



**JACKSON HARVEST FARMS
1894 WITMER ROAD
PART OF LOT 10
GERMAN BLOCK SOUTH OF BLEEMS ROAD
WILMOT TOWNSHIP
REGIONAL MUNICIPALITY OF WATERLOO**

DBH Soil Services Inc.

December 21, 2018



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December 21, 2018

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DBH Soil Services Inc.

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I BACKGROUND

DBH Soil Services Inc was retained to complete an Agricultural Impact Assessment (AIA) for a property located on Part Lot 10, German Block South of Bleems Road, Wilmot Township, in the Regional Municipality of Waterloo. The property is identified as 1894 Witmer Road.

The property is roughly rectangular in shape, with the longer boundaries running north-south, the narrower boundaries running east-west, and the southern narrow boundary abutting Witmer Road. A small laneway extends from the northern portion of this property to Bleams Road East, where the laneway exits within the hamlet of Shingletown.

The eastern boundary abuts agricultural lands and a ponded area. The northern boundary abuts agricultural lands and the hamlet of Shingletown. The western boundary abuts agricultural lands and woodlots.

There are no buildings or structures on this property. Historically, this property was used for the production of common field crops and included a beef cattle operation. The remnant foundations, the remnant liquid manure storage and the remnant concrete bunker feed storage facilities are located along the southern portion of the property adjacent to Witmer Road. Historically a residence had been located just north of the woodlot near the east central portion of the property. This residence has been dismantled.

There is one ponded area located along the central portion of the eastern boundary. There are no other areas of standing water or areas of flowing water on this property.

This property comprises approximately 64.0 ha (158.2 acres). The majority of the parcel was used for the production of agricultural crops. The crops grown in the 2018 growing season included soybean and corn. The remainder of the property comprised woodlot areas and disturbed areas (associated with the farm stead (barns, machine shed, garage, residential unit) and laneways).

This parcel is henceforth collectively referred to as the Subject Lands.

In the greater Regional context, the Subject Lands are located approximately 5.0 km west of the City of Kitchener, approximately 2.6 km south of the hamlet of Petersburg and roughly 3.8 km southeast of the town of Baden.

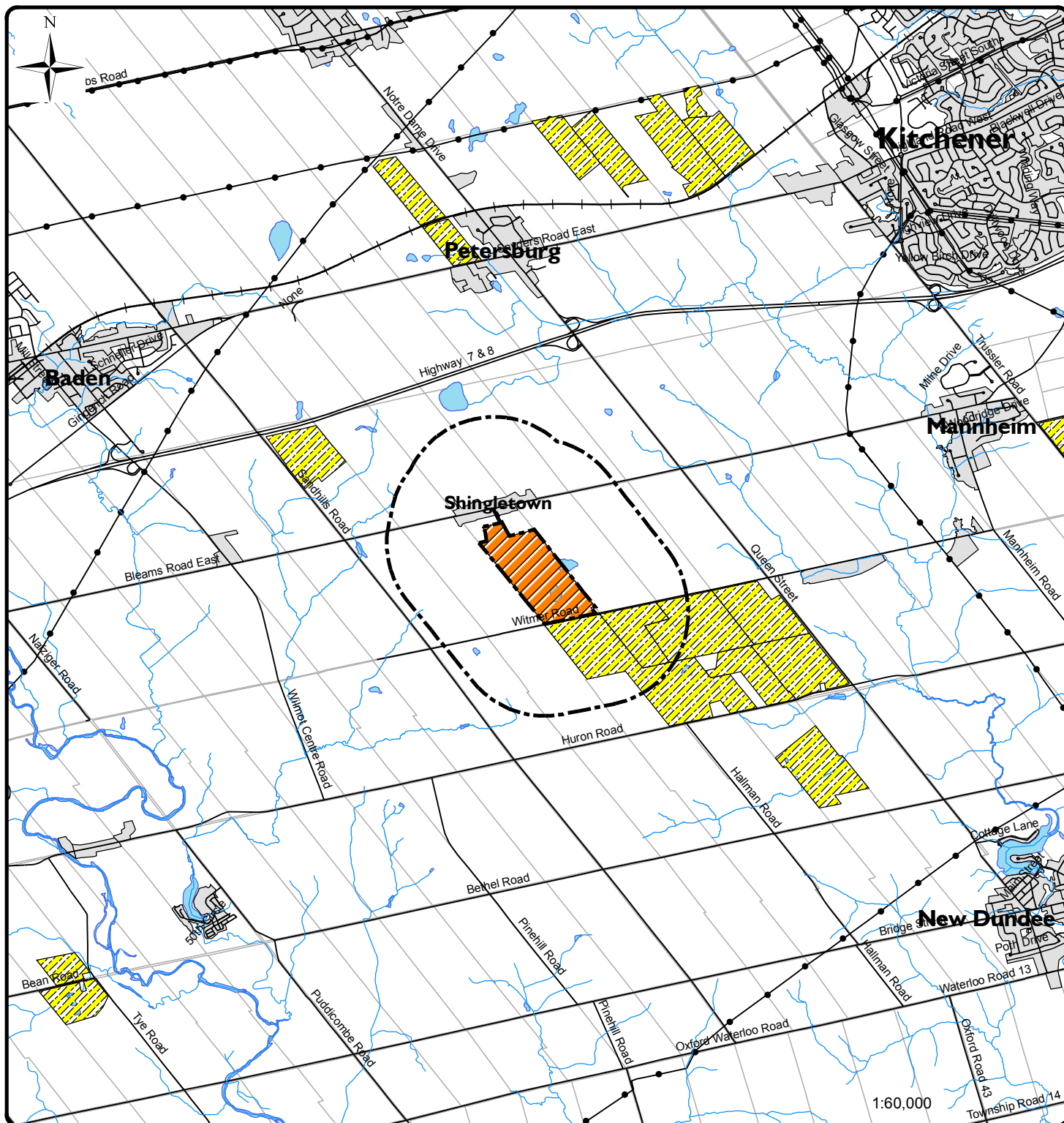
Figure 1 illustrates the relative location and shape of the Subject Lands with respect to the above mentioned features. Figure 1 also illustrates the relative location and occurrence of Authorized Aggregate Areas (as provided by Land Information Ontario, Ministry of Natural Resources (LIO, MNR), 2018).

For the purpose of an Agricultural Impact Assessment (AIA) report, agricultural operations and activities are evaluated in a larger area, the Study Area (Figure 1), described as a potential zone

of impact extending a minimum of 1000 m (1.0 km) beyond the boundary of the Subject Lands.

This minimum 1000 m (1.0 km) area of potential impact outside the Subject Lands is used to allow for characterization of the agricultural community and the assessment of impacts adjacent to and in the immediate vicinity of the Subject Lands.

This report documents the methodology, findings, conclusions and mapping completed for this study. A proposed rezoning of the Subject Lands to allow an above water table aggregate pit (rehabilitated back to agriculture) necessitated this study.



Legend

- | | |
|-----------------------------------|-------------------|
| —+—+— Railway (MNR) | □ Lot Lines (MNR) |
| — Roads (MNR) | ▨ Subject Lands |
| ••• Utility Line (MNR) | ■ Waterbody (MNR) |
| — Watercourse (MNR) | |
| ⋯ 1 km Buffer | |
| ▨ Aggregate Site Authorized (MNR) | |
| ■ Built Up Areas (MNR) | |

Figure 1

Location

DBH Soil Services Inc.

September 2018

2 METHODOLOGY

A variety of data sources were evaluated to characterize the extent of agriculture resources and to assess any potential existing (or future) impacts to agriculture within the Subject Lands and the surrounding Study Area.

It should be noted that the Region of Waterloo and Wilmot Township do not provide specific guidelines for completing an Agricultural Impact Assessment (AIA).

The Ontario Ministry of Agriculture, Food and Rural Affairs have recently released draft Agricultural Impact Assessment guidelines in a document titled “Draft Agricultural Impact Assessment (AIA) Guidance Document, March 2018”. This new document is considered as “Draft for Discussion Purposes” and does not have status.

A standard for completing Agricultural Impact Assessments was developed by the Region of Halton in 1985 (Agricultural Impact Assessment Guidelines, October 1985), and updated in June 2014.

The Region of Halton has specific standards and guidelines for completing Agricultural Impact Assessments (AIA) within the boundaries of the Region of Halton. The Halton Region guidelines are comprehensive and require considerable detail to complete.

This Agricultural Impact Assessment report has been completed with regard to the Region of Halton Agricultural Impact Assessment Guidelines (2014), a review of the new OMAFRA “Draft Agricultural Impact Assessment (AIA) Guidance Document, March 2018” and through discussion with staff from the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA).

The Region of Halton Agricultural Impact Assessment Guidelines states that an AIA should include the following:

- Description of the proposal
- Purpose
- Applicable Planning Policies
- Onsite and Surround Area Physical Resource Inventory (including: soils; climate; slope; topography; drainage)
- Minimum Distance Separation (MDS) calculations
- On-site features (including: past farming practices; type and intensity of existing agricultural production; nonagricultural land use; parcel size, shape and accessibility; existing farm management; capital investment related to agriculture)
- Offsite Land Use Features (including: surrounding land use types; existing and potential constraints to onsite agriculture; regional land use, lot and tenure patterns)
- Agricultural Viability
- Assessment of Impact on Agriculture
- Mitigative Measures/Avoidance/Minimizing impact

- Conclusions

These tasks are also identified and presented in the OMAFRA “Draft Agricultural Impact Assessment (AIA) Guidance Document, March 2018”.

2.1 DATA SOURCES

The following data sources were used (as a minimum) to carry out the AIA for the Subject Lands and the Study Area:

- 1:10000 scale Ministry of Natural Resources (MNR) Aerial Photography, 1978,
- 1:10000 scale Ontario Base Map (1983) Ministry of Natural Resources:
10 17 5450 47950
10 17 5500 47950
- 1:50000 scale NTS Map No 40 P/1 and 40 P/8. 1984. Ministry of Energy Mines and Resources, Canada,
- 1:50000 scale NTS Map No 40 P/1 and 40 P/8. Canada Land Inventory (CLI) Capability Mapping,
- Aggregate Resources Act, R.S.O. 1990.c. A.8.
- Agricultural Information Atlas online resource (OMAFRA),
- Agricultural Resource Inventory, Ontario Ministry of Agriculture and Food, 1988,
- Agricultural System Portal online resource (OMAFRA),
- Birdseye Online Imagery,
- *The Canadian System of Soil Classification*. 3rd ed. Agric. Can. Publ. 1646. Agriculture Canada Expert Committee on Soil Survey. 1998,
- Google Earth Pro Online Imagery,
- *Greenbelt Plan* (2017),
- *Growth Plan for the Greater Golden Horseshoe* (2017),
- *Guide to Agricultural Land Use*, Ontario Ministry of Agriculture, Food and Rural Affairs, March 1995,
- *Guidelines on Permitted Uses in Ontario's Prime Agricultural Areas*, 2016 (Publication 851),
- *Jackson Harvest Farms, 1894 Witmer Road, Wilmot Township, ON, Transportation Impact Study*. Paradigm Transportation Solutions Limited, September 2018,
- Ontario Ministry of Agriculture and Food - Land Use Systems Mapping,
- Ontario Ministry of Agriculture and Food - Artificial Drainage Mapping,
- Ontario Ministry of Natural Resources, Ontario Geological Survey, *Aggregate Resources Inventory Paper 81, Aggregate Resources Inventory of the Township of Wilmot, Regional Municipality of Waterloo, Southern Ontario*. 1984,
- Ontario Ministry of Natural Resources, Ontario Geological Survey, *Aggregate Resources Inventory Paper 161, Aggregate Resources Inventory of the Region of Waterloo (Townships of North Dumfries, Wellesley, Wilmot and Woolwich and the Cities of Cambridge, Kitchener and Waterloo)*, 1998,
- *Provincial Policy Statement*, 2014,
- *Regional Official Plan 2031 (Region of Waterloo, June 18, 2015)*,

- *Soils of Waterloo County*. Report Number 44 of the Ontario Soil Survey. (Presant, E.W. and R.E. Wicklund, 1971),
- *The Minimum Distance Separation (MDS) Document – Formulae and Guidelines for Livestock Facility and Anaerobic Digester Odour Setbacks*. Publication 853. Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). 2016,
- *The Physiography of Southern Ontario* 3rd Edition, Ontario Geological Survey Special Volume 2, Ministry of Natural Resources, 1984,
- *Township of Wilmot Official Plan (November 2006 Consolidation)*,
- *Wilmot Township Zoning By-Law (under review – information provided by Wilmot Township Staff)*,
- Windshield and field surveys by DBH Soil Services staff August 18, 2018, October 16, 2018 and October 23, 2018.

2.2 DATA COLLECTION

2.2.1 POLICY

Relevant policy, by-laws and guidelines related to agriculture and mineral aggregate application and operation were reviewed for this study.

The review included an examination of Provincial and Municipal policy as is presented in the Provincial Policy Statement (2014), the *Regional Official Plan 2031 (Region of Waterloo, June 18, 2015)* and the *Township of Wilmot Official Plan (November 2006 Consolidation)*.

The review also included a search of the Township of Wilmot Zoning By-Law.

Further, the review included an analysis of the Minimum Distance Separation (MDS) Document – Formulae and Guidelines for Livestock Facility and Anaerobic Digester Odour Setbacks. Publication 853. Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA, 2016) with respect to guidelines associated with aggregate resource studies.

An assessment of online data resources including the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), the Ministry of Natural Resources (MNR) Land Information Warehouse, the Region of Waterloo website, the Town of Wilmot Website, combined with telephone, email and in person communication was used to derive a list of relevant policy, by-law and guidelines. Each relevant policy, by-law and guideline was collected in digital or paper format for examination for this study.

2.2.2 PHYSIOGRAPHY AND AGGREGATE RESOURCES

A review of the *Physiography of Southern Ontario* 3rd Edition, Ontario Geological Survey Special Volume 2, Ministry of Natural Resources (1984) and the MNR Aggregate Resources Inventory Papers (ARIP) was completed to document the type(s) and depth of bedrock and soil parent materials, and how these materials, in conjunction with glacial landforming processes, have led to the development of the existing soil resources.

2.2.3 TOPOGRAPHY AND CLIMATE

Topographic information was reviewed from the 1:10000 scale Ontario Base Mapping, Land Information Ontario digital contour mapping, detailed soil survey assessment (using a hand held clinometer), aerial photo interpretation, the draft Existing Features and Contour data from the IBI Group and windshield surveys.

Climate data was taken from the OMAFRA document titled 'Agronomy Guide for Field Crops – Publication 811 (June 2009)'.

2.2.4 AGRICULTURAL LAND USE

Agricultural land use data was collected through observations made during roadside reconnaissance surveys and field surveys conducted on August 18, 2018, October 16, 2018 and October 23, 2018. Data collected included the identification of land use (both agricultural and non-agricultural), the documentation of the location and type of agricultural facilities, the location of non-farm residential units and the location of non-farm buildings (businesses, storage facilities, industrial, commercial and institutional usage).

Agricultural land use designations were correlated to the *Agricultural Resource Inventory (ARI)* (Ontario Ministry of Agriculture and Food report and maps) and the information provided in the Agricultural System Portal (OMAFRA) for the purpose of updating the Ontario Ministry of Agriculture and Food Land Use Systems mapping for the Subject Lands and the Study Area.

2.2.5 MINIMUM DISTANCE SEPARATION

Minimum Distance Separation (MDS) formulae were developed by OMAFRA to reduce and minimize nuisance complaints due to odour from livestock facilities and to reduce land use incompatibility.

A review of the Minimum Distance Separation (MDS) Document – Formulae and Guidelines for Livestock Facility and Anaerobic Digester Odour Setbacks (Publication 853. Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). 2016) revealed that Guideline # 3 pertains. Guideline # 3 – For What, and When, is an MSD setback NOT Required states:

“Certain proposed uses are not reasonably expected to be impacted by *existing livestock facilities* or *anaerobic digesters* and as a result, do not require an MDS I setback. Such uses may include, but are not limited to:

- extraction of minerals, petroleum resources and mineral aggregate resources;
- *infrastructure*; and
- landfills.”

Therefore, MDS I calculations are **NOT** required for this study.

2.2.6 LAND TENURE AND FRAGMENTATION

Land Tenure data was collected through a review of online interactive mapping on the Agricultural Information Atlas (OMAFRA) website, the Agricultural System Portal (OMAFRA), and a review of assessment data at the Township of Wilmot Offices in Baden, Ontario. This data was used to determine the extent, location and relative shape of each parcel/property within both the Subject Lands and the Study Area.

The Township of Wilmot offices were visited to access and review the Assessment Roll data to determine the address of the parcel owner and the farm land operator (ie: whether the land is owner or tenant farmed). The reviewed Assessment Roll data had been collected for “Assessment Roll Reference Date for 2018 Taxation”.

2.2.7 ONSITE SOIL SURVEY

An onsite soil survey was completed on the Subject Lands. The detailed soil survey was completed by following the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Guidelines for Detailed Soil Surveys for Agricultural Land Use Planning (May 31, 2004). These guidelines were created in response to concerns with the accuracy of published mapping and classification of soil materials and that the existing information is of too general a nature to adequately describe and interpret the soil properties for site-specific planning purposes.

A detailed onsite soil survey was conducted on October 16, 2018. At the time of the onsite survey portions of the corn crop had been harvested. The soybeans had not been harvested at the time of the onsite soil survey.

2.2.8 AGRICULTURAL SYSTEM

The Ontario Ministry of Agriculture, Food and Rural Affairs online Agricultural Systems mapping reviewed to determine the extent of agriculture on the Subject Lands, in the Study Area and within the Township of Wilmot.

The Agricultural System comprises two parts: Agricultural Land Base; and the Agri-Food Network.

The Agricultural Land Base illustrates the Prime Agricultural Areas (including Specialty Crop Areas), while the Agri-Food Network illustrates regional infrastructure/transportation networks, buildings, services, markets, distributors, primary processing and agriculture communities.

2.2.9 AGRICULTURAL STATISTICS

Agricultural statistics were provided by and downloaded from the OMAFRA website. The statistics were provided in Excel format for Western Ontario, with the Region of Waterloo data used for this project. The data documents up to the 2016 Census. The Township of Wilmot data was part of the Region of Waterloo data set.

3 POLICY REVIEW

Clearly defined and organized environmental practices are necessary for the conservation of land and resources. The long term protection of quality agricultural lands is a priority of the Province of Ontario and has been addressed in the Provincial Policy Statement (2014). Further, in an effort to protect agricultural lands, the Province of Ontario has adopted policy and guidelines to provide a framework for managing growth. These four provincial land use plans: Greenbelt Plan (2017); the Oak Ridges Moraine Conservation Plan (2017); the Niagara Escarpment Plan (2017); and the Growth Plan for the Greater Golden Horseshoe (GGH) (2017) support the long term protection of farmland. The four provincial land use plans have policy plans that require Agricultural Impact Assessments (AIA) in the GGH.

