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AGRICULTURAL IMPACT ASSESSMENT

PROPOSED EDWORTHY WEST PIT

Part of Lots 16, 17, and 18, Concession 9

Town of North Dumfries, Region of Waterloo

Dat

January 2023

Prepared for:
Cambridge Aggregates

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1.0
INTRODUCTION

MacNaughton Hermsen Britton Clarkson Planning Ltd. has been retained by Cambridge Aggregates to complete an Agricultural Impact Assessment (AIA) for a proposed aggregate operation on lands legally described as Part of Lots 16, 17, and 18, Concession 9, Township of North Dumfries, Regional Municipality of Waterloo (the 'subject lands'). The subject lands are located between Spragues Road on the east, Shouldice Side Road to the west, and Greenfield Road to the south (Figure 1). The proposed operation is an expansion of the existing Main Pit located at 1182 Alps Road.

The proposed license area is 44.3 hectares (109.5 acres), with a proposed extraction area of 35.2 hectares (87 acres). The proposed licensed area contains primarily agricultural lands. There are no buildings (agricultural or otherwise) located within the licensed area or limit of extraction. Surrounding lands include rural residential lots, agricultural uses, rural industrial uses and an active aggregate operation (Al's Stone Service).

The proposed operation will be extracted in 3 phases, starting in the centre of the subject lands towards the West for phase 2, then proceeding to the East portion of the lands for phase 3.

Cambridge Aggregates is filing an application with the Ministry of Northern Development, Natural Resources and Forestry (MNDNRF) for a Class A License (Pit above water) under the *Aggregate Resources Act* (ARA), and a Township Zoning By-Law amendment in order to permit aggregate extraction on the site.

The lands are located within the Growth Plan for the Greater Golden Horseshoe (Growth Plan) plan area. The Growth Plan requires an AIA for new aggregate operations located within Prime Agricultural Areas (4.2.8.3):

> *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 subject lands are designated Prime Agricultural by the Region of Waterloo and the Province, therefore, this report is required to satisfy the criteria for an AIA as per the requirements of the Growth Plan, and policies within the Township's Official Plan.

This report has been prepared to be consistent with the Province's *Draft Agricultural Impact Assessment Guidelines* released in 2018 by the Ministry of Agriculture, Food and Rural Affairs (OMAFRA).

1.1 Data Collection and Review

In preparing this report, the following background materials at the provincial, upper tier and municipal levels were reviewed:

- Provincial Policy Statement (2020)
- The Growth plan for the Greater Golden Horseshoe (2020 Consolidation)
- Region of Waterloo Official Plan (2015)
- Township of North Dumfries Official Plan (2018 Consolidation)
- Township of North Dumfries Zoning By-Law 689-83

In addition, a number of technical reports were completed in support of the application. Below is a list of reports that were also reviewed as part of the preparation of this Agricultural Impact Assessment:

- Water Report (Level 1/2) prepared by Golder Associates Ltd.
- Traffic Study prepared by Paradigm Transportation Solutions Ltd.
- Air Quality Assessment prepared by RWDI AIR Inc.
- Archeological Assessment prepared by AMICK Consultants Ltd.
- Soil Survey and Canada Land Inventory Classification prepared by DBH Soil Services Inc. (included in Appendix A)
- Natural Environment (Level 1/2) prepared by Goodban Ecological Consulting Inc.
- Noise Report completed by Aercoustics
- Planning report and ARA Summary Statement prepared by MHBC Planning Ltd.

The following materials were also reviewed to support the completion of this AIA.

- ARA Site Plans, including Existing Features Plan, Operational Plan, and Rehabilitation Plan
- Soil data resource information, which includes Ontario Soil Survey reports and mapping, the provincial digital soil resource database, the Canada Land Inventory Agricultural Capability Mapping, soil suitability information and mapping, and information from on site investigations
- Aerial photography (historic and recent with effective user scale of 1:10,000 or smaller)
- Agricultural Statistics (Statistics Canada, Census of Agriculture 2011 & 2016)
- OMAFRA's constructed and agricultural Artificial Drainage Mapping (OMAFRA Agricultural Information Atlas)
- Agricultural Systems data from OMAFRA's Agricultural Systems Portal, including Agricultural Asset Mapping completed by ConnectON
- Parcel mapping/fabric of the area

A land use survey was also conducted in November of 2020 and December 2021, with additional information gathered from Google Satellite Imagery used to gain a better understanding of those parcels that were not visible from the road and areas not accessible during the survey. A summary of the land use survey is included in section 2.0 of this report.

1.2 Description of Proposal

The proposed aggregate operation is to be located on Part of Lots16, 17, and 18, Concession 9 in the Township of North Dumfries, Regional Municipality of Waterloo. The lands are bounded by Greenfield Road to the south, Spragues Road to the east, and Shouldice Side Road to the west. The subject lands are approximately 1.7 kilometers from the Cambridge settlement boundary (see **Figure 1**). The proposed pit will be accessed via a new entrance along Spragues Road.

Aggregate materials from the proposed Edworthy West Pit will be extracted and hauled from the subject lands to the existing Main Pit via Spragues Road. Material will then be processed, stockpiled, blended and shipped from the Main Pit via the existing haul route along Cedar Creek Road.

The proposed pit is surrounded by varying land uses. The property is surrounded by agricultural uses to the north and east, industrial uses to the east (mineral aggregate operation) and south (Township Roads Department yard), and residential uses north of the eastern portion of the subject lands. The total proposed area to be licensed is 45.6 hectares (109.5 acres), with a limit of extraction totaling 35.2 hectares (87 acres). Of the total licensed area, 20.1 hectares (49.7 acres) is Class 1 soil, 18.7 hectares (46.2 acres) is Class 2, and 2.2 hectares (5.4 acres) is Class 3 soils (DBH Soil Survey, 2021), for a total of 89.8 percent (41 ha) of the lands being considered Prime Agricultural lands (Class 1-3). The lands are currently in active agricultural production. On the west portion of the subject lands, several parcels are separated by hedgerows. The eastern portion of the subject lands contains two parcels which are generally intact.

There is a natural feature (woodland) that is located on the southern portion of the subject lands. This feature is not located within the proposed license area or the limit of extraction, and thus will not be disturbed.

The proposed pit will be an above water pit. As such, it will be rehabilitated back to an agricultural condition in accordance with provincial and municipal policy.

1.3 State of Rehabilitation at Existing Operation

The existing Edworthy North Pit is currently being progressively rehabilitated back to an agricultural condition as per the approved ARA Site Plans (rehabilitation plan). The current operation is being extracted in sequential phases. Topsoil and subsoil stripped from the active phase of the operation is used where possible in the rehabilitation of the pit floor in the rehabilitated phases of the operation.

It is anticipated that Edworthy North will be rehabilitated prior to the opening of Edworthy West, as the excavation is currently reaching its final phases. It is anticipated that this will be rehabilitated in a few years.

A total of about 12.5 ha of the 54ha area of pit floor area has been progressively rehabilitated back to an Agricultural Condition and is currently producing cash crops. The farmer who owns and farms the land has been closely involved in the rehabilitation process and was able to produce cash crops in the first year that progressive rehabilitation was completed.

Figure 1
Context Plan

West Edworthy Pit

Part of Lots 16, 17, and 18, Concession 9
(former geographic Township of Dumfries)
Township of North Dumfries
Regional Municipality of Waterloo

Legend

- Limit of Extraction
- Potential Licence Boundary
- Primary Study Area (120m)
- Parcels

Agriculture
Agriculture
Agriculture
Forested Area
Open Space
Mineral Aggregates Pit
Agriculture
Agriculture
Agriculture
SHOULDICE SIDEROAD
SPRAGUES ROAD
GREENFIELD ROAD
Cambridge, Maxar

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Additionally, agricultural areas located outside of the limit of extraction but within the licensed area were able to be graded to improve the slopes for agricultural production, improving the existing agricultural operation for the farmer onsite.

1.4 Purpose of the Study

The purpose of this AIA is to evaluate potential impacts on agriculture from the proposed aggregate extraction operation and to identify mitigation measures to minimize or eliminate these impacts to the extent feasible. This report also serves as a baseline pre-extraction documentation of the site's agricultural capability (soils) and condition. As such, a soil survey and Canada Land Inventory (CLI) was completed by DBH Soil services to document existing soil conditions and provide a detailed CLI analysis of the site. This will provide information for post extraction rehabilitation back to an agricultural condition of similar capabilities.

This report also serves to document surrounding agricultural uses and assess any impacts that the proposed aggregate operation may have on the broader agricultural system. This report will identify the extent of mitigation required to minimize impacts to the agricultural system.

2.0
STUDY AREA

The agricultural land use assessment completed as part of this AIA is based on a study area comprised of a 'Primary Study Area' and 'Secondary Study Area'. The primary study area consists of the subject lands and lands immediately adjacent to the subject lands that have the potential to be directly impacted by the aggregate extraction operation. The primary study area encompasses a radius of approximately 120 metres from the subject lands.

The secondary study area includes the potential area that may be affected by indirect impacts of the proposed operation and can range depending on the size of the proposed aggregate operation. For this assessment, a 1.5 kilometre radius from the subject lands was used. This is in accordance with the Province's Draft Agricultural Impact Assessment Guidelines as a conservative approach. An Agricultural Land Use Survey was conducted which identified adjacent properties, existing crops and existing barns within the study areas, and is included as **Figure 2** in this report. The inventory of existing agricultural uses is based on observations made during a site visit completed in November of 2020 and updated on December of 2021.

2.1 Primary Study Area

The Primary Study Area consists of the subject lands, which is comprised of 3 separate parcels owned by 3 different agricultural operations. The lands consist primarily of hay and forage crops, with some cash cropping in the centre parcel. Cambridge Aggregates has a lease agreement with the owners of the parcels and does not own the subject lands. There are no structures located on the subject lands.

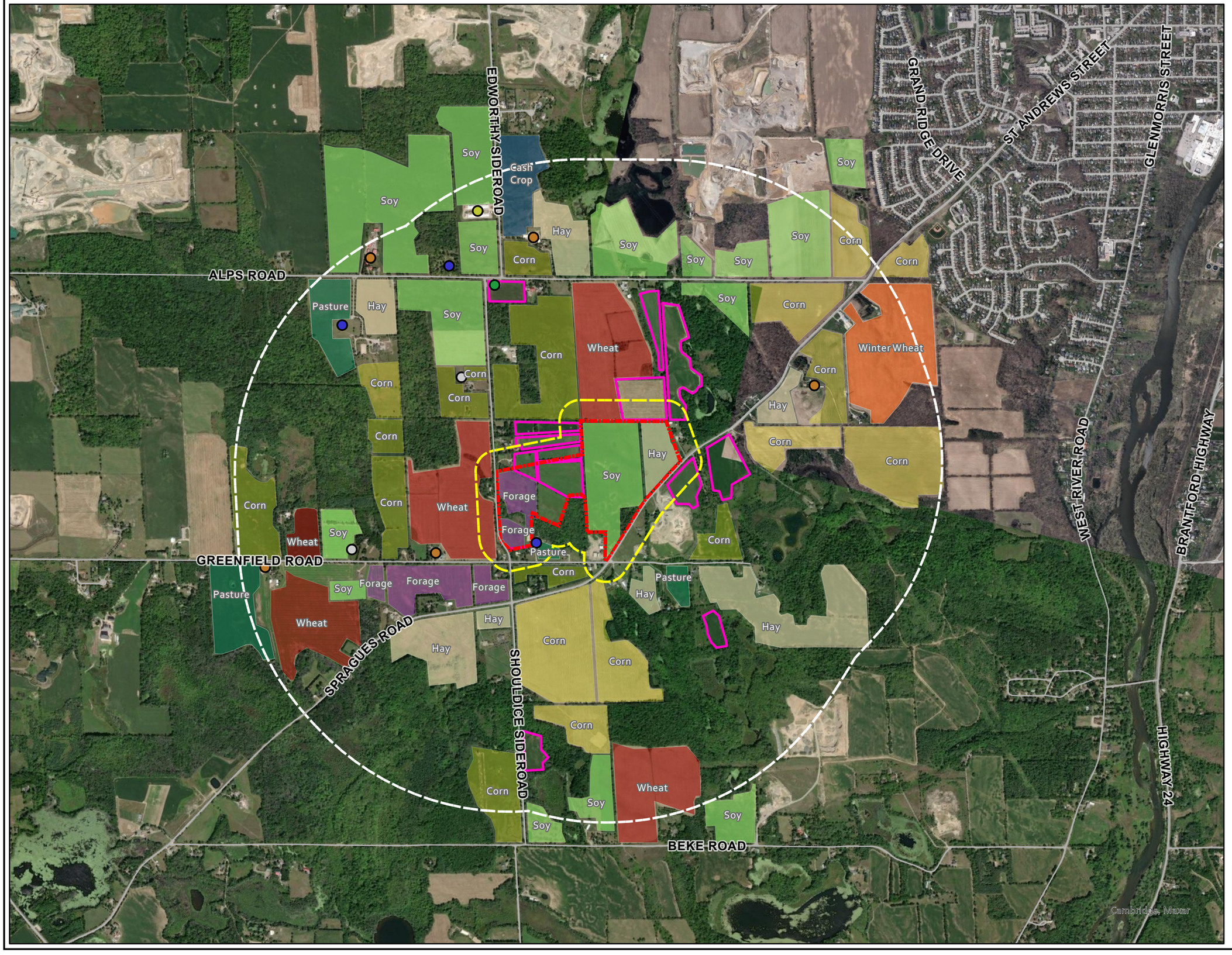
There is a range of land uses located within 120 metres of the subject lands, within the Primary Study Area. These uses include rural residential lots located to the northwest, agricultural uses (cash cropping) to the north, and industrial/employment use to the south (Township Public Works Yard). To the southeast is a mineral aggregate operation belonging to Al's Stone Service.

There is one bank barn located at 1262 Greenfield Road in the south side of the Primary Study Area (Image 1). The barn houses horses, and appeared to be a hobby operation. A fenced pasture was identified and enclosed by post and rail fencing near the frontage of the property. The property also contains a driveshed which is located near the rear of the operation. The barn and driveshed are located outside of the proposed license area and limit of extraction.

Figure 2
Agricultural Land Uses

West Edworthy Pit

Part of Lots 16, 17, and 18, Concession 9
(former geographic Township of Dumfries)
Township of North Dumfries
Regional Municipality of Waterloo



Legend

- Potential Licence Boundary
- Primary Study Area (120m)
- Secondary Study Area (1.5km)

Barn Use

- Grain Elevator
- Livestock (Dairy/Cattle)
- Poultry
- Equestrian
- No Livestock

Agricultural Land Use

- Cash Crop
- Corn
- Forage
- Hay
- Soy
- Wheat
- Winter Wheat
- Pasture
- Unknown

NOTES:

- Land use information based on Field Visit (October 2021)
- World Imagery: Cambridge, Maxar

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Image 1: 1262 Greenfield Road Equestrian Barn (via Google)

2.2 Secondary Study Area

The Secondary Study Area consists of lands within the 1.5 kilometre radius of the subject lands. There are a number of agricultural operations in the Secondary Study Area, which include cash cropping operations, as well as livestock facilities. These are described below.

Overall, the secondary study area can be characterized as primarily consisting of agricultural uses in the form of cash cropping operations. Crops observed in the Secondary Study Area consist of corn, soybean, wheat, forage crops such as hay and pasture. The lands contain several rural residential lots, primarily located along Greenfield Road and Spragues Road in the South. Cambridge Aggregates' North Dumfries Pit is also located within the Secondary Study Area to the North of Alps Road.

The following descriptions of agricultural uses (barns) is broken down by the types of livestock operation which was identified. The following types of livestock operations were identified in the secondary study area: Equestrian, Livestock (Dairy/Cattle), Poultry, and barns which were not feasible for future livestock use. In total, 10 barns were identified in the Secondary Study Area. No other supporting agricultural industries or operations were identified within the Secondary Study Area.

Livestock (Dairy/Cattle)

There were 5 livestock barns identified within the Secondary Study Area, two of which were located along Greenfield Road, the others on Alps Road, Edworthy Side Road, and Spragues Road.

The westernmost barn (approx. 1.5 km) located at 1547 Greenfield Road (Image 2) did not appear to be housing any livestock at the time of the site visit, but is in a condition to potentially house livestock. An empty manure storage pad as well as a wrapped large hay bails were observed. The

operation also had a long pasture along the west uncropped portion of the property. This pasture had fencing which appeared to be kept in good condition for livestock.

Image 2: 1547 Greenfield Road Livestock Barn

The second livestock barn located at 1358 Greenfield Road is to the east of the previous operation, and is approximately 490 metres from the subject lands (Image 3). The barn was also not identified as containing livestock at the time of the site visit, but had appeared to have the potential to in the future. Two drivesheds were observed at the rear of the property. A manure storage pad was identified via Google Satellite, however, there was no identification of pasture lands or fencing associated with the barn, further indicating the unlikelihood of its current use for livestock. The remainder of the property is cash cropped (wheat).

Image 3: 1358 Greenfield Road Livestock Barn via Google

The third livestock barn was identified at 1558 Alps Road to the North in the Secondary Study Area (Image 4). There was no livestock observed, however, the barn appeared to be in good condition to be capable of housing livestock. There was associated fencing along Alps Road, however, no pasture, grain silos or manure storage were observed. The lands surrounding the Barn and Drivesheds are currently cropped (soy). The lands surrounding this operation to the north, east, and west are already licensed under the Aggregate Resources Act for a pit by Dufferin Aggregates (CRH Canada).

Image 4: Alps Road Livestock Barn

The fourth barn located along Edworthy Side Road/Alps Road (1366 Alps Road) did not appear to house livestock, however, it appeared to be in a condition capable of future livestock use (Image 5). The barn is located approximately 1.1 km North from the Subject Lands. Clear identification of the agricultural infrastructure associated with the barn was blocked from view, however, air

Image 5: 1366 Alps Road Livestock Barn

photography confirms that the barn has associated pasture lands with what appears to be fencing. Two silos were also identified.

The fifth livestock barn is located at 1195 Sprague Road, approximately 865 metres east of the Subject Lands (Image 6). View of the barn from the roadside was limited, however, two silos were observed. A manure pad is also identifiable via air photography. Post and wire fencing was also identified on lands surrounding the barn.

Image 6: 1195 Spragues Road Livestock Barn

Equestrian

Two equestrian barns were identified within the Secondary Study Area. Both facilities are located along Alps Road, Northwest of the subject lands. The westernmost equestrian facility, Stone Fox Farms, is located at 1589 Alps road (approximately 1.02 KM from the Subject Lands – Images 7 & 8).

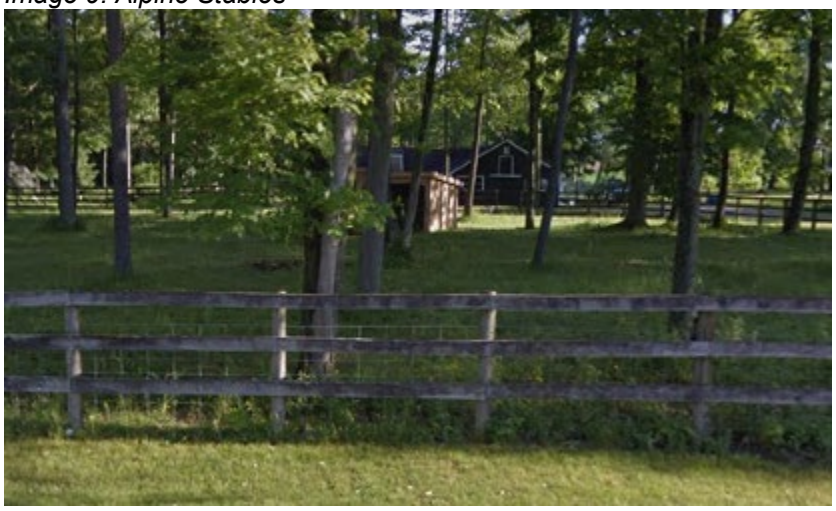
Image 7: 1589 Alps Road Stone Fox Farms Entry

The property is primarily comprised of pasturelands, a riding ring, and large stable. Additional storage facilities were identified via air photo.

