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PEER REVIEW OF THE DBH SOIL SERVICES AGRICULTURAL IMPACT ASSESSMENT FOR THE JACKSON HARVEST FARMS AGGREGATE PIT APPLICATION, WILMOT TOWNSHIP, REGION OF WATERLOO

Prepared for:
The Region of Waterloo

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INTRODUCTION

The following describes the results of a peer review of the report prepared by Mr. David Hodgson of DBH Soil Services Inc. on behalf of IBI Group (Waterloo) concerning the proposed aggregate pit located on 1894 Witmer Road within the Township of Wilmot, Waterloo Region. The DBH report has the title *Jackson Harvest Farms 1894 Witmer Road Part of Lot 10 German Block South of Bleems Road Wilmot Township Regional Municipality of Waterloo* and is dated December 2019.

AgPlan Limited was retained in December 2019 by Waterloo Region to complete the peer review. The review follows a set of guiding questions (City of Brampton [Dorfman], 2010) which are summarized in this report as Matrix 1, Appendix 1. The peer review is also informed by Agricultural Impact Assessment Guidelines (Ontario Ministry of Agriculture, Food and Rural Affairs, 2018; Halton Region, 2014) and the requirements of these Guidelines are summarized in Matrix 2, Appendix 1. The analysis of positive and negative effects associated with the proposed Jackson Harvest Farms above water table aggregate pit is multidisciplinary. As a result, this peer review should be read in conjunction with reports and peer reviews in other subject areas such as hydrogeology, planning and transportation.

The information used and the opinions expressed in this peer review (including appendices) may be supplemented, reconsidered or otherwise revised by the author due to new or previously unknown information. If additional information is supplied by the proponent's consultant team, as a result of matters described within this peer review, additional review comments may be produced by AgPlan.

BACKGROUND

A peer review of an Agricultural Impact Assessment (AIA) is reasonably based on guidelines for such work. AIA guidelines are described by DBH Soil Services in the AIA for Jackson Harvest Farms and it is recognized that these guidelines are subject to interpretation and there are opportunities for the use of different methods. It is not the intent of this peer review to list and/or recommend methods and interpretations.

The purpose of this review is to identify whether the Jackson Harvest Farms AIA provides sufficient information on:

1. planning policy, guidelines, and process;
2. scientific methods;
3. literature cited and/or reviewed, personal communications;
4. site location and site context;
5. findings related to agricultural land use, soil capability for common field crops, soil potential for fruit and vegetable crops, farm infrastructure, the agricultural system, etc.;
6. analysis (preferably quantitative) which puts the findings in context;
7. methods and data descriptions and limitations;
8. mitigation and/or monitoring; as well as,
9. the relationship between the 8 factors listed above to support the conclusions reached in the AIA.

The DBH Soil Services AIA addresses all 9 of the information components listed previously. There are, however, some matters which are limited and/or missing and which, when identified and/or described, will assist in characterizing the agricultural impacts associated with the proposed aggregate pit. It is these limited and/or missing components which are described in the following section.

FINDINGS

Findings are summarized in the following list.

1. The DBH Soil Services report does not provide references from scientific literature and/or quantitative studies documenting:
   - physical, chemical and biological characteristics of soils rehabilitated after aggregate mining for an agricultural after use,
   - crop characteristics, including yield, of a cross-section of different crops grown on soils rehabilitated after aggregate mining relative to crops grown on the same or similar soils unaffected by aggregate mining.

   This information is necessary to ascertain the probability that *substantially the same areas and same average soil capability for agriculture are restored* (see the definition of agricultural condition below).

2. In section 2.2.9, "Agricultural Statistics," page 8, the DBH Soil Services AIA report refers to Ontario Ministry of Agriculture, Food Rural and Rural Affairs statistical information up to the year 2016 but reference for this information is not included in the references section.

3. Policy discussion in the DBH Soil Services report is extensive (pages 9 - 18) but does not include Provincial Policy Statement (PPS, 2014) definitions for:

   Comprehensive rehabilitation*: means rehabilitation of land from which mineral aggregate resources have been extracted that is coordinated and complementary, to the extent possible, with the rehabilitation of other sites in an area where there is a high concentration of mineral aggregate operations*.