Municipal Governments have similar regard for the protection and preservation of agricultural lands, and address their specific concerns within their respective Official Plans on County/Regional level and Township level.

With this in mind, the: *Provincial Policy Statement (2014)*; Greenbelt Plan (2017); the Oak Ridges Moraine Conservation Plan (2017); the Niagara Escarpment Plan (2017); and the Growth Plan for the Greater Golden Horseshoe (GGH) (2017) were reviewed for this study.

With respect to this AIA and the four provincial land use plans, a review of the boundaries of the Greenbelt Plan Area, the Oak Ridges Moraine Area, the Niagara Escarpment Plan Area and the Growth Plan for the Greater Golden Horseshoe Area was completed. Only the Growth Plan for the Greater Golden Horseshoe (2017) is applicable to this site.

The *Regional Official Plan 2031 (Region of Waterloo, June 18, 2015)* and the *Township of North Wilmot Official Plan* (November 2006 Consolidation) were reviewed. The Township of Wilmot Zoning By-Law is under review and is not available for public distribution. Conversations with staff at the Township of Wilmot provided the existing zoning for the Subject Lands and a section of the Zoning By-Law that documents the zoning identified for these lands.

The relevant policies from the above mentioned documents are presented as follows.

3.1 PROVINCIAL AGRICULTURAL POLICY

The Provincial Policy Statement (2014) was enacted to document the Ontario Provincial Governments development and land use planning strategies. The Provincial Policy Statement provides the policy foundation for regulating the development and use of land.

Agricultural policies are addressed within Section 2.3 of the Provincial Policy Statement. Section 2.3.1 states that 'Prime agricultural areas shall be protected for long term use for agriculture.' Prime agricultural areas are defined as Specialty Crop Areas and Classes 1 – 3 lands with the order of preservation being Specialty Crop Areas, Classes 1, 2 and 3 in that

order respectively, followed by any associated Class 4 through 7 lands within the prime agricultural area, in this order of priority.

Specific Policies for Mineral Aggregate Resources are provided in Section 2.5 of the PPS (2014). Section 2.5 states:

“2.5 Mineral Aggregate Resources

2.5.1 *Mineral aggregate resources* shall be protected for long-term use and, where provincial information is available, *deposits of mineral aggregate resources* shall be identified.

2.5.2 Protection of Long-Term Resource Supply

2.5.2.1 As much of the *mineral aggregate resources* as is realistically possible shall be made available as close to markets as possible.

Demonstration of need for *mineral aggregate resources*, including any type of supply/demand analysis, shall not be required, notwithstanding the availability, designation or licensing for extraction of *mineral aggregate resources* locally or elsewhere.

2.5.2.2 Extraction shall be undertaken in a manner which minimizes social, economic and environmental impacts.

2.5.2.3 *Mineral aggregate resource conservation* shall be undertaken, including through the use of accessory aggregate recycling facilities within operations, wherever feasible.

2.5.2.4 *Mineral aggregate operations* shall be protected from *development* and activities that would preclude or hinder their expansion or continued use or which would be incompatible for reasons of public health, public safety or environmental impact. Existing *mineral aggregate operations* shall be permitted to continue without the need for official plan amendment, rezoning or development permit under the *Planning Act*. When a license for extraction or operation ceases to exist, policy 2.5.2.5 continues to apply.

2.5.2.5 *In known deposits of mineral aggregate resources and on adjacent lands, development and activities which would preclude or hinder the establishment of new operations or access to the resources shall only be permitted if:*

- a) resource use would not be feasible; or
- b) the proposed land use or development serves a greater long-term public interest; and
- c) issues of public health, public safety and environmental impact are addressed.

2.5.3 Rehabilitation

2.5.3.1 Progressive and final rehabilitation shall be required to accommodate subsequent land uses, to promote land use compatibility, to recognize the interim nature of extraction, and to mitigate negative impacts to the extent possible. Final rehabilitation shall take surrounding land use and approved land use designations into consideration.

2.5.3.2 Comprehensive rehabilitation planning is encouraged where there is a concentration of mineral aggregate operations.

2.5.3.3 In parts of the Province not designated under the Aggregate Resources Act, rehabilitation standards that are compatible with those under the Act should be adopted for extraction operations on private lands.

2.5.4 Extraction in Prime Agricultural Areas

2.5.4.1 In prime agricultural areas, on prime agricultural land, extraction of mineral aggregate resources is permitted as an interim use provided that the site will be rehabilitated back to an agricultural condition.

Complete rehabilitation to an *agricultural condition* is not required if:

- a) outside of a *specialty crop area*, there is a substantial quantity of *mineral aggregate resources* below the water table warranting extraction, or the depth of planned extraction in a quarry makes restoration of pre-extraction agricultural capability unfeasible;
- b) in a *specialty crop area*, there is a substantial quantity of high quality mineral aggregate resources below the water table warranting extraction, and the depth of planned extraction makes restoration of pre-extraction agricultural capability unfeasible;
- c) other alternatives have been considered by the applicant and found unsuitable. The consideration of other alternatives shall include resources in areas of Canada Land Inventory Class 4 through 7 lands, resources on lands identified as designated growth areas, and resources on prime agricultural lands where rehabilitation is feasible. Where no other alternatives are found, prime agricultural lands shall be protected in this order of priority: specialty crop areas, Canada Land Inventory Class 1, 2 and 3 lands; and
- d) agricultural rehabilitation in remaining areas is maximized.

A review of the OMAFRA Agricultural Systems Portal has indicated that the Subject Lands are not located in a provincially designated Specialty Crop area and are located in a Prime Agricultural Area.

3.2 OFFICIAL PLAN POLICY

Official Plan policies are prepared under the Planning Act, as amended, of the Province of Ontario. Official Plans generally provide policy comment for land use planning while taking into consideration the economic, social and environmental impacts of land use and development concerns. For the purpose of this study the *Regional Official Plan 2031 (Region of Waterloo, June 18, 2015)* and the *Township of Wilmot Official Plan (November 2006 Consolidation)* were reviewed for policy related to agriculture and mineral aggregate applications.

3.3 REGIONAL OFFICIAL PLAN 2031 (REGION OF WATERLOO, JUNE 18, 2015)

The *Regional Official Plan 2031 (Region of Waterloo, June 18, 2015)* was reviewed for agricultural policy as it relates to mineral aggregate operations/applications.

The *Regional Official Plan 2031 (Region of Waterloo, June 18, 2015)* Map 7 – The Countryside illustrates the Subject Lands as Protected Countryside and Prime Agricultural Area, while Map 8 – Mineral Aggregate Resource Areas and Aggregate Bedrock Areas identifies the Subject Lands

as a Mineral Aggregate Resource Area. Select portions of Map 7 and Map 8 illustrate the respective Protected Countryside and Mineral Aggregate Resource Areas. The approximate location of the Subject Lands is illustrated with blue star on the select portions of Map 7 and Map 8 below.



Map 7 – The Countryside (2015) – Region of Waterloo – Regional Official Plan



Map 8 – Mineral Aggregate Resource Areas and Aggregate Bedrock Deposits (2015) – Region of Waterloo – Regional Official Plan

Agricultural Policies with respect to the Mineral Aggregate applications and operations are presented in Section 9 – Managing Aggregate Resources (Regional Official Plan). Select policies are presented as follows:

“9.F Rehabilitation of Aggregate Operations

9.F.1 All proposals for new *mineral aggregate operations*, including *wayside pits and quarries*, will include a rehabilitation plan to the satisfaction of the Region and Area Municipalities that will ensure that:

- (a) progressive rehabilitation will be carried out whenever feasible so that depleted areas are restored while extraction continues in other areas of the site;

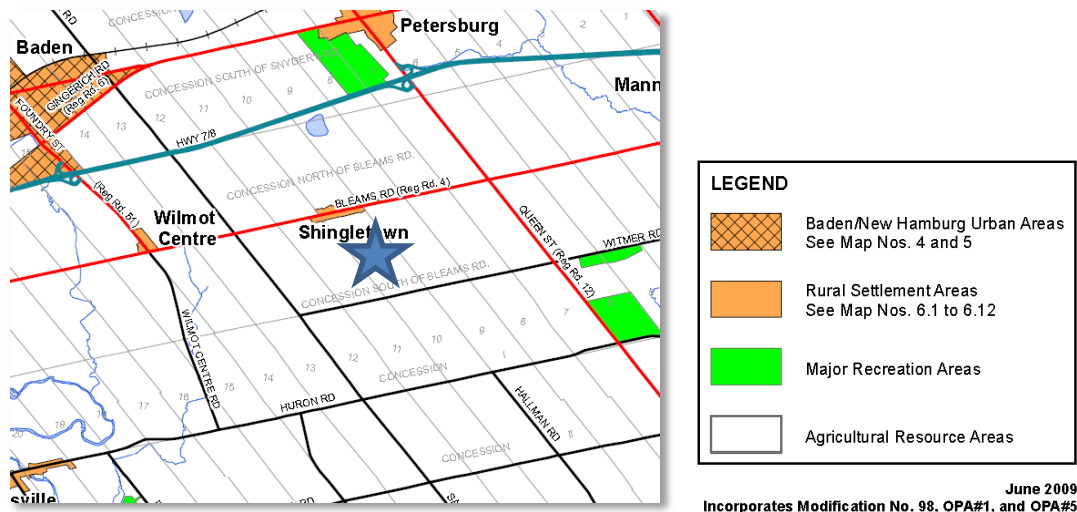
- (b) final rehabilitation will comply with the land use designations contained in this Plan and Area Municipal official plan, and be compatible with the character of surrounding land uses;
- (c) within the Prime Agricultural Area and Rural Areas designations, rehabilitation to agriculture will be the first priority, as follows:
 - i) 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; and
 - ii) within Rural Areas, rehabilitation of the site will be carried out so that substantially the same land area and same average soil quality for agriculture are restored.
- (d) where mineral aggregate extraction has occurred below the water table, rehabilitation will be in accordance with Policy 9.D.1 (c) to protect groundwater quality.

9.F.3 Where multiple *mineral aggregate operations* are located in close proximity to one another, the Region will collaborate with the *Province*, Area Municipalities, the Grand River Conservation Authority and the affected owners/applicants to jointly develop comprehensive rehabilitation plans for multiple properties.”

3.3.1 TOWNSHIP OF WILMOT OFFICIAL PLAN

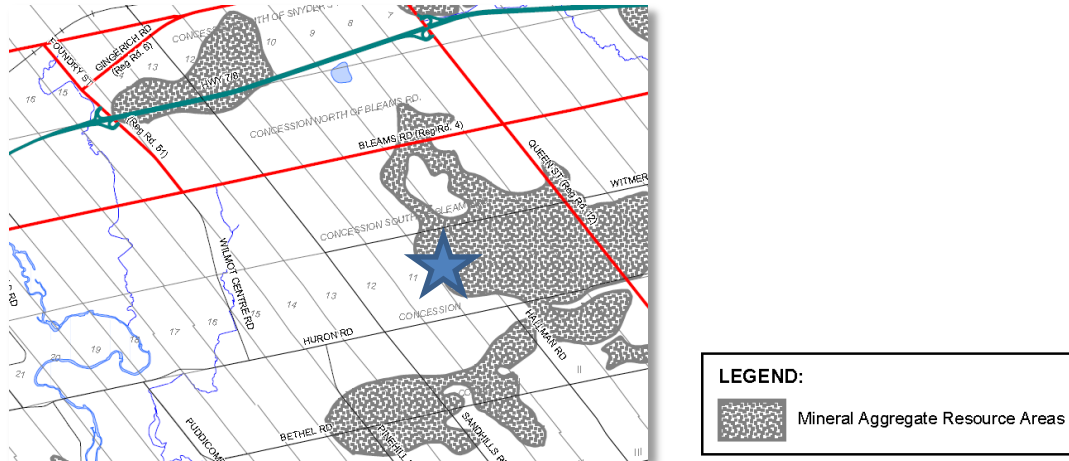
The *Township of Wilmot Official Plan (November 2006 Consolidation)* was reviewed for agricultural policy and mapping/schedules related to mineral aggregate applications/operations.

The *Township of Wilmot Official Plan Map No. 2 – Land Use Map* illustrates that the Subject Lands are located in the Agricultural Resource Area. The following image represents a portion of Map No. 2 – Land Use Map. The approximate location of the Subject Lands is identified with a blue star on the following maps.



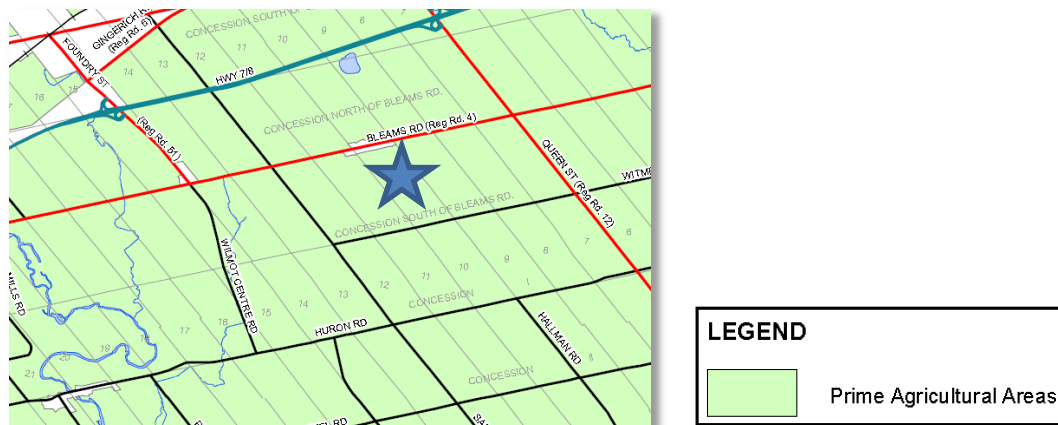
Map No. 2 – Land Use – Township of Wilmot Official Plan

The *Township of Wilmot Official Plan Map No. 10 - Mineral Aggregate Resource Areas* illustrates that the select portions of the Subject Lands are located within the designated Mineral Aggregate Resource Areas. The approximate location of the Subject Lands is identified with a blue star on the following portion of the Mineral Aggregate Resource Map.



Map No, 10 – Mineral Aggregate Resource Areas – Township of Wilmot Official Plan

The *Township of Wilmot Official Plan* Map No. 11 – Agricultural Resource Areas Map illustrates that the Subject Lands are located in Prime Agricultural Resource Area . The following image represents a portion of Map No. 11 – Agricultural Resource Areas Map. The approximate location of the Subject Lands is identified with a blue star on the following map.



Map No, 11 – Agricultural Resource Areas – Township of Wilmot Official Plan.

Township of Wilmot Official Plan policies related to agriculture and mineral aggregate applications/operations are presented in the *Township of Wilmot Official Plan* Chapter 3: Agricultural Resource Area Policies, and Chapter 7: Mineral Aggregate Resource Area.

Select *Township of Wilmot Official Plan* policies related to mineral aggregate operations in agricultural areas are presented as follows:

7.1.1 Designation and Protection

- 7.1.1.1 Mineral Aggregate Resource Areas are designated as shown on Map 10 of this Plan. Mineral Aggregate extraction is a permitted use both within and outside the Mineral Aggregate Resource Area, subject to the policies of this Plan.

- 7.1.1.8 *New mineral aggregate extraction on Prime Agricultural Lands as defined in the Glossary in this plan may be permitted as an interim use provided that for areas remaining above the water table agricultural rehabilitation is maximized. (MODIFICATION NO. 56)*
- 7.1.1.9 *Notwithstanding Policy 7.1.1.8, new mineral aggregate extraction on Prime Agricultural Lands may be permitted without rehabilitation to an agricultural use subject to the provisions of Policy 5.3.12 of the Regional Official Policies Plan. (MODIFICATION NO. 57)*
- 7.1.1.11 *The Township will encourage and co-operate with the owners of licensed extractive operations to achieve orderly phased extraction of licensed areas based on practices that promote minimal active mining areas and progressive rehabilitation.*
- 7.1.1.12 *The Township will encourage the construction of intra-pit road systems and new roads intended for aggregate traffic so as to lessen the impact of aggregate traffic on local residents and sensitive land uses.*

7.2 NEW MINERAL AGGREGATE APPLICATIONS

- 7.2.1 *Where the approval of a development application is required prior to the establishment of a new aggregate extraction operation or expansion to an existing operation, the applicant will organize a pre-submission consultation meeting with the Region, the Grand River Conservation Authority, and the Township to identify the study requirements necessary for the appropriate evaluation of the application and the process to be followed. (MODIFICATION NO. 58)*
- 7.2.2 *Where the approval of a development application is required prior to the establishment of a new aggregate extraction operation or expansion to an existing operation, Township support for the zone change application will be subject to the following:*
- a) the submission of a traffic study for approval by the Township and/or the Region indicating potential transportation impacts from the proposed extraction operation on the Regional and/or Township Road system;*
 - b) if required, the submission of an Environmental Impact Statement in accordance with Chapter 8 of this Plan;*
 - c) demonstration that the proposed rehabilitation is consistent with the policies of the Regional Official Policies Plan and this Plan;*
 - d) the submission of all reports required by the Ministry of Natural Resources in accordance with the Aggregate Resources Act, and the Region in accordance with the Regional Official Policies Plan;*
 - e) the Township being satisfied that the following conditions will be dealt with through the site plan approved under the Aggregates Act, or other appropriate means:*
 - i) ensuring adequate buffers and/or screenings along road right-of-ways, or adjacent to any existing or proposed residences or as determined through the approval of required studies, adjacent to sensitive land uses to the satisfaction of the Township;*

- ii) that no new excavation or processing will take place until all required buffers and/or screenings have been constructed;
- iii) that no water or washing or screening operations will be discharged into any water course;
- iv) that the applicant in cooperation with the Township will establish all haul routes for truck traffic,
- v) that required road improvements identified through the transportation study noted in a) above are in place and the Township is satisfied that any road improvements are in place prior to the removal of aggregates from the site; and,
- vi) that no new excavation or processing will take place until all required fencing and/or security measures have been put in place.