Image 8: 1589 Alps Road Stone Fox Farms Overhead

The Second facility, located at 1488 Alps Road to the West of Stone Fox Farms, is Alpine Stables (Image 9). Alpine Stables is a smaller facility (comparatively), and appeared to be more of a hobby operation due to the size of the barn and pasture, which is located near the front of the property (treed) and included a lean-to. Fencing around the pasture appeared in good condition.

Image 9: Alpine Stables



Poultry

One poultry operation was observed in the North portion of the Secondary Study Area, at 1083 Edworthy Sideroad, approximately 1.3 km from the Subject Lands (Image 10). The operation includes two, one floor barns with outdoor manure storage at the rear. A storage/driveshed was identified near the front of the property. The remainder of the lands on the parcel were cash cropped (soy).

Image 10: Edworthy Side Road Poultry Barn

Not Capable of Housing Livestock

Two barns were identified as not being able to house livestock due to their age or condition. One, a small bank barn located along Greenfield road, appeared to be used for storage (Image 11). The second was located along Shouldice Side Road (Image 12) which also appeared to be used for storage. Neither barn had livestock identified, nor did they appear capable to house livestock due to the appearance of the structure and its condition, and their use for storage. Additionally, the barn located on Greenfield road did not appear to have adequate fencing for pasturing animals, and the Shouldice Side Road Barn was not identified to have any fencing or pastureland at all.

Image 11: Greenfield Road Bank Barn (Via Google)

Image 12: Shouldice Side Road Barn

Finally, of note, there was one identified Grain Elevator located at the corner of Shouldice Side Road and Alps road in the North portion of the Secondary Study Area. This Grain Elevator is a representation of investment in agricultural infrastructure in the area. Few other investments in agricultural land and infrastructure or buildings were identified, except for some agricultural tile drainage in the Secondary Study Area (**Figure 3**).

Figure 3
Tile Drainage Area

West Edworthy Pit

Part of Lots 16, 17, and 18, Concession 9
(former geographic Township of Dumfries)
Township of North Dumfries
Regional Municipality of Waterloo

Legend

- Potential Licence Boundary
- Tile Drainage Area

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3.0

FIELD COLLECTION DATA

3.1 Soil and CLI Capability

The Canada Land Inventory (CLI) system uses soil attributes to create a class system for soil capability ranging from 1, the most capable of sustained common field crop production, to 7, not capable for use of arable culture or permanent pasture. Classes 1, 2, and 3 soils are considered to be capable of sustained common field crop production. Class 4 soils are limited for sustained agriculture, while Class 5 is capable for permanent hay or pasture. Class 6 soils are best utilized for wild pasture. Soil Classes 1-3 are considered "Prime Agricultural Land" under the Provincial Policy Statement (2020).

Canada Land Inventory Soils Mapping produced by the Province indicates that the Edworthy West subject lands contain primarily Class 1 and 4 soils (see **Figure 4**).

A Soil Survey and Canada Land Inventory Classification assessment was completed by DBH Soil Services Inc. to confirm the CLI classification and soil type. According to the survey, the proposed Edworthy West pit lands are comprised primarily of Classes 1, 2, and 3 soils. A small portion of the lands were described as potholes, and thus not given a rating. This was due to the extremely eroded shoulder areas of the slope compared to depositional areas in the bottom of the hole.

The soil survey included a number of tasks, including:

- Completion of a review of published soil information (*Soils of Waterloo County. Report No. 44 of the Ontario Soil Survey,* Presant & Wicklund 1971).
- Review of Published CLI ratings for soils in the area and surrounding the subject lands
- Review of aerial photography and interpretation of soil polygons, disturbed areas and other landforms
- On-Site Soil Survey (June 13, 2020)
- Mapping to illustrate the location of the subject lands and the occurance of soil polygons

A total of 22 inspection sites were examined on the subject lands. Soil inspection information was correlated with soil descriptions in *The Soils of Waterloo County* and the OMAFRA digital soils data to produce the soils map, which is shown in **Figure 5**.

The following table outlines the percent occurrence of each capability class for the subject lands.

Table 1 – Canada Land Inventory – Phase 1 Lands (Noted as Part 1 in DBH report)

ALPS ROAD

SHOULDICE SIDEROAD

SPRAGUES ROAD

GREENFIELD ROAD

Figure 4
Canada Land Inventory (CLI1)

West Edworthy Pit

Part of Lots 16, 17, and 18, Concession 9
(former geographic Township of Dumfries)
Township of North Dumfries
Regional Municipality of Waterloo

Legend

- Limit of Extraction
- Potential Licence Boundary

Canada Land Inventory (CLI1)

- Class 1
- Class 2
- Class 3
- Class 4
- Class 5
- Organic Soils

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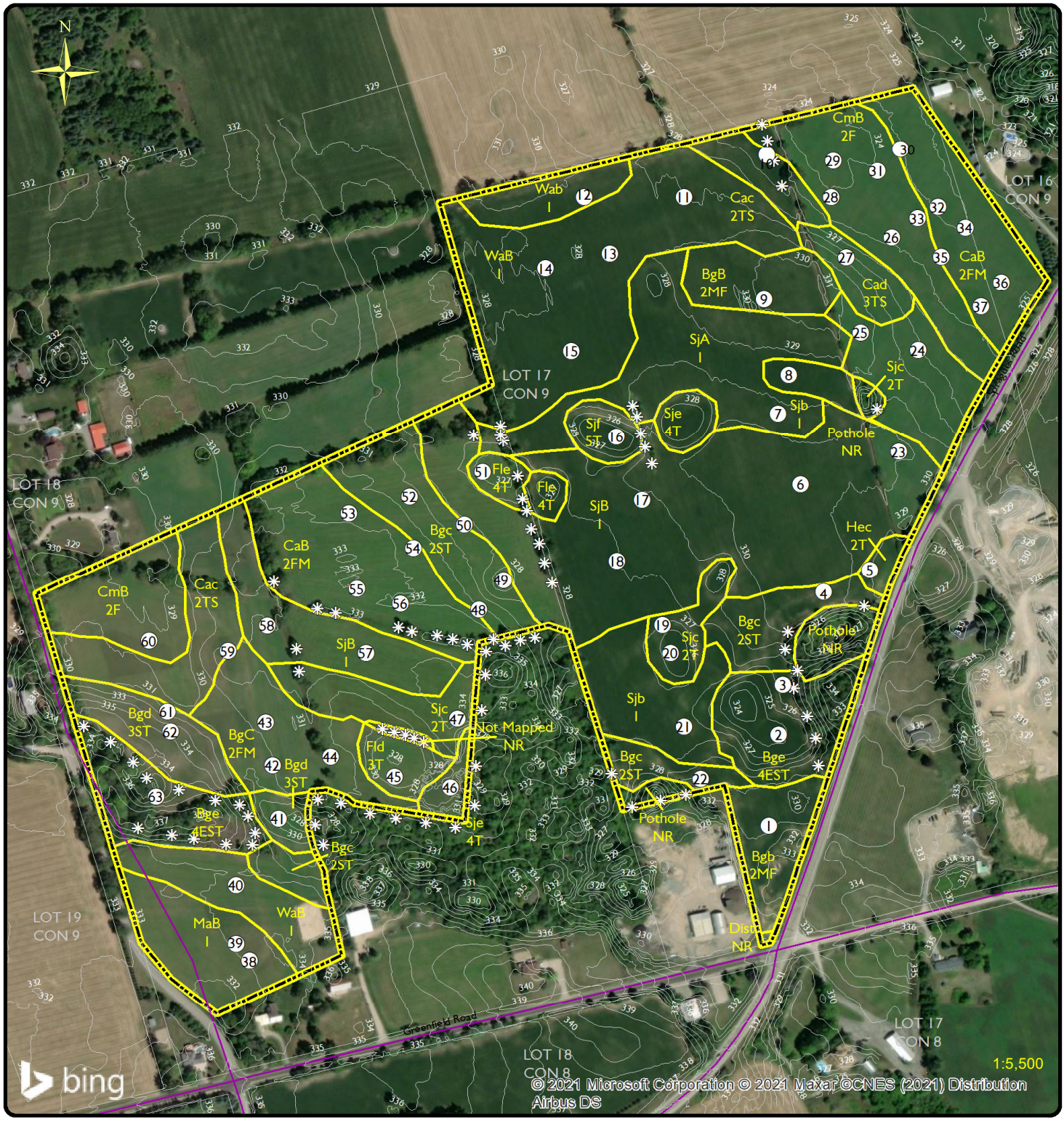
Figure 5



Legend

- Soil Inspection Site
- Stone Pile
- Contour Line (MHBC)
- Roads (MNRF)
- Lot Lines (MNRF)
- Soil Polygon Boundary
- Potential License Boundary (45.6 ha)

Soil Code

Bg - Burford gravelly loam
Ca - Caledon sandy loam
Cm - Camilla sandy loam
Fl - Floradale loam
He - Heidelberg fine sandy loam
Ma - Mannheim loam
Sj - St. Jacobs loam
Wa - Waterloo fine sandy loam
Dist = Disturbed Area
Pothole/NR - Not Rated

Soil Code / Slope Code
Bgb
2MF
CLI Class / CLI Subclass

Slope Class

Aa = 0.0 - 0.5%
Bb = 0.5 - 2.0%
Cc = 2.0 - 5.0%
Dd = 5.0 - 9.0%
Ee = 9.0 - 15.0%

Lower case = Slope length < 50 m
Upper case = Slope length > 50 m

CLI Subclass Limitation

E - Erosion
F - Fertility
M - Moisture
S - Adverse Soil Characteristics
T - Topography

Canada Land Inventory (CLI)
Edworthy Pit West

DBH Soil Services Inc.

August 4, 2021

Canada Land Inventory Class (CLI)	Area (ha/acres)	Percent Occurrence (%)
Class 1	20.1	44.2
Class 2	18.7	40.9
Class 3	2.2	4.8
Class 4	3.6	7.8
Class 5	0.4	0.9
Class 6	-	-
Class 7	-	
Not Rated	0.7	1.5
Totals	45.6	100.00

The subject lands are approximately 89.8 percent CLI Class 1-3 soils, according to the DBH Soil Survey. They are predominantly CLI Class 1 (44.2%), and Class 2 (40.9%), with some Class 3 (4.8%) soils. Approximately 7.8% of the lands are class 4 soils. A small portion (0.9%) of the lands are Class 5 soils, while 1.5% of the soils are not rated due to disturbance, as indicated above. The presence of Class 1-3 soils on the subject lands means that they are considered Prime Agricultural Lands.

The Hoffman Productivity Index (HPI) is a tool that is used to relate the productivity of lands to the CLI soil capability. The value is derived from the sum of the percent occurrence of each CLI Soil Class on the subject lands. Based on DBH's findings, the Soil Productivity Rating of the subject lands is 0.84, or Class 2 equivalent. The findings of DBH's Soil Survey confirm that the proposed Edworthy West pit lands are comprised of Prime Agricultural Land, specifically containing 89.8% Class 1, 2, and 3 Soils. The Soil Productivity Rating of 0.84 confirms that the productivity of the subject lands are a Class 2 equivalent.

3.2 Soil Suitability and Microclimate for Specialty Crop Production

The Physiography of Southern Ontario Physiographic Unit Map indicates that the subject lands are located in the Horseshoe Moraine Physiographic Region. The Horseshoe Moraine Physiographic Region is a large horseshoe shaped region that flanks the uplands west of the Niagara cuesta. The subject lands are located in the portion of the moraine that trend west of the Niagara Escarpment with moderately hilly relief. South of Paris the moraines tend to flatten out and finally disappear under the sands of the Regional Municipality of Haldimand-Norfolk.

The subject lands are located within the 2700 - 2900 average accumulated Crop Heat Units area in Ontario (**Figure 6**). 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. Given the typical climactic conditions, there are limited opportunities for growing speciality crops, and therefore, the properties have not been identified as a specialty crop area in the Region of Waterloo Official Plan and do not meet the criteria as identified by the Province.

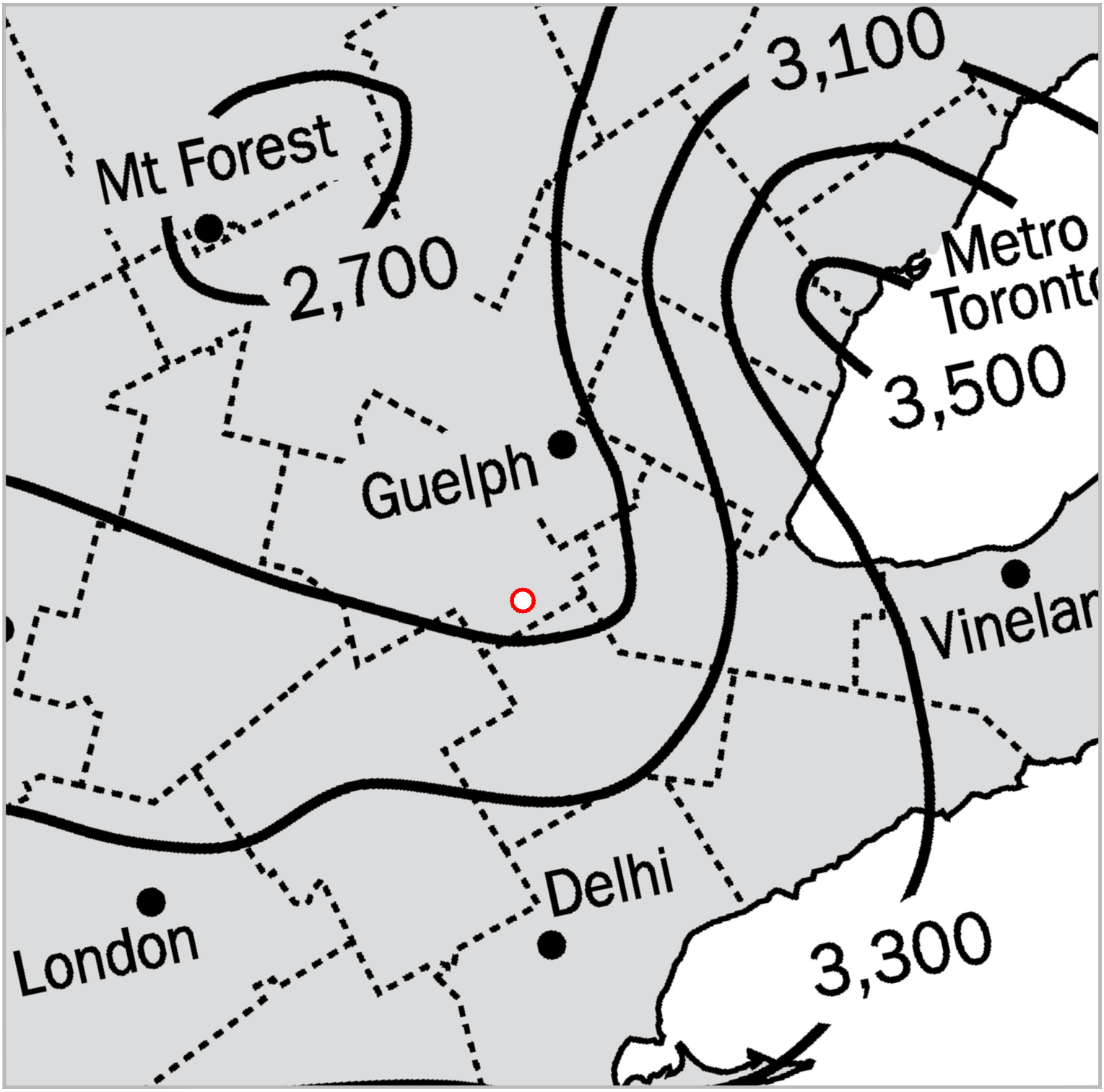


Figure 6
Crop Heat Units

LEGEND

Subject Lands

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West Edworthy Pit
Part of Lots 16, 17, and 18, Concession 9
(former geographic Township of Dumfries)
Township of North Dumfries
Regional Municipality of Waterloo

Source:
Agronomy Guide For Field Crops Publication 811, Ministry of Agriculture, Food and Rural Affairs

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4.0 PLANNING POLICY FRAMEWORK

A number of key documents were reviewed as part of this Agricultural Impact Assessment in order to provide a comprehensive assessment of the policy framework from an agricultural perspective regarding the proposed aggregate extraction operation. The following is review of the land use policy framework related to the subject lands.

4.1 Provincial Policy Statement

The Provincial Policy Statement 2020 (PPS) provides land use planning direction on matters of provincial interest. It establishes the policy foundation for all land use planning decisions within the Province. The PPS provides for appropriate development, while protecting resources of provincial interest, such as agricultural and aggregate resources.

The PPS provides a long-term vision for land use planning in Ontario. It promotes the long term prosperity and social well-being, which depends on sustainable and resilient communities, a clean and healthy environment, and a strong and competitive economy. The vision recognizes the importance of both aggregate and agricultural resources and their contribution to environmental, economic and social benefits. The wise use and management of these resources over the long term is a key provincial interest as indicated in the vision.

The PPS provides a definition of "Prime Agricultural Areas" as the following:

> *"areas where prime agricultural lands predominate. This includes areas of prime agricultural lands and associated Canada Land Inventory Class 4 through 7 lands, and additional areas where there is a local concentration of farms which exhibit characteristics of ongoing agriculture. Prime agricultural areas may be identified by the Ontario Ministry of Agriculture and Food using guidelines developed by the Province as amended from time to time. A prime agricultural area may also be identified through an alternative agricultural land evaluation system approved by the Province."*

This differentiates from Prime Agricultural Lands, which the PPS defines as the following:

> *"means specialty crop areas and/or Canada Land Inventory Class 1, 2, and 3 lands, as amended from time to time, in this order of priority for protection."*

The PPS also provides a definition of Specialty Crop Areas as the following:

> *Means areas designated using guidelines developed by the Province, as amended from time to time. In these areas, specialty crops are predominantly grown such as tender fruits (peaches, cherries, plums), grapes, other fruit crops, vegetable crops, greenhouse crops, and crops from agriculturally developed organic soil, usually resulting from:*
>
> *a) soils that have suitability to produce specialty crops, or lands that are subject to special climatic conditions, or a combination of both;*
> *b) farmers skilled in the production of specialty crops; and*
> *c) a long-term investment of capital in areas such as crops, drainage, infrastructure and related facilities and services to produce, store, or process specialty crops.*

The Edworthy West pit expansion is located on Prime Agricultural Lands in a Prime Agricultural area. The Province has mapped Prime Agricultural Areas through its Agricultural Systems Mapping (**Figure 7**). The proposed Edworthy West Pit is located entirely within the Province's Prime Agricultural Area, but outside of designated specialty crop areas. There were no specialty crops identified within the Secondary Study Area, nor was any significant long-term investment of capital identified for specialty crops. As such, the Edworthy West lands are not considered a specialty crop area, consistent with Provincial Mapping.

Section 2.3 of the PPS provides direction on protecting Prime Agricultural Areas, and provides for the long term protection of the lands for agricultural uses. It directs planning authorities to implement an Agricultural System approach to maintain and enhance the geographic continuity of the agricultural land base (2.3.2).