   Agricultural condition*: means*
   a) in regard to specialty crop areas, a condition in which substantially the same areas and same average soil capability for agriculture are restored, the same range and productivity of specialty crops common in the area can be achieved, and, where applicable, the microclimate on which the site and surrounding area may be dependent for specialty crop production will be maintained or restored; and
   b) in regard to prime agricultural land outside of specialty crop areas, a condition in which substantially the same areas and same average soil capability for agriculture are restored.

The DBH AIA does refer to the Waterloo Regional Official Plan requirements for rehabilitation where that requirement has different wording than the wording in the PPS. The difference in the wording concerning rehabilitation and the significance of the difference, if any, has not been described by DBH.

The definitions and wording of policy provide a way to measure the "success" of agricultural rehabilitation and therefore a measure of agricultural impact. This will be discussed further later in this peer review.

4. The DBH AIA section on policy does not refer to policy 2.3.3.2 which states that *in prime agricultural areas, all types, sizes and intensities of agricultural uses and normal farm practices shall be promoted and protected in accordance with provincial standards*. Rather, this policy is discussed later in the DBH AIA. Policy 2.3.3.2 can be interpreted to mean that discrimination amongst types, sizes and intensities of agricultural uses and normal farm practices should not occur. How this interpretation of policy 2.3.3.2 is linked to discussions in the DBH AIA concerning agriculture characteristics such as fragmentation, ownership/tenancy and water quality protection discussed on page 34 is not apparent to this reviewer.

5. On pages 19 and 20, the DBH AIA contains reference to climate, principally Crop Heat Units (CHU). The reference is to a very broad scale map of CHU. The limitations associated with the use of a broad scale map when it is applied to a single property such as the proposed aggregate pit have not been discussed in the AIA. Additionally, some discussion concerning the lack of detailed information to be applied to a single site aggregate pit application and related to precipitation (amount, rates and timing), wind velocity (a wind rose) as well as other components of climate would assist in characterizing climate generally but will also provide additional context associated with the limitations of available climate data.

6. A discussion on land use is found on pages 22 through to 26. The predominant land use, on the site and in the study area, is common field crop production. However, within the study area, market garden crops were identified. Therefore, some discussion concerning whether the soils and climate on the site are similar or the same as those lands used for market garden production would assist in understanding whether the site has some potential for specialty crop production. If such potential for specialty crop production is present on the site, then the DBH AIA needs to address whether site rehabilitation will result in soil potential for specialty crop production which is similar to the current soil potential on the site.

7. The AIA by DBH examines agricultural investment on pages 26 through to page 32. Much of the investment relates to a description of agricultural facilities (pages 27-29) where facilities are linked to livestock production. Several unused and derelict buildings are identified by DBH in Figure 3 on page 30. It would be helpful if information providing context and within a 30 year planning timeframe was provided to understand whether livestock production in the study area

reflects changes in number of farms producing livestock, kinds of livestock production, and amount of livestock being produced in Wilmot and in Waterloo Region. This information would assist in understanding context for the conclusion on page 62 *that the study area is an area of transition from livestock agricultural operations to cash crop and aggregate extraction*. In addition, a review of the aggregate pits in the study area should reveal whether those pits are required to be rehabilitated to an agricultural after use. If the other pits are intended to be rehabilitated to an agricultural after use, then the DBH AIA statement concerning transition could be interpreted as being incorrect.

