

**THIRD REVIEW OF THE DBH ADDENDUM SOIL SERVICES
SURFICIAL SOILS ASSESSMENT
BRAMPTON BRICK APPLICATION**

Prepared for:
The City of Brampton

By:
AgPlan Limited

May 22, 2014.





INTRODUCTION

The following describes the results of a third AgPlan review of the 2nd peer review reply prepared by Mr. David Hodgson of DBH Soil Services Inc. on behalf of Brampton Brick concerning the proposed quarry located within the City of Brampton, Regional Municipality of Peel. The 1st DBH report has the title *Surficial Soils Study West Half of Lot 12, Concession 6 WHS, City of Brampton, Regional Municipality of Peel* and is dated August, 2008. A 2nd report summarizing additional information has been prepared by DBH Soil Services Inc. has the title, *Addendum and Peer Review Response for the Norval Quarry Surficial Soil Study West Half of Lot 12, Concession 6 WHS, City of Brampton, Regional Municipality of Peel*. The 3rd piece of information, provided by Mr. Hodgson, is a letter with the title *Brampton Brick - Norval Quarry AgPlan Limited Second Peer Review of DBH Soil Services Inc. Addendum and Peer Review Response (March 27, 20130)*. It is this 3rd letter that is the subject of this AgPlan report.

The following sections will outline that the 3rd piece of information provided by DBH has still left this reviewer with insufficient information with respect to changes in surficial soils that may or are likely to occur post mitigation as a result of the proposed extraction of shale below the water table at the location West Half of Lot 12, Concession 6 WHS, City of Brampton, Regional Municipality of Peel..

BACKGROUND

The peer review completed by AgPlan is based on a number of general assumptions as follows:

- The work completed by DBH would be a reasoned and reasonable response completed to answer questions concerning the kinds/characteristics/severity of effects of the proposed quarry on surficial soils.
- The reasoned and reasonable response would be a function of Dave Hodgson's observations made with respect to other aggregate operations in addition to a review of the literature - where the observations and literature are explicitly discussed.
- The kind/characteristics/severity of effects would be related to specific surficial soil characteristics based on a written interpretation of legislation, regulations and policy in force at the time of the writing of the DBH report. If there is a hierarchy associated with legislation, regulations and/or policy, then that the hierarchy would be part of the interpretation outlined within the surficial soils study. If the existing legislation, regulations and/or policy are, in the opinion of the proponent's consultant, deemed to be somewhere on a continuum between limited and absurd, then the proponents would put forward an opinion and supporting documentation with respect to that opinion.
- Given that soils are part of an ecosystem, then one person or several people would indicate the relative relationships amongst different components of that ecosystem relative to the professional disciplines reporting on the probable and/or possible effects of the proposed quarry. For example, for surficial soils, the significance of the relative amount of poorly drained Jeddo versus imperfectly drained Chingacousy soil series might be discussed with respect to hydrology and subsequently to hydrogeology. Vegetative cover in agricultural fields which will be removed as a result of the quarry will affect soil infiltration rates and subsequent field saturated hydraulic conductivity - again, hydrology and hydrogeology. The soils have an existing level of diversity related to plants as well as animals at macroscopic to microscopic scales and this would need to be compared to the diversity of the pond which will replace these soils. The discussion on ecosystem would need to be put in context to the existing land-use characteristics of the site and surrounding lands and subsequently to a predominantly urban environment which would surround the site.

On the basis of the review of the information provided by DBH soils as well as a partial review of reports prepared by other disciplines, the proponent study team is using a different set of assumptions.

FINDINGS

Findings are summarized descriptively in the following section. The letter provided by DBH follows the subheadings used in the 2nd report peer review by AgPlan which summarizes peer review observations



related to background, methods, information bases, data limitations/certainty, missing information, mitigation/monitoring and conclusions.

Background

DBH reaches an erroneous conclusion that two comments made by AgPlan confirms that I am of the opinion *that the DBH report meets the requirements of the Aggregate Resources Act Category 2 Provincial Standards, consistent with the Brampton Official Plan*. My 1st statement quoted includes the phrase “would appear”, I did not state that the DBH report meets ARA Category 2 standards. I also stated that the terms of reference supplied by DBH soil services were met by DBH Soil Services. I did not state that the terms of reference were adequate to answer questions required by my interpretation of legislation, regulation and/or policy.

DBH subsequently provides points with respect to the use of surficial soils:

- *all of the soil materials stripped from excavation Stage 2 will be placed on the quarry floor and south slopes in accordance with Note 2.1;*
- *all of the soil materials recovered from the berms will be placed on the quarry floor and south slopes in accordance with Note 4.2; and*
- *topsoil and inert fill will be imported to complete surficial rehabilitation and the proposed pond perimeter, in accordance with Notes 2.4, 3.3 and 4.3.*

Various notes related to the progressive rehabilitation plan are quoted as part of this DBH response and are quoted here as follows:

- 2.1 *Stage 2 overburden will be placed in the lifts and compacted to form the initial south rehabilitation slope shown as staged 2A.*
- 2.4 *Importation of off-site topsoil and inert fill may commence to continue progressive slope rehabilitation. See drawings note 2.3 and 4 for fill policy details.*
- 3.3 *Importation of off-site topsoil and inert fill will continue to complete rehabilitation. See drawings note 2.3 and 4 for fill policy details.*
- 4.2 *Haul road and stockpile area berms will be removed. This soil material will enable completion of the south rehabilitation slope, shown as stage 2B.*
- 4.3 *Importation of off-site topsoil inert fill will continue to complete rehabilitation. See drawings 5. Note 2.3 and 4 for fill policy details.*

What I take from all of this is that topsoil and subsoil/parent materials (the A, B and C horizons) of surficial soils will be mixed with all other materials found over the shale deposit (the geologist’s word is overburden) to be used in side slopes and to cover the bottom of the pond. I am none the wiser about why this mix of materials (which will be compacted) will be similar to the weathered and/or consolidated shale in terms of saturated hydraulic conductivity (how quickly the compacted materials will allow the transmission of water under saturated conditions relative to weathered and/or undisturbed shale). Hence, I do not know whether the conditions related to existing soil drainage will be maintained in the natural features which are to be protected from the quarry activity as outlined by DBH under the title “methods”.