The PPS recognizes that planning authorities may permit limited non-agricultural uses in Prime Agricultural Areas, which includes the extraction of minerals, petroleum resources, and mineral aggregate resources (2.3.6.1.a), and requires that any impacts from new or expanding non-agricultural uses to be mitigated to the extent feasible (2.3.6.2). This AIA serves to analyze the potential impacts from the proposed Edworthy West Pit and provide recommendations to mitigate these impacts to the extent feasible.

The PPS also outlines policy direction as it relates to mineral aggregate operations. Section 2.5.4 outlines policies pertaining to rehabilitation of mineral aggregate operations in Prime Agricultural Areas. It states that:

> *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;*

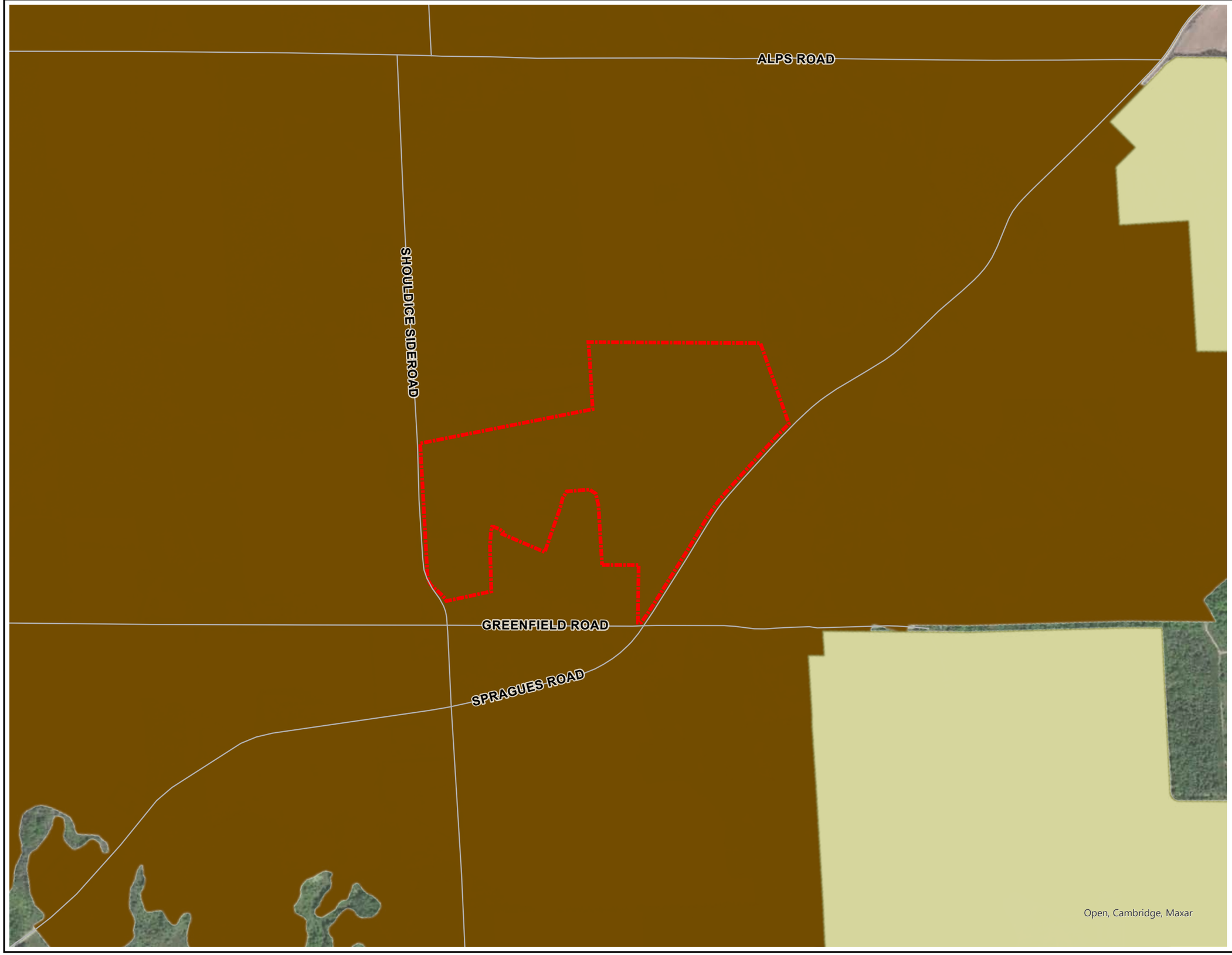

Figure 7
Provincial Agricultural Land Base

West Edworthy Pit

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Regional Municipality of Waterloo

Legend

Potential Licence Boundary

Agricultural Land Base

Prime Agricultural Area

Candidate Area

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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.*

The PPS defines "Agricultural Condition" as the following:

> *b) In regard to prime agricultural land outside of specialty crop areas, a condition in which substantially the same areas and same average soil capability for agriculture are restored.*

Approximately 23.4 hectares of land is proposed to be returned to agricultural production. This is due to the depth of the aggregate resource and the resulting depth of the pit floor requiring significant side slopes to meet legislative requirements. This reduces the final land form area for agricultural production. Additionally, approximately 10 ha of the proposed rehabilitated area is proposed to be used for natural linkages to enhance natural features in the area. The rehabilitated area has been maximized for agricultural production to the extent feasible by reducing slide slopes to 2.1:1 gradient, and backfilling a portion of the site to grade.

4.2 A Place to Grow, Growth Plan for the Greater Golden Horseshoe (2020)

A Place to Grow, Growth Plan for the Greater Golden Horseshoe (2020) (the 'Growth Plan') is the Province's initiative to plan for growth and development in a way that supports economic prosperity, protects the environment, and helps communities achieve a high quality of life. The Growth Plan is issued under Section 7 of the *Places to Grow Act*, 2005. The proposed Edworthy West pit is located within the Growth Plan area (**Figure 8**).

The Growth Plan recognizes the importance of natural resources such as agricultural lands and mineral aggregate resources. Section 4.2.6 provides policy direction on the Agricultural System, and the long-term protection of agricultural resources. Similar to the PPS, it directs that Prime Agricultural Areas, including Specialty Crop Areas, will be identified in accordance with Provincial mapping, and protected for the long-term use for agriculture (4.2.6.1, 4.2.6.2).

The Growth Plan also provides policy direction on managing land-use compatibility between interfacing agricultural uses and non-agricultural uses in Prime Agricultural Areas, and requires that avoidance or mitigation of adverse impacts on the Agricultural System should be incorporated as part of the non-agricultural use (4.2.6.3). This is done through the completion of an AIA.

Section 4.2.8 of the Growth Plan also provides policy direction for mineral aggregate applications within Prime Agricultural Areas. The Plan states the following:

> *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.*

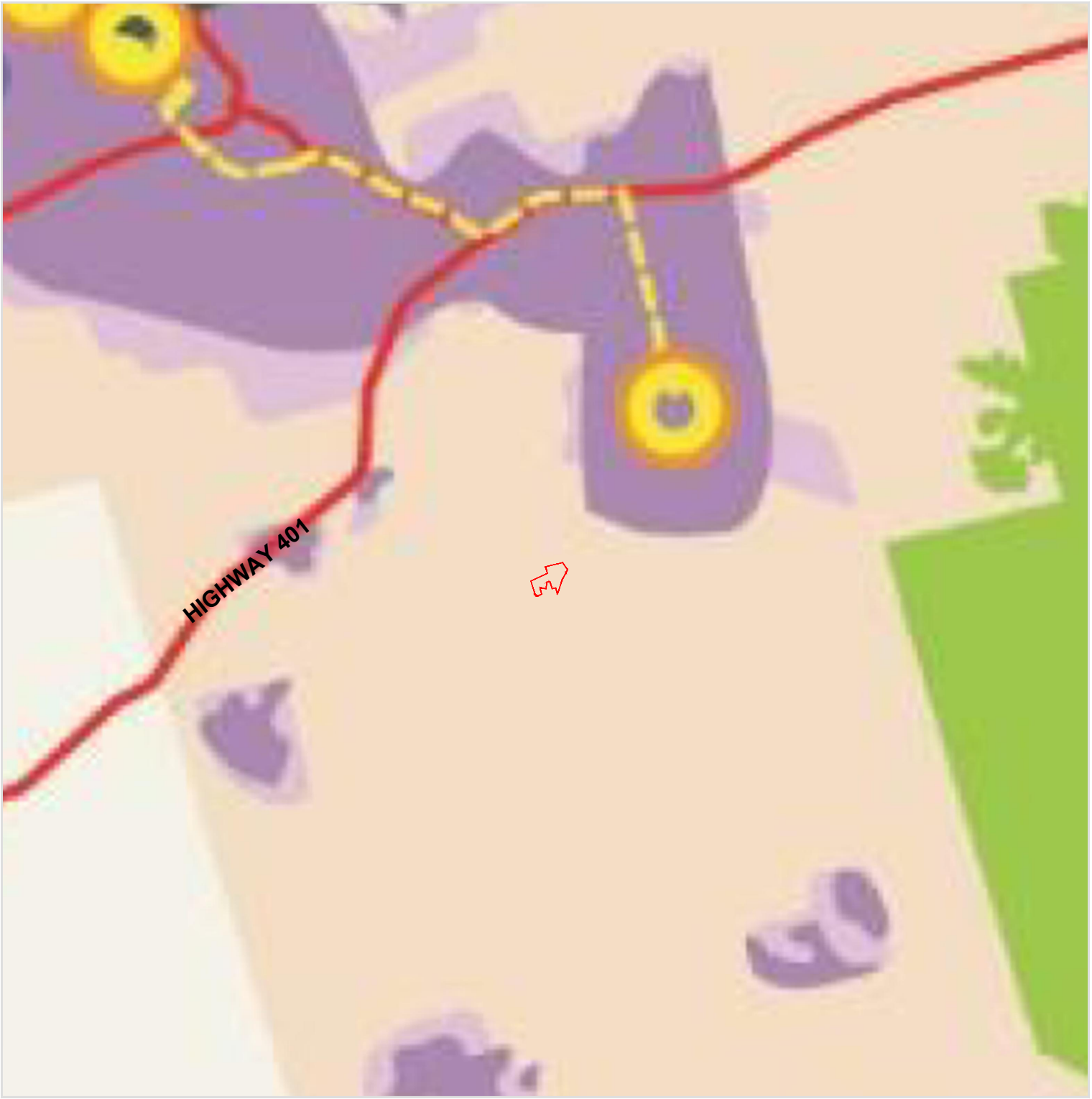

Figure 8
A Place to Grow
Schedule 2:
A Place to Grow Concept

LEGEND

License Boundary

Urban Growth Centres
Existing Major Highways*
Built-Up Area – Conceptual
Designated Greenfield
Greenbelt Area+
Greater Golden Horseshoe Growth Plan Area++

Source: Province of Ontario - A Place to Grow

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Township of North Dumfries
Regional Municipality of Waterloo

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This AIA serves to support the Edworthy West pit expansion application, and assess any potential impacts to the Agricultural system. Impacts and potential mitigation measures are described in Section 5 of this report. Additionally, this AIA serves to provide recommendations on the final rehabilitation of the proposed application back to an agricultural condition, which would serve to maintain the connectivity of the Agricultural System.

4.3 Region of Waterloo Official Plan

The Regional Official Plan (ROP) was approved by the Ministry of Municipal Affairs and Housing (MMAH) with modifications on December 22, 2010, and approved with amendments by the Ontario Municipal Board on June 18, 2015. The current 'in effect' ROP was processed as a municipal comprehensive review and represents the Region's conformity exercise with respect to the 2006 Growth Plan for the Greater Golden Horseshoe. As of the date of this report, the Region was undertaking a Municipal Comprehensive Review process to implement A Place to Growth – Growth Plan (2020) and the Provincial Policy Statement (2020). For the purposes of this report, we have reviewed the proposed development relative to the in effect ROP.

The Region of Waterloo Official Plan (ROP) is the guidance document for directing growth in the Region over the next 20 years. The plan aims to create a sustainable Waterloo Region through the wise use of valuable natural resources for the next generation.

Chapter 6 of the ROP outlines policies regarding the Countryside in the Region. The ROP recognizes the important role that agriculture plays in the regional economy, as well as the other positive social benefits that agriculture provides. The ROP identifies a broad band of agricultural lands and permanently protected natural features, which makes up the "Protected Countryside". The Protected Countryside is intended to protect these valuable areas from urban development to ensure their conservation and use for agriculture, as well as providing appropriate access to natural resources such as mineral aggregate resources.

The Proposed Edworthy West pit is located within the Prime Agricultural designation in the Protected Countryside on Map 7 of the Official Plan (**Figure 9**). Mineral aggregate operations are permitted as an interim use within the Prime Agricultural Area designation, provided they are rehabilitated in accordance with Regional Policy (6.A.7).

Chapter 9 of the ROP provides policy direction for Mineral Aggregate Resources within the Region. Section 9.F outlines rehabilitation requirements for new or expanding mineral aggregate applications. With regards to agriculture, Policy 9.F.1 states:

> *(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.*

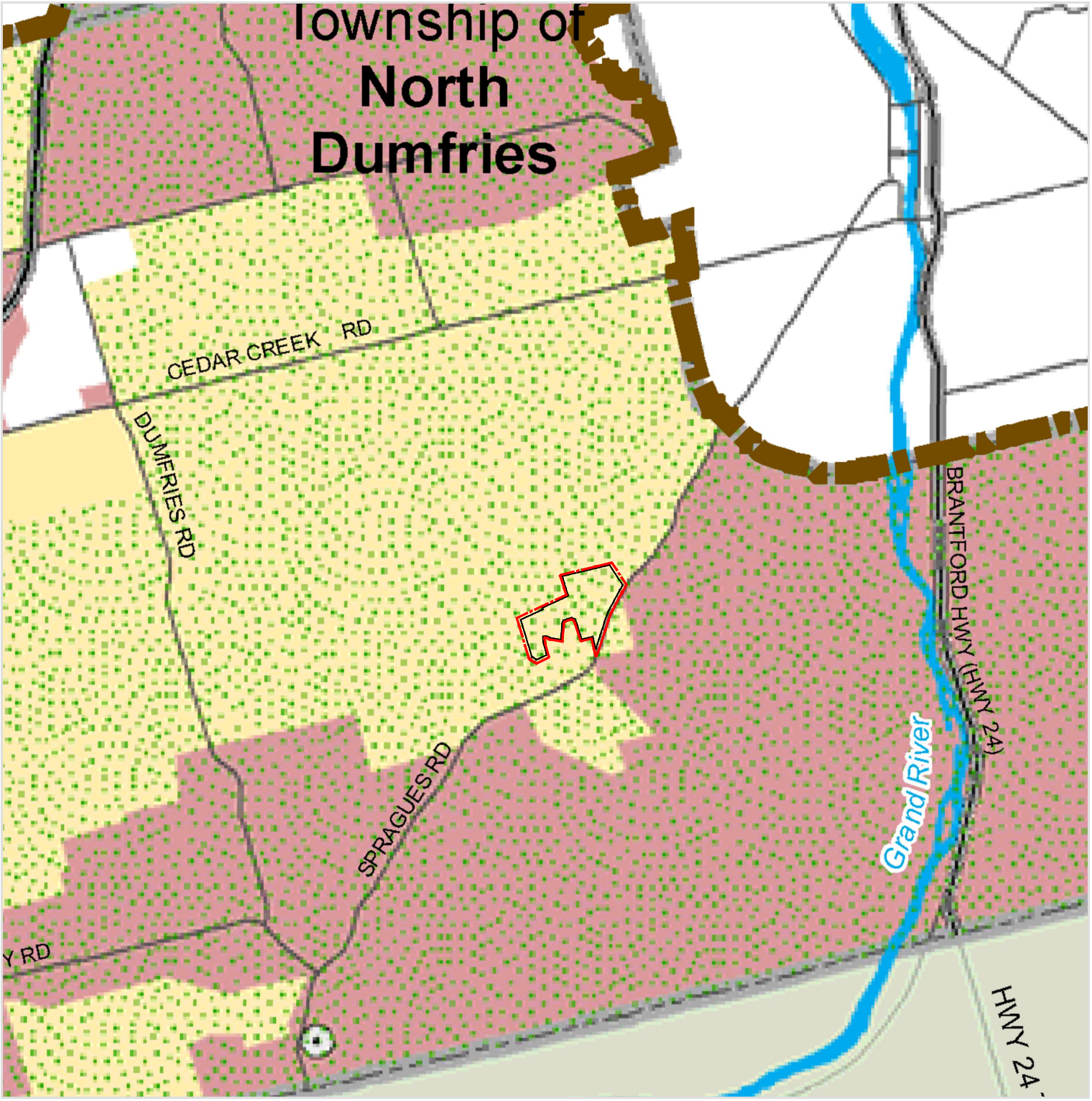

Figure 9
Region of Waterloo
Official Plan (2015):
Map 7 The Countryside

LEGEND

- License Boundary
- Limit of Extraction
- Protected Countryside
- Prime Agricultural Area
- Rural Areas

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West Edworthy Pit
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Township of North Dumfries
Regional Municipality of Waterloo

Source: Region of Waterloo

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The ROP provides additional requirements for agricultural rehabilitation in policy 9.F.2, which states the following:

> *9.F.2 In the Prime Agricultural Area designation, rehabilitation to agriculture will be the first priority. Notwithstanding this, complete agricultural rehabilitation within the Prime Agricultural Area and Rural Areas designations may not be required where:*
>
> *(a) the depth of the planned extraction makes restoration of pre-extraction agricultural capability impractical;*
>
> *(b) hydrogeological investigations completed in accordance with the policies in this Plan have demonstrated to the satisfaction of the Region that agricultural rehabilitation is not desirable due to groundwater protection requirements;*
>
> *(c) the Region, in collaboration with the Province, Area Municipalities and the Grand River Conservation Authority, have determined a suitable alternative post-extractive use in conformity with the policies in this Plan and the Area Municipal official plan; or*
>
> *(d) Aggregate extraction would remove natural features such as woodlands, wetlands and watercourses on lands not otherwise protected by the Greenlands Network policies in this Plan, in which case these natural features will be restored and, where possible, enhanced consistent with the intent of Policy 9.C.11.*

The proposed Edworthy West Pit lands are located within the Prime Agricultural Area designation. As such, they are proposed to be rehabilitated back to an agricultural condition to the greatest extent feasible. The depth of the proposed pit operation requires a significant area of the proposed rehabilitated landform to be used for side sloping, in accordance with legislative requirements. Policy 9.F.2 a) states that if the depth of planned extraction makes restoration of pre-extraction agricultural capability impractical, then complete agricultural rehabilitation may not be required. Additionally, the proposed rehabilitation plan provides a significant amount of natural linkage area in the south west portion of the property to restore and enhance natural features in the area. This also reduces the area for agricultural rehabilitation, in accordance with 9.F.2 d).

Despite these policies, efforts to maximize the agricultural area in the rehabilitation have been made. 2.1:1 side slopes have been provided in the proposed rehabilitation plan to maximize the final agricultural area. Additionally, the southwest corner of the property is proposed to be back-filled to grade in order to maximize final agricultural area. The total area of rehabilitated agricultural lands will be 23.4 hectares (57 acres).

4.4 Township of North Dumfries Official Plan

The Township of North Dumfries Official Plan was adopted by the Township in December 2013, and was approved by the Region of Waterloo in August of 2014. The Township of North Dumfries Official Plan establishes a policy framework to guide public and private sector decisions relating to development and the provision of community infrastructure and services. The Plan sets out the intentions of the Township Council relating to future economic, social, and land use changes within the Township to the year 2031. The Township Official Plan recognizes the contribution that the agricultural industry has within the Township's economy, as well as other community benefits that agriculture provides.