8. The section on land tenure and fragmentation on pages 33 through to page 37 contains several statements that require substantiation. In the following and in other parts of the report, statements copied from the DBH AIA are italicized. On page 34:

   i. *Statistics Canada Census of Agriculture (2016) indicates that the average farm size in Ontario is 100.8 ha (249 acres)*. It should be noted that the data from Statistics Canada refers to the farm operation size and not land parcel size (as discussed later in the following). Additionally, why use the average for Ontario instead of the average for southern Ontario, the Greater Golden Horseshoe, Waterloo Region and Wilmot Township? For example, are the farm operation sizes found in the study area similar or dissimilar to those in Wilmot Township or at other scales?

   ii. *Areas of high agricultural activities generally have larger tracts or blocks of land with few smaller severed parcels in close proximity. In areas of transition from the agricultural land base to more rural residential, there will be many smaller severed parcels and fewer large blocks of agricultural land*. How is “high agricultural activity” defined? What studies support this statement?

   iii. *Locally owned parcels reflect the owners desire to live and work in the immediate area. Non-locally owned parcels often reflect areas of properties purchased for speculation development*. Does speculation development include aggregate mining? Is speculation different from investment for purposes such as retirement planning? How is local versus non-local defined? How is land ownership reflected in the wording of agricultural policy?

   iv. *The Study Area comprises many larger parcels of land of 40 ha (well below the provincial average of 100.8 ha), smaller parcels associated with lots within Shingletown, and few small parcels of land (severed parcels outside Shingletown). This mix of property sizes and proximity to the Subject Lands illustrates an area in transition from strong agricultural land base to a more rural setting*. Land parcel size is a function of the original surveys completed in Ontario. How do these parcel sizes in the original surveys vary within Ontario? This DBH AIA statement appears to be

inappropriately comparing farm operation size to farm land parcel size. The average number quoted for Ontario is likely "farm operation size" rather than "farm parcel size". How are these definitions qualified within the DBH AIA document? What is a strong agricultural land base relative to a rural setting - is just one characteristic used to differentiate a strong agricultural land base or are several characteristics used? What study or studies demonstrate where strong agricultural versus weaker/rural land bases are located where, during what time?

v. *It should be noted that within the Study Area, much of the lands south of Witmer Road are already designated as Aggregate Authorized Area (illustrated in Figure 1). Portions of these lands are still being farmed for cash crop operations. Active aggregate pits were observed south of Witmer Road to the east*. Are portions of aggregate authorized areas being used for cash crop production because mining has yet to occur or have some of these sites been rehabilitated to an agricultural after use?

vi. *It is evident from Figure 4 and Table 3 that the Study Area is a mix of Owner/Operator interactions with large portions Local Owner/Operators, Local Owners with Tenant Farmers and Non-Local Ownership. These observations indicate that this area is in transition from farming*. Some context associated with ownership versus tenancy in farmland is necessary to understand whether the characteristics of the study area are similar or dissimilar to farmland in Ontario generally and more specifically in Waterloo region and Wilmot Township. If an area is in transition from farming, would the rate of change in census farm number and in census farm area correlate with the rate of change in the proportion of Local Owner/Operators, Local Owners with Tenant Farmers and Non-Local Ownership?

9. On page 36 this statement is made that:

> *Based on an evaluation of the Township of Wilmot Assessment data, the land tenure of the Subject Lands illustrates a Local Owner with a Tenant Farmer relationship. This type of relationship is often an indication of an area in transition from the traditional owner/operator farm*.

What does traditional owner/operator farm mean in the context of Wilmot and Waterloo Region? Is agriculture in parts or all of southern Ontario *in transition from the traditional owner/operator farm*? If the transition is intended in the AIA to be indicative of less important agriculture area or areas, what planning policy discusses the use of this transition to rate agricultural land as of lesser importance? Agricultural policy in the PPS is intended to differentiate the better from the poorer agricultural land and to preserve or save those better lands for agriculture. Given that policy interpretation, the use of the characteristic "transition away from owner/operator farms", if that transition can reasonably be

used to differentiate agricultural land based on the wording of policy, requires temporal as well as geographic context associated with that transition. In other words, the "transition away from owner/operator farms" needs to be comparative in order to rate the site for that transition as lower versus higher and therefore better versus poorer agriculturally. The DBH AIA presents no:

i. analysis of agricultural policy providing evidence of the need for the consideration of farmland ownership and owner/operator farms,

ii. comparative analysis (geographically and temporally) for the "transition away from owner/operator farms".

In the absence of the policy as well as comparative analysis, why include this factor in the AIA?