7.2.3 Where a development application is not required to permit a new aggregate extraction operation or expansion to an existing operation, the Township will ask the Ministry of Natural Resources to request the submission of the appropriate studies noted in Policy 7.2.2 as part of the aggregate license and site plan approval process.
(MODIFICATION)

7.4 REHABILITATION OF EXISTING OR ABANDONED AGGREGATE PITS

7.4.1 The Township will cooperate with land owners, the Region, pit operators, the Ministry of Natural Resources in efforts to rehabilitate existing and/or abandoned pits and quarries to reduce or eliminate dangerous or hazardous conditions and return the pit site to a suitable land use as determined by the Township in conformity with the policies of this Plan and Policies 5.3.11 and 5.3.12 of the Regional Official Policies Plan.

3.4 THE TOWNSHIP OF WILMOT ZONING BY-LAW

The Township of Wilmot was contacted to determine the status of the *Township of Wilmot Zoning By-Law*. The *Township of Wilmot Zoning By-Law* was not available online or for purchase from the Township office.

Discussions with staff at the Township of Wilmot offices indicated that there are no zoning maps available for view; however, staff was able to identify that the Subject Lands are zoned as Z1 – Agricultural.

Section 7 – Zone a (Z.1) of the *Township of Wilmot Zoning By-Law* provides Zoning information (permitted uses, regulation) for agriculture.

Select portions of the *Township of Wilmot Zoning By-Law* are presented as follows. Section 7.1 provides comment on Permitted Uses. Section 7.2 identifies the respective regulations. The regulations are provided below.

7.2 Regulations

Within a Zone 1, no land shall be used and no building or structure shall be erected or used except

in conformity with the applicable regulations in Section 6 – General Regulations and the following:

7.2.1 Minimum Lot Area 35 hectares

7.2.2 Minimum Lot Frontage 230 metres

7.2.3 Minimum Side Yard (each side)

(a) Residence

(b) Other Permitted and/or Accessory Buildings 3.0 metres Equal to one-half (1) building height but in no case less than 3.0 metres

7.2.4 Minimum Rear Yard 7.5 metres

7.2.5 Minimum Ground Floor Area – Residential Building

(a) 1 storey - 100 square metres

(b) More than 1 storey - 70 square metres

7.2.6 Off-Street Parking

Shall be provided in conformity with the regulations contained in subsections 6.10 and 6.12 of this By-law.

7.2.7 Minimum Distance Separations

(a) No new farm building or structure designed or intended for the housing of livestock, nor any building or structure intended for the keeping or storage of manure shall be erected within 900 metres of any zone limit established by this by-law unless the applicant can provide a letter issued by the Ministry of Agriculture and Food which indicates that the proposed structure will comply with the Minimum Distance Separation Formula devised by that Ministry.

(b) No new farm building or structure designed or intended for the housing of livestock, nor any building or structure intended for the keeping or storage of manure shall be erected within 300 metres of a non-farm Residential Building located on an adjacent lot unless the applicant can provide a letter issued by the Ministry of Agriculture and Food which indicates that the proposed structure will comply with the Minimum Distance Formula devised by that Ministry.

(c) No new farm building or structure designed or intended for the housing of livestock, nor any building or structure intended for the keeping or storage of manure shall be erected within 60 metres of the limit of any street or road.

3.5 THE GROWTH PLAN FOR THE GREATER GOLDEN HORSESHOE (2017)

A review of the Growth Plan for the Greater Golden Horseshoe (2017) through the OMAFRA Agricultural System Portal illustrated that the Subject Lands are located within a Prime Agricultural Area.

The Growth Plan for the Greater Golden Horseshoe (2017) provides comment on Agricultural Lands in Section 4.2.6 – Agricultural System and on Mineral Aggregate Resources in Section 4.2.8. Specific to this study, Section 4.2.8 was scrutinized and the appropriate policies are provided below.

Section 4.2.8 states:

“3. In prime agricultural areas, applications for new mineral aggregate

operations will be supported by an *agricultural impact assessment* and, where possible, will seek to maintain or improve connectivity of the *Agricultural System*.

The Growth Plan for the Greater Golden Horseshoe (2017) provides the following definitions:

Agricultural Impact Assessment - A study that evaluates the potential impacts of non-agricultural development on agricultural operations and the *Agricultural System* and recommends ways to avoid or, if avoidance is not possible, minimize and mitigate adverse impacts. (Greenbelt Plan).

Agricultural System - The system mapped and issued by the Province in accordance with this Plan, comprised of a group of inter-connected elements that collectively create a viable, thriving agricultural sector. It has two components: 1. An agricultural land base comprised of *prime agricultural areas*, including *specialty crop areas*, and *rural lands* that together create a continuous productive land base for agriculture; 2. An *agri-food network* which includes *infrastructure*, services, and assets important to the viability of the agri-food sector. (Greenbelt Plan).

Agri-Food Network - Within the *Agricultural System*, a network that includes elements important to the viability of the agri-food sector such as regional *infrastructure* and transportation networks; on-farm buildings and infrastructure; agricultural services, farm markets, distributors, and primary processing; and vibrant, agriculture-supportive communities. (Greenbelt Plan).

4 AGRICULTURAL RESOURCE POTENTIAL

4.1 PHYSICAL CHARACTERISTICS

The physiographic resources within the Subject Lands and the Study Area are described in this section. The physiographic resources identify the overall large area physical characteristics documented as background to the soils and landform features. These characteristics are used to support the description of the agricultural potential of an area.

4.1.1 PHYSIOGRAPHY

The Subject Lands and the Study Area are located within the Waterloo Hills Physiographic Region. The Waterloo Hills Physiographic Region is located primarily within the Region of Waterloo and extends westward into Perth County.

The Waterloo Hills Physiographic Region surface is composed of sandy hills. Some of the hills are ridges of sandy till, while others are kame or kame moraines. Associated with the hilly region is an area of alluvial terraces of the Grand River spillway system. These areas comprise more uniform sand and gravel materials.

4.1.2 TOPOGRAPHY AND CLIMATE

Topographic information was reviewed and correlated to the 1:10000 scale Ontario Base Mapping, Land Information Ontario digital contour mapping, detailed soil survey assessment (using a hand held clinometer), aerial photo interpretation and windshield surveys.

The Subject Lands are a complex mix of topography with steeper slopes and high land on the west side of the property, sloping down to a lower flat bottomed area extending from the northwest corner towards the farm buildings on the south end of the property. A second steeply sloping area rises from the lower flat bottomed area. The lands on the east side of the property are gently sloping complex (slope length less than 50 m) and simple sloped (slope length greater than 50 m) topography.

Climate data was taken from the OMAFRA document titled 'Agronomy Guide for Field Crops – Publication 811 (June 2009)' and the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Factsheet – Crop Heat Units for Corn and Other Warm Season Crops in Ontario, 1993.

The Subject Lands are located between the 2700 – 2900 Crop Heat Units (CHU-M1) available for corn production area. Ontario. The Crop Heat Units (CHU) index was originally developed for field corn and has been in use in Ontario for 30 years. The CHU ratings are based on the total accumulated crop heat units for the frost free growing season in each area of the province. CHU averages range between 2500 near North Bay to over 3500 near Windsor. The higher the CHU value, the longer the growing season and greater are the opportunities for growing value crops.

Crop Heat Units for corn (based on 1971-2000 observed daily minimum and maximum temperature (OMAFRA, 2009)) map is illustrated below. The approximate location of the Subject Lands is marked with a blue star.

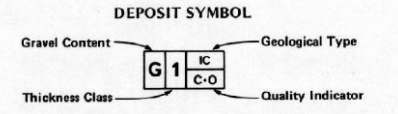
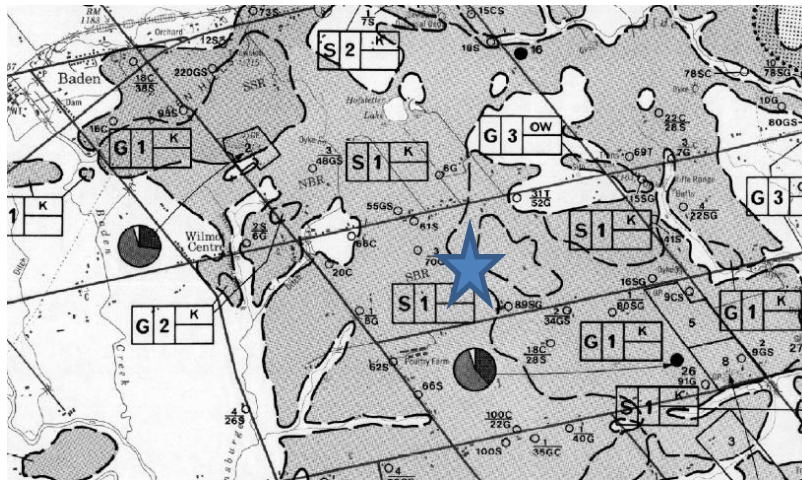


4.1.3 AGGREGATE RESOURCE INVENTORY PAPERS

The Ministry of Natural Resources (MNR) Ontario Geological Survey Aggregate Resources Inventory Paper (ARIP) 81 – Aggregate Resources Inventory of the Township of Wilmot, Regional Municipality of Waterloo, Southern Ontario (1984) and Paper 161 – Aggregate Resources Inventory of the Regional Municipality of Waterloo Townships of North Dumfries, Wellesley, Wilmot and Woolwich and the Cities of Cambridge, Kitchener and Waterloo (1998) were reviewed to determine the extent and type of aggregate resources in the Study Area.

The review of ARIP report 81 Map 1 – Township of Wilmot Distribution of Sand and Gravel Deposits revealed that the Subject Lands are located within gravel and sand deposit areas with a thickness class of I which relates to an average thickness of greater than 6 m. The cropped image below is a select portion of the ARIP 81 Map 1. The approximate location of the Subject Lands is located with a blue star symbol.

A review of the Study Area location confirmed similar conditions. The Study Area is located within gravel and sand deposit areas with a thickness class of I.

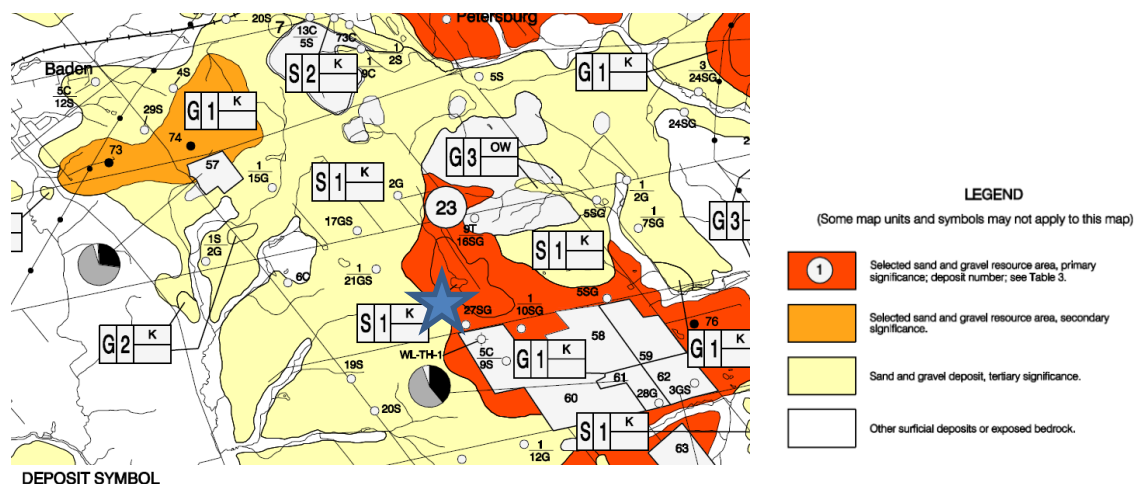


ARIP 81 – Select portion of Map I Sand and Gravel Deposits – Wilmot Township

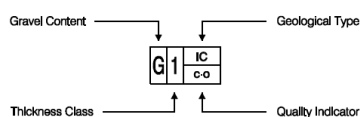
Gravel Content		
G	Greater than 35% gravel.	
S	Less than 35% gravel.	
Thickness Class		
Class	Average Thickness in feet (metres)	Tons per acre (Tonnes per hectare)
1	greater than 20 (> 6)	greater than 50,000 (> 112 000)
2	10-20 (3-6)	25,000-50,000 (56 000 - 112 000)
3	5-10 (1.5-3)	12,500 - 25,000 (28 000 - 56 000)
4	less than 5 (< 1.5)	less than 12,500 (< 28 000)
Geological Type		
AL	Older Alluvium	K Kame
E	Esker	LB Lacustrine Beach
EM	End Moraine	LD Lacustrine Delta
IC	Undifferentiated Ice- Contact Stratified Drift	LP Lacustrine Plain
ICT	Ice-Contact Terrace	OW Outwash
	(see Appendix C for descriptions of Geological Types)	WD Windblown Forms
Quality Indicator		
	If blank, no known limitations present.	
C	Clay and/or silt (fines) present in objectionable quantities.	
L	Deleterious lithologies present.	
O	Oversize particles or fragments present in objectionable quantities.	

The review of ARIP report 161 Map 161-I (Sand and Gravel Resources) from ARIP 161 illustrates that the majority of the Subject Lands are located within a Primary Significance area for sand and for gravel, with a thickness class of 1 (greater than 6 m). The Study Area is comprised of Primary and Tertiary sand and gravel deposits, with the Primary deposits occurring centrally within the Study Area and to the east.

The cropped image below illustrates a select portion of the ARIP report 161 map 161-I. The approximate location of the Subject Lands is denoted with a blue star.



DEPOSIT SYMBOL



Gravel Content

G	Greater than 35% gravel
S	Less than 35% gravel

Thickness Class

Class	Average Thickness in Metres	Tonnes per Hectare
1	greater than 6	greater than 106 000
2	3 - 6	53 000 - 106 000
3	1.5 - 3	26 500 - 53 000
4	less than 1.5	less than 26 500

Geological Type

AL	Older Alluvium	LB	Lacustrine Beach
E	Esker	LD	Lacustrine Delta
M	Moraine	LP	Lacustrine Plain
IC	Undifferentiated Ice-Contact Stratified Drift	OW	Outwash
ICT	Ice-Contact Terrace	SF	Subaqueous Fan

(see Appendix C for descriptions of Geological Types.)

Quality Indicator

	If blank, no known limitations present.
C	Clay and/or silt (lines) present in objectionable quantities.
L	Deleterious lithologies present.
O	Oversize particles or fragments present in objectionable quantities.

4.2 LAND USE

The land use for both the Study Area and the Subject Lands was completed through a combination of windshield and field surveys (completed in the summer and fall of 2018), a review of recent aerial photography, Google Earth Imagery, Bing Imagery, Birdseye Imagery, Region of Waterloo Imagery, and correlation to the OMAFRA Land Use Systems mapping. Agricultural and non-agricultural land uses are illustrated on Figure 2.

The windshield survey identified the types of land uses including farm and non-farm uses (built up areas, non-farm residential uses, industrial, commercial, recreational, roads). Farms were identified as livestock or cash crop. Livestock operations were further differentiated to the type of livestock based on the livestock seen at the time of the survey, or through a review of on farm infrastructure (type of buildings, manure system, feed (bins, bales), and types of equipment).

It should be noted that the roadside survey is based on a line of sight process. Therefore, dense brush, woodlots, and topography can prevent an accurate assessment of some fields and/or buildings. In those instances, measures are taken to try to identify the crop and/or buildings through conversations with landowners or review of aerial photography. In some instances no information is available. In those instances the field polygon will be identified as 'unknown crop' or 'unknown building use or type'.

Agricultural cropping patterns were identified and mapped. Corn and soybean crops were mapped as 'common field crops'. Small grains are typically characterized as including winter wheat, barley, spring wheat, oats and rye, but for the Study Area only winter wheat was observed. Forage crops may include mixed grasses, clovers and alfalfa. Other areas used for pasture, haylage or hay were mapped as 'forage/pasture'.

Non-farm (built up or disturbed areas) uses can include non-farm residential units, commercial, recreational, estate lots, services (utilities), industrial development and any areas that have been man-modified and are unsuitable for agricultural land uses (cropping).

Figure 2 illustrates the land use both on the Subject Lands and within the Study Area.

Land Use information was digitized in Geographic Information System (GIS - Arcmap) to illustrate the character and extent of Land Use in both the Subject Lands and the Study Area. Area calculations for each land use polygon (area) were calculated within the GIS software and exported as tabular data. The data is presented as follows.

Land use designations and land use definitions are provided in Table I.

Table I Typical Land Use Designations

Land Use Designation	Land Use Definitions
Built Up/Disturbed Areas	Residential, Commercial, Industrial, Man Modified
Common Field Crop	Corn, Soybean, Cultivated
Specialty Crop	Vines, Orchards, Nursery Stock, Market Garden
Forage/Pasture	Forage/Pasture
Railway/roads	Linear Corridor (not mapped)
Scrublands	Unused field (>5 years)
Unknown	Unknown Use (not seen from the road)
Small Grains	Wheat, Oats, Barley
Woods	Forested Areas

4.2.1 LAND USE – SUBJECT LANDS

The Subject Lands land use comprises built up/disturbed areas, common field crop production, ponded areas and woodlots.

There were no stream channels or areas of flowing surface water.

The Subject Lands comprise approximately 11.9 percent built up/disturbed lands, 77.2 percent as common field crop (corn/soybean in 2018 growing season), 0.3 percent as ponded, 0.7 percent as scrublands and 9.8 percent as wooded areas.

The predominant land use on the Subject Lands is the production of common field crops (corn and soybean). There are no specialty crops grown on the Subject Lands.

4.2.2 LAND USE - STUDY AREA

The Study Area consists of a variety of land uses including, but not limited to built up/disturbed areas, common field crops, scrubland, grains, mineral aggregate pit operations and wooded areas.

For the purposes of this study built up areas included: rural residential (farm stead); commercial; and roads.

The Study Area comprises land use of approximately 7.2 percent as built up/disturbed areas, approximately 68.1 percent common field crop (corn and soybean), approximately 2.6 percent in active mineral aggregate operations (gravel pits), approximately 4.6 percent in small grains (winter wheat), approximately 3.4 percent in forage/pasture, approximately 0.2 percent as ponded areas, approximately 3.6 percent as scrubland and approximately 9.9 percent as wooded areas.

On review of the Land Use data it was observed that the predominant land uses included wooded areas and the production of common field crop and small grains. These lands are scattered throughout the Study Area and often comprise large fields of corn, soybeans and small grains.

One small area of specialty crops was noted in the southern portion of the Study Area. This area appears to comprise market garden type crops.

Table 2 illustrates the percent occurrence of the land uses for both the Subject Lands and the Study Area.