The Township Official Plan must conform to the Region of Waterloo Official Plan. As such, most of the Township policies repeat policies of the ROP. The Subject Lands are designated "Prime Agricultural" and within the Protected Countryside in Map 7 of the Official Plan.

Chapter 5 of the Official Plan outlines policies pertaining to Agricultural Resources in the Township. The Official Plan recognizes that agriculture plays an important role in the Township's economy and provides many other benefits to the community. The Township Official Plan, similar to the ROP, identifies a protected countryside made of agricultural and rural lands and protected natural features.

Chapter 5 of the Township Official Plan also recognizes the importance of its aggregate resources for providing significant material used in the construction of buildings and infrastructure in the region. The Official Plan seeks to provide for the orderly extraction and optimum utilization of mineral aggregate resources within the Township.

Specifically, the Official Plan states the following regarding Mineral Extraction Operations within the Prime Agricultural Area.

> *5.2.3.4 New mineral aggregate extraction within the prime agricultural area and rural areas designation may be permitted as an interim use, subject to the policies of this Plan, provided that agricultural rehabilitation is maximized.*

The proposed Edworthy West Pit is permitted within the Prime Agricultural Area as an interim use as indicated in policy 5.2.3.4. Careful design of the proposed Pits Rehabilitation Plan and side slopes have been done to maximize agricultural rehabilitation.

5.0 ASSESSMENT OF IMPACT

The following section provides an assessment of the potential impacts of the proposed Edworthy West pit on components of the Agricultural System.

5.1 Reduction / Loss of Agricultural Land and Infrastructure

The proposed Edworthy West pit expansion is located on approximately 45.6 hectares (112.7 acres) of Prime Agricultural Land, with an average soil capability of CLI Class 2 soils. Currently, 33.1 hectares (81.7 acres) of the lands are actively farmed within the limit of extraction. The lands are proposed to be rehabilitated back to an agricultural condition. However, due to the depth and amount of material located onsite, the final rehabilitated landform will only result in 23.4 hectares (57.8 acres) being rehabilitated to an agricultural condition, due to the loss of lands from required side sloping and natural linkages. Despite all efforts to maximize the remaining area for agricultural production, including 2.1:1 side slopes and back filling a portion of the site to grade, this will result in the loss of approximately 9.7 hectares (23 acres) of Prime Agricultural Lands.

Despite this loss of Agricultural Land, Region of Waterloo Policy states that agricultural rehabilitation may not be required where the depth of extraction deems it unfeasible. Careful design of the rehabilitation plan has maximized the area to be rehabilitated to the greatest extent possible, in accordance with these policies, and to minimize the reduction of agricultural land.

There are no agricultural buildings being proposed to be removed onsite. Additionally, there was no agricultural tile drainage identified on the subject lands, and thus there is expected to be no impact to agricultural infrastructure as a result of the proposed extraction on the subject lands.

5.2 Fragmentation of Agricultural Lands

Agriculture benefits from being adjacent to other agricultural operations and if lands are fragmented, there is potential to negatively impact farming practices on the isolated farm parcels. The proposed Edworthy West pit on the subject lands will not result in creating isolated agricultural lands as the operation is an interim use and will be returned to agricultural production. Further, agricultural production will continue on the subject lands as a phased approach to extraction is proposed.

The surrounding lands are characterized by agricultural lands, rural residential lots, industrial uses, and mineral aggregate operations. It is evident that some fragmentation of the agricultural land base has already occurred. Despite this, the lands are proposed to be returned to an agricultural condition, and it is not expected that the proposed pit will result in the long term fragmentation of agricultural lands. Additionally, mineral aggregate operations are an established use in the Study Areas.

5.3 Dust Impact

There are a number of typical sources of fugitive dust emissions resulting from mineral aggregate operations including:

- On-site traffic;
- Internal roads, paved and unpaved areas;
- Material stockpiles;
- Loading / unloading areas and loading / unloading techniques;
- Material spills;
- Material conveyance system;
- Crushing and screening equipment; and
- Active pit faces.

The Aggregate Resources Act (ARA) sets provincial standards for dust control in pits and quarries. All new licenses must adhere to the following prescribed conditions as set out in the ARA provincial standards for a Class A pit:

- Dust will be mitigated on site;
- Water or other provincially approved dust suppressants will be applied to internal haul roads and processing areas as often as required to mitigate dust;
- Processing equipment will be equipped with dust suppressing or collecting devices, where the equipment makes dust or is operated within 300 metres of a sensitive receptor; and
- If required, an environmental compliance approval (ECA) will be obtained from the processing equipment to be used on site.

In addition, the Environmental Protection Act (EPA) prohibits the discharge of a contaminant into the natural environment in an amount, concentration or level in excess of that prescribed by regulation. The EPA states:

> *"No person shall discharge into the natural environment any contaminant, and no person responsible for source of contaminant shall permit the discharge into the natural environment of any contaminant from the source of contaminant, in an amount, concentration allowable in access of that prescribed by the regulations."* (Section 6.(1)).

Dust is required to be mitigated on site through the prescribed conditions of the ARA and any applicable ECAs that may be required for any permanent equipment on site.

An Air Quality Assessment was completed by RWDI in 2021 to evaluate the potential impacts of the proposed Edworthy West Pit on air quality. The report outlined recommendations for mitigation measures in the form of on site dust mitigation, water suppressants on internal haul roads, and the implementation of a Dust Management Best Management Practices Plan. With these measures

implemented, the proposed Edworthy West Pit is not predicted to have a significant impact on air quality in the surrounding area and thus on surrounding agricultural operations.

5.4 Hydrogeology

Management of water resources is an important consideration for farm operations, particularly for watering field/ vegetable crops and hydrating livestock. Changes to the hydrologic and/or hydrogeologic conditions in the area surrounding the subject lands could have a negative impact on farm operations and crop yields.

There is no extraction proposed below the water table on this site. The proposed operation does not include de-watering and no other water diversion, storage, or drainage facilities are involved in the pit operations. A Maximum Predicted Water Table report was completed by MTE on December 17, 2021. The report included an impact assessment associated with the proposed pit, and concluded that they did not anticipate any adverse hydrologic impacts to nearby features as a result of the proposed pit. There is no anticipated drawdown of the water table, and there is negligible impacts expected to private wells. The report also included a monitoring program and contingency plan to be implemented throughout the lifespan of the operation.

There are a limited number of livestock operations in the area. Given the conclusions of the Maximum Predicted Water Table report, and the types of crops and livestock in the study area, it is not anticipated that the surrounding agricultural operations will be impacted from a groundwater or surface water resource perspective.

5.5 Traffic

The proposed Edworthy West pit will be accessed via Spragues Road, which is a Regional Road intended for moving high volumes of traffic throughout Waterloo Region, and is already an established haul route for many mineral aggregate operations in the area. Agricultural traffic on these County roads is not anticipated to be high as this type of traffic would generally avoid high volume routes and be directed towards local / Township roads.

As a result, it is not anticipated that the truck traffic on the haul route will significantly conflict with agricultural traffic on Spragues Road. This opinion recognizes that the haul route is a well established route and neighbouring property owners have been accustomed to the truck traffic patterns from existing aggregate operations in the area. Furthermore, given the limited operating hours of the aggregate operations (7:00 am to 5:00 pm Monday to Friday) it is anticipated that any potential impacts / conflicts with agricultural traffic / machinery would be nominal and only concentrated during planting and harvest periods (early spring / late fall).

5.6 Noise Impacts

Noise is an additional potential impact from aggregate operations. A Noise Impact Study has been prepared by Aercoustics and has confirmed that with the appropriate implementation of the

mitigation measures outlined in the report, the sound levels on the site will be in compliance with the Ministry of the Environment, Conservation and Parks (MECP) noise guideline limits.

The Noise Study recommends a number of noise control measures required to be incorporated into the aggregate operation including:

- Compliance of sound emission levels for all pieces of equipment used for construction activities (including site preparation and rehabilitation);
- Limiting on-site construction activities between 7:00 am and 5:00 pm, Monday to Friday; and,
- Construction of perimeter berms as early as possible and as recommended in figures 1-3 of the noise report.

Based on the results of the noise study and the recommended mitigation measures, adverse impacts to surrounding agricultural operations are not anticipated.

5.7 Summary of Net Impacts

The following table is consistent with Table 3 (*Minimize and Mitigate Impacts*) found in section 3.2.2 of the Province's *Draft Agricultural Impact Assessment Guidelines*. The purpose of this table is to provide a summary of how the proposed expansion minimizes or mitigates impacts on surrounding agricultural uses.

Table 2: Summary of Net Impacts

Objective	Mitigation Measure	Description
Minimize the loss of agricultural land	Select areas with less agricultural land and lower priority agricultural lands	The proposed operation is an expansion to an existing, licenced pit (Licence no.). An expansion is preferable to a new aggregate operation as impacts on surrounding agricultural uses are already managed and mitigated by the existing operation (e.g. established haul route, dust and noise management etc.). The lands are primarily comprised of Class 2 soils. A large proportion of the designated primary and secondary sand and gravel resource identified in the Region of Waterloo OP and within the Town of North Dumfries are coincident with

		designated prime agricultural areas. As a result, it would be difficult to locate any new aggregate operations within the Town that would avoid prime agricultural areas.
	Rehabilitate the land	As much of the of the proposed expansion land will be rehabilitated to the same average soil capability as is feasibly possible. Of the 41 hectares of land considered to be prime agricultural land (Class 1 -3 lands), 23.4 hectares are proposed to be rehabilitated to the same average soil capability. Through variations in the proposed side slopes, the proposed pit was carefully designed to maximize the rehabilitated agricultural area to the fullest extent possible.
	Phase Development	Development and rehabilitation will be phased. As agricultural lands are removed for extraction, other phases will be progressively rehabilitated in accordance with ARA site plans.
Minimize the fragmentation of agricultural land	Maintain farm parcels	The proposed expansion will not result in creating isolated agricultural lands, as the lands will be returned to an agricultural condition.
Minimize impacts on farmland and agricultural operations	Minimum Distance Separation	MDS I and II setbacks are not required for mineral aggregate resources.
	Select compatible land uses; put lower impact development adjacent to farmland and operations	The proposed expansion would be buffered from adjacent agricultural land uses through the provision of setbacks, berms and existing vegetation.
	Design to support agriculture (e.g. help farms to continue to operate; help prevent and	Conflicts between the proposed expansion and the surrounding agricultural land uses will be minimized

	reduce trespassing and vandalism)	through the implementation of physical and visual barriers (vegetative berms) as required by the ARA site plans. Unprocessed materials will shipped via Sprauges Road from the proposed Edworthy West pit to the existing Edworthy North Pit (**Figure 10**). Spragues Road is a Regional Road which is intended to carry heavy traffic and the movement of goods. Material will not be processed onsite. There will be no accessory facilities on the Subject Lands.
Minimize and mitigate changes in water quality or quantity	Implement a groundwater monitoring program	Cambridge Aggregates will continue to monitor groundwater through their existing groundwater monitoring program.
Mitigating impacts during construction or operations (e.g. mitigate dust, noise)	Adjust operational procedures to accommodate agriculture in the area	With the existing aggregate use of the licenced pit, and predominance of aggregate operations in the area, surrounding agricultural uses are accustomed to the operational procedures associated with mineral resource extraction. The proposed expansion would carry over the same hours of operation to manage noise, and apply dust suppression as needed. There are no specialty in the area which would be affected by the operation. Subject to the recommendations of the Water Report, and due to the distances from the proposed pit, there are not anticipated

		to be impacts on surrounding livestock operations.
	Vegetative berms	A setback of 30 metres will be provided from Sprauges Road and Shoudice Side Road to create buffering between the proposed expansion and surrounding land uses. A 23 metre buffer will be provided between the proposed extraction limit and agricultural operation (cropping) to the north of the proposed subject lands. Vegetative berms will also be implemented which will provide a visual barrier.
	Maintain, restore or construct farm infrastructure	The subject lands do not include any farm infrastructure. The barn and pasture area that exist in the Primary Study Area have been excluded from the licensed area, which will maintain agricultural infrastructure.
Mitigate ongoing impacts from new development	Implement measures that can be in place post development to support compatibility with agriculture	All planting associated with the berms and forest enhancement will be non-invasive species and will not impact agricultural rehabilitation or production when the lands are returned to production. The balance of the site will be rehabilitated to an agricultural condition. Every effort has been made to maximize the rehabilitated area for agricultural production.
Education to achieve greater compatibility between agricultural and non-agricultural uses	Education and awareness	Cambridge Aggregates will continue to educate the public on rehabilitation efforts to demonstrate the importance and impact of

		progressive agricultural rehabilitation.

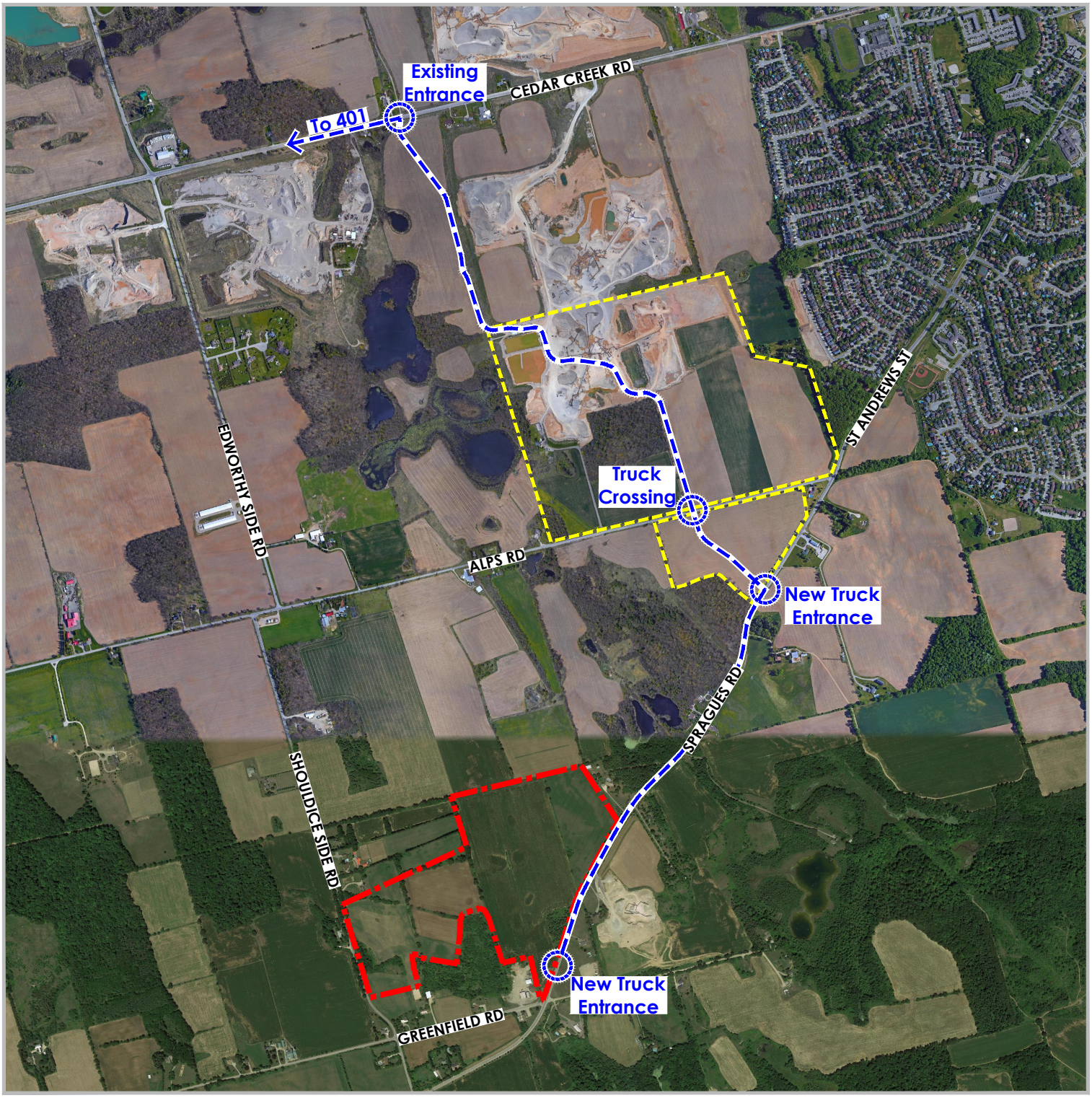

Figure 10 Entrances and Haul Road

LEGEND

- Subject Site
- Cambridge Aggregates Main Pit
- Truck Entrance / Crossing
- Haul Road

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6.0 PROPOSED REHABILITATION PLAN

The proposed rehabilitation plan for the subject lands includes rehabilitation back to an agricultural landform. As previously noted, approximately 23.4hectares (57.8 acres) of the subject lands will be returned to agriculture with the balance of the lands consisting of side slopes and ecological areas. The objectives of the rehabilitation plan are to:

- Return the lands to an agricultural use as quickly as possible;
- Maintain or improve soil capability; and,
- Restore farmland on the pit floor.

The following agricultural rehabilitation best practices should be implemented to maximize the post-extraction condition of the property for an agricultural uses. The following example of rehabilitated pits demonstrate how the agricultural capability of former gravel pits can be restored by implementing the following best practices.

Cambridge Aggregates Edworthy North

Image 13: Edworthy North Agricultural Rehabilitation

Cambridge Aggregates has demonstrated their ability to successfully rehabilitate operations to an agricultural condition at their Edworthy North Pit (Image 13). As part of their rehabilitation plan, topsoil and subsoil are stripped from the active phase of the operation and used as quickly as possible in progressive rehabilitation which follows the active phase. Subsoils are ripped prior to placement of topsoil, and reapplication of soil materials is accomplished using wide tracked equipment to minimize soil compaction.

The success of this rehabilitation has resulted in the current farmer being able to plant and cultivate cash crops in the first year of progressive rehabilitation. Crops which have been produced include beans and corn. The farmer operating the lands has reported no issues with regards to stoniness of the lands. Additionally, lands outside of the area of extraction but within the license area were able to be graded for better agricultural use, at the request of the farmer.

6.1 Phasing & Progressive Rehabilitation

Figure 11 of this report illustrates the proposed rehabilitation plan and recommended agricultural rehabilitation sequence, which reflects the additional best practices discussed below. Progressive rehabilitation should follow the extraction sequence.

To the extent possible, agricultural operations on the site should be maximized during pit operations. Later phases of extraction should be maintained in an active agricultural conditions for as long as possible. The phasing of the operation can be seen on the Operations Plan. During operations, access will be maintained to undisturbed areas in order to facilitate their continued use for farming.

6.2 Stripping and Handling of Soil Resources

Rehabilitation should balance the availability of stripped soils with the need for soils in areas being rehabilitated. As much as possible, stripped soils should be moved directly to depleted areas where it will be immediately used for agricultural rehabilitation. This practice reduces the area that is disturbed at any one time and reduces the time land is out of agricultural production. It also reduces the need and time of soil storage and reduces double handling of soil materials. Implementing progressive rehabilitation procedures that avoid substantial storage of topsoil and minimize storage of subsoil is encouraged.

In order to avoid impacts on soil structure as a result of compaction, it is also recommended that soil material only be handled under dry (not saturated) conditions and a wet weather shut down procedure should be put in place to deal with soil moisture conditions during stripping operations. Stripping when the soil is frozen is also generally not recommended as the potential of mixing of topsoil and subsoil increases under frozen conditions.