Methods

In this section DBH indicates that the conditions that support natural features, vegetation protection zones (I assume that’s what VPZ is) and buffers will be maintained. Upon what evidence this confidence is based is not readily apparent to this reviewer. The existing soils are part of an ecosystem that transports water by surface and subsurface to natural features etc. and the removal of those existing soils would suggest that water relationships (as one of many soil functions) will change.

Information Base.

I interpret the information provided by DBH as “DBH couldn’t reference reports by Beacon or Golder because they were prepared at the time DBH was preparing its report”. The 2nd part of this section of the letter has been interpreted as “if you/AgPlan want to know how the surficial soils information was used, look it up in the Beacon and Golder reports. This would indicate that the identification of relationships between different disciplines providing information about an ecosystem has become the responsibility of others, not of the proponent.

Data Limitations/Certainty



This section has been interpreted to mean that DBH is of the opinion that the level of data limitations and certainty are reasonable given that the proponent is going to take an existing relatively better soil resource (based on soil capability for common field crop production) and turn it into a pond liner.

Missing Information

DBH states that the site will be rehabilitated to “a state of equal or better ecological value through the development of a pond and ecological shoreline developed on imported soils”. At the same time, DBH indicates that he is “not prepared to speculate as to the soils that may be available for excavation area backfilling and pond perimeter construction in 30 years”. Given that different soils will support different ecosystems with different levels of diversity and therefore ecological value, refusing to speculate on final soil characteristics can be interpreted to mean that they don’t really know what they’re going to be able to grow as part of the rehabilitation plan because they don’t know what will be available as a soil to support that growth.

Mitigation/Monitoring

This section follows on from the discussion related to missing information. What is apparent is that Beacon and Todd Hunter Associates have chosen specific vegetation species as part of the rehabilitation plan without an understanding of whether the soils available will support such species at a level of growth, vigour or health to maintain a state of equal or better ecological value.

Conclusions

The DBH letter reply now provides conclusions for the previously supplied DBH Addendum. The 2nd conclusion seems too precise because it states that “shale quarries are expressly permitted on this property [underlining added] in the Greenbelt Plan and the Official Plans of the Region and the City. The remaining conclusions might be supportable if additional information was made available to answer questions previously asked of DBH. Additionally, the final conclusion does not commit to laboratory testing of the physical and chemical characteristics of the imported soil to be used to rehabilitate the site. Therefore, even at the time of rehabilitation, the ability of the imported soils to support vegetation being planted will not be known. If the planted materials are used as an indicator of the suitability of the soils for plant growth, problems such as stunted plants or leaf chlorosis, for example, may not show up for several years or, alternatively, may not be observable until times of a particular stress such as a dry growth season.

SUMMARY AND DISCUSSION

The only specific result of the AgPlan peer review seems to be that DBH Soil Services has stated that no evaluation of surficial soils needs to be completed related to agriculture and agricultural capability. However, the information presented within this DBH 3rd response leaves me none the wiser about how the surficial soils information has been integrated into the evaluation of an existing ecosystem. Neither does the information presented by DBH provide the probability of success in maintaining “ecological value” resulting from site rehabilitation. In evaluating the DBH information several assumptions were made. These general assumptions, previously outlined at the beginning of this report, can be attacked on the basis of:

- the scale and precision of information normally supplied in support of aggregate/quarry operations (the information presented on behalf of the proponents Brampton Brick follows industry standards);
- the findings of behavioral economists that clearly support the view that human decision-making is far from rational; therefore, an expectation of a reasoned response ignores the probability of that kind of response that is presented within the scientific literature.

My preference would be to put together a model to show the various ecological functions associated with surficial soils - everything from a medium for the transfer of surface and subsurface water, to physical support for plant roots, to an environment supporting subsurface macro and microscopic plant and animal life, to a carbon sink, to a medium for the storage and subsequent dispersal of heat energy, to a supplier of nutrients necessary for biological growth and sustenance. These various functions could be shown as part of a hydrological cycle. Regardless of the model, I would like to better understand how the surficial soils data has been used within the model created by Golder and I would like to have a better



understanding of whether the vegetation proposed to be used as part of the site rehabilitation has specific preferences with respect to soil texture, drainage, temperature, density etc. This understanding would be facilitated by use of a meeting with other disciplines, particularly hydrogeology, hydrology and biology. Much of the information on surficial soils that I have requested of DBH previously rests on certain assumption about interpretations of legislation, regulation and policy. I have previously used the phrase "ecological function" but I don't see that wording showing up in the reports by the proponents and I wonder whether they have a specific strategy which, in their opinion, excuses them from having to consider ecological function. Neither do I have an understanding about what legislation/regulation/policy can be rated as most important and which can be rated as least important. This understanding could be enriched by meetings with the legal and planning members of the team. I would also like to understand whether site development plans mentioned as part of the interim rehabilitation plan, which would occur after surrendering the license, could include filling the pond with inert fill from Toronto's proposed new subway work and subsequent development as allowed by the Greenbelt Plan.

AgPlan Limited

A handwritten signature in black ink, appearing to read "Michael K. Hoffman", with a long horizontal stroke extending to the right.

Michael K. Hoffman