Table 2 Land Use – Subject Lands and Study Area

Land Use Designation	Subject Lands Percent Occurrence	Study Area Percent Occurrence
Built Up/Disturbed Areas	11.9	7.2
Common Field Crop	77.2	68.1
Mineral Aggregate Operations (Active)	-	2.6
Small Grains	-	4.6
Forage/Pasture	-	3.4
Ponded	0.3	0.2
Scrubland	0.7	3.6
Woods	9.8	9.9
Totals	100.0	100.0

It should be noted that although many areas were being actively farmed as cash crop operations with common field crop, large portions of the Study area, particularly to the south east, south of Witmer Road are designated for mineral aggregate operations and portions of those properties are actively used for mineral aggregate extraction.

Additional calculations were completed to illustrate the extent of the Study Area that is within Authorized Aggregate Areas as based on MNR data. The extent of the Study Area that is within Authorized Aggregate Areas (MNR) is illustrated on Figure 2. Approximately 96.4 ha or 14.0 percent of the Study Area is considered as Authorized Aggregate Areas.

4.3 AGRICULTURAL INVESTMENT

Agricultural investment is directly associated with the increase in capital investment to agricultural lands and facilities. In short, the investment in agriculture is directly related to the money used for the improvement of land through tile drainage or irrigation equipment, and through the improvements to the agricultural facilities (barns, silos, manure storage, sheds).

As a result, the lands and facilities that have increased capital investment are often considered as having greater tendency of preservation than similar capability lands and facilities that are

undergoing degradation and decline. The investment in agriculture is often readily identifiable through observations of the condition and type of the facilities, field observations and a review of OMAFRA artificial tile drainage mapping.

4.3.1 AGRICULTURAL FACILITIES

The potential agricultural facilities were identified through a combination of aerial photographic interpretation, a review of online digital imagery (Google Earth Pro, Bing Mapping, and Birds Eye Imagery), a review of Ontario Base Mapping and roadside evaluations. The potential livestock facilities that were identified on mapping and imagery prior to conducting field investigations included buildings used for the active housing of livestock, barns that were empty and not used to house livestock, barns in poor structural condition, barns used for storage and any other large building that had the potential to house livestock. Field investigations revealed that some of the buildings identified from the mapping and imagery no longer existed (torn down), or were not agricultural, but used for commercial activities.

Agricultural activities such as livestock rearing usually involve an investment in agricultural facilities. Dairy operations require extensive facilities for the production of milk. Poultry and hog operations require facilities specific for those operations. Beef production, hobby horse and sheep operations usually require less investment capital (when compared to dairy operations).

Some cash crop operations are considered as having a large investment in agriculture if they have facilities that include grain handling equipment such as storage, grain driers and mixing equipment that is used to support ongoing agricultural activities. Figure 3 illustrates the location of buildings, agricultural facilities and tile drainage for both the Subject Lands and the Study Area.

4.3.1.1 Subject Lands

The Subject Lands contained no barns/buildings or investment in agriculture. Historically, the Subject Lands had been used for the production of beef cattle and common field crops. The barns, manure storage, feed storage (silos and bunkers), ancillary buildings, sheds and residence have been demolished. The concrete foundations are still in place along the southern boundary of the Subject Lands. Conversations with the land owner indicated that these concrete remnants will be removed from the property.

4.3.1.2 Study Area

The Study Area contains a mix of buildings and facilities including: rural residence (non-farm residential units); farm complexes (residence, barns, sheds and ancillary buildings); mineral aggregate pits; water pumping station, and a dog kennel. A total of 25 potential livestock facilities were noted in the Study Area. Some of the farm complexes were used for the production of livestock including poultry and beef cattle.

Cash crop operations were noted throughout the Study Area. Cash crop operations generally comprised common field crops (soybean and corn). One small area of specialty crop operations

was observed along the southern extent of the Study Area. The specialty crop operations appear to comprise market garden crops.

Building # 1 was observed from the roadside to be a pet care facility (dog kennel).

Buildings #2 and #3 appear to be part of a poultry operation. These buildings were relatively modern pole barns, in good condition, with large fans on the south end and small feed bins along the western wall.

Buildings #4, #5, #6, #7, #8 and #9 were pole barns, in reasonable condition, used as part of a beef operation. A few horses were also noted in a pasture to the east of the barns. Beef cattle were noted in a pasture to the east side of the barns.

Building #10 was a bank barn, in good condition, used as part of a beef operation. A sign at the roadside indicated that Angus beef was available for sale.

Building #11 was a bank barn, in reasonable condition, located within the boundaries of a property used as and licensed (MNR data) as an aggregate operation. It appears that this facility is not used for livestock. A review of aerial photography and online imagery indicates that the barn is not used for livestock. No manure storage, feed storage, livestock shelters, pastures or paddocks were observed.

Building #12 appears to be a pole barn, in good condition, that is not used for livestock production. A review of aerial photography and online imagery indicates that the barn is not used for livestock. No manure storage, feed storage, livestock shelters, pastures or paddocks were observed.

Building #13 is a shed, in good condition, used for storage. This building is not used for livestock production.

Building #14 is a bank barn set well back from the road, providing limited site lines. It appears that the barn is in good condition. A review of online aerial photography and online imagery indicates that small paddock or pasture areas are located on the eastern side of the barn. This barn is part of a cash crop operation, and may have some livestock.

Building #15 is a bank barn adjacent to County Road 4. The barn is in good condition and does not appear to be used for livestock production. A sign at the road indicates that the farm is the Witzel Homestead farm operation. The sign has an image of beef cattle. A review of online aerial photography and online imagery indicates that the barn is not used for livestock. No manure storage, feed storage, livestock shelters, pastures or paddocks were observed.

Building #16 is a small shed/garage adjacent to a residence within the hamlet of Shingletown. No livestock were associated with this building.

Building #17 is a series of adjacent sheds or small barns behind a residence within the hamlet of Shingletown. The buildings are not visible from the roadside. A review of online aerial photography and online imagery indicates that manure piles were located near the buildings. It is unknown the numbers or type of livestock at this location.

Building #18 was a plastic covered arched structure used for storage of farming machinery and equipment. No livestock appear to be associated with this structure.

Building #19 was a bank barn (in good condition) with extension, plus a capped silo. This building was partially hidden from roadside viewing by topography and vegetation. A review of online aerial photography and online imagery indicated that a large manure pile was located along the southern wall of the barn. No livestock were observed from the roadside or on the online imagery.

Building #20 was an old bank barn in poor condition (missing roof sections and wall boards). No livestock were associated with this building.

Building #21 was not visible from the roadside due to the topography in this location. It is unknown if the building still stands. A review of online aerial photography and satellite imagery indicated that this building was standing and was a single building within an area that may have comprised a farmstead (other building foundations were noted on the imagery). No livestock appear to be associated with this building. This building is located within an area identified as an Authorized Aggregate Area (MNR).

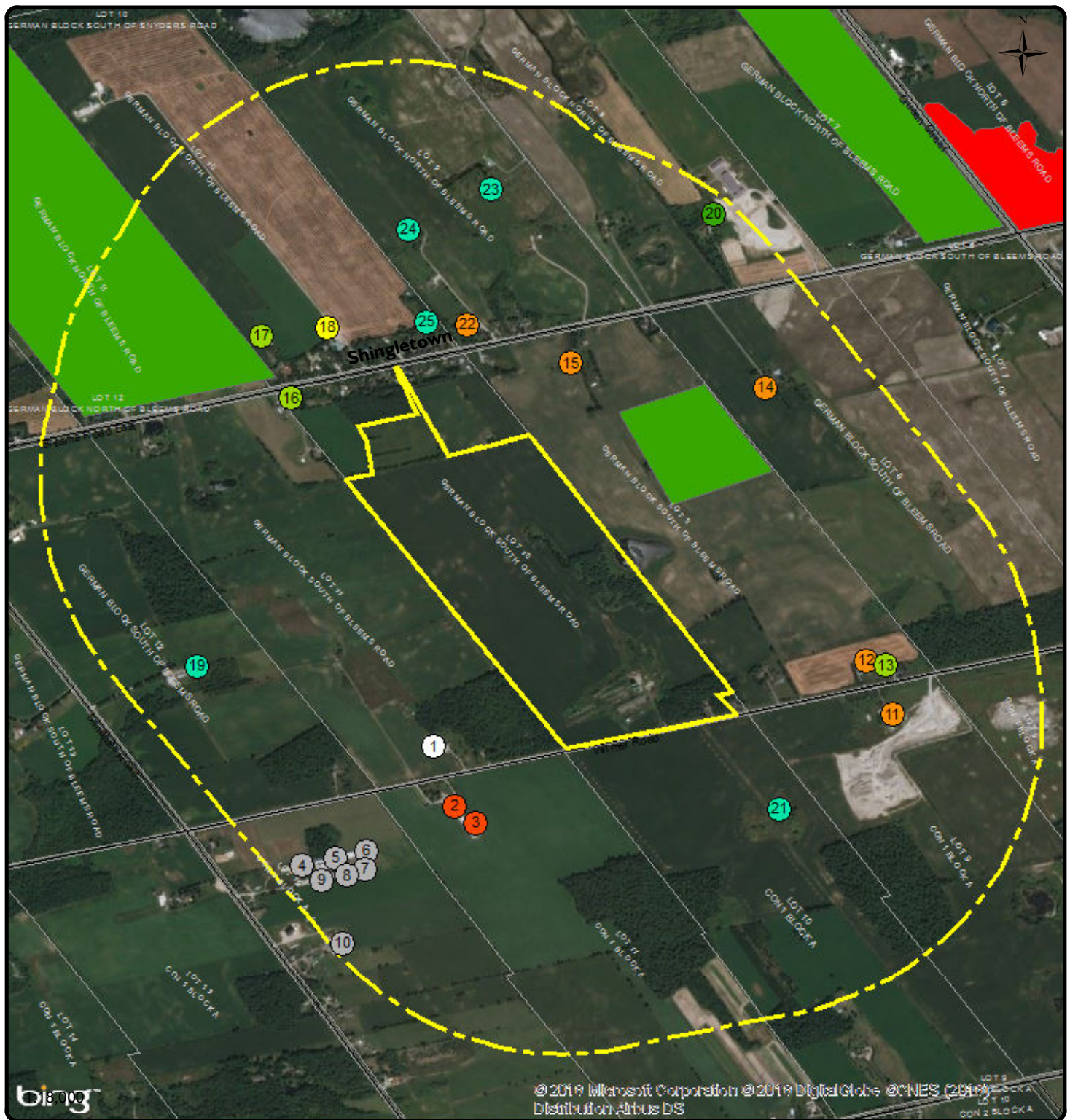
Building #22 was a bank barn in good condition, located adjacent to a residence within the hamlet of Shingletown. No livestock were observed from the roadside survey.

Building #23 was not visible from the roadside. A review of online aerial photography and online satellite imagery suggests that the building is unused. The building is surrounded by large trees. The laneway to the building is not well used. There are no pastures, paddocks, manure or feed storage observed near this building.

Building #24 was not visible from the roadside. A review of online aerial photography and online satellite imagery suggests that the building is unused. The building is surrounded by large trees. There are no pastures, paddocks, manure or feed storage observed near this building.

Building #25 was not visible from the roadside. A review of online aerial photography and online satellite imagery suggests that the building is unused. The building is surrounded by large trees. The laneway to the building is not well used. There are no pastures, paddocks, manure or feed storage observed near this building.

Photographs and/or aerial photography/satellite imagery of the respective barns are located in Appendix A.



Legend

- Lot Lines (MNR)
- Roads (MNR)
- Subject Lands
- Study Area (1000 m buffer)

Tile Drainage System Type

- Random
- Systematic

Building Use

- Kennel
- Machine Shed
- Poultry
- Shed
- Unused for Livestock
- Beef
- Derelict
- Unknown (not visible)

Figure 3

Agricultural Investment

DBH Soil Services Inc.

October 2018

4.3.2 ARTIFICIAL DRAINAGE

An evaluation of artificial drainage on the Subject Lands and within the Study Area was completed through a correlation of observations noted during the soil survey, aerial photographic interpretation and a review of the Ontario Ministry of Agriculture and Food (OMAF) Artificial Drainage System Mapping.

Visual evidence supporting the use of subsurface tile drains would have included observations of drain outlets to roadside ditches or surface waterways, and surface inlet structures (hickenbottom or french drain inlets). There was no observed evidence of artificial tile drainage.

Evidence in support of subsurface tile drainage on aerial photographs would be based on the visual pattern of tile drainage lines as identified by linear features in the agricultural lands and by the respective light and dark tones on the aerial photographs. The light and dark tones relate to the moisture content in the surface soils at the time the aerial photograph was taken.

OMAFRA Artificial Drainage System Maps were downloaded from Land Information Ontario (LIO) in July 2018 and were reviewed to determine if an agricultural tile drainage system had been registered for the Subject Lands or in the Study Area. Figure 3 illustrates the OMAFRA Artificial Drainage Systems Mapping for the Subject Lands and the Study Area.

As noted on Figure 3 there are no artificial drainage systems registered on the Subject Lands. There is no investment in tile drainage on the Subject Lands.

There are two areas of artificial drainage systems registered to lands within the Study Area. These two areas are located to the northwest and to the east of the Subject Lands. Both areas comprise random tile drainage systems.

Further, discussions with Mr. John Kuntze (Drainage Superintendent, Township of Wilmot) indicated that there is no record of a tile drainage system that is registered to the property. Mr. Kuntze also indicated that he reviewed recent and historical aerial photography/online imagery in a further effort to determine if there was a visual indication of tile drainage (patterns of thin lines on the property). Mr. Kuntze indicated that he did not see any visual evidence. In his opinion, there is no tile drainage system on this property.

Therefore, there is limited investment in tile drainage in the Study Area.

4.3.3 IRRIGATION

Observations noted during the reconnaissance survey indicated that the Subject Lands are not irrigated, further, that this property is not set up for the use of irrigation equipment. Visual evidence supporting the use of irrigation equipment would include the presence of the irrigation equipment (piping, water guns, sprayers, tubing/piping, etc), the presence of a body of water (pond, lake, water course) capable of sustaining the irrigation operation and lands that are appropriate for the use of such equipment (large open and level fields).

There is no investment in irrigation on the Subject Lands.

Similar observations were made of the lands within the Study Area. No irrigation equipment was noted on any property within the Study Area.

There is no investment in irrigation in this area.

4.3.4 LANDFORMING

Landforming is the physical movement of soil materials to create more uniformly sloped lands for the ease of mechanized operations. The costs associated with landforming can be exorbitant, depending on the volumes of soils moved.

There has been no land leveling or landforming for the purpose of creating gently sloped agricultural areas on the Subject Lands. Historically a roadway/laneway had been constructed from the barn area in the southern portions of the Subject Lands toward the western edge of the central woodlot on the eastern side of the property. During the use of this land as a beef operation, this roadway/laneway was used as a dam to store water (to the west side of the roadway/laneway) to be used for mixing with manure prior to disposal on the Subject Lands. In present times, the water has been drained from this area and the lands are used for the production of common field crops.

The photography below illustrates the western flank of the roadway/laneway bermed area (centrally in the photograph). The basin area is now used for the production of common field crop.

There is no investment in landforming for agricultural purposes in this area.



Photograph of illustrating the built up roadway/laneway (berm) and the basin area that is used for common field production.

4.4 LAND TENURE AND FRAGMENTATION

Land tenure was evaluated to determine the characteristics of land ownership and the degree of land fragmentation in the Subject Lands and the Study Area. In order to evaluate land tenure, the most recent Assessment Roll mapping and Assessment Roll information from the Regional Municipality of Waterloo and the Township of Wilmot were referenced on a property by property basis (for the Study Area and the Subject Lands) to determine the approximate location, shape and size of each parcel. The approximate location and shape of each large property were digitized into the Geographic Information System (GIS) to provide an overview of land tenure and land fragmentation.

For the purpose of this study, the most recent Assessment Roll mapping and Assessment Roll information for the Regional Municipality of Waterloo and the Township of Wilmot were evaluated. The Assessment mapping information and Assessment Roll information was acquired from online interactive mapping and the Township of Wilmot Office in Baden. Discussions with the staff at the Township Office indicated that the Assessment Mapping and Roll information was compiled in 2017 for the 2018 Taxation Year. Assessment (land owner/tenant) information is illustrated on the Land Tenure/Fragmentation map in Figure 4.

A review of the assessment data illustrated a variety of Owner-Operator combinations including: Local Owner – No Farmland (woodlots only); Local Owner Operator; Local Owner – with owner to advise the Township of Farmer; Local Owner with Tenant Farmer; Local Owner – No data in the Assessment Roll information; Non-Local Owner – Aggregate Pit; and Non-Local Owner Operator.

The Provincial Policy Statement (PPS, 2014) identifies the provincial land use policies and

provides context for the protection of agriculture. The PPS (2014) does not provide an indication of a minimum lot size for agriculture, but does state in Section 2.3.3.2 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.

Statistics Canada Census of Agriculture (2016) indicates that the average farm size in Ontario is 100.8 ha (249 acres). Farms comprise many types, sizes and intensities. They may consist of larger areas for livestock operations or tender fruit farms on smaller parcels.

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.

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.

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.

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.

Livestock operations were limited to the poultry operation to the south west of the Subject Lands (south of Witmer Road) and two beef operations farther to the west and south of Witmer Road. Livestock operations were illustrated on Figure 3.

Table 3 provides an indication of the Ownership and Operator relationships on both the Subject Lands and within the Study Area. 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.

Table 3 Land Tenure

	Subject Lands (Percent Occurrence)	Study Area (Percent Occurrence)
Local Owner – No Farm Land	-	0.7
Local Owner/Operator	-	23.8
Local Owner – To Advise Town	-	4.2
Local Owner – Tenant Farmer	100.0	39.1
Non-Local Owner – Tenant Farmer	-	14.8
Non-Local Owner – Owner to Advise Town	-	10.0
Non-Local Owner – Owner Farms Land		0.9
Severed Parcels	-	6.4
Totals	100.0	100.0

4.4.1 SUBJECT LANDS

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.

4.4.2 STUDY AREA

The land tenure in the Study Area illustrates a mix of ownership and operators including a portion of lands associated with a transition in farming such as Non-Local Owners and Local Owners with Tenant Farmers.

All classes of Non-Local Ownership (tenant farmer, owner to advise, owner farms land) included approximately 25.7 percent of the Study Area Lands, while an additional 6.4 percent would be included in severed parcels.

Local ownership with a local operator comprised approximately 23.8 percent of the Study Area, while local ownership with tenant farmer accounted for approximately 39.1 percent. All local ownership (owner/operator, owner to advise, tenant farmer, no farm land) comprises approximately 67.8 percent of the Study Area.

As illustrated in Figure 4, agriculture within the Study Area is under pressure due to Non-Local Ownership, Tenant Farming and parcels without farm lands.

On review of the Land Tenure mapping various observations can be made.

Land Tenure of the Study Area is typical of areas under pressure from non-local ownership.