Vegetation cover over the area to be stripped should be considered. Where the lands to be stripped are under a perennial cover (e.g. hay), the area may need to be mowed and the vegetation removed prior to stripping and incorporating the sod into the topsoil. Where soils are bare or crop residue is minimal, planting the area with a perennial crop well in advance of stripping may be beneficial as it adds organic matter to the soil and improves soil structure. All large woody vegetation should be

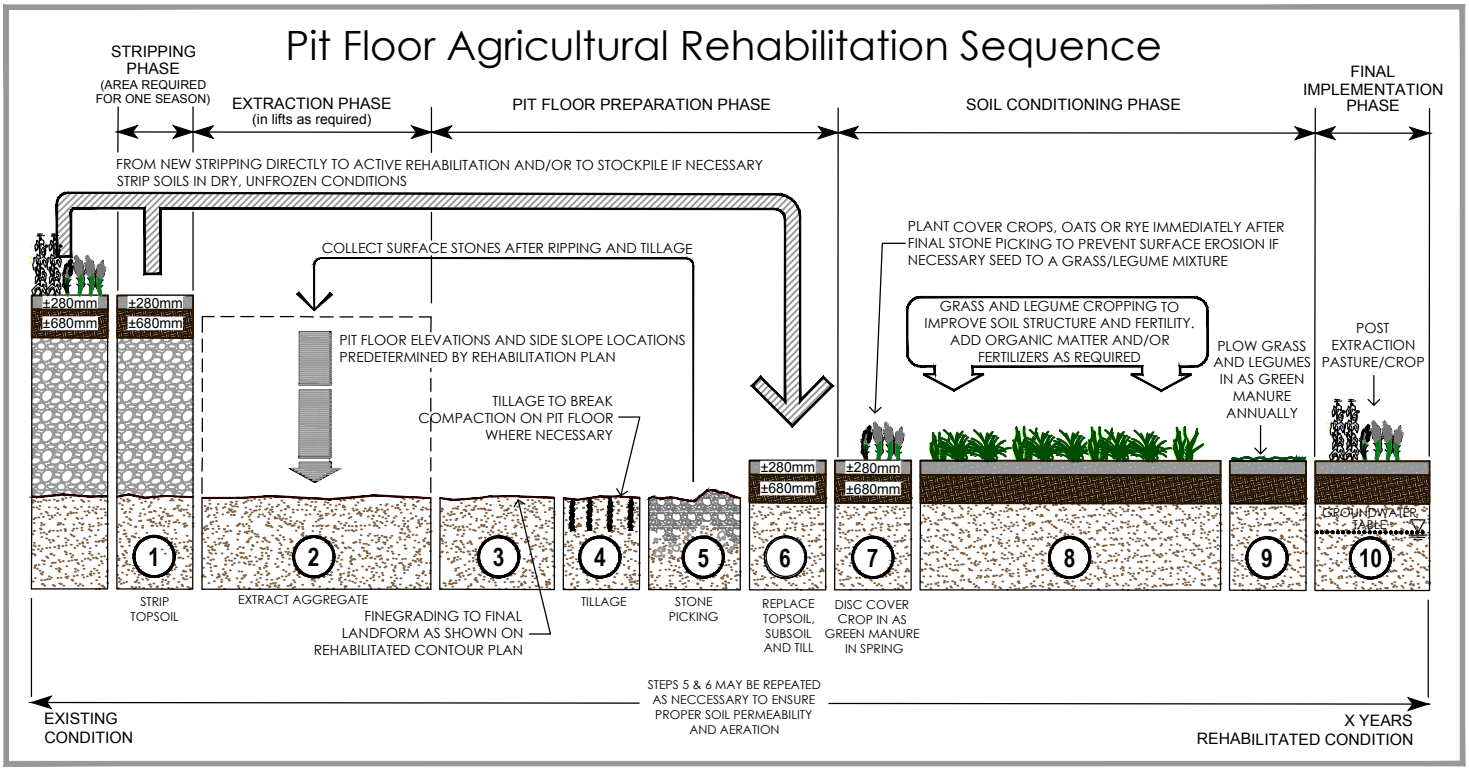

Figure 11

Recommended Pit Floor Agricultural Rehabilitation Sequence

Cambridge Aggregates
Part lots 16, 17, and 18,
concession 9
Township of North Dumfries
Region of Waterloo

DATE: March 2022

FILE: 1896E

SCALE: NTS

DRAWN: DGS

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
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removed prior to stripping and any large roots, stumps and stones encountered during stripping should be removed from the topsoil being placed in stockpiles or used directly in progressive rehabilitation.

Depths of soil being removed during stripping should be monitored. Based on the Soil Survey completed by DBH, the existing topsoil depths range from approximately 20-36 cm in depth with subsoil depths averaging approximately 36 – 100 cm in depth.

For more details on stripping and handling, please refer to Figure 11.

6.3 Create Appropriate Post-Extraction Land Form

To maximize the agricultural condition on the post extraction pit floor, 2.1:1 side slopes will be used. The side slopes should be graded to the desired slope prior to the replacement of topsoil and subsoil. The side slopes should be ripped/tilled to alleviate any compaction and to minimize potential for erosion. A permanent vegetative cover should be provided to stabilize the slopes. Subsoil and topsoil can be placed directly over the top the overburden on the side slope provided the topsoil is uniformly placed at a depth of approximately 10 to 15 cm to ensure the establishment of a perennial vegetative cover where possible and subject to material availability. Replacement of soil resources should be minimized on non-agricultural side slopes.

Slope contours on the pit floor should be as uniform as possible and large regularly shaped fields should be created. Any grading should ensure there are no irregular undulations or depression areas on the rehabilitated pit floor. Where irregular landforms are created due to the extent of the side sloping (southwest corner), backfilling to grade should be considered to maximize agricultural area.

In order to facilitate the development of an appropriate post-extraction landform, imported materials will be required in order to create necessary side slopes. Additionally, in the final landform, access points (5:1) will be created where side slopes are 2.1:1 to allow agricultural vehicle access.

6.4 Soil Compaction

Soil compaction should be minimized by handling soils under dry conditions and using wide track equipment or other equipment designed to minimize compaction. To the extent possible, travel over soils and rehabilitated areas should be minimized. After spreading each layer of topsoil / subsoil, compaction should be remediated by ripping or tilling the soils. Any ripping / tilling during this process should avoid mixing of soil materials / layers (i.e. do not rip below the upper most / latest applied soil horizon).

6.5 Soil Replacement / Conditioning Soil

When replacing and handling topsoil, subsoil or overburden these materials should be handled separately and under dry (unsaturated) conditions. Replaced soil should be free of stones, debris and deleterious materials. Soil testing should be completed to confirm soil fertility and nutrient content in order to determine the appropriate amount and type of soil amendments and / or fertilizer required.

Plantings in agricultural areas include an agricultural seed mix of Annual Rye (50%), Oats (23%), Winter Rye (23%), White Clover (4%) and should be established initially and maintained up to five

(5) years in order to maximize results. Crops should be plowed under annually in order to promote and increase organic matter. Crops should be monitored at least twice during the growing season to ensure success of cover crop and control of weed growth. Over seeding and reseeding may be necessary to control weeds and ensure successful crop establishment.

6.6 Monitoring

Annual reporting of all stages of the rehabilitation process should be documented and reported. Random soil testing should also be completed at the beginning of each growing season to analyze soil fertility and structure. Adjustments to cropping practices and / or soil amendments may be required based on the results of the soil testing.

An annual rehabilitation practices report should be submitted in order to documents agricultural rehabilitation activities and demonstrate compliance in relation to soil stripping, handling and storage; rehabilitation progress, methods and best practices; soil tests; and, post rehabilitation soil capability and farming activity.

Once progressive rehabilitation begins, an Annual Rehabilitation Report should be prepared by a qualified person (e.g. an agrologist or certified crop advisor) that reports on the stages of the rehabilitation process, where applicable, including,

- Evaluate the rehabilitated agricultural condition and soil capability, relative to the baseline soil conditions documented. The baseline soil conditions shall be included as an appendix in the annual monitoring report;
- An overview of the status of the current extraction and progressive rehabilitation phases;
- Description of annual soil removal and storage methods;
- Description of any land that has been progressively rehabilitated;
- Documentation on the alleviation of any soil compaction, drainage provisions, erosion control, etc.;
- Description of how the soil has been replaced and any amendments added (fertilizer, organic matter)
- Description of any seeding or planting that has occurred;
- A review of previous rehabilitation management activities and observations regarding field conditions;
- Report of agricultural activity (crops grown, annual yields) and any anecdotal feedback from the farmer;
- Review of drainage issues and recommended mitigation measures as necessary;
- Summary of soil test results and post rehabilitation soil capability; and

- Summary of monitoring data; and
- Make recommendations on future agricultural rehabilitation activities and any needed adjustments to best management practices.

The report should include observational documentation, records of activity and quantitative information on soil conditions. These reports should be appended by Cambridge Aggregates as part of their annual compliance assessments.

7.0 RECOMMENDATIONS

Based on our analysis, the following recommendations will ensure the proposed extraction is rehabilitated back to the same average soil capabilities and agricultural production. The following recommendations will be included on the ARA site plans.

1. Extraction will occur in three sequential phases to minimize the amount of disturbed area. Later phases of the operation that are not currently in extraction shall remain in agricultural production for as long as realistically possible.

2. Agricultural rehabilitation shall be in accordance with the agricultural rehabilitation sequence schematic on the Rehabilitation Plan to ensure best practices are followed throughout the progressive rehabilitation of the pit.

3. Progressive rehabilitation procedures that avoid substantial storage of topsoil and minimize the storage of subsoil shall be implemented. Stripped soils, not required for berm construction, shall be moved directly to depleted areas where they will be immediately used for agricultural rehabilitation. Stripping areas shall be limited to what is required for the season of operation.

4. During pit operations, access to the agricultural rehabilitation areas and undisturbed areas used for agricultural purposes will be maintained.

5. For the areas that are being returned to an Agricultural Condition, topsoil and subsoil shall be replaced at the same pre-extraction depth which is approximately 28 centimetres for topsoil and 68 centimetres for subsoil, in accordance with the agricultural rehabilitation schematic on the plan.

6. Soil material for agricultural rehabilitation shall not be handled during frozen conditions. The soil will only be handled under dry conditions and a wet weather shut down procedure shall be put in place. Travel over soils and rehabilitated areas shall be minimized to reduce compaction. Ripping / tilling the soil will occur, where necessary, to alleviate soil compaction and shall avoid the mixing of soil materials / layers during the process.

7. Once grading is completed, a vegetation cover (such as perennial crops) shall be immediately established within the agricultural rehabilitation area in order to reduce erosion, add organic matter to the soil and improve soil structure. A grass-legume cover crop shall be established throughout rehabilitation and maintained for up to five years and ploughed under annually in order to promote and increase organic matter. Alternatively, field crops (e.g. wheat, soy, corn, hay) shall be established immediately following rehabilitation grading.

8. Once progressive rehabilitation has been completed in each Phase, random soil testing shall be completed at the beginning of each growing season by a qualified professional to analyze soil conditions, using an accredited lab for any analytical testing. Soil inspections shall be conducted at a density to allow for sufficient coverage of the area. The parameters for the soil testing shall be determined by the qualified professional and shall include items such as: soil macro and micronutrients, soil chemistry (e.g. pH, etc.), organic matter, soil texture and structure and bulk density to analyze soil fertility, structure and drainage. Adjustments to cropping practices and/or soil amendments may be required based on the results of the soil testing and shall be undertaken in consultation with the property owner. Soil testing is no longer required for a progressively rehabilitated phase, once the pre-extraction soil capability has been restored.

9. An Agricultural Rehabilitation Monitoring Program Report shall be submitted annually by a qualified professional once progressive agricultural rehabilitation efforts have commenced and will continue until it can be demonstrated that the agricultural area in each Phase has been rehabilitated back to the pre-extraction soil capability and the final landform is completed as shown on the Rehabilitation Plan. The report shall document the stages of the rehabilitation process and include details on matters such as the following:
    a) Evaluate the rehabilitated agricultural condition and soil capability, relative to the baseline soil conditions documented. The baseline soil conditions shall be included as an appendix in the annual monitoring report;
    b) An overview of the status of the current extraction and progressive rehabilitation phases;
    c) Description of annual soil removal and storage methods;
    d) Description of any land that has been progressively rehabilitated;
    e) Documentation on the alleviation of any soil compaction, drainage provisions, erosion control, etc.;
    f) Description of how the soil has been replaced and any amendments added (fertilizer, organic matter)
    g) Description of any seeding or planting that has occurred;
    h) A review of previous rehabilitation management activities and observations regarding field conditions;
    i) Report of agricultural activity (crops grown, annual yields) and any anecdotal feedback from the farmer;
    j) Review of drainage issues and recommended mitigation measures as necessary;
    k) Summary of soil test results (if required) and post rehabilitation soil capability; and
    l) Summary of monitoring data; and
    m) Make recommendations on future agricultural rehabilitation activities and any needed adjustments to best management practices.

The report shall include observational documentation, records of activity and quantitative information on soil conditions. These reports will be appended as part of annual ARA Compliance Assessment Reports. The purpose of the annual monitoring report is to ensure the site will be rehabilitated to a condition in which substantially the same area and the same average soil capability for agriculture, relative to the baseline conditions are restored and gather data on average soil capabilities to ensure the recommended rehabilitation sequence is implemented and documented.

10. Best management practices shall be implemented with respect to the storage and application of organic material, fertilizers and pesticides.

8.0 SUMMARY

In summary, the proposed mineral aggregate extraction on the subject lands is not anticipated to have a significant negative impact on the long term agricultural uses and operations on the subject lands and within the primary / secondary study areas. This opinion recognizes the following:

- Provincial and local planning policies recognizes that mineral aggregate extraction operations are an interim land use. Mineral aggregate extraction is a permitted use within prime agricultural areas in accordance with provincial policy.
- There are no specialty crop areas within the Primary or Secondary Study Areas.
- The Subject Lands will be rehabilitated back to an agricultural condition with the same average soil capability that currently exists.
- The proposed Edworthy West Pit is within an area of established mineral aggregate operations.
- 23.4 hectares of the existing agricultural lands will be returned to an agricultural condition, with the loss of agricultural lands due to the depth of extraction and resulting side slopes.
- Extraction is proposed to be above the watertable and no processing is proposed onsite. As a result, no impacts are anticipated on the availability of groundwater resources for the continued operation of surrounding agricultural uses.
- Impacts from dust and noise will be mitigated through implementation of prescribed conditions and technical requirements / recommendations and berming.
- Implementation of the recommended rehabilitation plan including the recommended best practices in the report will ensure a successful agricultural rehabilitation process.

Pierre J. Chauvin, BSc (Agr), MA, MCIP, RPP

Dawson McKenzie, MSc

Appendix A: Soil Survey and Canada Land Inventory Classification – DBH Soil Services Inc .

DOCUMENT TRANSMITTAL

Document: **SOIL SURVEY AND CANADA LAND INVENTORY (CLI) EVALUATION – EDWORTHY WEST PIT (HANSON READY MIX INC.)**

Prepared for:
Ms. Caitlin Port
Partner
MHBC Planning, Urban Design & Landscape Architecture
540 Bingemans Centre Drive
Suite 200
Kitchener, ON
N2B 3X9

Date: March 16, 2022
Our Ref. No.: 2020 - 12
Your Ref. No.:

Attention: Ms. Caitlin Port

DRAFT

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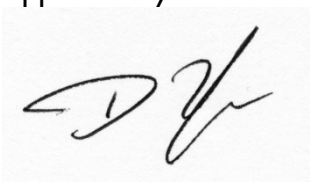

Dave Hodgson, P. Ag.
DBH Soil Services Inc.

SOIL SURVEY AND CANADA LAND INVENTORY CLASSIFICATION (CLI) FOR CONCESSION 9, PART LOTS16, 17 AND 18 TOWNSHIP OF NORTH DUMFRIES REGIONAL MUNICIPALITY OF WATERLOO

Prepared for:

Hanson Ready Mix Inc.
1182 Alps Road
Cambridge, ON
N1R 5S5

DBH Soil Services Inc.

March 16, 2022

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1.0 BACKGROUND

DBH Soil Services Inc was retained by Hanson Ready Mix Inc. to complete a Soil Survey and Canada Land Inventory (CLI) Classification assessment for an area identified as:

Concession 9, Part Lots 16, 17 and 18
Township of North Dumfries
Regional Municipality of Waterloo

This area is comprised of three parcels identified by the Municipal Property Assessment Corporation (MPAC) Roll Number:

30010300041460000000
30010300041440000000 (1262 Greenfield Road)
30010300041480000000 (1354 Spragues Road)

The Roll Numbers were identified in the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Agricultural Atlas (AgMaps) (http://www.gisapplication.lrc.gov.on.ca/AIA/Index.html?viewer=AIA.AIA&locale=en-US) and through a review of the Region of Waterloo GIS Locator online map viewer http://gis.region.waterloo.on.ca/Html5Viewer_2_4/Index.html?configBase=http://gis.region.waterloo.on.ca/Geocortex/Essentials/GeocortexEssentials_4/REST/sites/LocatorBasic/viewers/LocatorHTML/virtualdirectory/Resources/Config/Default.

For the purposes of this report, these parcels are henceforth referred to as the Subject Lands

The Subject Lands comprise approximately 45.6 ha (112.7 acres) of which the majority of the lands are used for the production of common field crop (soybean in the 2020 and 2021 growing seasons). The non-cropped lands included a small, wooded area (trees and brush) that was observed along the southeast edge, adjacent to Spragues Road, and a hill along the western edge near Greenfield Road. The Subject Lands topography is considered to be gently to moderately rolling, with a few bowl-like depressional areas (kettles), and a steep hill along the western edge.

The Subject Lands are roughly bounded: on the north by agricultural lands; on the east by agricultural lands and Spragues Road; on the south by Spragues Road/Greenfield Road and a Township maintenance yard; and on the west by Shouldice Side Road, woodlands and agricultural land. An existing and operating aggregate pit was noted on the east side of Spragues Road.