10. On pages 36 and 37 , the phrase "under pressure" is used. It would be helpful if this phrase was defined. Does "under pressure" include a component that means that the lands are of lesser value for agriculture? If "under pressure" is being used to rate lands, then as stated previously, policy and comparative analysis is necessary.

11. Soil survey and soil capability information is discussed extensively on page 37 to page 45 of the DBH AIA. Several questions related to soils and soil capability arise after as follows:

i. On page 7 and 19 there is discussion about the review of contour mapping. It would be helpful if the soils and soil capability map polygon boundaries could be overlaid on the contour map used in the hydrogeology report. A review of the topography map and soils map, by examining the 2 maps by placing them side-by-side, suggest that some soils may have slope gradients that are less than that shown on the soil map. For example, Lisbon soil series mapped to the north and west side of the site appear to have sections that are relatively flat and in slope class "B". Even if these soils are in slope class "C" they would be mapped as soil capability class 2 based on descriptions provided by Presant and Wicklund (1971). It is possible that the generalization of the original soil survey mapping by Presant and Wicklund resulted in changes to the soil capability class attached to Lisbon series as presented in the Land Information Ontario database. Regardless, Lisbon soils with "C" slope classes have been assigned a soil capability class 3 in the DBH AIA. The reasons for the change in soil capability class need to be included within the DBH AIA. Presant and Wicklund (1971) also state that *early potatoes are an important crop on these* [Lisbon] *soils*. Therefore, this fact needs to be included in any discussion associated with the soil potential for fruits and vegetables as previously discussed in paragraph 6 of this review.

ii. On the other hand, Presant and Wicklund (1971) have downgraded the soil capability class of gravelly/cobbly Burford series, some of which are identified on the site. For example, the authors of the original published soil survey for Waterloo County state *cobbly Burford soils with 3 to 6%*

complex slopes or 6 to 12% single slopes are rated as Class 4s/t soils…. Burford soils with complex slopes greater than 12% are, at best, Class 5t soils. Cobbly Burford soils with similar slopes have a rating of Class 6t. Whether these soil capability classifications for Burford series can be applied to the site cannot be ascertained because the soil record forms in the DBH AIA do not include slope gradients.

iii. No statistical analyses of soil horizon depths are included as part of the DBH AIA. A reading of the soil record forms does indicate that the depth and thickness of the "A" and "B" are variable. The General Rehabilitation Plan in the DBH AIA does include the stripping of topsoil, subsoil and overburden separately. The use of the terms topsoil, subsoil and overburden have not been correlated with the "A", "B", and "C" horizons. Neither is there specific information to ascertain whether all of the "B" horizon will be stripped. Some of the soils on the site have a "Bt" horizon characterized by an enrichment of clay which will affect water infiltration and field saturated hydraulic conductivity and therefore water available in the soil profile for plants. Thus, it is important to understand whether that "Bt" will be re-established in the rehabilitated aggregate pit.

iv. Surface textures for the soils on the site vary from sandy loam to loamy sand to gravelly cobbly sandy loam based on the soil record forms in the DBH AIA. Soil capability can vary based on these different textures. Is it likely that the surface textures will be "combined" when soils are rehabilitated for an agricultural after use on the site and, if this mixing does occur, how will the mixing/combination affect soil capability?

12. Soil capability classes have been converted to productivity indices using Hoffman (1971) in the DBH AIA (pages 44 and 45) to provide an average soil capability for the site (Hoffman's work hasn't been included in the references section of the DBH AIA). The average soil capability for the site calculated by DBH appears to apply capability a value of 7 to the disturbed (not rated) soils on the site. The word "appears" has been used because, using a rating for class 7 in a calculation of the site average soil productivity for common field crops, provides a result slightly different from that presented in the DBH AIA. In addition, are the disturbed soils not capable of being rehabilitated? If they are capable of rehabilitation, then would that not represent a best management practice, and should the average soil capability of the site reflect the rehabilitated capability/productivity of the disturbed soils?

13. The section on agricultural statistics on pages 48 to 50 in the DBH AIA describe field crop production for census years 2011 and 2016. Why only 2 census periods and why only field crop statistics (given that the agricultural census has recorded an extensive number of different agricultural characteristics)?