Land Fragmentation of the Study Area is also typical of areas under pressure due to numerous severed parcels and built up areas. Many of the severed parcels are associated with the hamlet of Shingletown.

4.5 DETAILED ONSITE SOIL SURVEY

A detailed on-site soil survey was conducted to more accurately map and classify the soil resources of the soil materials on the Subject Lands. The soil survey included the following tasks:

- Completion of a review of published soil information (*Soil Survey of Waterloo County, (Presant, E.W. and R.E. Wicklund, 1971). Report No. 44 of the Ontario Soil Survey*),
- Conduct a review of published Canada Land Inventory (CLI) ratings for the soils of this area,
- Conduct an aerial photographic review and interpretation of the soil polygons, disturbed soil areas and miscellaneous landscape units (ie: streams, boulder pavement, wayside pits),
- Conduct an on-site soil survey,
- Completion of mapping to illustrate the location of the property (Subject Lands), the occurrence of soil polygons and appropriate CLI capability ratings,
- Completion of a report outlining the methodologies employed, findings (including a discussion of relevant features identified) and a conclusion as to the relevance of the CLI classifications for the soil polygons on the property.

The detailed soil survey of the Subject Lands was conducted on October 16, 2018. Aerial photographic interpretation was used to delineate soil polygon boundaries by comparing areas, on stereoscopic photographs, for similar tone and texture. Delineated soil polygons were evaluated for the purpose of verifying soil series and polygon boundaries. The evaluation was completed through an examination of the existing soil conditions to a minimum depth of 100 cm or to refusal. A hand held Dutch Soil Auger and/or Dutch Stone Auger was used to extract the soil material to a minimum depth of one metre (or to refusal).

Each soil profile (inspection site) was examined to assess inherent soil characteristics. Soil attributes were correlated with the *Canadian System of Soil Classification (CSSC)* (Agriculture Canada, 1998) and the *Field Manual for Describing Soils in Ontario* (Ontario Centre for Soil Resource Evaluation, 1993). A hand held clinometer was used to assess percent slope characteristics. Soils were assigned to a soil map unit (series) based on soil texture (hand texturing assessment), soil drainage class and topography (position and slope).

Depth to free water within one metre of the soil surface was also recorded at inspection sites located on lower slope positions (where applicable). Names for the soil series and the Canada Land Inventory (CLI) ratings were assigned to each soil polygon by correlating the soil series with soils information presented in the *Soil Survey of Waterloo County, (Presant, E.W. and R.E.*

Wicklund, 1971). Report No. 44 of the Ontario Soil Survey), the online digital soils data from OMAFRA and with the CLI information presented in the 1:50000 scale manuscript mapping.

Observations noted during the detailed onsite soil survey of the Subject Lands revealed that much of the soil surface of the agricultural lands was sandy (fine sands), and that the dry surface soil materials were prone to wind erosion. At the time of the onsite survey, the soybean crop was still on the fields, and ready for harvest. The winds had access to the soil surface resulting in blowing sandy materials in the more open areas of the Subject Lands.

The weather conditions on the day of the onsite survey were cloudy with sunny breaks and temperatures near 11 degrees Celsius in the afternoon. Winds were moderate with gusts up to 52 kph in the afternoon.

The surface soil conditions were predominantly dry. Soils with higher moisture content were observed on lower slope positions particularly toward the ponded area on the eastern central side. Surface stone (cobble sized) was observed in the corn field in the southeast section, east of the barn foundations. Stone piles within fence rows, fields or tree lines were not noted during the onsite survey. This does not indicate that the stone piles did not exist, just that the piles (if any) were not noted. It should be noted that the corn harvest had just started and as such, the line of sight to the fence rows, into fields or into tree lines was obscured.

The following photograph illustrates the surface stone observed in the south east section of the Subject Lands. This photograph illustrates the relative size, shape and occurrence of the stone in this portion of the Subject Lands.



Photograph of the size, shape and occurrence of surface stone.

The following photograph illustrates the crop residue from this year's corn harvest, plus the condition of this year's crop (as of October 16, 2018). Also noted in this photograph are the relative size, shape and occurrence of surface stone.



Photograph illustrates examples of this year's crop and last year's crop residue, plus the relative size and occurrence of surface stone.

A total of 39 soil inspection sites were examined on the Subject Lands. The soil inspection information was correlated with soil descriptions in *Soil Survey of Waterloo County*, (Presant, E.W. and R.E. Wicklund, 1971). Report No. 44 of the Ontario Soil Survey and the OMAFRA digital soils data (2018), prior to the production of the soils map in Figure 5. Soil names used in the identification of the soil series on Figure 5 were taken from *Soil Survey of Waterloo County*, (Presant, E.W. and R.E. Wicklund, 1971) Report No. 44 of the Ontario Soil Survey.

The onsite soil survey identified four soil series and two miscellaneous landscape units. The four soil series were Burford gravelly Loam, Fox Sandy Loam, Brady Sandy Loam and Lisbon Sandy Loam. The two miscellaneous landscape units were identified as Disturbed areas and ponded areas. The Disturbed areas were associated with the lands occupied by the old farmstead area including the remnant residential unit, barns, manure pits, feed bunker and ancillary buildings, plus the area associated with the laneway to the buildings.

The Burford gravelly Loam soils are the well-drained member of the Burford soil catena. These soils developed on glaciofluvial deposits of gravelly sands and gravel textures. These soils usually consist of 15 to 20 cm of loam or silt loam with varying degrees of gravels in the surface horizon. The B horizons are generally loamy with the C horizons as calcareous gravelly coarse sandy materials. Burford soils occur on nearly level or gently sloping topography.

The Fox Sandy Loam soils are the well-drained-member of the Fox soil catena. These soils developed on sandy glaciolacustrine sediments which were then modified on the surface by eolian (wind modified) activity. The surface horizons range from Sandy Loam to Loamy Sand, and are underlain by deep Loamy Sand or Sand textures. Fox soils typically contain a Bt horizon in which there is a significant increase in clay.

The Brady Sandy Loam soils are the imperfectly drained member of the Fox Soil Catena. The Brady Sandy Loam soils developed on medium to coarse sandy loam. These soils developed on outwash plains and in old river channels. They are often associated with Lisbon Soil Series. The Brady soils are usually found on gently sloping topography.

The Lisbon Sandy Loam soils are the well-drained member of the Lisbon soils series. These soils developed on sandy loam and gravelly loam parent materials. The Lisbon soils contain inclusions of Fox, Brady, Burford and Caledon soils which also developed on sandy and gravelly materials.

A summary description of the basic soil characteristics at each inspection site is included in Appendix B.

4.5.1 SOIL CAPABILITY FOR AGRICULTURE

Basic information about the soils of Ontario is made more useful by providing an interpretation of the agricultural capability of the soil for various crops. The Canada Land Inventory (CLI) system combines attributes of the soil to place the soils into a seven-class system of land use capabilities. The CLI soil capability classification system groups mineral soils according to their potentialities and limitations for agricultural use. The first three classes are considered capable of sustained production of common field crops, the fourth is marginal for sustained agriculture, the fifth is capable for use of permanent pasture and hay, the sixth for wild pasture and the seventh class is for soils or landforms incapable for use for arable culture or permanent pasture.

Organic or Muck soils are not classified under this system. Disturbed Soil Areas are not rated under this system.

The Ontario Ministry of Agriculture, Food and Rural Affairs document “Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for Application of the Canada Land Inventory in Ontario” defines the Canada Land Inventory (CLI) classification as follows:

“Class 1 - Soils in this class have no significant limitations in use for crops. Soils in Class 1 are level to nearly level, deep, well to imperfectly drained and have good nutrient and water holding capacity. They can be managed and cropped without difficulty. Under good management they are moderately high to high in productivity for the full range of common field crops

Class 2 - Soils in this class have moderate limitations that reduce the choice of crops, or require moderate conservation practices. These soils are deep and may not hold moisture and nutrients as well as Class 1 soils. The limitations are moderate and the soils can be managed and cropped with little difficulty. Under good management they are moderately high to high in productivity for a wide range of common field crops.

Class 3 - Soils in this class have moderately severe limitations that reduce the choice of crops or require special conservation practices. The limitations are more severe than for Class 2 soils. They affect one or more of the following practices: timing and ease of tillage; planting and harvesting; choice of crops; and methods of conservation. Under

good management these soils are fair to moderately high in productivity for a wide range of common field crops.

Class 4 - Soils in this class have severe limitations that restrict the choice of crops, or require special conservation practices and very careful management, or both. The severe limitations seriously affect one or more of the following practices: timing and ease of tillage; planting and harvesting; choice of crops; and methods of conservation. These soils are low to medium in productivity for a narrow to wide range of common field crops, but may have higher productivity for a specially adapted crop.

Class 5 - Soils in this class have very severe limitations that restrict their capability to producing perennial forage crops, and improvement practices are feasible. The limitations are so severe that the soils are not capable of use for sustained production of annual field crops. The soils are capable of producing native or tame species of perennial forage plants and may be improved through the use of farm machinery. Feasible improvement practices may include clearing of bush, cultivation, seeding, fertilizing or water control.

Class 6 - Soils in this class are unsuited for cultivation, but are capable of use for unimproved permanent pasture. These soils may provide some sustained grazing for farm animals, but the limitations are so severe that improvement through the use of farm machinery is impractical. The terrain may be unsuitable for the use of farm machinery, or the soils may not respond to improvement, or the grazing season may be very short.

Class 7 - Soils in this class have no capability for arable culture or permanent pasture. This class includes marsh, rockland and soil on very steep slopes.”

Each polygon identified on-site was classified according to the Canada Land Inventory rating system then correlated to the CLI classifications as presented *Soil Survey of Waterloo County*, (Presant, E.W. and R.E. Wicklund, 1971). Report No. 44 of the Ontario Soil Survey, the digital soil data provided by OMAFRA, and the OMAFRA document “Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for the Application of the Canada Land Inventory in Ontario”.

The Burford gravelly Loam soils that were located on 2.0 - 5.0 percent complex ‘c’ slopes (slope length less than 50 m) were rated as CLI class 2FM and on 2.0 – 5.0 percent simple ‘C’ slopes (slope length greater than 50 m) were rated as CLI class 2FM. Burford soils located on 5.0 – 9.0 percent complex ‘d’ slopes were rated as CLI class 3T. Burford soils located on 9.0 – 12.0 percent complex ‘e’ slopes were rated as CLI class 4T.

The Brady Sandy Loam soils that were located on 0.5 – 2.0 percent complex and simple ‘b,B’ slopes were both rated as CLI class 2T. The Brady soils located on 2.0 – 5.0 percent complex ‘c’ slopes were rated as CLI class 2T.

The Fox Sandy Loam soils that were located on 0.5 – 2.0 percent complex and simple ‘b,B’ slopes and 2.0 – 5.0 percent complex and simple ‘c,C’ slopes were all rated as CLI class 2FM. Fox soils located on 5.0 – 9.0 percent complex ‘d’ slopes were rated as CLI class 3T. Fox soils located on 9.0 – 12.0 percent complex ‘e’ slopes were rated as CLI class 4T.

The Lisbon Sandy Loam soils that were located on 2.0 – 5.0 percent simple 'C' slopes were rated as CLI class 3ST. Lisbon soils that were located on 9.0 – 15.0 complex 'e' slopes were rated as CLI class 4ST.

Disturbed areas and ponded areas are not rated and are given a 'NR' symbol.

The Ontario Ministry of Agriculture, Food and Rural Affairs document "Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for Application of the Canada Land Inventory in Ontario" defines the Canada Land Inventory (CLI) subclassification as follows:

Subclass F - Low Natural Fertility

Subclass F denotes soils having low fertility that is either correctable through fertility management or is difficult to correct in a feasible way. Low fertility may be due to low cation exchange capacity, low pH, presence of elements in toxic concentrations (primarily iron and aluminum), or a combination of these factors.

Subclass M – Moisture Deficiency

Subclass M denotes soils which have low moisture holding capacities and are more prone to droughtiness.

Subclass S - Adverse Soil Characteristics

This subclass denotes a combination of limitations of equal severity. In Ontario it has often been used to denote a combination of fertility (F) and moisture (M) when these are present with a third limitation such as topography (T) or stoniness (P).

Subclass T - Topography

The steepness of the surface slope and the pattern or frequency of slopes in different directions are considered topographic limitations if they: 1) increase the cost of farming the land over that of level or less sloping land; 2) decrease the uniformity of growth and maturity of crops; and 3) increase the potential of water and tillage erosion.

Disturbed soil areas (built up areas and stream courses) are considered as Not Rated within the Canada Land Inventory classification system.

Table 4 summarizes the relative percent area occupied by each capability class for the Subject Lands.

Table 4 Canada Land Inventory - Subject Lands

Canada Land Inventory Class (CLI)	Area (ha)	Percent Occurrence
Class 1	-	
Class 2	23.5	36.6
Class 3	25.0	39.1
Class 4	6.9	10.8
Class 5	1.4	2.2
Class 6	-	
Class 7	-	
Not Rated	7.2	11.2
Totals	64.0	100.0

The Subject Lands comprise approximately 75.7 percent Canada Land Inventory (CLI) capability of Class 1 – 3. Approximately 13.0 percent of the Subject Lands is considered Canada Land Inventory (CLI) class 4 - 7 soils, with the remaining 11.2 percent as Not Rated.

4.5.2 HOFFMAN PRODUCTIVITY INDEX (SOIL PRODUCTIVITY RATING)

The Hoffman Productivity Index (HPI) is a tool that was published in ARDA Report No. 4 “The Assessment of Soil Productivity for Agriculture” and is used to relate the productivity of lands to the Canada Land Inventory (CLI) soil capability.

These indices are also referred to as the Soil Productivity Index and are used to calculate and assign a parcel or polygon a single value which represents the overall productivity of that parcel or polygon.

The single value is derived from the sum of the percent occurrence of each CLI Soil Capability Class on the parcel or within the polygon multiplied by the productivity index corresponding to the soil class.

Certain assumptions are made when using the productivity index. The HPI assumes that if the same level of management is applied to areas of differing CLI classes, then the productivity for each class will differ. Hoffman determined the average yields produced for common field crops on lands with CLI classes 1 to 4 within Ontario.

In developing the HPI, it was determined that a CLI class 2 land produced approximately 80% of the yield that would be associated with a class 1 land. Further that a class 3 land produced approximately 64% of the yield that would be associated with a class 1 land, while a class 4 land produced approximately 49%. Values for class 5 through class 7 lands were extrapolated. As a result, it was determined that the productivity ranges were as follows as illustrated in Table 5.

Table 5 Soil Productivity Index Ranges

Soil Productivity Index Ratings	
CLI Class	Soil Productivity Index
1	1.0
2	0.8
3	0.64
4	0.49
5	0.33
6	0.17
7	0.02

A parcels or polygons HPI or Soil Productivity Index is calculated as follows:

Soil Productivity Index =

(percent occurrence of class 1 lands x 1.0) + (percent occurrence of class 2 lands x 0.8) + (percent occurrence of class 3 lands x 0.64) + (percent occurrence of class 4 lands x 0.49) + (percent occurrence of class 5 lands x 0.33) + (percent occurrence of class 6 lands x 0.17) + (percent occurrence of class 7 lands x 0.02)

Once a Soil Productivity Index value is calculated for the parcel or polygon, the value can be related back to a CLI Equivalent. The following table (Table 6) illustrates the range of values which can be directly correlated to the equivalent CLI class.

Table 6 Soil Productivity Index Range and Equivalent CLI

Soil Productivity Index Range	
Equivalent CLI Class	Soil Productivity Range
1	0.90 - 1.00
2	0.73 - 0.89
3	0.58 – 0.72
4	0.43 – 0.57
5	0.28 – 0.42
6	0.10 – 0.27
7	0.00 – 0.09

With respect to the Subject Lands, an HPI calculation was completed. The HPI value and subsequent CLI class are provided in Table 7.

Table 7 Soil Productivity Rating and Equivalent CLI for the Subject Lands

	Soil Productivity Rating	Corresponding CLI Class
Subject Lands	0.604	3

The calculated Soil Productivity Rating for the Subject Lands was 0.604 or a CLI class 3 equivalent.

4.6 AGRICULTURAL SYSTEMS PORTAL

A review of the OMAFRA Agricultural System Portal online resource for agricultural services/agricultural network (markets, abattoirs, renderers, livestock auctions, investment, warehousing and storage, wineries and breweries) within Wilmot Township noted that the Subject Lands were located within the Prime Agricultural Area of the Agricultural Land Base within the Boundary Area of the Greater Golden Horseshoe.

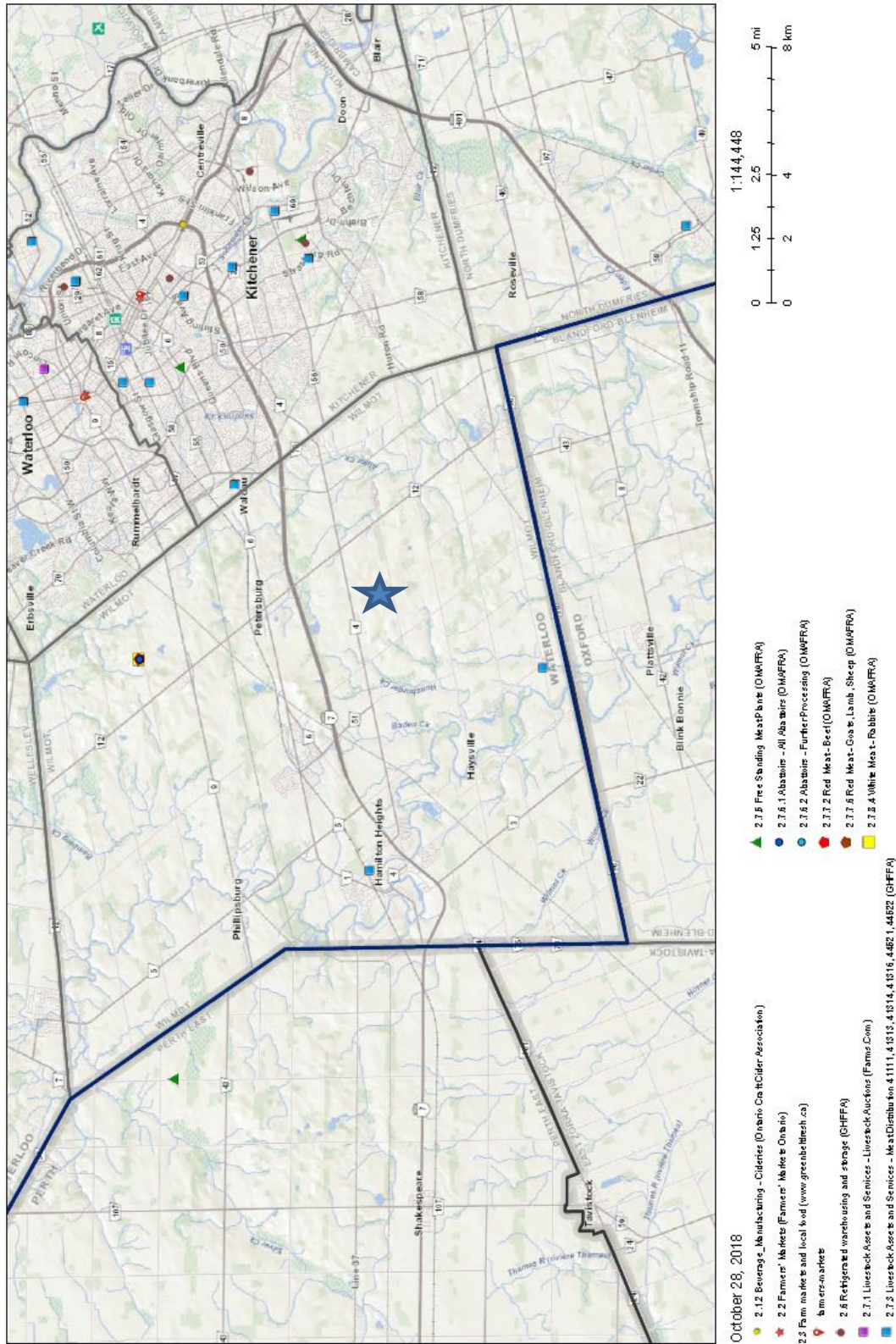
A review of the online Agricultural System Portal (OMAFRA) indicated that there were no farmers markets, pick your own operations, nurseries, specialty farms (crop or livestock), frozen food manufacturing, refrigerated warehousing/storage, livestock assets or abattoirs within close proximity to the Subject Lands.