There are no farm buildings or buildings of any type on the western two parcels. A residential unit and shed were noted on the eastern parcel, outside the Potential License Boundary. Similarly, a residential unit, pole barn, and machine shed were noted on the western parcel (1262 Greenfield Road), again, outside the Potential License Boundary. A small concrete

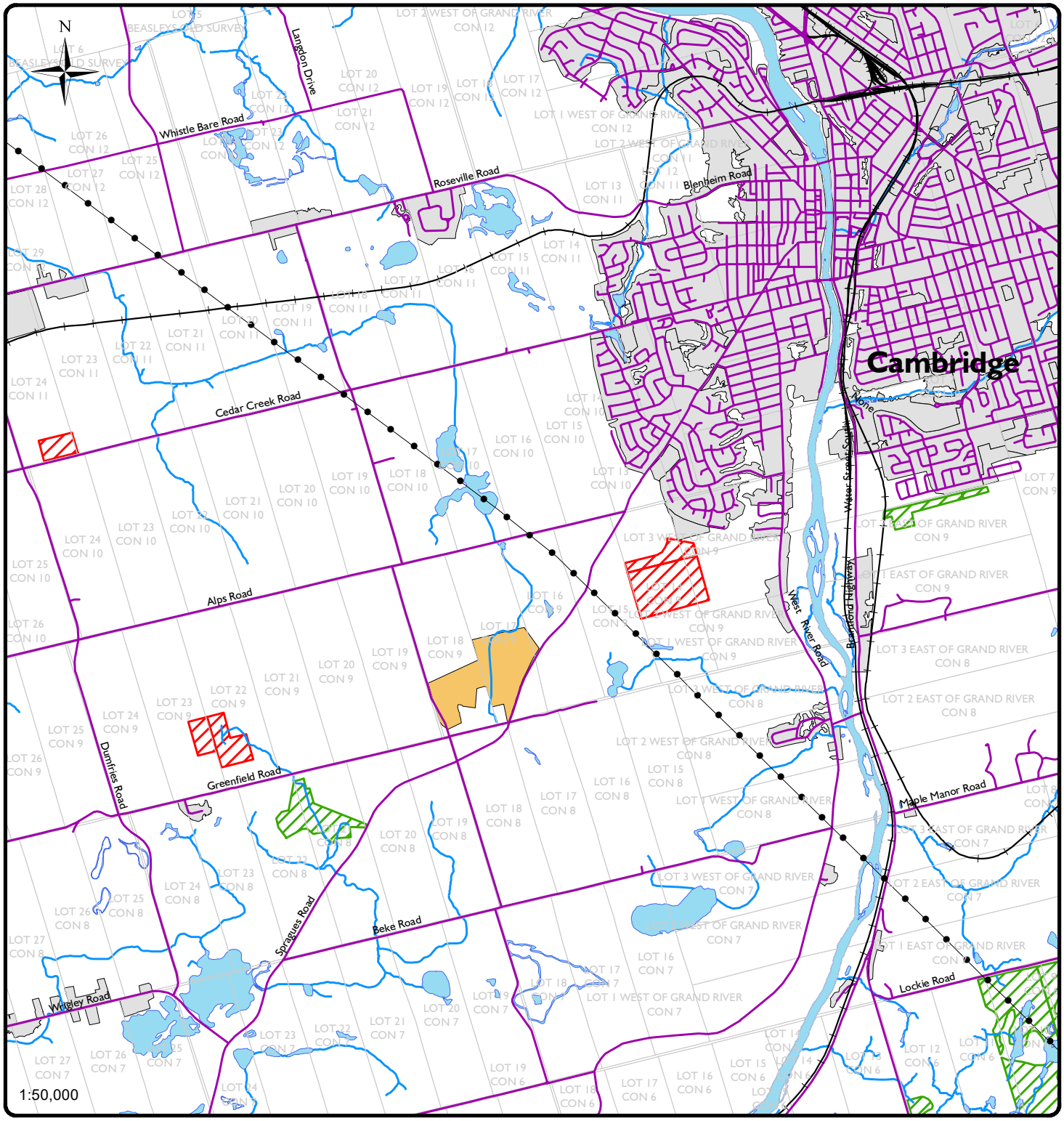
structure was noted in the southern portion near the Township maintenance yard. The structures use is unknown, and the structure appears unused.

In the local area context, the Subject Lands are located approximately 2.0 km south, southwest of the City of Cambridge

This report was completed to document the existing soil conditions and to provide a more detailed assessment of the Canada Land Inventory (CLI) classification of the soil resources onsite. A proposed aggregate pit application necessitated this study. The proposed aggregate pit will be an above water table extraction with rehabilitation back to an agriculture land use.

Figure 1 illustrates the relative location of the Subject Lands with respect to the above-mentioned geographic features.

This report documents the methodology, findings, conclusions, and mapping completed for this study.



Legend

- Hydro Line
- Railway (MNRF)
- Roads (MNRF)
- Watercourse (MNRF)
- Built Up Areas (MNR)
- Edworthy West Pit Boundary
- Lot Lines (MNRF)
- Waterbodies (MNRF)

Tile Drainage System Type (OMAFRA)

- Random
- Systematic

Figure 1

Location
Edworthy Pit West

DBH Soil Services Inc.

August 3, 2021

2.0 METHODOLOGY

2.1 DATA SOURCES

The following data sources were used to carry out the detailed Soil Survey and Canada Land Inventory Classification (CLI) for this study:

- 1:10000 scale Ministry of Natural Resources (MNR) Aerial Photography, 1978,
- 1:10000 scale Ontario Base Map (1983) Ministry of Natural Resources:
  - 10 17 5500 47950

  1:50000 scale NTS Map No 40 P/8. 1984. Ministry of Energy Mines and Resources, Canada,
- 1:50000 scale NTS Map No 40 P/8. Canada Land Inventory (CLI) Capability Mapping,
- Agricultural Information Atlas (online resource, Ontario Ministry of Natural Resources),
- *Agronomy Guide for Field Crops (Publication 811). (2009).* Ontario Ministry of Agriculture, Food and Rural Affairs,
- *Birdseye Satellite Imagery - Garmin,*
- *Classifying Prime and Marginal Agricultural Soils and Landscapes:* Guidelines for Application of the Canada Land Inventory in Ontario. OMAFRA. Online, 2016,
- *Draft Agricultural Impact Assessment (AIA) Guidance Document (March 2018),*
- *Google Earth Pro Imagery,*
- *Greenbelt Plan* (2017),
- *Growth Plan for the Greater Golden Horseshoe (2019),*
  Guide to Agricultural Land Use, Ontario Ministry of Agriculture, Food and Rural Affairs, March 1995,
  Guidelines for Detailed Soil Surveys for Agricultural Land Use Planning (OMAFRA, 2018 online) (*http://www.omafra.gov.on.ca/english/landuse/facts/soil_survey.htm),*
- Guidelines on Permitted Uses in Ontario's Prime Agricultural Areas (Publication 851), Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), 2016,
- Online Soils data for the Province of Ontario (Land Information Ontario (LIO), 2020 and 2021,
- Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Factsheet – Crop Heat Units for Corn and Other Warm Season Crops in Ontario, 1993,
- Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) AgMaps online mapping, (http://www.gisapplication.lrc.gov.on.ca/AIA/Index.html?viewer=AIA.AIA&locale=en-US)
- Ontario Ministry of Agriculture and Food - Land Use Systems Mapping,
- Ontario Ministry of Agriculture and Food - Artificial Drainage Mapping,
- *Provincial Policy Statement, 2020,*
- *Regional Official Plan (2031). Region of Waterloo June 18, 2015.*
- *The Physiography of Southern Ontario 3rd Edition, Ontario Geological Survey Special Volume 2, Ministry of Natural Resources, 1984,*
- *The Soils of Waterloo County. Report No. 44 of the Ontario Soil Survey*. Presant, E.W. and R.E. Wicklund, 1971,
- *Township of North Dumfries Official Plan (Consolidation Date: November 2018),*
- *Windshield and field surveys by DBH Soil Services staff on June 13, 2020 and June 10, 2021.*

2.2 FIELD DATA COLLECTION

2.2.1 SOIL INVESTIGATION

Basic soils (and Canada Land Inventory classification (CLI)) information was provided in the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) soils and mapping report *The Soils of Waterloo County. (Report No. 44 of the Ontario Soil Survey*. Presant, E.W. and R.E. Wicklund, 1971) with mapping at a scale of 1:20000. Digital mapping was provided by the Ontario Ministry of Agricultural, Food and Rural Affairs (OMAFRA) through the Land Information Ontario (LIO) warehouse website. The digital mapping was provided at a scale of 1:50000. Mapping at this scale is of a general nature when referring to site-specific planning; therefore, detailed soils or soil verification assessments are often required for farm scale or lot size planning initiatives and applications for amendments to Official Plans and /or Zoning By-Laws.

With this in mind, a detailed soil survey was completed for 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 and surrounding land reconnaissance survey were conducted on June 13, 2020 and updated on June 10, 2021.

2.2.2 PHYSIOGRAPHY

Physiographic information and Quaternary Geology information was provided in *The Physiography of Southern Ontario 3rd Edition, Ontario Geological Survey Special Volume 2, Ministry of Natural Resources, 1984.* Physiographic information provides detail on the parent materials from which the soils developed in a specific area.

2.2.3 TOPOGRAPHY AND CLIMATE

Topographic information was reviewed and correlated to the detailed contour mapping provided by MHBC Planning, Urban Design & Landscape Architecture. Additional contour data, mapping and assessments were reviewed and included the 1:10000 scale Ontario Base Mapping, Land Information Ontario (LIO) digital contour mapping, detailed soil survey assessment (using a handheld clinometer), aerial photo interpretation and windshield surveys.

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.

2.2.4 AGRICULTURAL LAND USE

Initial Agricultural Land Use data was provided by the Ontario Ministry of Agriculture, Food and Rural Affairs in digital format through the Land Information Ontario (LIO) website. This information is presented at the Township level and identified a land usage for individual properties and fields. This information provided a baseline for the identification of agricultural land use on the Subject Lands. It should be noted that the OMAFRA Land Use data is of older material and is not updated on a regular basis. With this in mind, the OMAFRA data was used for comparison purposes.

Agricultural land use data was collected through observations made during the detailed soil survey completed on June 13, 2020 and updated on June 10, 2021. Data collected included the identification of land use (both agricultural and non-agricultural), documentation of the type and location of agricultural facilities (if any), non-farm residential units (if any) and non-farm buildings (business, commercial and institutional usage). The data presented in this report reflects the present-day agricultural land use (if any).

3.0 POLICY REVIEW

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 (2020). Municipal Governments have similar regard for the protection and preservation of agricultural lands and address their specific concerns within their respective Official Plans. With this in mind, the Provincial Policy Statement (2020), the *Regional Official Plan (2031), Region of Waterloo June 18, 2015, and the Township of North Dumfries Official Plan (Consolidation Date: November 2018)* were reviewed for policies directly related to soil resources and Canada Land Inventory (CLI) with respect to aggregate operations.

The Official Plan Policies were reviewed to verify if there were any additional or specific soil components to be investigated when determining the potential impacts to agriculture due to a mineral aggregate operation.

Further, in an effort to protect agricultural lands, the Province of Ontario has adopted policy and guidelines to provide a framework for managing growth in four land use plans. 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) (2019)* support the long-term protection of farmland.

With respect to this proposed Agricultural Soil Evaluation (detailed soil survey) and the four provincial land use plans only the *Growth Plan for the Greater Golden Horseshoe (2019)* is applicable to this site.

3.1 PROVINCIAL POLICY STATEMENT (2020)

The Provincial Policy Statement (2020) 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 in Section 2.3 – Agriculture. Section 2.3.6 – Non-Agricultural Uses in Prime Agricultural Areas provides policy specific to this study. Section 2.3.6.1 states:
"*Planning authorities may only permit non-agricultural uses in prime agricultural areas for:*

a) extraction of minerals, petroleum resources and mineral aggregate resources

Mineral Aggregate Resource Policies are addressed within Section 2.5 of the Provincial Policy Statement. Section 2.5.1 identifies the Protection of Long-term Resource Supply and states:
"Mineral aggregate resources shall be protected for long-term use and, where provincial information is available, deposits of mineral aggregate resources shall be identified."

Further, Section 2.5.2.1 states:

"*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. Where the Aggregate Resources Act applies, only processes under the Aggregate Resources Act shall address the depth of extraction of new or existing mineral aggregate operations. 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.

3.2 GROWTH PLAN FOR THE GREATER GOLDEN HORSESHOE (2019)

A review of the Growth Plan for the Greater Golden Horseshoe (2019) 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 (2019) provides comment on Agricultural Lands in Section 4.2.6 – Agricultural System. Section 4.2.6 states:

1. An *Agricultural System* for the *GGH* has been identified by the Province.
2. *Prime agricultural areas*, including *specialty crop areas*, will be designated in accordance with mapping identified by the Province and these areas will be protected for long-term use for agriculture.
3. Where *agricultural uses* and non-agricultural uses interface outside of *settlement areas*, land use compatibility will be achieved by avoiding or where avoidance is not possible, minimizing and mitigating adverse impacts on the *Agricultural System*. Where mitigation is required, measures should be incorporated as part of the non-agricultural uses, as appropriate, within the area being developed. Where appropriate, this should be based on an *agricultural impact assessment*.
4. The geographic continuity of the agricultural land base and the functional and economic connections to the *agri-food network* will be maintained and enhanced.

5. The retention of existing lots of record for *agricultural uses* is encouraged, and the use of these lots for non-agricultural uses is discouraged.
6. Integrated planning for growth management, including goods movement and transportation planning, will consider opportunities to support and enhance the *Agricultural System*.
7. Municipalities are encouraged to implement regional agri-food strategies and other approaches to sustain and enhance the *Agricultural System* and the long-term economic prosperity and viability of the agri-food sector, including the maintenance and improvement of the *agri-food network* by:
    a. providing opportunities to support access to healthy, local, and affordable food, urban and near-urban agriculture, food system planning and promoting the sustainability of agricultural, agri-food, and agri-product businesses while protecting agricultural resources and minimizing land use conflicts;
    b. protecting, enhancing, or supporting opportunities for *infrastructure*, services, and assets. Where negative impacts on the *agri-food network* are unavoidable, they will be assessed, minimized, and mitigated to the extent feasible; and
    c) establishing or consulting with agricultural advisory committees or liaison officers.

8. Outside of the *Greenbelt Area*, provincial mapping of the agricultural land base does not apply until it has been implemented in the applicable upper- or single-tier official plan. Until that time, *prime agricultural areas* identified in upper- and single-tier official plans that were approved and in effect as of July 1, 2017 will be considered the agricultural land base for the purposes of this Plan.

9. Upper- and single-tier municipalities may refine provincial mapping of the agricultural land base at the time of initial implementation in their official plans, based on implementation procedures issued by the Province. For upper-tier municipalities, the initial implementation of provincial mapping may be done separately for each lower-tier municipality. After provincial mapping of the agricultural land base has been implemented in official plans, further refinements may only occur through a *municipal comprehensive review*.

Further, the review of the Growth Plan for the Greater Golden Horseshoe indicated that additional policy and comment for Mineral Aggregate Resources was provided in Section 4.2.8.
Section 4.2.8 - ***Mineral Aggregate Resources states:***

1. *"Municipalities will develop and implement official plan policies and other strategies to conserve mineral aggregate resources, including:*
    a) the recovery and recycling of manufactured materials derived from mineral aggregate resources for reuse in construction, manufacturing, industrial, or maintenance projects as a substitute for new mineral aggregate resources; and
    b) the wise use of mineral aggregate resources, including utilization or extraction of on-site mineral aggregate resources prior to development occurring.

2. *Notwithstanding the policies in subsections 4.2.1, 4.2.2, 4.2.3 and 4.2.4, within the Natural Heritage System, mineral aggregate operations and wayside pits and quarries are subject to the following:*
   a) *no new mineral aggregate operation and no new wayside pits and quarries, or any ancillary or accessory use thereto, will be permitted in the following key natural heritage features and key hydrologic features:*
      i. *significant wetlands;*
      ii. *habitat of endangered species and threatened species; and*
      iii. *significant woodlands unless the woodland is occupied by young plantation or early successional habitat, as defined by the Province, in which case, the application must demonstrate that policies 4.2.8.4 b) and c) and 4.2.8.5 c) have been addressed and that they will be met by the operation;*
   b) *any application for a new mineral aggregate operation will be required to demonstrate:*
      i. *how the connectivity between key natural heritage features and key hydrologic features will be maintained before, during, and after the extraction of mineral aggregate resources;*
      ii. *how the operator could replace key natural heritage features and key hydrologic features that would be lost from the site with equivalent features on another part of the site or on adjacent lands;*
      iii. *how the water resource system will be protected or enhanced; and*
      iv. *how any key natural heritage features and key hydrologic features and their associated vegetation protection zones not identified in policy 4.2.2.3 a) will be addressed in accordance with policies 4.2.8.4 b) and c) and 4.2.8.5 c); and*
   c) *an application requiring a new approval under the Aggregate Resources Act to expand an existing mineral aggregate operation may be permitted in the Natural Heritage System for the Growth Plan, including in key natural heritage features, key hydrologic features and any associated vegetation protection zones, only if the related decision is consistent with the PPS and satisfies the rehabilitation requirements of the policies in this subsection..*
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.*
4. *For rehabilitation of new mineral aggregate operation sites, the following apply: the disturbed area of a site will be rehabilitated to a state of equal or greater ecological value and, for the entire site, long-term ecological integrity will be maintained or enhanced;*

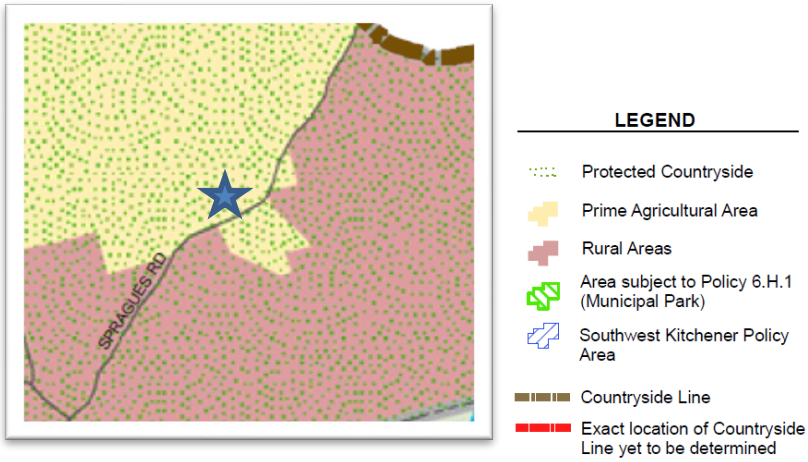
3.3 **OFFICIAL PLAN POLICY**

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 report the *Regional Official Plan (2031), Region of Waterloo June 18, 2015*, and the *Township of North Dumfries Official Plan (consolidation date: November*

2018) were reviewed for policy related to agricultural designated areas and mineral aggregate extraction. The *Township of North Dumfries Zoning By-Law Number 689-83 Consolidation Date: November 2018* was also reviewed for policy related to aggregate resources.

3.3.1 REGIONAL OFFICIAL PLAN (REGION OF WATERLOO)

A review of the *Regional Official Plan (2031), Region of Waterloo June 18, 2015, and respective Schedules) Map 7 – The Countryside* illustrates that the Subject Lands comprise lands designated as Prime Agriculture Area. The image below represents a select portion of Map 7 – The Countryside. The blue star identifies the approximate location of the Subject Lands.



Regional Official Plan Map 7 – The Countryside

A review of the *Regional Official Plan (2031), Region of Waterloo June 18, 2015, and respective Schedules) Map 8 – Mineral Aggregate Resource Areas* illustrates that the Subject Lands are located within a Mineral Resource Aggregate Area. The image below represents a select portion of Map 8 – Mineral Resource Aggregate Area. The blue star identifies the approximate location of the Subject Lands.

Regional Official Plan Map 8 – Mineral Aggregate Resource Area

3.3.2 THE TOWNSHIP OF NORTH DUMFRIES OFFICIAL PLAN

A review of the *Township of North Dumfries Official Plan (consolidation date: November 2018)* identified that Agricultural policy is defined in Chapter 2.6 Land Use Designations, subsection 2.6.10 Agricultural, and that Mineral Aggregate Resource Areas policies are defined in Chapter 5.2.

The Township of North Dumfries Official Plan Map No. 4 – Agricultural Resource Area illustrates that the Subject Lands are located within a Prime Agricultural Area. The Township of North Dumfries Official Plan Map No. 5 – Mineral Aggregate Resource Area illustrates that the Subject Lands are located in a Mineral Aggregate Resource Area.

The Township of North Dumfries Official Plan recognizes the value of sand and gravel resources for future development and growth, while providing direction on siting, potential impacts and rehabilitation.

The Township of North Dumfries Official Plan recognizes that the establishment of a pit or quarry may be permitted as an interim use, subject to the policies within the Official Plan.

3.3.3 THE TOWNSHIP OF NORTH DUMFRIES ZONING BY-LAW

A review of the *Township of North Dumfries Zoning By-Law Number 689-83 Consolidation Date: November 2018* provides Zoning policy for Pits and Quarries in Section 6.22.

Section 6.22- Pits and Quarries states: "Except by amendment to this By-law, the making or establishment of pits and quarries within the Township is hereby prohibited save and except for those areas located in Zone 14 (Z.14) as shown on the maps forming Schedule 'B' to this By-law and except for those areas shown on the maps forming sections 2.1.111, 20.1.112 and 20.1.113 of Schedule 'A' to this By-law subject to the provisions of sub-section 19A.2 of the said Zone 14. Nothing in this By-law shall prevent the making or establishment of a wayside pit or wayside quarry as defined in this By-law."