14. The section on rehabilitation in the DBH AIA provides a General Rehabilitation Plan. As a generalization, the plan is reasonable. However, the acceptability of

the plan is a function of the requirement within policy to return the lands to *a condition in which substantially the same areas and same average soil capability for agriculture are restored* (PPS, 2014) and *within the Prime Agricultural Area, substantially the same land area will be rehabilitated back to an agricultural condition to allow for the same range and productivity of crops common in the area* (Region of Waterloo, 2015). These phrases set the goals that rehabilitation to an agricultural after use will reach. Given these goals, additional information described in the following would assist in establishing the probability that the goals can be reached.

i. As described, in part, previously, the site has a range of soil surface textures, surface stoniness, horizons depth and thickness, "B" horizon differences as well as differences in soil drainage class as identified in the DBH AIA. Step 1 in the General Rehabilitation Plan would appear to ignore some of these differences and create 3 separate stripped soil components of topsoil, subsoil and overburden. What evidence is available to suggest that this approach, which will combine soil textures and stoniness, will not affect soil capability?

ii. Soil texture and structure may also be affected by the presence of the recycling of concrete and asphalt as well as the presence of aggregate material washing. How will the lands used for these activities be rehabilitated and to what level of soil capability?

iii. In step 4 in the General Rehabilitation Plan, it is stated that *progressive rehabilitation allows for direct movement of soil from the natural state to an area of restoration, without the intermediate stockpiling step*. Later in the description of the General Rehabilitation Plan the AIA states that *it is noted that in the initial stages of the pit start up and operation there are limited opportunities for soil rehabilitation. As a result, in the early stages of pit start up, soil materials will be used for longer term berm material*. Therefore, how much of the topsoil stripped from the site will be subject to deterioration *over time in storage due to changes in soil organisms (fungal and bacterial)*?

iv. In step 6 in the General Rehabilitation Plan, it is stated that *there should be a minimum of 2.0 m (1.5 m left above water table plus 0.5 m of replacement soil) of soil over the ground water levels to provide for adequate plant growth.* Therefore, agricultural crops will be approximately 14 to 18 m closer to groundwater levels after extraction and after replacement of at least part of the original soil profile. Research by Mackintosh and Van der Hulst (1978) demonstrates that, in agricultural soil profiles,
    - depth to free water is not significantly different for imperfectly, poorly and very poorly soils,
    - that some imperfectly drained soils are saturated for periods during the month of May, and,

- that saturation would result in a delay associated with the seeding of crops.

Given the depth to free water measured by Mackintosh and Van der Hulst (1978) and the change in depth to the water table after extraction, what evidence is being used to indicate the probability that tile drainage will be required as part of agricultural rehabilitation of the site?

v. The hydrogeology report (Harden Environmental Services Limited, 2019) documents levels of nitrate nitrogen in groundwater and attribute these elevated levels to agriculture. The hydrogeology report also states on page 22 that *the site will be returned to agricultural potential by placing topsoil back onto the pit floor and sides. We recommend that best management practices related to nutrient applications are adhered to in the future farmland. The farmland within the Issue Contributing Area (ICA) should have restrictions or prohibition on nutrient applications*. Therefore, will the restrictions or prohibitions with respect to nutrient applications prevent the growing of, and/or reduce the yields of, crops with high nitrogen requirements such as corn? Is the need for this restriction or prohibition made more likely because the distance between the crop rooting zone and water table is changed after extraction? If the restriction or prohibition results in changes in the variety of crops that can be grown and/or their yields, then this change would need to be reflected in the soil capability classification of the soils on the rehabilitated site (the soil capability classification uses the range of crops that can be grown in the differentiation of soil capability classes).

vi. The Harden Environmental Services Limited report (2019) water balance also documents that there will be some increase in the infiltration of water on the rehabilitated site. How will this increased water infiltration, in combination with depth to free water in the agricultural soil profile, together with the reduced distance between crop rooting zone and water table, affect soil water content and subsequent crop growth?