The closest transportation network (major roadway) is Highway 7 (two concession blocks to the north), with direct access through Highway 8 to Highway 401. A rail line is located approximately one concession block north of Highway 7.

A copy of the image from the Agricultural System Portal is provided below with the approximate location of the Subject Lands identified with a blue star.

Figure 6 Agricultural Systems

Agricultural System Portal - Accessible Viewer



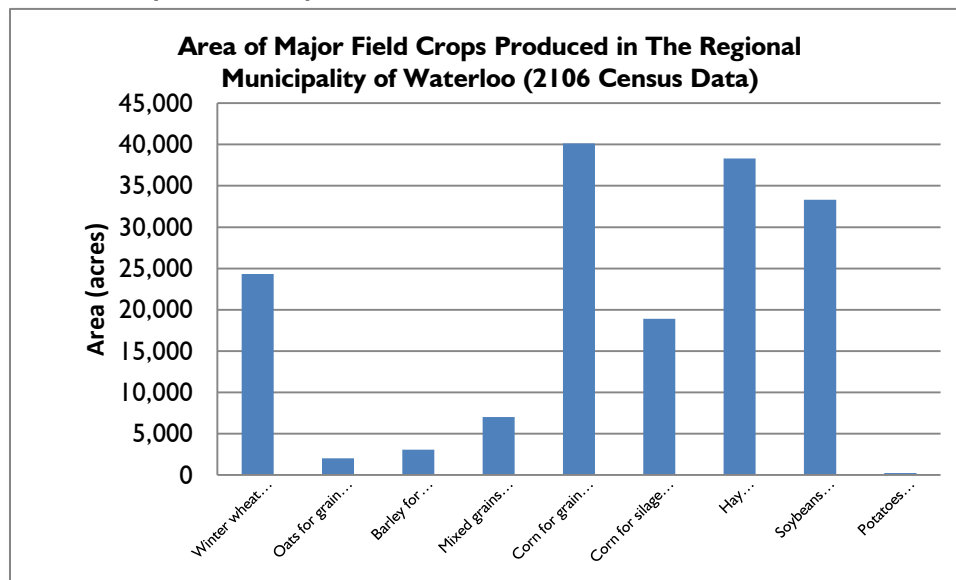
4.7 AGRICULTURAL CENSUS DATA

A review of the Census of Agricultural data (Census 2016) was completed to determine the agricultural characteristics of the Regional Municipality of Waterloo and the Township of Wilmot, and to allow comparison to the agricultural characteristics on the Subject Lands.

Common field crops are the predominant crop production in The Regional Municipality of Waterloo and in the Township of Wilmot. The predominant field crop in both instances is corn for grain. Graph 1 and Graph 3 illustrate the relative areas of major field crops for both The Regional Municipality of Waterloo and for the Township of Wilmot.

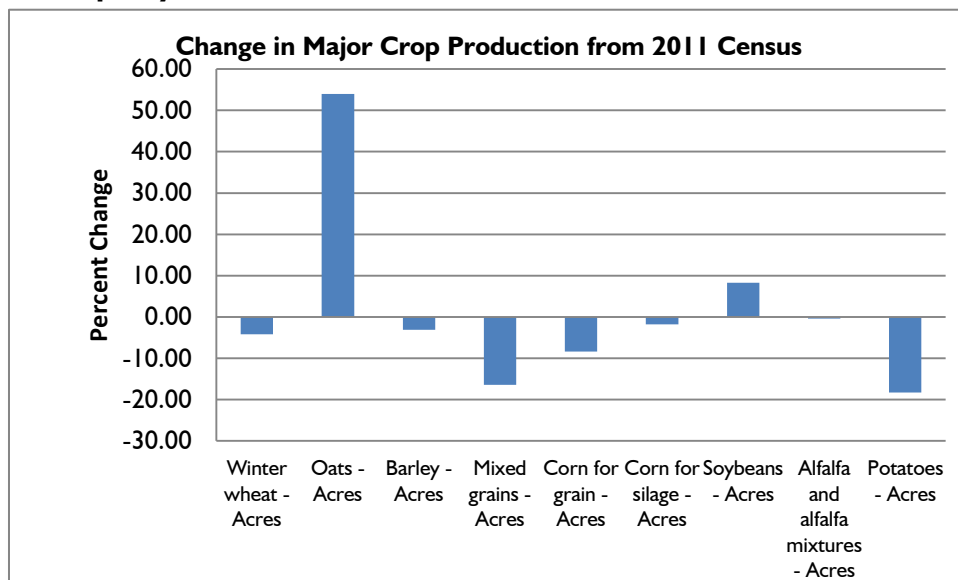
As illustrated in the graphs, the major field crops for both the Regional Municipality of Waterloo and for the Township of Wilmot are the traditional crops of soybean, corn for grain, hay and winter wheat. It was previously identified within this report that the Subject Lands were used for the production of winter wheat in the 2018 growing season. Crop residue on the Subject Lands indicated that the fields have also been used for the production of corn. In comparison to the Census data for The Regional Municipality of Waterloo and for the Township of Wilmot, the Subject Lands cropping pattern is consistent with a crop rotation of soybean, corn and winter wheat which is consistent with the typical cropping found in the area.

Graph 1 Area of Major Field Crops Produced in the Regional Municipality of Waterloo (2016 Data)



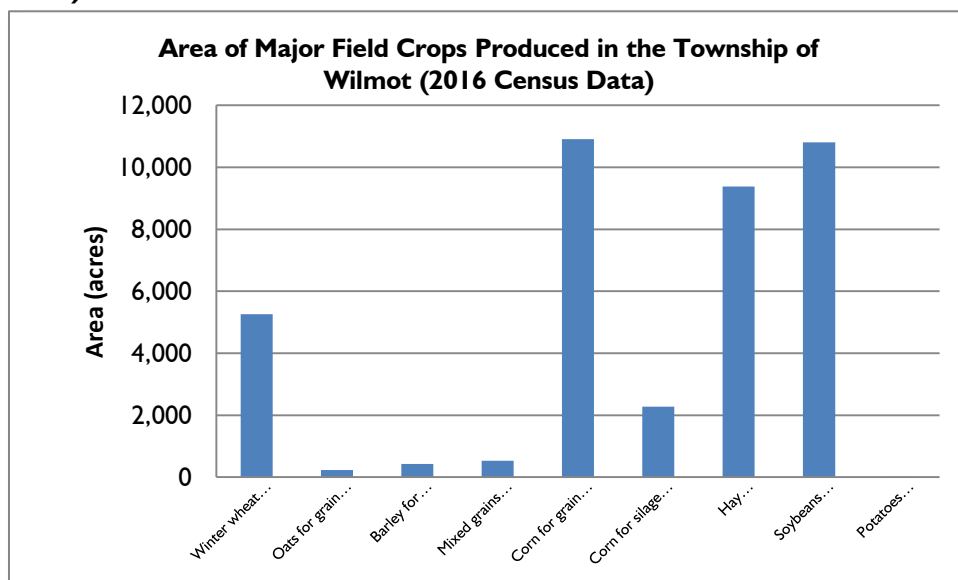
A review of the major field crops grown in the Region of Waterloo illustrates that the common crop types are winter wheat, corn for grains, corn for silage, hay and soybean. The crops grown on the Subject Lands are consistent with the major crops types grown in the Region of Waterloo.

Graph 2 Change in Major Crop Production from 2011 Census Data – The Regional Municipality of Waterloo



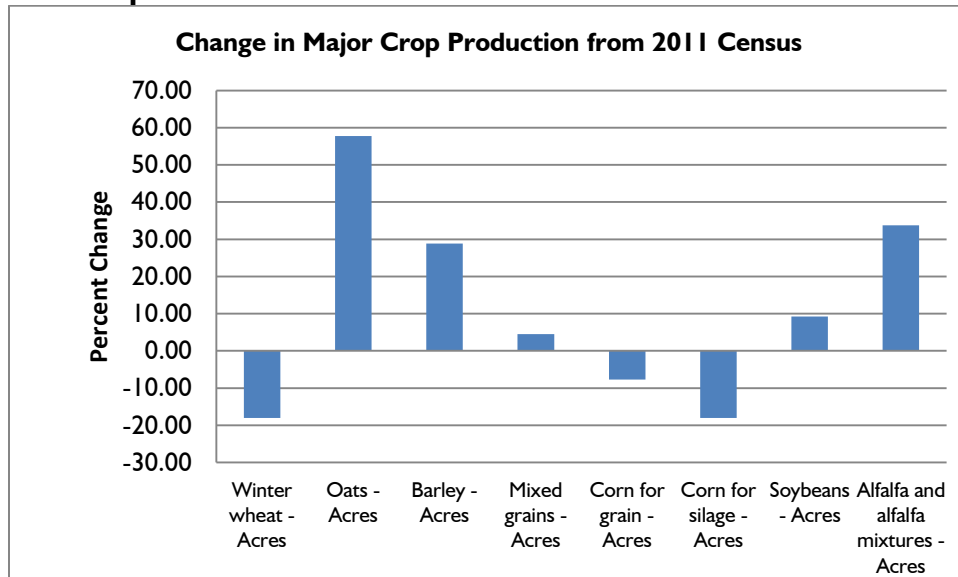
The change in major crop production from the 2011 Census data indicates that there have been increases in the hectares planted in oats for grain and soybean, while the hectares planted in winter wheat, barley, mixed grains, corn for grain, corn for silage, hay and potatoes has declined in the Region of Waterloo.

Graph 3 Area of Major Field Crops Produced in the Township of Wilmot (2016 Data)



A review of the 2016 Census data for Wilmot Township indicates that the major crops grown were corn for grain, corn for silage, hay and soybean. The crops grown on the Subject Lands are consistent with the major crop types grown in the Township of Wilmot.

Graph 4 Change in Major Crop Production from 2011 Census Data for the Township of Wilmot



A review of the change in major crop production from the 2011 Census to the 2016 Census for the Township of Wilmot illustrates an increase in the production of oats, barley, mixed grains, soybean and hay. Decreases were noted in the production of winter wheat, corn for grain and corn for silage.

4.8 REHABILITATION

The application by Jackson Harvest Farms Ltd. is to establish an above water table gravel pit on the subject lands. This will involve the sequential stripping of topsoil, subsoil and any overburden. This stripped material is typically used to construct perimeter berms which have practical purposes of noise attenuation and/or visual screening. Once stripped, the aggregate will then be extracted to a estimated depth of 16.0 m to 20.0 m with the final pit floor graded to provide surface drainage back towards the existing pond area. As each of the extraction Phases is completed, the subsoil and topsoil will be progressively reapplied to the pit floor.

4.8.1 GENERAL REHABILITATION PLAN

Sand and gravel pit restoration/reclamation is defined as the stabilization of areas from which aggregate has been extracted. The purpose is to provide stabilization of the soil, prevention of erosion and improvements to the site to restore agricultural operations.

A 'progressive' rehabilitation plan is proposed for the Subject Lands. In general terms, this type of rehabilitation involves the sequential removal of topsoil and subsoil materials from the developing areas of the pit and reestablishing these same soil materials (in the appropriate sequence) into the excavated areas.

Successful rehabilitation of the pit areas to agriculture after uses may be accomplished by following a series of established steps. The basic steps are listed as follows:

- 1) Strip the topsoil, subsoil and overburden separately. Each soil material should be stripped, moved and stored separately. Intermixing of the soil materials should not occur or be kept to a minimum.
- 2) Strip small areas as necessary for the advancement of the extraction operations. The stripping of the ground cover and surface soil materials leaves the exposed area prone to erosion.
- 3) Soil materials should be moved under appropriate weather conditions. Surface soils are easily damaged when wet.
- 4) Apply a progressive rehabilitation to prevent the degradation of the topsoil materials. Progressive rehabilitation allows for direct movement of soil from the natural state to an area of restoration, without the intermediate stockpiling step.
- 5) Grade and contour the pit floor as part of the progressive rehabilitation. The pit floor should be deep chisel plowed or ripped to release compaction from the extraction heavy equipment.
- 6) Reestablish the overburden, subsoil and topsoil in the appropriate sequence. 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. During the restoration of the soil profile, each horizon should be chisel plowed to release soil compaction prior to the placement of the next horizon.
- 7) Use best management agricultural practices as are appropriate for the area, climate and conditions.

The most critical step to the success of rehabilitation to agriculture is the conservation of the topsoil material. The main reason for topsoil conservation is that these materials are high in organic matter (when compared to the underlying soil horizons/layers) which relates to higher natural fertility and water holding capacity. In an ideal progressive restoration plan, the topsoil materials are stripped from a natural area and moved directly to an area of rehabilitation, without a significant time spent in stockpile formation. The quality of topsoil materials deteriorates over time in storage, due to changes in soil organisms (fungal and bacterial). 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.

The reapplication of soil materials should be accomplished in dry soil conditions and through the use of equipment that does not cause excessive soil compaction. Ideally, the soil materials should be reapplied with wide tracked crawler bulldozers. Rubber tired equipment should be avoided as it causes significant soil compaction as compared to tracked equipment.

Once the soil materials have been replaced, it may be necessary to chisel plow and stone pick the field prior to seeding the first crops.

4.8.2 CROPS

In the early stages of site restoration, the choice of crops for use in reestablishing the site back to agriculture should be related to the reinstatement of the soil organic matter and soil structure.

On completion of reapplication of the soil materials, the area should be seeded to a cover crop to control surface soil erosion. On slopes of 5:1 or steeper, the use of hydroseeding and mulch materials may be required. Oats or rye grasses are appropriate cover crops to use while establishing a legume/grass cover. Cover crops will be disc plowed in the spring as a green plow down crop to add organic matter to the surface soils.

Grass and legume cropping should continue for 3 to 4 years to improve soil structure and add fertility.

When dealing with poorly structured or compacted soil horizons by attempting to improve soil structure and soil fertility, it is important to use a cropping program that initially includes a leguminous crop such as alfalfa, or legume/grass mixtures. Alfalfa is often preferred due to its deep penetrating taproots. These roots aid in breaking up the poorly structured layers and add organic matter and nitrogen to the soil as well as improving the general soil structure.

The following tables provide suggested cropping sequences and crop types for the rehabilitation of the Subject Lands to agricultural use.

Table 8 Cropping Sequence

Time Frame	Crop	Comments
Year 1	Cover crop (Oats or Rye Grass)	Control of erosion
Years 2 – 4	Legume or legume/grass mixture	Improve general soil conditions
Years 5 +	Row crops in rotation with legume, legume/grass mixtures	

Table 9 Crop Types

Legumes
Alfalfa (<i>Medicago sativa</i>)
Birdsfoot Trefoil (<i>Lotus corniculatus</i>)
Alsike Clover (<i>Trifolium hbridum</i>)
Red Clover (<i>Trifolium pretense</i>)
Sweet Clover (<i>Melilotus alba</i>)
White Clover (<i>Trifolium repens</i>)
Crownvetch (<i>Coronilla varia</i>)
Soybean (<i>Glycine max</i>)
Grasses
Bromegrass (<i>Bromus inermis</i>)
Tall Fescue (<i>Festuca</i>)
Orchard Grass (<i>Dactylis glomerata</i>)
Timothy (<i>Phleum pretense</i>)
Perennial Ryegrass (<i>Lolium perenne</i>)
Grains
Spring Barley (<i>Hordeum vulgare</i>)
Oats (<i>Avena ativa</i>)
Winter Barley (<i>Hordeum vulgare</i>)
Winter Rye (<i>Secale cereale</i>)
Winter Wheat (<i>triticum aestivum</i>)

5 RESOURCE ALLOCATION AND CONFLICT POTENTIAL

Land use planning decisions involves trade-offs among the competing demands for land. The fundamental base used for the evaluation of agricultural lands is land quality, i.e. CLI soil capability ratings. Within the rural/urban interface, there are a number of other factors which contribute to the long term uncertainty of the economic viability of the industry and these, in turn, are reflected in the lack of investments in agricultural facilities, land and infrastructure and changes to agricultural land use patterns in these areas. Several of these factors include, but are not limited to, the presence of rural non-farm residents, land fragmentation, intrusions of non-agriculture land uses, non-resident ownership of lands and inflated land values. This section summarizes the impact of these factors on agriculture in the area.

5.1 IMPACTS, ASSESSMENT AND COMPATABILITY WITH SURROUNDING LAND USES

The identification and assessment of potential impacts is paramount to determining potential mitigation measures to either eliminate or offset the impact to the extent feasible. Potential impacts may include:

- Interim or permanent loss of agricultural lands
- Fragmentation of agricultural lands and operations
- The loss of existing and future farming opportunities
- The loss of infrastructure, services or assets
- The loss of investments in structures and land improvements
- Disruption or loss of functional drainage systems
- Disruption or loss of irrigation systems
- Changes to soil drainage
- Changes to surface drainage
- Changes to landforms
- Changes to hydrogeological conditions
- Disruption to surrounding farm operations
- Effects of noise, vibration, dust
- Potential compatibility concerns
- Traffic concerns

It should be noted that this Agricultural Impact Assessment (AIA) report should be read in conjunction with all other discipline reports in an effort to provide an adequate evaluation of the above mentioned potential impacts.