4.0 FINDINGS

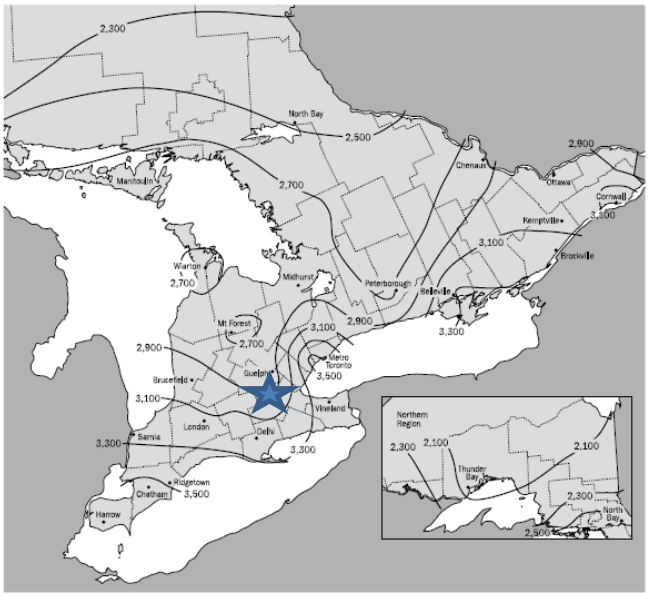
4.1 PHYSIOGRAPHY AND CLIMATE

The *Physiography of Southern Ontario* Physiographic Unit Map indicates that the Subject Lands are located in the Horseshoe Moraine Physiographic Region. The Horseshoe Moraine Physiographic Region is a large horseshoe shaped region that flanks the uplands west of the Niagara cuesta. The Subject Lands are located in the portion of the moraine that trend west of the Niagara Escarpment with moderately hilly relief. South of Paris the moraines tend to flatten out and finally disappear under the sands of the Regional Municipality of Haldimand-Norfolk.

Often associated with the moraine are systems of old spillways with terraces of sand and gravel. Some of the moraine comprises areas of steep irregular topography and small kettles/potholes. The soil materials in the moraine are coarse, open, stony tills. The soils associated with the spillways are sands and gravels.

The Subject Lands are located within the 2700 - 2900 average accumulated Crop Heat Units area in 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.

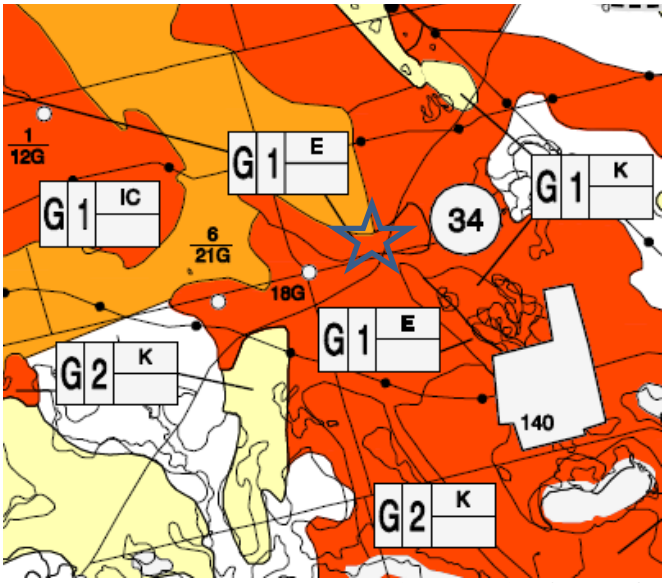
Crop Heat Units for corn (based on 1971-2000 observed daily minimum and maximum temperature (OMAFRA, 2009)) map is illustrated below. The approximate location of the Subject Lands is marked with a blue star.

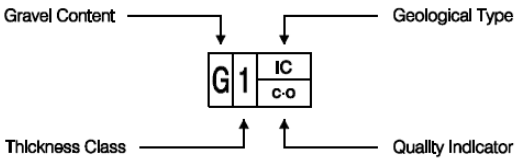


Source: Agronomy Guide for Field Crops OMAFRA – Publication 811

4.2 AGGREGATE RESOURCES INVENTORY

A review of the 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 (ARIP Report 161, 1998) reveals that the Subject Lands comprise small areas of Selected sand and gravel resource area, primary significance, as identified below. The approximate location of the Subject Lands is illustrated with a blue star.





From Aggregate Resources Inventory Paper 161 – ARIM 161-1 Sand and Gravel Resources

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 (fines) present in objectionable quantities.
L	Deleterious lithologies present.
O	Oversize particles or fragments present in objectionable quantities.

LEGEND

(Some map units and symbols may not apply to this map)

- (1) Selected sand and gravel resource area, primary significance; deposit number; see Table 3.
- Selected sand and gravel resource area, secondary significance.
- Sand and gravel deposit, tertiary significance.
- Other surficial deposits or exposed bedrock.

4.3 DETAILED 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 (*The Soils of Waterloo County. Report No. 44 of the Ontario Soil Survey*. Presant, E.W. and R.E. Wicklund, 1971),
- 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, 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 and reconnaissance of the surrounding area was conducted on June 13, 2020 and updated on June 10, 2021. 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 handheld 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 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 handheld 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). Further, slope information was provided by MHBC Planning in GIS shapefile format, and was used as an aid in determining polygon shape/boundaries.

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 Soils of Waterloo County. Report No. 44 of the Ontario Soil Survey*. Presant, E.W. and R.E. Wicklund, 1971 and with the CLI information presented on the 1:50000 scale manuscript mapping.

Observations noted at the time of the onsite soil survey included:

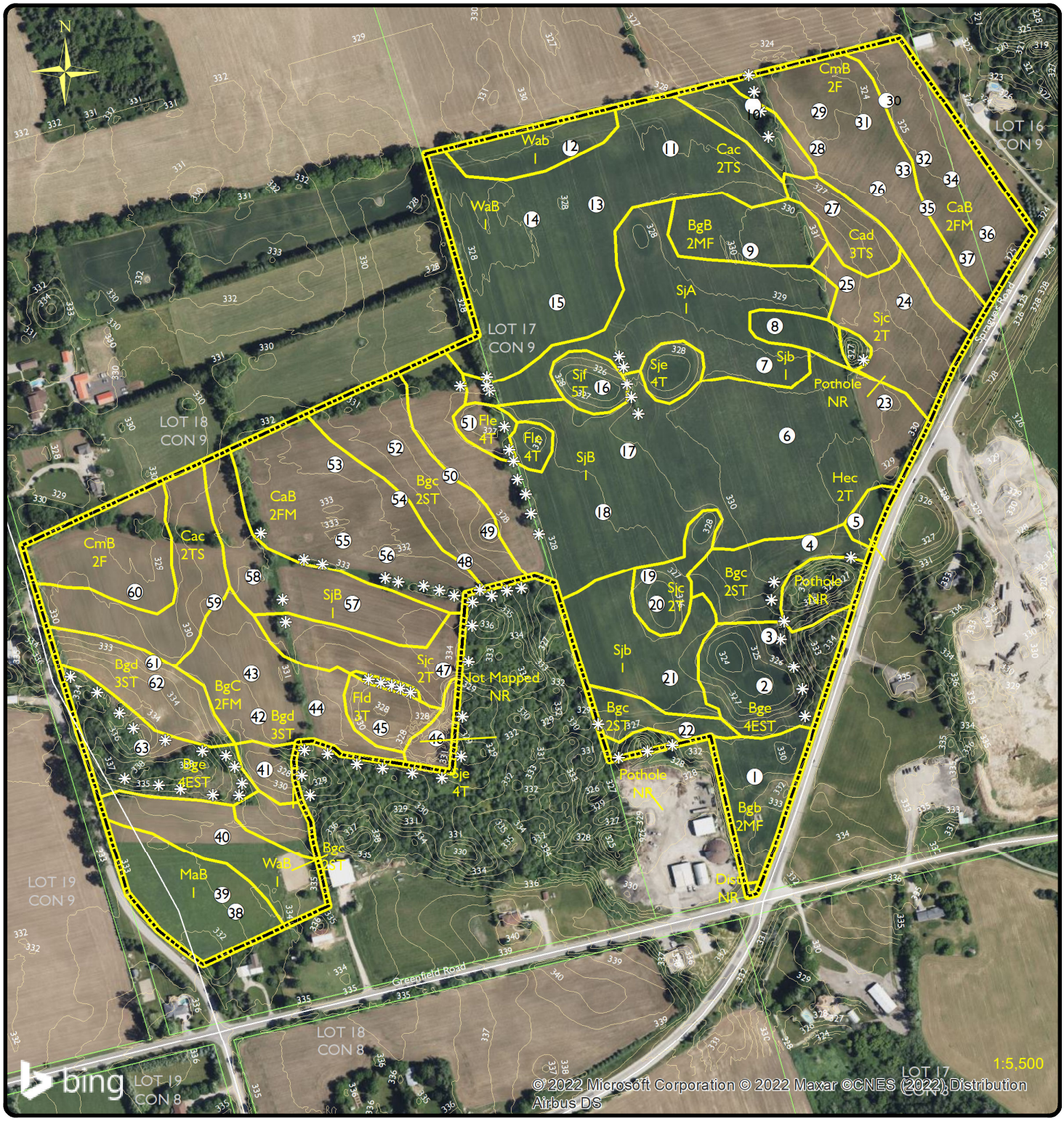
- The majority of the Subject Lands were used for the production of common field crop (Soybean) in the 2020 and 2021 growing seasons
- The lands are gently to moderately rolling, with predominantly long simple sloped areas
- A few kettle type depressional areas were noted at various locations
- Stone piles were noted along the edge of the fields in various locations around the Subject Lands.
- Stones were rounded (river stone).

The following photograph illustrates the condition of the crop (on June 13, 2020) in the central portion of the Subject Lands.

Photograph illustrates examples of this year's crop

A total of 63 soil inspection sites were examined on the Subject Lands. The soil inspection information was correlated with soil descriptions in *The Soils of Waterloo County (Report No. 44 of the Ontario Soil Survey*. Presant, E.W. and R.E. Wicklund, 1971) and the OMAFRA digital soils data (Land Information Ontario, 2018), prior to the production of the soils map in Figure 2. Soil names used in the identification of the soil series on Figure 2 were taken from *The Soils of Waterloo County (Report No. 44 of the Ontario Soil Survey*. Presant, E.W. and R.E. Wicklund, 1971).

It should be noted that the soil mapping provided with *The Soils of Waterloo County (Report No. 44 of the Ontario Soil Survey*. Presant, E.W. and R.E. Wicklund, 1971) report makes use of slope groupings as follows: Aa = 0 – 3 percent; Bb = 3 – 6 percent; Cc = 6 – 12 percent; Dd = over 12 percent. Capital letters represent simple slopes (slope lengths greater than 50 metres), while lower case letters represent complex slopes (slope lengths less than 50 metres).



Legend

- Soil Inspection Site
- Stone Pile
- Contour Line (MHBC)
- Roads (MNRF)
- Lot Lines (MNRF)
- Soil Polygon Boundary
- Potential License Boundary (45.6 ha)

Soil Code

Bg - Burford gravelly loam
Ca - Caledon sandy loam
Cm - Camilla sandy loam
Fl - Floradale loam
He - Heidelberg fine sandy loam
Ma - Mannheim loam
Sj - St. Jacobs loam
Wa - Waterloo fine sandy loam
Dist = Disturbed Area
Pothole/NR - Not Rated

Soil Code / Slope Code
Bgb
2MF
CLI Class / CLI Subclass

Slope Class

Aa = 0.0 - 0.5%
Bb = 0.5 - 2.0%
Cc = 2.0 - 5.0%
Dd = 5.0 - 9.0%
Ee = 9.0 - 15.0%

Lower case = Slope length < 50 m
Upper case = Slope length > 50 m

CLI Subclass Limitation

E - Erosion
F - Fertility
M - Moisture
S - Adverse Soil Characteristics
T - Topography

Figure 2

Soils and
Canada Land Inventory (CLI)
Edworthy Pit West

DBH Soil Services Inc.

August 4, 2021

The normal or standard slope groupings (as presented in the Ontario Centre for Soil Resource Evaluation document "*Field Manual for Describing Soils in Ontario*, 4th Edition (1993)" provides slope groupings as follows: Aa = 0.0 – 0.5 percent; Bb = 0.5 – 2.0 percent; Cc = 2.0 – 5.0 percent; Dd = 5.0 – 9.0 percent; Ed = 9.0 – 15.0 percent; Ff = 15.0 – 30.0 percent; and Gg = 30.0 – 45.0 percent.

On review of the OMAFRA document "*Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for Application of the Canada Land Inventory In Ontario*" soils are rated for topography with slopes grouped similar to the description provided in the *Field Manual for Describing Soils in Ontario* and are presented as follows: <2; 2-5; 5-9; 9-15; 15-30; 30-60; and >60. These groupings are similar to the groupings presented in the *Field Manual for Describing Soils in Ontario.*

For the purposes of providing mapping and soil capability ratings that are consistent with the OMAFRA document "*Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for Application of the Canada Land Inventory In Ontario*", the slope groupings and mapping presented in this report reflect the standard percent slope groupings as are documented in the *Field Manual for Describing Soils in Ontario*.

The onsite soil survey identified eight soil series and two miscellaneous nonsoil groups. The eight series were identified as: Burford; Caledon; Camilla; Floradale; Heidelberg; Mannheim; St. Jacobs; and Waterloo. The miscellaneous nonsoil groups comprised areas that have been disturbed and Potholes.

The Burford soils are the well-drained member of the Burford soil catena. These soils developed on glaciofluvial or outwash deposits of sands, gravelly sands, gravel textures or cobbly parent materials. 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 terraces and outwash areas bordering the Grand, Speed and Conestogo Rivers. There are also large areas of Burford soils on gravelly outwash areas. Burford soils are often found in association with Brisbane soils. Burford soils may have inclusions of stony Dumfries soils and coarse/medium sandy soils.

Caledon soils are the well-drained member of the Caledon soil catena. Caledon soil developed in sandy loam sediments overlying gravel deposits. The surface horizons are often low in organic matter. The Bt horizons usually develop near the boundary between the sands and gravels. Caledon soils have low water holding capacity, low inherent fertility and may be located on steep and complex topography.

Camilla soils are the imperfectly drained member of the Caledon soil catena. These soils developed from sandy loam sediments overlying gravel materials, usually between 25 and 100 cm deep. These soils have low inherent fertility and a seasonally high-water table.

Floradale soils are the imperfectly drained member of the St. Jacobs soil catena. The Floradale soils developed from loam and silt loam sediments overlying gravel materials, usually between 25 and 100 cm deep. These soils have a low water holding capacity, low inherent fertility and may be found on steep and complex slopes.

Heidelberg soils are the imperfectly drained member of the Waterloo soil catena. Heidelberg soils developed on very fine and fine sandy loam materials of alluvial and lacustrine origin. These soils are typically found in low-lying areas and with sandy moraines. The Heidelberg soils are often underlain by gravel deposits. The surface horizons have medium amounts of organic matter. These soils may have a seasonally high-water table.

Mannheim soils are the well-drained member of the Mannheim soil catena. The Mannheim soils developed from loam and silt loam sediments overlying stony loam till materials. These soils are generally stone free between 25 and 100 cm in depth. These soils may be found on moderately steep or complex slopes and may have a relatively low water holding capacity.

St. Jacobs soils are the well-drained member of the St. Jacobs soil catena. These soils have developed on loam and silt loam materials overlying gravel deposits. In relation to the Subject Lands, these soils are found within the Galt and Paris Moraines. The St. Jacobs soils are found on moderately steeply sloping and complex topography. These soils have low natural fertility and low water holding capacity.

Waterloo soils are the well-drained member of the Waterloo soil catena. The Waterloo soils developed on deposits of fine and very fine sandy loam materials. The Waterloo soils occur in the Waterloo Sandhills and in the Galt and Paris Moraines. These soils may occur on steep slopes, however, if they occur on level and gently sloping areas, they will have deeper A horizons. Waterloo soils may be limited by excessively steep slopes or complex topography and low water holding capacity.

A small area of disturbed soils was noted within the Subject Lands. Disturbed soils are associated with areas where the soil materials were modified by human activities such as: construction activities (house construction, roadway/laneway construction, wells, septic systems, barns); aggregate operations (quarries, pits); or other activities that would cause significant soil mixing and degradation. A laneway area (field access) was noted at the southern end of the property.

A few small areas were defined as Potholes within *The Soils of Waterloo County (Report No. 44 of the Ontario Soil Survey*. Presant, E.W. and R.E. Wicklund, 1971). A pothole is defined as a hole generally deeper than wide, worn into solid rock at falls and strong rapids by sand, gravel and stones being spun around by the force of the current. In *The Soils of Waterloo County (Report No. 44 of the Ontario Soil Survey*. Presant, E.W. and R.E. Wicklund, 1971) the term pothole is also used to describe circular depressions that occur in soil materials that may or may not be kettle holes.

It should be noted that there were a few kettle type depressions that have been used for agricultural production. These particular depressional areas have been mapped with soil names and the appropriate Canada Land Inventory (CLI) class as based on the textures and slope class. Kettle areas identified in woodland areas and not used for agricultural production have been identified as Kettles and are not rated for CLI.

A detailed description of the soils at each inspection site is included in Appendix A.

4.3.1 ARTIFICIAL DRAINAGE

An evaluation of artificial drainage on the Subject Lands was completed through a correlation of observations noted during the windshield surveys, aerial photographic interpretation and a review of the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Artificial Drainage System Mapping.

Visual evidence supporting the use of subsurface tile drains would include observations of drain outlets to roadside ditches or surface waterways, and surface inlet structures (hickenbottom or french drain inlets).

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 reviewed to determine if an agricultural tile drainage system had been registered to the Subject Lands. The OMAFRA maps revealed that no agricultural drainage systems were registered on the Subject Lands.

Figure 1 illustrates the location of the OMAFRA artificial tile drainage systems in the area.

4.3.2 IRRIGATION

Observations noted during the surficial soil survey indicated that the Subject Lands are not irrigated, and that the 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, etc), the presence of a body of water capable of sustaining the irrigation operation and lands that are appropriate for the use of such equipment.

No irrigation equipment was observed onsite during the course of the on-site survey.

4.3.3 LANDFORMING

With the exception of the creation of laneways to allow access there is no evidence of any landforming for the purposes of leveling or reducing slope for the enhancement of agricultural activities or operations.

4.3.4 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 *The Soils of Waterloo County (Report No. 44 of the Ontario Soil Survey*. Presant, E.W. and R.E. Wicklund, 1971), CLI map No. 40 P/9, 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".

Burford soils on simple (slope length greater than 50 m) 'B' (0.5 -2.0 percent) and complex (slope length less than 50 m) slopes were both rated as CLI class 2MF'; on complex (slope length less than 50 m) 'c' (2.0 – 5.0 percent) slopes were rated as CLI class 3ST; and on complex 'e' (9.0 – 15.0 percent) slopes were rated as CLI class 5EST.

Caledon soils on complex 'c' slopes were rated as CLI class 2MF.

Camilla soils on simple 'B' slopes were rated as CLI class 2F.

Floradale soils on complex 'd' slopes were rated as CLI class 3T, and on complex 'e' slopes were rated as class 4T.

Heidelberg soils on complex 'c' slopes were rated as CLI class 2T.

Mannheim soils located on simple 'B' slopes were rated as CLI class 1.

St. Jacobs soils on simple 'A' (0.0 – 0.5 percent) and on simple/complex 'B' (0.5 – 2.0 percent) were both rated as CLI class 1. St Jacobs soils on complex 'c' slopes (2.0 – 5.0 percent) were rated as CLI Class 2T.