15. Section 5 of the DBH AIA several statements require additional information.

i. There is a reference by DBH to the ownership pattern as a clear indication of an “area in transition” with subsequent reference to long-term intentions for agriculture. Is this to be interpreted to mean that the site and study area are in transition away from agriculture? Notwithstanding the lack of data to put matters such as ownership in context (as an indication of transition away from agriculture and discussed previously in this review), the long-term intentions for the site and surrounding area, given a planning timeframe, have been set because the lands are within a prime agricultural area. On the other hand, DBH mentions that the proposed aggregate extraction is only an interim use and that the lands will be returned to agriculture. How is this discussion in the AIA about transition

and long-term intentions for agriculture, relative to intentions to provide an agricultural after use of the site, to be interpreted?

ii. The phrase “interim use” has been used within the AIA but has not been defined. There are several aggregate mining activities that are near or adjacent to the proposed site. How long have these aggregate mining areas been present? How will the information about these study area operations and others in the province be used to indicate how long the site lands will be removed from agricultural production?

iii. The number of aggregate mining license areas that are contiguous to the site can be interpreted to be such that comprehensive rehabilitation is possible and/or preferable. Why is comprehensive rehabilitation not part of the discussions in the DBH AIA?

iv. The number of aggregate mining license areas that are contiguous to the site have all had some impacts to agriculture. Why does the DBH AIA not describe the total combined effects of these aggregate operations on agriculture?

v. The tests outlined in policy for the acceptability of the proposed aggregate pit relates to the maintenance of soil capability/productivity of a rehabilitated site relative to the soil capability/productivity of the site prior to extraction. There is no statement in sections 5 or 6 of the DBH AIA that states that the soil capability/productivity of the site will be maintained within the limits described by policy. Section 5 of the AIA does make statements that are correct - such as, there will be no land fragmentation; no loss of agricultural infrastructure, investment in drainage systems and irrigation systems; as well as permanent loss of agricultural lands. But for this site, none of these relate to the soil capability/productivity tests outlined in policy.

16. On the other hand, there are statements made on pages 55 and 56 of the AIA that require substantiation - such as, those related to the maintenance of soil drainage, changes to surface drainage and, no loss of existing or future farming opportunities. However, these characteristics of agriculture are only important if they affect, or are affected by, the soil capability/productivity of the rehabilitated site relative to the existing site.

CONCLUSIONS

Based on this peer review, the DBH Soil Services Agricultural Impact Assessment of Jackson Harvest Farms, 1894 Witmer Rd., Wilmot Township lacks information where that information would assist in characterizing the policy requirement for rehabilitation of the aggregate pit to *substantially the same areas and same average soil capability for agriculture* (PPS 2014) and that *substantially the same land area will be rehabilitated*

back to an agricultural condition to allow for the same range and productivity of crops common in the area (Region of Waterloo, 2015).

Therefore, additional information needs to be requested from the proponent's consultants to ascertain if the tests in policy for soil capability/productivity have been met in other aggregate mining areas and are likely to be met for the Jackson Harvest Farms site.

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REFERENCES

The following references, in addition to the reports related to planning, hydrogeology etc., have been cited and used as a framework for the peer review of the DBH Soil Services Inc. report.

Brampton, City of. 2010. *Guideline Principles and Questions for Brampton Peer Reviewers Brampton Brick Peer Review.* Prepared for the City oof Brampton by Mark L. Dorfman.

Government of Ontario. 2014. *Provincial Policy Statement*. Queen's printer for Ontario.

Halton, Region of. 2014. *Agricultural Impact Assessment (AIA) Guidelines Regional Official Plan Guidelines*.

Hoffman, D. W., 1971. *The Assessment of Soil Productivity for Agriculture*. ARDA Report No. 4.

Mackintosh, E. E. and Van der Hulst. 1978. Soil drainage classes and soil water table relations in medium and coarse textured soils in southern Ontario*. Can. J. Soil Sci. 58:287-301*.

Ontario Ministry of Agriculture, Food and Rural Affairs. 2018. *Draft Agricultural Impact Assessment (AIA) Guidance Document*.