It has been documented within this report, the agricultural character of both the Subject Lands and the Study Area. It has been determined that the Study Area comprises portions of active agricultural land uses including cash crop operations in combination with a few livestock operations (beef, poultry). It was observed that many farm operations have reverted from

livestock rearing to cash crop operations. This was noted with the numbers of large and medium sized barns, some with silos, which are now used for storage or other non-livestock purposes.

The Study Area comprises a mix of land tenure, with areas of Local and Non-Local Ownership and Tenant Farmers. The Subject Lands contain Locally Owned farm lands with a tenant farmer. A large concentration of small severed parcels was located immediately north of the Subject Lands, largely within the hamlet of Shingletown.

These types of Ownership are a clear indication of an area in transition and provide an indication as to the long term intentions for agriculture in the Subject Lands and in the Study Area.

It has been documented that the proposed aggregate operation will be designated as above the water table. This will require that the lands are used for aggregate extraction as an interim use and that the lands will be returned to agriculture on the completion of the phased aggregate and rehabilitation operation.

It has been documented that the Subject Lands do contain a small ponded area, but no other areas of ponded or flowing (surface) water resources.

Should the Subject Lands be rezoned, the impact on the surrounding agricultural operations will be minimal. The areas surrounding the Subject Lands are characteristic of zones in transition from: a livestock based agricultural system to a crop based agricultural system; mixed local and non-local ownership with tenant farming; and existing designated authorized aggregate areas.

With respect to the potential impacts as listed on Page 53 of this report:

- Interim or permanent loss of agricultural lands – there will be interim loss of the use of agricultural lands during the time of the phased extraction process and the early steps in rehabilitation back to agriculture. There will be no permanent loss of agricultural lands.
- Fragmentation of agricultural lands and operations – there will be no fragmentation of agricultural lands.
- The loss of existing and future farming opportunities – there will be no loss of existing or future farming opportunities. The existing site is used for agriculture and will be again on completion of the rehabilitation process.
- The loss of infrastructure, services or assets – there is no loss of infrastructure, services or assets.
- The loss of investments in structures and land improvements – there is no loss of investments in structures or land improvements.
- Disruption or loss of functional drainage systems – there is no loss of investment in drainage systems.
- Disruption or loss of irrigation systems – there is no loss of investment in irrigation systems.
- Changes to soil drainage – the existing open soil drainage (based on

sandy/gravelly/cobbly soil materials) will be present in the soil materials remaining on site and used in rehabilitation.

- Changes to surface drainage – the change in soil drainage will be to create long, simple and uniform slopes that will provide for more controlled surface drainage than presently exists due to the existing rolling and steep topography.
- Changes to landforms – The change in landform will be to create long, simple and uniform slopes which will be well suited to mechanized farming.
- Changes to hydrogeological conditions – will be addressed under separate cover by the hydrogeological consultant.
- Disruption to surrounding farm operations – there should be limited disruption for surrounding/adjacent farm operations due to the use of berms for visual and sound attenuation, a traffic plan and the lack of offsite surface runoff potential.
- Effects of noise, vibration, dust - there should be limited potential for noise, vibration and dust during the operations of the proposed pit. There is a potential for noise, vibration and dust during the initial construction of berms.
- Potential compatibility concerns – there should be limited potential for compatibility concerns due to the presence of existing and active open pits in the surrounding area.
- Traffic concerns - Traffic issues were documented in the Paradigm Transportation consulting report as indicated below.

Given the existing land use pattern in the vicinity of the Subject Lands the introduction of the proposed zoning change would not have a significant impact on agriculture in the area.

5.2 TRAFFIC, TRESPASS AND VANDALISM

Specific to agriculture, increased vehicle traffic along roadways can lead to safety issues with respect to the movement of slow moving, long, wide farm machinery and, as well, interrupt or alter farm traffic flow patterns.

Trespassing and vandalism impacts are generally related to development within agricultural areas predominated by specialty crop operations or large livestock operations, and in areas of close proximity to urban environments.

A review of the Paradigm Transportation Impact Study (September 2018) section 5.2 states:

“The use of agricultural equipment is prevalent in this area. The Agricultural Impact Assessment (AIA) Guidance Document , requires aggregate trucks to take the shortest possible route to major roads to reduce the impacts on agricultural vehicles. The direct route to Queen Street for the proposed pit is consistent with the AIA guidelines and will minimize impact on agricultural vehicles.”

5.3 AGRICULTURAL INFRASTRUCTURE

The reconnaissance level land use survey failed to identify any agricultural equipment dealers, seed dealers/cleaning/drying services or farm equipment maintenance service businesses within the Subject Lands or the Study Area. A mobile farm service company (Pinegrove Farm Service Inc.) was noted on Sandhills Road, south of Witmer Road (outside the Study Area).

A review of the OMAFRA Agricultural System Portal was completed to identify the presence of any livestock assets and services (renderers, meat plants, abattoirs), refrigerated warehousing and storage, frozen food manufacturing, farm markets, wineries, or cideries within the Study Area. None of these features was identified within the Subject Lands, the Study Area or near vicinity.

The lack of local agricultural business and infrastructure is also indicative of areas in decline from agriculture, as these services rely on the business supplied by the local farm operators.

5.4 MITIGATION MEASURES

The Growth Plan for the Greater Golden Horseshoe defines an Agricultural Impact Assessment as:

“A study that evaluates the potential impacts of non-agricultural development on agricultural operations and the Agricultural System and recommends ways to avoid or, if avoidance is not possible, minimize and mitigate adverse impacts. (Greenbelt Plan)”

With respect to this AIA, the following provide comment with regard to the avoidance, minimization and mitigation of adverse impacts.

5.4.1 AVOIDANCE

Any change in land use within or adjacent to an identified or designated prime agricultural area will result in the potential for impacts to the adjacent agricultural area. The severity of the potential impacts is related to the type and size of the change in land use, and the degree of agricultural activities and operations in the surrounding area.

The first method of addressing potential impacts is to avoid the potential impact. In this study, the proposed aggregate pit will be an interim use of agricultural lands in an agricultural area. The lands will be returned to agriculture in a phased rehabilitation plan. The type of change in land use, an operational aggregate pit, does not allow for an avoidance of Prime Agricultural Lands.

5.4.2 MINIMIZING IMPACTS

When avoidance is not possible, the next priority would be to minimize impacts to the extent feasible. Mitigation measures should be developed to lessen the potential impacts. The

minimization of impacts can be achieved during the design process and through proactive planning measures that provide for the separation of land uses.

In the shorter term, the Subject Lands will be used as an aggregate pit operation, with agricultural being a priority for the phased rehabilitation of the lands.

In the longer term, the Subject Lands will maintain the agricultural designation and be returned to active agricultural use. In this way, the long term use of the lands has been maintained, resulting in a minimization of the impact of the short term loss of agricultural land use.

5.4.3 MITIGATING IMPACTS

When avoidance techniques and minimizing impacts potential impacts to agriculture have not achieved the desired effect the next priority is to mitigate any further impact.

Potential mitigation measures include:

- The use of natural heritage feature or a road to separate agriculture from non-agricultural land uses to create a defined boundary to reduce trespassing and potential vandalism.
- The creation of a berm or vegetated feature between the different types and intensities of land uses to reduce the potential for trespassing and potential vandalism.
- The use of adequate fencing to reduce the potential for trespassing and potential vandalism.
- The use of signage between the different types and intensities of land uses to indicate No Trespassing or Private Property.
- Locate low occupancy uses on the developing lands adjacent to farmland and agriculture operations.
- The use of plantings/vegetation as buffers to reduce visual impacts and sounds.
- The use of reduced speed limits in the agricultural areas.
- Implementation of surface and/or groundwater monitoring in areas where agricultural operations make use of surface or groundwater as part of their normal farm practices.

With respect to this study and the Subject Lands, Mitigation Measures will include the use of berms and fencing to provide separation and physical barriers to reduce trespassing and potential vandalism, and for sound attenuation.

Therefore, this AIA has provided comment on the avoidance (if possible), minimizing potential impacts and mitigation measures in the instances where avoidance is not possible. Further, it has been illustrated that the proposed mitigation measures will be incorporated as part of the interim non-agricultural use.

6 SUMMARY AND CONCLUSIONS

DBH Soil Services Inc was retained to complete an Agricultural Impact Assessment (AIA) for a property located on Part Lot 10, German Block South of Bleems Road, Wilmot Township, in the Regional Municipality of Waterloo. The property is identified as 1894 Witmer Road.

The eastern boundary abuts agricultural lands and a ponded area. The northern boundary abuts agricultural lands and the hamlet of Shingletown. The western boundary abuts agricultural lands and woodlots.

There are no buildings or structures on this property. Historically, this property was used for the production of common field crops and included a beef cattle operation. The remnant foundations, the remnant liquid manure storage and the remnant concrete bunker feed storage facilities are located along the southern portion of the property adjacent to Witmer Road. Historically a residence had been located just north of the woodlot near the east central portion of the property. This residence has been dismantled.

There is one ponded area located along the central portion of the eastern boundary. There are no other areas of standing water or areas of flowing water on this property.

The majority of the parcel was used for the production of agricultural crops. The crops grown in the 2018 growing season included soybean and corn. The remainder of the property comprised woodlot areas and disturbed areas (associated with the farmstead (barns, machine shed, garage, residential unit) and laneways).

In the greater Regional context, the Subject Lands are located approximately 5.0 km west of the City of Kitchener, approximately 2.6 km south of the hamlet of Petersburg and roughly 3.8 km southeast of the town of Baden.

The results of this assessment indicate the following:

- **Geographical Limits**

The property is roughly rectangular in shape, with the longer boundaries running north-south, the narrower boundaries running east-west, and the southern narrow boundary abutting Witmer Road. A small laneway extends from the northern portion of this property to Bleams Road East, where the laneway exits within the hamlet of Shingletown.

This property comprises approximately 64.0 ha (158.2 acres).

- **Agricultural Policy**

The Regional Official Plan 2031 (Region of Waterloo, June 18, 2015) and *The Township of Wilmot Official Plan (November 2006 Consolidation)* were reviewed for policy related to agriculture and mineral aggregate applications.

The review of The Regional Official Plan 2031 (Region of Waterloo, June 18, 2015) Map 7 – The Countryside and Map 8 – Mineral Aggregate Resource Areas and Aggregate Bedrock Areas identifies that the Subject Lands are Located in Protected Countryside and Prime Agricultural Area, and are within a Mineral Aggregate Resource Area.

With respect to the Regional Official Plan 2031 (Region of Waterloo, June 18, 2015), neither the Subject Lands nor the Study Area is located within a Specialty Crop Area.

The review of *The Township of Wilmot Official Plan* Map No. 2 – Land Use Map illustrates that the Subject Lands are located in the Agricultural Resource Area. The *Township of Wilmot Official Plan* Map No. 10 - Mineral Aggregate Resource Areas illustrates that the select portions of the Subject Lands are located within the designated Mineral Aggregate Resource Areas. The *Township of Wilmot Official Plan* Map No. 11 – Agricultural Resource Areas Map illustrates that the Subject Lands are located in Prime Agricultural Resource Area .

Neither the Subject Lands nor the Study Area is located within a designated Specialty Crop Area.

It should be noted that both the Official Plans do allow for the use of agricultural lands in an interim basis to allow aggregate extraction provided the lands are returned to an agricultural after use.

The Township of Wilmot Zoning By-Law was reviewed for policy and By-Law related to the Subject Lands. The review revealed that the Subject Lands are zoned Z.1 (Agriculture).

Neither the Subject Lands nor the Study Area is zoned an agricultural special area.

- **Agricultural Land Use**

The Subject Lands land use comprises common field crop, disturbed areas (laneways and shed location), ponded area and wooded lands. The predominant agricultural land use on the Subject Lands is the production of field crop (corn and soybean in the 2018 growing season). There are no specialty crops grown on the Subject Lands.

The Study Area land use consists of a variety of uses including, but not limited to common field crops, scrubland, built up/disturbed area, aggregate operations and woodlots.

The predominant agricultural land use in the Study Area is common field crop. There is

one small area of market garden crop (specialty crop) grown in the Study Area.

- **Agricultural Investment**

There is no investment in agricultural buildings, facilities or structures on the Subject Lands.

There is limited investment in agricultural buildings and structures within the Study Area.

There is no investment in irrigation in either the Subject Lands or the Study Area.

There is no investment in landforming on either the Subject Lands or the Study Area.

A total of 25 potential agricultural facilities were noted in the Study Area, with seven used for beef operations and two facilities housing poultry. The agricultural facilities were located to the west, southwest of the Subject Lands.

- **Land Tenure/Fragmentation – Land tenure/fragmentation represents a major impact to the long term viability of agriculture in the Subject Lands and the Study Area and is typical of areas under pressure from non-agricultural land uses.**

Land Tenure on the Subject Lands is a Local Owner with a tenant farmer relationship.

Land Tenure of the Study Area is typical of areas under pressure from non-local ownership with a relatively equal mix of Local and Non-Local Ownership.

Land Fragmentation of the Study Area is also typical of areas under pressure due to numerous severed parcels and built up areas. Many of the severed parcels are associated with the hamlet of Shingletown.

- **Rehabilitation – The proposed rezoning of the Subject Lands to allow for aggregate extraction also requires that the Subject Lands are progressively rehabilitated back to agriculture.**

The proposed change in zoning of the Subject Lands to allow for an aggregate operation has a requirement under the Aggregate Resources Act (1990, as amended), the PPS (2014), the respective Official Plans, and the Growth Plan (2017) that the lands are rehabilitated back to an agricultural use.

General rehabilitation guidelines have been included with this AIA.

The foregoing represents a comprehensive Agricultural Impact Assessment with the purpose of evaluating the Subject Lands to document the existing agricultural character and to determine any potential impacts to agriculture should the Subject Lands be rezoned.

It was determined that the Study Area is an area of transition from livestock agricultural operations to cash crop and aggregate extraction.

Given the geographical location of these lands, it is the conclusion of this study that the proposed change in zoning would have minimal impact on the surrounding agricultural activities within the Study Area.

7 REFERENCES

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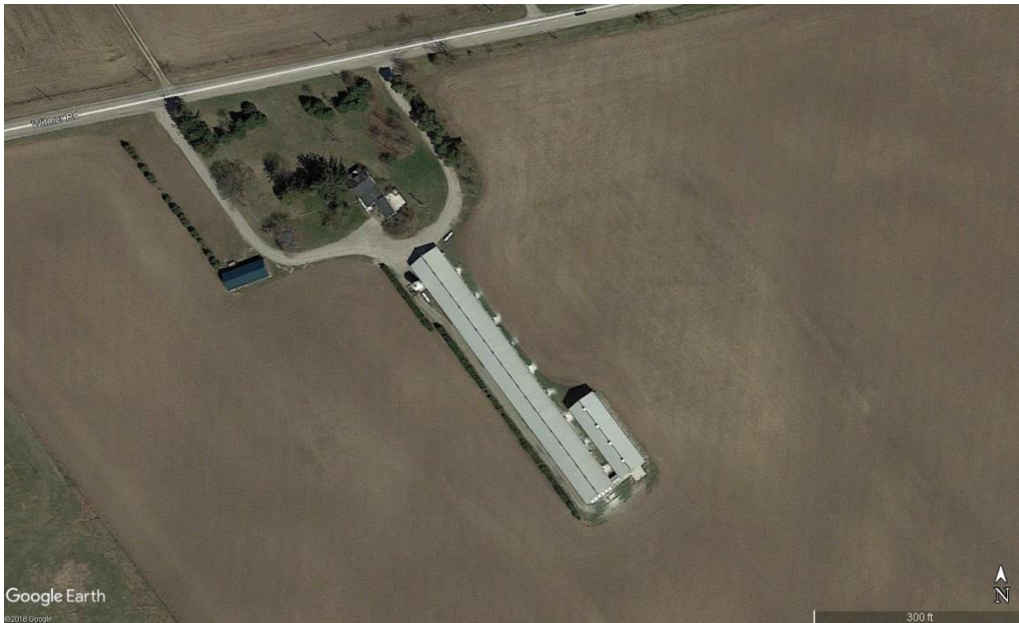
- *Wilmot Township Zoning By-Law (under review – information provided by Wilmot Township Staff),*
- Windshield and field surveys by DBH Soil Services staff August 18, 2018, October 16, 2018 and October 23, 2018.

