/Brampton Brick/Norval Property City of Brampton, Regional Municipality of Peel, by Archaeological Services Inc (2010) 	<p>Not yet fully addressed based on remaining uncertainties and questions and new questions raised by AMP.</p>
CITY OF BRAMPTON			
<p>The entire subject property is identified as Shale Resources on Schedule F (Urban Utilities and Resources) of the City of Brampton Official Plan. - Schedule A – “General Land Use Designations” designates the Credit River tributary on-site as Open Space and as Valleyland/Watercourse Corridor on Schedule D – “Natural Heritage Features and Areas”.</p> <p>Policy 4.5.7.1 of the Official Plan states that “development and site alteration is generally not permitted within a valleyland or watercourse corridor unless it has been demonstrated that there will be no negative impact on the feature and its functions in accordance with the required studies”.</p>	<p>The assessment of the impacts associated with the “site alteration” required to upgrade the existing valley and tributary crossing is not detailed/comprehensive enough to clearly demonstrate that there will be no negative impact on the features and functions associated with the valleyland and watercourse corridor.</p>	<p>It is noted that section 4.5.14.2 (ix) of the Brampton OP defers to Greenbelt Plan in reference to aggregate operations. Therefore, Greenbelt Policies must be addressed and satisfied, not specific policies in the OP.</p> <p>Notwithstanding this, Beacon believes that the proposal when considered in the context of both the NER and the Golder report provides for the protection and eventual enhancement of the stream corridor. Other than the minor infringements associated with the haul route crossing, the stream corridor will be virtually untouched throughout the operation of the quarry and during rehabilitation the size of the corridor will be enlarged and enhanced.</p> <p>Extensive mitigation measures have been described in both reports to ensure ecological and hydrological functionality are maintained.</p>	<p>Not yet fully addressed based on remaining uncertainties and questions and new questions raised by AMP.</p>

Relevant Policies	Ecoplans Comment	Beacon Comment/[Response]	Ecoplans Follow-up Response
<p>Section 4.5.23 also states that a minimum 10 m buffer to define the limit of development is required from all natural features to be protected. Schedules A and D both identify the subject property as being part of the Provincial Greenbelt/Protected Countryside. For these lands, applicable policies include the Natural Heritage System, Water Resources Systems, Key Natural Heritage Features and Key Hydrological Features and External Connections as provided in the Greenbelt Plan.</p> <p>The creek valley land is designated on Schedule "A" as Open Space. Development approval in the North West Brampton Urban Development Area must be preceded by subwatershed studies, terrestrial landscape analysis, determination of natural heritage system, secondary plan, environmental implementation report for block plan areas, block plans, other growth management considerations.</p>	<p>The minimum buffer from all natural features to be protected is <10 m (as little as 1-2 m in 2 locations, and an average of 15 m making it difficult to determine if there are more than 2 areas where the buffer is <10m) along portions of the retained valley and forest feature. See Greenbelt Plan policy review.</p>	<p>See above.</p> <p>Section 3.2.4.1.c) of the Greenbelt Plan permits site alternation or development within KNHFs and KHF's and their associated vegetation protection zone subject to the general policies of section 4 of the Plan.</p> <p>It should also be noted that this encroachment has been lessened in the updated Final Rehabilitation Plan.</p> <p>The intrusion into the Vegetation protection zone will have minimal impact because:</p> <ul style="list-style-type: none"> • these encroachments by and large represent habitats already highly disturbed through agricultural use • in no case does it intrude into areas of the dripline, therefore the roots systems associated with the applicable woodland will be protected • as part of final rehabilitation, all woodland edges will be provided with a minimum vegetation protection zone of 30 metres. 	
ENDANGERED SPECIES ACT			
<p>In the case of Butternut, Section 5(1) of Regulation 242/08 states:</p> <ul style="list-style-type: none"> • 5. (1) Clause 9 (1) (a) of the Act does not apply to a person who kills a butternut tree that occurred naturally if, in the opinion of a person or member of a class of persons designated by the Minister, the butternut tree is affected by butternut canker to such a degree that it is not necessary to retain the tree at its current location to support the protection or recovery of butternut. 	<p>There are inconsistencies in the mapping of Butternut locations between the NH report figures and the Site Plan – Existing Features. MNR delineation of Significant Habitat and inconsistencies between the text and mapping. ESA permitting requirements with respect to Butternut need to be addressed. While we agree that no technical guidelines are currently available from the MNR to determine significant habitat of Butternut, we are not familiar with the interpretation in the report (p 40) that refers to habitat being only "the land area that lies immediately beneath its canopy". This limited area might not necessarily be sufficient for the maintenance, survival and/or recovery of the population (PPS 2005). No reference for the interpretation is provided in the NER. Transplanting of several Butternuts that are proposed for removal for the haul road upgrade is identified, however it is not clear whether the MNR has been contacted to confirm whether a permit under the Endangered Species Act is required (and whether associated measures to provide "overall benefit to the species" are also required). No details regarding the transplant are provided (e.g. development of a plan to tend and monitor these transplants to ensure successful establishment at their new location), or an explanation as to when and where this information will be provided. No monitoring is proposed for the transplanted trees.</p>	<p>This error has been corrected. See Section 2.1.3 of the PPS above. Each tree will be addressed in accordance with according to O.Reg. 242/08 and the MNR, including transplanting opportunities, compensation and monitoring.</p> <p>All other SAR are also being dealt with accordingly. A memorandum detailing all SAR observed on the subject property has been sent to MNR to facilitate discussion of these issues.</p>	<p>Accepted as supported by MNR review</p>
FISHERIES ACT			
	<p>Minor drainage features that are removed and Drainage Feature B1 that is enclosed are deemed to be indirect fish</p>	<p>The NER concludes that the excavation and subsequent rehabilitation of the site will not impact the quality or health</p>	<p>Fisheries Act requirements will be address through CVC's review. However, per our comments, some water-related</p>

Relevant Policies	Ecoplans Comment	Beacon Comment/[Response]	Ecoplans Follow-up Response
	<p>habitat (although the possibility that shifting the boulders at the culvert might enable seasonal direct use was not assessed). While appearing reasonable, the removal and enclosure effects require review and approval by review agencies (and would benefit from additional detail). The potential impacts of the project to the water system that supports the Main Tributary and associated features are not fully identified by the information provided in the NER, either during excavation or rehabilitation. There appear to be deficiencies in the mitigation and monitoring plan to protect those features based on information provided. Ultimately the implications of the works proposed under the application, the mitigation and monitoring plan for the retained features and any residual implications of excavation on those features in consideration of the proposed mitigation still require review by approval agencies, and would appear to require additional detailing to be acceptable.</p>	<p>of fish habitat located in the tributary stream located on site and therefore will not result in a violation of the Fisheries Act.</p> <p>Consideration has been made regarding permitting requirements from CVC, and will be addressed at a future date with the Conservation Authority.</p>	<p>uncertainties and questions that affect the risk analysis remain, both underlying the functional analysis and w.r.t. the protectiveness of the mitigation and AMP measures.</p>



A member of  **MMM GROUP**

72 Victoria St. South, Suite 100, Kitchener, ON N2G 4Y9
phone: (519) 741-8850 fax: (519) 741-8884
www.ecoplans.com