Ontario Ministry of Agriculture, Food and Rural Affairs. No date. Guidelines *for Detailed Soil Surveys for Agricultural Land Use Planning*. Ontario Ministry of Agriculture, Food and Rural Affairs.

Ontario Ministry of Agriculture, Food and Rural Affairs. No date. *Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for Application of the Canada Land Inventory in Ontario*. Ontario Ministry of Agriculture, Food and Rural Affairs.

Statistics Canada. 1926 - 2016. Census of Agriculture data.

Waterloo, Regional Municipality of. 2015. *Regional Official Plan 2031*.

APPENDIX 1

MATRIX 1 (City of Brampton [Dorfman], 2010)

REVIEW SUBCOMPONENT	GUIDING QUESTIONS
Purpose	Is the purpose of the work clearly and understandably stated in the applicant's report/study?
	Are all relevant and probable issues and impacts encompassed by the purpose?
	Is the purpose worded so that it encompasses the questions that are relevant to surficial soils and/or agriculture?
Methodology	Is the methodological approach to the purpose technically sound to permit an objective review of issues, data, facts, and appropriate to fulfill the purpose?
	Are there technical concerns related to the methodology and assumptions that may compromise the analysis and/or the conclusions of the report/study?
Information	Are relevant data and facts clearly and consistently presented in the applicant's report/study?
	Is the information useful and is the data used critical to the conclusions?
	Are the data useful and accurate, or are there concerns about their quality?
	Are complete, relevant and appropriate data sets provided?
	Are the relevant data and other information sufficiently detailed? Is anything missing?
Certainty	Are certainties and uncertainties of the proposal's success openly and objectively stated in the applicant's report/study?
	Are all assumptions clearly stated? Are the assumptions reasonable?
	Are the standards or thresholds commonly accepted in surficial soils and/or agriculture identified and appropriately utilized?
Issue Gaps	Are there issue gaps arising from the peer review?
	Were all identified issues addressed?
	Are there additional issues identified through the peer review that need to be addressed?
	Are there any key issues (from the perspective of surficial soils and/or agriculture) that have not been studied?
Mitigation/ Monitoring	Are realistic mitigation measures (or contingency plans) proposed in the applicant's report/study? Are they presented in sufficient detail?
	Do the proposed measures mitigate the impacts?
	Will the proposed measures be adequate to address outstanding concerns?
Conclusion	Are the conclusions of the report/study supported by and follow from the work undertaken?
	Are the conclusions relevant to the purpose/objectives of the work?
	Would the peer reviewer reach the same conclusions, and if not, then what conclusions would that reviewer reach?
	Do the conclusions satisfy the applicable policies of the Official Plans and provincial plans, policies, guidelines and standards?
Adequacy	Generally, does the applicant's report/study adequately address the stated purpose?
	Does the applicant's report/study adequately address the stated purpose, from the perspective of surficial soils and/or agriculture?
	Is there anything that I would have done differently?
	Is the applicant's report/study complete?

MATRIX 2 (A Generalized Summary of AIA Guidelines)

Principal information requirements	Subcomponent information
Development proposal description	Site plan, location plan, description
Site physical resource inventory	Soils and soil capability including inherent limitations to the capability classification
Site land use	Past and present agricultural production, the non-agricultural uses on site, land parcel(s) shape and size, land tenure, operation and farm operator characteristics, farm capital investment
Off-site land-use	Adjacent land uses (type and intensity), existing constraints imposed by external uses including Minimum Distance Separation (MDS), land parcel sizes, ownership/tenancy, off-site soil capability, off-site designations/zoning
Economic viability	Viability of the lands themselves, viability when in combination with a larger farm operation, flexibility for different kinds of farm use
Impacts on agriculture	Direct loss of agricultural land, affects the surrounding lands including the general area in which the site is located
Mitigation measures	Methods of impact mitigation on-site and off-site
Conclusions	Summary and recommendations, compliance with MDS and policy
Background information	Literature cited, data sources, personal communications, methodologies, Curriculum Vitae of team member(s)