APPENDIX A

POTENTIAL AGRICULTURAL FACILITIES PHOTOGRAPHS



Agricultural Facility #1



Agricultural Facility #2 and #3



Agricultural Facility #4, #5, #6, #7, #8 and #9



Agricultural Facility #10



Agricultural Facility #11



Agricultural Facility #12 and #13



Agricultural Facility #14



Agricultural Facility #15



Agricultural Facility #16



Agricultural Facility #17



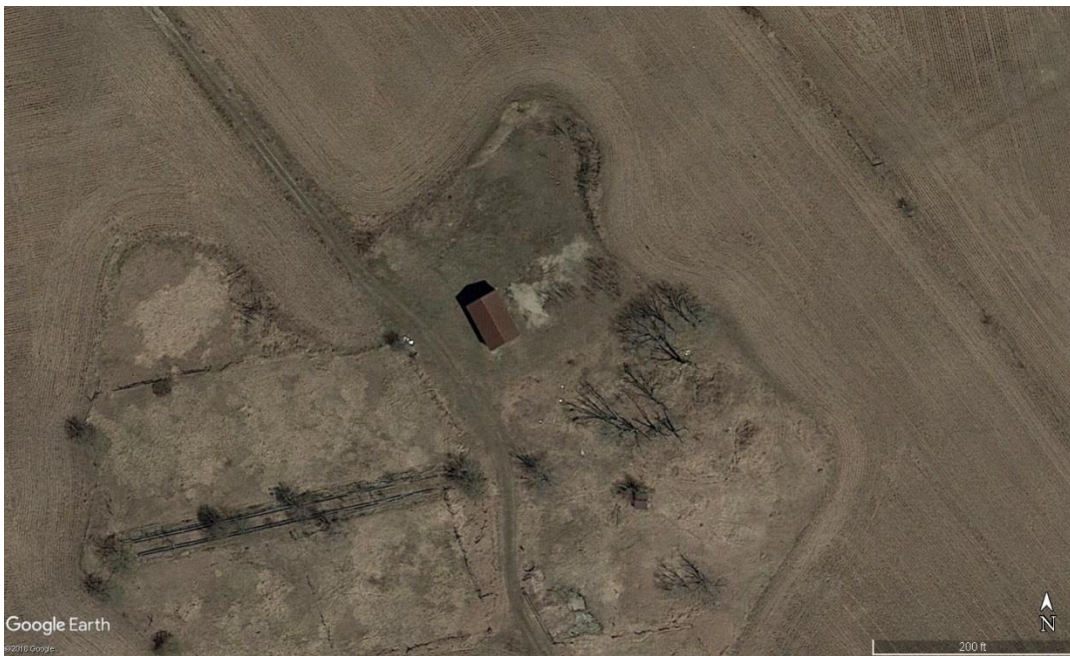
Agricultural Facility #18



Agricultural Facility #19



Agricultural Facility #20



Agricultural Facility #21



Agricultural Facility #22



Agricultural Facility #23



Agricultural Facility #24



Agricultural Facility #25

APPENDIX B

SOIL INSPECTION LOCATION SUMMARY

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
1	Ap Ae/Bm Bt Ck	0 – 21 21 – 41 41 – 75 75 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
2*	Ap AB Ae/Bm Bt Ck	0 – 23 23 – 45 45 – 68 68 – 91 91 - 100	Loam Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
3**	Ap Ae/Bm Bm	0 – 22 22 – 48 48 - 65	g/cSandy Loam Loam Gravelly Loam	Well	Burford
4**	Ap Ae/Bm Bm	0 – 21 21 – 52 52 - 71	g/cSandy Loam Loam Gravelly Loam	Well	Burford
5	Ap Ae/Bm Btgj Ckgj	0 – 25 25 – 44 44 – 74 74 - 100	Loamy Sand Loamy Sand Loamy Sand Sand/Sandy Loam	Imperfect	Brady
6**	Ap Ae/Bm Bm Ck	0 – 24 24 – 45 45 – 67 67 - 85	g/cSandy Loam Loam Gravelly Loam Gravelly Loam	Well	Burford
7	Ah Ae/Bm Btgj Ckgj	0 – 24 24 – 48 48 – 84 84 - 100	Loamy Sand Loamy Sand Loamy Sand Sand/Sandy Loam	Imperfect	Brady
8**	Ap Ae/Bm Bm	0 – 25 25 – 35 35 - 85	g/cSandy Loam Loam Gravelly Loam	Well	Burford
9	Ap Ae/Bm Bt Ck	0 – 23 23 – 38 38 – 80 80 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
10	Ap Ae/Bm Bt Ck	0 – 21 21 – 39 39 – 70 70 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
11	Apk Bmk1 Bmk2 Ck	0 – 18 18 – 45 45 – 66 66 - 100	Sandy Loam Sandy Loam Sandy Loam Loamy Sand	Well	Lisban
12	Ap Ae Bt Ck	0 – 25 25 – 39 39 – 65 65 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
13	Ap Ae Bt Ck	0 – 26 26 – 45 45 – 80 80 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
14	Ap Bm Bmk Ck	0 – 20 20 – 46 46 – 73 73 - 100	Sandy Loam Sandy Loam Sandy Loam Loamy Sand	Well	Lisban

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
15	Ap Ae/Bm Bt Ck	0 – 23 23 – 35 35 – 81 81 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
16	Ap Bm1 Bm2 Ck	0 – 25 25 – 51 51 – 78 78 - 100	Sandy Loam Sandy Loam Sandy Loam Loamy Sand	Well	Lisban
17	Ap Ae Bt Ck	0 – 25 25 – 32 32 – 65 65 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
18	Ap Bm Bmk Ck	0 – 25 25 – 48 48 – 70 70 - 100	Sandy Loam Sandy Loam Sandy Loam Loamy Sand	Well	Lisban
19	Ap Bm Bmk Ck	0 – 26 26 – 39 39 – 69 69 - 100	Sandy Loam Sandy Loam Sandy Loam Loamy Sand	Well	Lisban
20	Ap Ae Bt Ck	0 – 27 27 – 35 35 – 62 62 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
21	Ap Ae Btgj Ckgj	0 – 25 25 – 39 39 – 74 74 - 100	Loamy Sand Loamy Sand Loamy Sand Sand/Sandy Loam	Imperfect	Brady
22	Ap Ae/Bm Bt Ck	0 – 21 21 – 30 30 – 59 59 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
23	Ap Bm Bmk Ck	0 – 26 26 – 42 42 – 75 75 - 100	Sandy Loam Sandy Loam Sandy Loam Loamy Sand	Well	Lisban
24	Ap Ae Bt Ck	0 – 24 24 – 38 38 – 72 72 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
25	Ap Bm1 Bm2 Ck	0 – 24 24 – 45 45 – 76 76 - 100	Sandy Loam Sandy Loam Sandy Loam Loamy Sand	Well	Lisban
26	Ap Bm Bmk Ck	0 – 26 26 – 46 46 – 71 71 - 100	Sandy Loam Sandy Loam Sandy Loam Loamy Sand	Well	Lisban
27	Ap Ae Bt Ck	0 – 24 24 – 35 35 – 76 76 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
28	Ap Ae Bt Ck	0 – 25 25 – 41 41 – 74 74 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
29	Ap Ae/Bm Bt Ck	0 – 26 26 – 42 42 – 79 79 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
30	Ap Ae/Bm Btgj Ckgj	0 – 23 23 – 36 36 – 72 72 - 100	Loamy Sand Loamy Sand Loamy Sand Sand/Sandy Loam	Imperfect	Brady
31	Ap Ae Bt Ck	0 – 25 25 – 40 40 – 70 70 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
32	Ap Bm1 Bm2 Ck	0 – 25 25 – 38 38 – 79 79 - 100	Sandy Loam Sandy Loam Sandy Loam Loamy Sand	Well	Lisban
33	Ap Bm1 Bm2 Ck	0 – 25 25 – 51 51 – 65 65 - 100	Sandy Loam Sandy Loam Sandy Loam Loamy Sand	Well	Lisban
34	Ap Ae/Bm Bm	0 – 24 24 – 52 52 – 68	Sandy Loam Loam Gravelly Loam	Well	Burford
35	Ap Ae/Bm Bm	0 – 25 22 – 44 44 – 78	Sandy Loam Loam Gravelly Loam	Well	Burford
36	Ap Ae/Bm Bt Ck	0 – 25 25 – 39 39 – 75 75 - 100	Loamy Sand Loamy Sand Loamy Sand Sand/Sandy Loam	Imperfect	Brady
37	Ap Bm1 Bm2 Ck	0 – 25 25 – 50 50 – 75 75 - 100	Sandy Loam Sandy Loam Sandy Loam Loamy Sand	Well	Lisban
38	Ap Ae Bt Ck	0 – 25 25 – 40 40 – 82 82 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox
39	Ap Ae/Bm Bt Ck	0 – 21 21 – 39 39 – 70 70 - 100	Loamy Sand Loamy Sand Loamy Sand Sand	Well	Fox

Notes: g/c = gravelly/cobbly ; * = Area of soil importation; ** = refusal

APPENDIX C

DAVE HODGSON CURRICULUM VITAE



**DAVID B. HODGSON, B.Sc., P.Ag.
SENIOR PEDOLOGIST/PRESIDENT**

EDUCATION

- B.Sc. (Agriculture), 1983-1987; University of Guelph, Major in Soil Science
- Agricultural Engineering, 1982-1983; University of Guelph.
- Materials Science Technology, 1981-1982; Northern Alberta Institute of Technology (NAIT), Edmonton, Alberta.

AREAS OF PROFESSIONAL EXPERIENCE

2000 to Present Senior Pedologist/President. DBH Soil Services Inc., Kitchener, Ontario.

Mr. Hodgson provides expertise in the investigation, assessment and resource evaluation of agricultural operations/facilities and soil materials. Dave is directly responsible for the field and office operations of DBH Soil Services and for providing advanced problem solving skills as required on an individual client/project basis. Dave is skilled at assessing soil and agricultural resources and is responsible for providing the analysis of and recommendations for the remediation of impacts to soil/agricultural/environmental systems in both rural and urban environments.

1992 to 2000 Pedologist/Project Scientist. Ecologistics Limited, Waterloo, Ontario.

As pedologist (soil scientist), Mr. Hodgson provided expertise in the morphological, chemical and physical characterization of insitu soils. As such, Mr. Hodgson was involved in a variety of environmental assessment, waste management, agricultural research and site/route selection studies.

Dave was directly responsible for compiling, analysis and management of the environmental resource information. Dave is skilled at evaluating the resource information utilizing Geographic Information System (GIS) applications.

Dave was also involved the firms Environmental Audit and Remediation Division in the capacity of: asbestos identification; an inspector for the remediation of a pesticide contaminated site; and an investigator for Phase I and Phase II Audits.

1988 to 1992 Project Manager/Soils Specialist. Ecological Services for Planning Limited, Guelph, Ontario.

As project manager/soils specialist, Mr. Hodgson provided expertise in the management and technical aspects of pedological studies. As well, Dave was involved with the technical inputs to a variety of planning, environmental assessment, agricultural research, waste management, linear transmission and various site selection studies. These studies involved co-ordination of resources, logistics concerns and the management of multidisciplinary teams.



SELECTED PROJECT EXPERIENCE

Environmental Assessment Studies

- Agricultural Component for the High Speed Rail Kitchener to London –Terms of Reference, 2018 – On-going,
- Agricultural Component of the Mount Nemo Heritage District Conservation Study – City of Burlington, 2014 – 2015.
- Agricultural Component of the Greater Toronto Area West (GTAW) Highway Corridor Assessment – Phase 2, 2014 – 2016.
- Peer Review of the Agricultural Component of the Walker Group Landfill – Ingersoll, 2013 – On-going.
- Agricultural Component of the Highway 407 East Extension Design and Build Phase, 2012 – 2013.
- Agricultural Component of the Beechwood Road Environmental Centre (Landfill/Recycling) – Napanee, 2012 – 2013.
- Agricultural Component of the Clean Harbors Hazardous Waste Landfill Lambton County 2009 – 2015.
- Agricultural Component of the Highway 401 widening Cambridge to Halton Region 2009 – 2012.
- Agricultural Component of the Upper York Sanitary Sewer Study, York Region, 2009 – 2013.
- Agricultural Component of the Greater Toronto Area West Corridor Environmental Assessment Study 2007 – 2013 (Phase I).
- Agricultural Component of the Niagara to GTA Planning and Environmental Assessment Study, 2007 – 2013.
- Agricultural Component of the Highway 401 widening, Chatham, 2006 - 2007.
- Peer Review Agricultural Component of the Union Gas Dawn Corridor Expansion, 2006.
- Agricultural Component of the Trafalgar Road study, Halton Region, 2005.
- Agricultural Component of the Highway 404 Extension North, 2004.
- Agricultural Component of the Highway 404 – 400 Bradford Bypass, 2004.
- Agricultural Component of the Highway 407 East Extension, 2002 – 2010.

Agricultural Impact Studies

- Town of Wilmot, Agricultural Impact Assessment (AIA) Aggregate Pit Study, 2018, On-going.
- Courtice Area South East Secondary Plan (Clarington) Agricultural Impact Assessment (AIA), 2018 – On-going.
- Town of Halton Hills, Minimum Distance Separation (MDS I), August 2018,
- Cedar Creek Pit/Alps Pit (North Dumfries), Agricultural Impact Assessment (AIA), 2018 – On-going,
- Belle Aire Road (Simcoe County) Agricultural Impact Assessment (AIA) Study, May 2018 – On-going,
- Vinemount Quarry Extension (Niagara) Agricultural Impact Assessment (AIA) Study, December 2017.
- Grimsby – Agricultural Impact Assessment Opinion, November 2017.
- City of Hamilton, Urban Core Developments – Agricultural Capability Assessment, February 2017.
- Township of North Dumfries – Minimum Distance Separation (MDS I), February 2017.
- Township of Erin, County of Wellington – Minimum Distance Separation I (MDSI Study), 2016.
- Halton Hills Employment Area Secondary Plan, Halton, 2015 - 2016.
- Peer Review of Agricultural Impact Assessment, Oro-Medonte Township, 2015.
- Greenwood Construction Aggregate Pit, Mono Township, 2014 - 2015.
- Innisfil Maplevue Developments, Town of Innisfil – Minimum Distance Separation (MDS I), 2014.
- Loyalist Township – Minimum Distance Separation (MDS I & 2), 2014.
- Rivera Fine Homes, Caledon – Minimum Distance Separation (MDS I), 2014.
- Town of Milton PanAm Velodrome – Minimum Distance Separation (MDS) 2012 – 2013.

Soil Surveys/Soil Evaluations

- Soil Survey and Canada Land Inventory Evaluation, Glen Morris Pit, Lafarge Canada, On-going.
- Soil Survey and Canada Land Inventory Evaluation, Brantford Pit Extension, Lafarge Canada, On-going,
- Soil Survey and Canada Land Inventory Evaluation, Pinkney Pit Extension, Lafarge Canada, May 2018,
- Soil evaluation and opinion, King-Vaughan Road, March 2018,
- Soil Sampling, Upper Medway Watershed, Agriculture and Agri-Food Canada. December 2017 – On-going.



- Soil Survey and Canada Land Inventory Evaluation, Hillsburgh Pit Extension, SBM St Marys, December 2017.
- Soil Survey and Canada Land Inventory Evaluation, Erin South Pit Extension, Halton Crushed Stone, December 2017.
- City of Kitchener, City Wide Urban Soil Assessments, 2016 – On-going.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT) Program Study, 2016.
 - Bruce County (15 sites)
 - Grey County (4 sites)
- Soil Survey and Canada Land Inventory Evaluation, Wasaga Beach area, County of Simcoe, 2016.
- Soil Survey and Canada Land Inventory Evaluation Study, MHBC Bradford, Simcoe County, 2016.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), Carbon Foot Print Offsetters, Durham Region, 2015.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), Abundant Solar Energy (12 Sites – Peterborough, Madoc, Havelock, Belleville), 2015.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), City of Hamilton, 2015.
- Soil Survey and Canada Land Inventory Evaluation, Official Plan Amendment, Township of Essa, County of Simcoe, 2014.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), Stonescape, Buckhorn, 2013.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), Hatch Engineering, 2013.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), Stantec, 2013.
 - Thunder Bay – 3 Sites.
- Soil Survey and Canada Land Inventory Evaluation, Waterford Sand And Gravel Quarry, 2013.
- City of Kitchener, City Wide Urban Soils Evaluations, 2012 – 2013.
- City of Kitchener, Urban Soils Evaluations in Natural Areas and City Boulevards, 2010 – 2011.

Land Evaluation and Area Review Studies (LEAR)

- Land Evaluation and Area Review – Soils Component, in Association with AgPlan Ltd, Kanata/Munster. December 2017 – On-going.
- Land Evaluation and Area Review – Soils Component, Prince Edward County, 2016 – 2017.
- Land Evaluation and Area Review – Soils Component, Peel Region, 2013 - 2014.
- Land Evaluation and Area Review, Minto Communities, Ottawa, 2012 – 2013.
- GIS and LE component of Land Evaluation and Area Review, York Region 2008 – 2009.
- Land Evaluation and Area Review, Mattamy Homes, City of Ottawa – Orleans, 2008 – 2009.
- GIS for Manitoba Environmental Goods and Services (EG&S) Study. 2007 – 2008.
- GIS and LE component of Land Evaluation and Area Review, Halton Region 2007 - 2008.
- GIS and LE component of Land Evaluation and Area Review, City of Hamilton, 2003 – 2005.
- Evaluation of Soil Resources - Land Evaluation and Area Review, City of Sudbury, 2003 - 2004.

Expert Witness

- Town of Mono Council Meeting, Greenwood Aggregates Violet Hill Pit, January 2018.
- Ontario Municipal Board (OMB) Hearing, Burl's Creek Event Grounds, Simcoe County, 2015 – 2016.
- Ontario Municipal Board (OMB) Hearing, Town of Woolwich, Gravel Pit, 2012 – 2013.
- Ontario Municipal Board (OMB) Hearing, Mattamy Homes – City of Ottawa, 2011 – 2012.
- Ontario Municipal Board (OMB) Hearing, Town of Colgan, Simcoe County, 2010.
- Presentation to Planning Staff on behalf of Mr. MacLaren, City of Ottawa, 2005.
- Ontario Municipal Board (OMB) Hearing, Flamborough Severance, 2002.
- Preparation for an Ontario Municipal Board Hearing, Flamborough Golf Course, 2001.
- Ontario Municipal Board (OMB) Hearing, Stratford RV Resort and Campground – Wetland Delineation Assessment, 2000.
- Ontario Municipal Board (OMB) Hearing, Watcha Farms, Grey County, Agricultural Impact Assessment – Land



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Use Zoning Change, 1999-2000.

- Ontario Municipal Board (OMB) Hearing, Town of St. Vincent Agricultural Impact Assessment – Land Use Zoning Change, 1999 – 2000.
- Halton Agricultural Advisory Committee (HAAC), Halton Joint Venture Golf Course Proposal - Agricultural Impact Assessment for Zoning Change, 1999-2000
- Halton Agricultural Advisory Committee (HAAC), Sixteen Mile Creek Golf Course Proposal – Agricultural Impact Assessment for Zoning Change, 1999.
- Ontario Municipal Board (OMB) Hearing, Town of Flamborough, Environs Agricultural Impact Assessment for Zoning Change – Golf Course Proposal, 1999.
- Ontario Municipal Board (OMB) Hearing, Stratford RV Resort and Campground – Agricultural Impact Assessment, 1998.

Monitoring Studies

- CAEPLA – Union Gas 36” Gas Pipeline Construction Monitoring and Post Construction Clean Up – Agricultural Monitoring 2017 – On-going.
- CAEPLA – Union Gas 36” Gas Pipeline Construction Clearing – Agricultural Monitoring, 2017 (Feb-March).
- City of Kitchener, Soil Sampling and data set analysis, 2017 – On-going.
- GAPLO – Union Gas 48” Gas Pipeline Construction Soil and Agricultural Monitoring, 2016 – 2017.
- GAPLO – Union Gas 48” Gas Pipeline (Hamilton –Milton) Clearing – Agricultural Monitoring, 2016.
- City of Kitchener, Soil Sampling and Laboratory Analysis, Urban Silviculture, 2009 – 2012.
- Soils Resource Group Inc. – City of London Water Supply Aqueduct soil monitoring program, 2011.

Publications

D.E. Stephenson and D.B. Hodgson, 1996. Root Zone Moisture Gradients Adjacent to a Cedar Swamp in Southern Ontario. In Malamoottil, G., B.G. Warner and E.A. McBean., *Wetlands Environmental Gradients, Boundaries, and Buffers*, Wetlands Research Centre, University of Waterloo. Pp. 298.