Waterloo soils on simple 'B' and complex 'b' slopes were rated as CLI class 1.

Disturbed soils were listed as Not Rated. The majority of the areas that were determined to be Potholes were also identified as Not Rated. This nonrating was applied to these areas due to the extremely eroded shoulder areas of the slope compared in contrast to the depositional areas in the bottom of the hole. The depositional areas included deeper topsoil, however, the topsoils in the depressional areas were highly calcareous due to the accumulation of the eroded shoulder slope materials.

Further, disturbed soil areas are considered as Not Rated within the Canada Land Inventory classification system. Pothole areas were not rated within *The Soils of Waterloo County (Report No. 44 of the Ontario Soil Survey*. Presant, E.W. and R.E. Wicklund, 1971).

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 E – Erosion: Subclass E is applied to soils which have been badly damaged by erosion. The productivity of such soils is therefore reduced. Organic matter, topsoil and subsoil losses in these soils reduce yields. In extreme situations, where erosion has caused deep gullies, farm machinery use is obstructed.*
>
> *Subclass F – Low Natural Fertility: This subclass is made up of soils having low fertility that is either correctable with careful management in the use of fertilizers and soil amendments or is difficult to correct in a feasible way. The limitation may be due to a lack of available plant nutrients, high acidity, low exchange capacity, or presence of toxic compounds.*
>
> *Subclass M – Moisture deficiency: Soils in this subclass have lower 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 F and M when these are present with a third limitation such as T, E or P*
>
> *Subclass T - Topography: This subclass denotes limitations due to slope steepness and length. Such limitations may hinder machinery use, decrease the uniformity of crop growth and maturity, and increase water erosion potential.*

Table 1 summarizes the relative percent area occupied by each capability class for the Subject Lands.

Table 1 Canada Land Inventory – Limit of Extraction Area

Canada Land Inventory Class (CLI)	Area (ha)	Percent Occurrence
Class 1	20.1	44.2
Class 2	18.7	40.9
Class 3	2.2	4.8
Class 4	3.6	7.8
Class 5	0.4	0.9
Class 6	-	-
Class 7	-	-
Not Rated	0.7	1.5
Totals	45.6	100.0

The Subject Lands comprise approximately 89.8 percent Canada Land Inventory (CLI) class 1 – 3 soils. The remaining soils (Not Rated areas and CLI class 4 – 7) comprise approximately 10.2 percent of the Subject Lands.

4.3.5 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.

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 1land, 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 2

Table 2 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 3) illustrates the range of values which can be directly correlated to the equivalent CLI class.

Table 3 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 4.

Table 4 Soil Productivity Rating and Equivalent CLI for the Subject Lands

	Soil Productivity Rating	Corresponding CLI Class
Subject Lands	0.84	2

The calculated Soil Productivity Rating for the Subject Lands was 0.84 or a CLI class 2 equivalent.

5.0 SUMMARY AND CONCLUSIONS

DBH Soil Services Inc was retained by Hanson Ready Mix Inc. to complete a Soil Survey and Canada Land Inventory (CLI) Classification assessment for an area identified as:

Concession 9, Part Lots 16, 17 and 18
Township of North Dumfries
Regional Municipality of Waterloo

This area is comprised of one parcel identified by the Municipal Property Assessment Corporation (MPAC) Roll Number:

30010300041460000000
30010300041440000000 (1262 Greenfield Road)
30010300041480000000 (1354 Spragues Road)

The Roll Number was identified in the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Agricultural Atlas (http://www.gisapplication.lrc.gov.on.ca/AIA/Index.html?viewer=AIA.AIA&locale=en-US) and through a review of the Region of Waterloo GIS Locator online map viewer http://gis.region.waterloo.on.ca/Html5Viewer_2_4/Index.html?configBase=http://gis.region.waterloo.on.ca/Geocortex/Essentials/GeocortexEssentials_4/REST/sites/LocatorBasic/viewers/LocatorHTML/virtualdirectory/Resources/Config/Default.

For the purposes of this report, these parcels were referred to as the Subject Lands. The Subject Lands comprise approximately 45.6 ha (112.7 acres) of which the majority of the lands are used for the production of common field crop (soybean in the 2020 and 2021 growing seasons). The non-cropped lands included a small, wooded area (trees and brush) that was observed along the southeast edge, adjacent to Spragues Road, and a small area along the western edge of the parcels. The Subject Lands topography is considered to be gently to moderately rolling, with a few depressional or kettle areas.

The Subject Lands are roughly bounded: on the north by agricultural lands; on the east by agricultural lands and Spragues Road; on the south by Spragues Road/Greenfield Road and a Township maintenance yard; and on the west by woodlots, agricultural land, and Greenfield Road. An existing and operating aggregate pit was noted across Spragues Road.

In the local area context, the Subject Lands are located approximately 2.0 km south, southwest of the City of Cambridge.

The results of the Soil Survey assessment include the following:

- The majority of the Subject Lands are used for the production of common field crops. (Soybean) in the 2020 and 2021 growing seasons.

- Small portions of the Subject Lands comprised woods and brush areas along the eastern edge, and along the western edge.

- There are no buildings on the Subject Lands, with the Potential License Boundary.

  Significant stone piles were noted along the fence lines and in the middle of the property near the Pothole areas.

- No irrigation equipment or irrigation systems were observed on the Subject Lands

- There are no registered artificial tile drains associated with these properties.

- Approximately 89.8 percent of the Subject Lands is Canada Land Inventory (CLI) class 1 – 3 soils.

- The Soil Productivity Rating for the Subject Lands is 0.84 giving a CLI equivalent rating of class 2.

The foregoing represents a comprehensive onsite soil survey assessment with the purpose of evaluating the Subject Lands existing soil resources.

Given the geographical location of these lands, it is the conclusion of this study that the majority of the Subject Lands comprises CLI class 1 – 3 soils (89.8 percent), with the remainder comprising approximately 10.2 percent of CLI class 4 – 7 and Not Rated areas.

Sincerely
DBH Soil Services Inc.

Dave Hodgson, P. Ag
President

APPENDIX A

Soil Inspection Site Characteristics

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
1	Ap Bt IICk	0 – 22 22 – 48 48+*	SL SL gSL/SL	Well	Burford
2	Ap Bt IICk	0 – 24 24 – 52 52+*	SL SL gSL/SL	Well	Burford
3	Ap Btk IICk	0 – 21 21 – 55 55+*	SL SL gSL/SL	Well	Burford
4	Ap Bt IICk	0 – 23 23 – 65 65+*	SL SL gSL/SL	Well	Burford
5	Ap Ae Btgj Ckgj	0 – 21 21 – 30 30 – 49 49 - 95	vf SL f SL SL/SCL f SL	Imperfect	Heidelberg
6	Ap IIBt IICK	0 – 23 23 – 65 65+*	SiL L/SL gLS	Well	St. Jacobs
7	Ap IIBt IICK	0 – 25 25 – 70 70+*	SiL L/SL gLS	Well	St. Jacobs
8	Ap IIBt IICK	0 – 21 21 – 68 68+*	SiL L/SL gLS	Well	St. Jacobs
9	Ap Ae Btgj Ckgj	0 – 21 21 – 30 30 – 49 49 - 95	vf SL f SL SL/SCL f SL	Well	Burford
10	Ap Ae Bt IICk	0 – 20 20 – 30 30 – 70 70 +*	SL SL SL g SL/S	Well	Caledon
11	Ap Ae Bt Ck	0 – 24 24 – 32 32 – 62 62 - 100	fSL LS SL fS	Well	Waterloo
12	Ap Ae Bt Ck	0 – 25 25 – 36 36 – 70 70 - 100	fSL LS SL fS	Well	Waterloo
13	Ap Ae Bt Ck	0 – 21 21 – 29 29 – 59 59 - 100	fSL LS SL fS	Well	Waterloo
14	Ap Ae Bt Ck	0 – 23 23 – 34 34 – 67 67 - 100	fSL LS SL fS	Well	Waterloo
15	Ap Ae Bt Ck	0 – 25 25 – 34 34 – 71 71 - 100	fSL LS SL fS	Well	Waterloo

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
16	Apk Bmk Ck	0 – 30 30 – 55 55 +	SL SL SL	Variable	Pothole
17	Ap IIBt IICK	0 – 24 24 – 60 60+*	SiL L/SL gLS	Well	St. Jacobs
18	Ap IIBt IICK	0 – 20 20 – 68 68+*	SiL L/SL gLS	Well	St. Jacobs
19	Ap IIBt IICK	0 – 23 23 – 59 59+*	SiL L/SL gLS	Well	St. Jacobs
20	Ap IIBt IICK	0 – 25 25 – 70 70+*	SiL L/SL gLS	Well	St. Jacobs
21	Ap IIBt IICK	0 – 23 23 – 65 65+*	SiL L/SL gLS	Well	St. Jacobs
22	Ap Btk IICk	0 – 21 21 – 53 53+*	SL SL gSL/SL	Well	Burford
23	Ap Bm Bt	0 – 20 20 – 40 40 – 50*	fSL/L fSL/L CL	Well	St. Jacobs
24	Ap Bm Bt	0 – 20 20 – 40 40 – 55*	fSL/L fSL/L CL	Well	St. Jacobs
25	Ap Bm Bt	0 – 20 20 – 40 40 – 55*	fSL/L fSL/L CL	Well	St. Jacobs
26	Ap Ae Bt/Bm Bm	0 – 24 24 – 35 35 – 55 55 - 70	fSL fSL fSL fSL	Imperfect	Camilla
27	Ap	0 – 26*	fSL	Well	Caledon
28	Ap Ae Bt	0 – 35 35 – 70 70 - 100	fSL fSL fSL	Imperfect	Camilla
29	Ap Ae Bt	0 – 24 24 – 35 35 – 50*	fSL fSL fSL	Imperfect	Camilla
30	Ap	0 – 25*	fSL	Well	Caledon
31	Ap	0 – 26*	fSL	Imperfect	Camilla
32	Ap	0 – 28*	fSL	Well	Caledon
33	Ap	0 – 25*	fSL	Well	Camilla
34	Ap	0 – 23*	fSL	Well	Caledon
35	Ap	0 – 27*	fSL	Well	Caledon
36	Ap	0 – 28*	fSL	Well	Caledon
37	Ap	0 – 24*	fSL	Well	Caledon
38	Ap	0 – 25*	fSL	Well	Mannheim
39	Ap	0 – 20*	fSL	Well	Mannheim
40	Ap Ae Bt1 Bt2	0 – 20 20 – 30 30 – 43 43 - 70	fSL fSL/L fSL/L fSL/L	Well	Waterloo

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
41	Ap Bm1 Bm2	0 – 30 30 – 65 65 - 95	fSL fSL fSL/L/CL*	Well	Burford
42	Ap Ae? Bm/Bt Bt	0 – 28 28 – 36 36 – 72 72 – 98*	fSL fSL fSL L/CL	Well	Burford
43	Ap Bm Bt	0 – 27 27 – 54 54 – 90*	fSL fSL L/CL	Well	Burford
44	Ap Ae? Bm/Bt Bt	0 – 27 27 – 35 35 – 75 75 – 96*	fSL fSL fSL L/CL	Well	Burford
45	Ap Bm1 Bm2 Bm3	0 – 30 30 – 60 60 – 80 80 - 100	fSL fSL fSL/L fSL/L	Imperfect	Floradale
46	Ap Bm1 Bm2 Bm3	0 – 25 25 – 54 54 – 80 80 - 100	fSL fSL fSL/L fSL/L	Well	St. Jacobs
47	Ap Bm1 Bm2	0 – 28 28 – 60 60 - 90	fSL fSL fSL/L	Well	St. Jacobs
48	Ap Bm/Bt	0 – 15 15 – 40*	fSL L/fSL	Well	Burford
49	Ap Bm1 Bm2(Bt)	0 – 25 25 – 50 50 - 80	fSL fSL L/fSL	Well	Burford
50	Ap Bm1	0 – 25 25 – 40	fSL fSL	Well	Burford
51	Ap Ck1 Ck2	0 – 20 20 – 30 30 - 100	fSL fSL S	Imperfect	Floradale
52	Ap	0 – 25*	fSL	Well	Burford
53	Ap Ae Bt	0 – 26 26 – 41 41 – 68*	fSL fSL L/SL/CL	Well	Caledon
54	Ap	0 – 30*	fSL	Well	Burford
55	Ap	0 – 28*	fSL	Well	Burford
56	Ap	0 – 26*	fSL	Well	Burford
57	Ap Bm1 Bm2	0 – 25 25 – 65 65 - 90	fSL fSL fSL	Well	St. Jacobs
58	Ap Bm1 Bm2	0 – 25 25 – 65 65 - 90	fSL fSL fSL	Well	St. Jacobs
59	Ap Bm1 Bm2	0 – 22 22 – 40 40 – 50*	fSL fSL fSL	Well	Caledon
60	Ap Ae Bt	0 – 35 35 – 68 68 – 95*	fSL fSL fSL	Imperfect	Camilla
61	Ap	0 – 23*	L	Well	Burford

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
62	Ap	0 – 26*	L	Well	Burford
63	Ap	0 – 28*	L	Well	Burford

Notes:
L = Loam, SL = Sandy Loam, LS = Loamy Sand, SiL = Silt Loam, fSL = fine Sandy Loam, SCL= Sandy Clay Loam, g= gravelly
- A horizons are the surface materials often with the greatest percent of organic material
- B horizons are generally beneath the A horizon and show slight soil formation (ie: increases in clay and organic content)
- C horizons are generally beneath the B horizon and show little to no soil profile/horizon formation
* = refusal (excessive stoniness (gravels, cobbles))

APPENDIX B

Photographs

Photograph taken from the south, looking north into the property.

Photograph illustrating the steep topography associated with a pothole in the wooded area.

Photograph illustrating a large stone pile in the northern portion of the property.

Photograph illustrating the sloping topography and limited crop take in a pothole area.

APPENDIX C

Curriculum Vitea

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DAVID B. HODGSON, B.Sc., P. Ag.
PRESIDENT – Senior Pedologist/Agrologist

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, determining potential impacts 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.

SELECT PROJECT EXPERIENCE

Environmental Assessment Studies

- Agricultural Component of the Bradford Bypass (Highway 400 to 404 link) 2021 – ongoing.
- Agricultural Component of the Green for Life (GFL) Environmental, Moose Creek, Eastern Ontario Waste Handling Facility (EOWHF) Expansion, 2020 – 2021.
- Agricultural Component of the Greater Toronto Area West (GTAW) Highway Corridor Assessment, 2019 – ongoing.
- Peer Review of the Walker Environmental Group (WEG) Inc. Southwestern Landfill Proposal, Ingersoll, 2013 – 2021.
- Agricultural Component for the High-Speed Rail Kitchener to London –Terms of Reference, 2018,
- 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 – 2015.
- 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 1).
- Agricultural Component of the Niagara to GTA Planning and Environmental Assessment Study, 2007 – 2013.
- Agricultural Component of the Highway 401 widening, Chatham, 2006 - 2007.
- 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
- Bradford Bypass Highway 400- 404 Link, Agricultural Impact Assessment, 2021 – ongoing.
- Wilfrid Laurier Milton Campus, Agricultural Impact Assessment, 2021 – ongoing.
- Town of Lincoln Road Realignment, Agricultural Impact Assessment, 2021 – ongoing.
- Britannia Secondary Plan, Agricultural Impact Assessment, Milton, 2021 – ongoing.
- Petersburgh Sand Pit, Agricultural Impact Assessment, 2021 – ongoing.
- Milton, CRH Quarry Expansion, Agricultural Impact Assessment, 2020 – ongoing.
- Grimsby, Specialty Crop Area Redesignation, Agricultural Impact Assessment, 2020-ongoing.
- Halton Hills, Premier Gateway Phase 2 Employment Lands Secondary Plan, Agricultural Impact Assessment, 2020 - 2021.
- Milton Education Village Secondary Plan, Agricultural Impact Assessment, 2020 - 2021.
- Woodstock, Pattullo Avenue Realignment, Agricultural Impact Assessment, 2020 - 2021.
- Smithville, West Lincoln Master Community Plan, Agricultural Impact Assessment, AECOM, 2019 – On-going.
- Kirby Road Agricultural Impact Assessment, HDR, Vaughan, 2019 – 2021.
- Elfrida Lands, City of Hamilton, Agricultural Impact Assessment Update, WSP, 2019 – 2021.
- Dorsay Development – Durham Region High Level Agricultural Assessment, 2019.
- Stoney Creek Landfill AIA Update – GHD, 2019.
- Town of Wilmot, Agricultural Impact Assessment (AIA) Aggregate Pit Study (Hallman Pit), 2018, On-going.
- Courtice Area South East Secondary Plan (Clarington) Agricultural Impact Assessment (AIA), 2019,
- Town of Halton Hills, Minimum Distance Separation (MDS 1), 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, 2019,
- 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 1), February 2017.
- Township of Erin, County of Wellington – Minimum Distance Separation 1(MDS1 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 Mapleview Developments, Town of Innisfil – Minimum Distance Separation (MDS 1), 2014.
- Loyalist Township – Minimum Distance Separation (MDS 1 & 2), 2014.
- Rivera Fine Homes, Caledon – Minimum Distance Separation (MDS 1), 2014.
- Town of Milton PanAm Velodrome – Minimum Distance Separation (MDS) 2012 – 2013.

Soil Surveys/Soil Evaluations
- Soil Sampling, City of Kitchener, 2021 – 2022.

- Soybean Cyst Nematode Soil Sampling, Enbridge, 2021.
- Soil Survey and Canada Land Inventory Evaluation, Max Becker Enterprises, City of Kitchener, 2021
- Soil Survey and Canada Land Inventory Evaluation, Max Beck Enterprises, City of Kitchener, 2021 – 2022.
- Soil Survey and Canada Land Inventory Evaluation, Burlington, Nelson Quarry, 2020-2021.
- City of Kitchener, City Wide Soil Studies, 2020-ongoing.
- Soil Survey, Fallowfield Drive, City of Kitchener Development Manual Study, 2020 - ongoing.
- Soil Survey, Williamsburg Estates, City of Kitchener Development Manual Study, 2020 - 2021.
- Soil Survey, South Estates, City of Kitchener Development Manual Study, 2020 - 2021.
- Soil Survey and Canada Land Inventory Evaluation, Burlington, Nelson Quarry, 2019.
- Soil Survey and Canada Land Inventory Evaluation, Maryhill Pit, 2019.
- Soil Survey and Canada Land Inventory Evaluation, Glen Morris Pit, Lafarge Canada, 2018,
- Soil Survey and Canada Land Inventory Evaluation, Brantford Pit Extension, Lafarge Canada, 2018,
- 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 – June 2018.
- 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.

Municipal Comprehensive Review Studies (MCR)

- Simcoe County, 2020 - ongoing.
- Northhumberland County, 2020 - ongoing.
- Halton Region, 2019 - ongoing.

Land Evaluation and Area Review Studies (LEAR)

- Mapping Audit Northumberland County. Comparison of Regional and Provincial Prime Agricultural Area Mapping – 2021 - ongoing.
- Mapping Audit Simcoe County. Comparison of Regional and Provincial Prime Agricultural Area Mapping – 2021 - ongoing.
- Mapping Audit Halton Region. Comparison of Regional and Provincial Prime Agricultural Area Mapping – 2019 - ongoing.
- Land Evaluation and Area Review – Soils Component, in Association with AgPlan Ltd, Kanata/Munster. December 2017 – July 2018.
- 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.

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- 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.

Expert Witness

- Local Planning Appeal Tribunal (LPAT) Hearing, Greenwood Aggregates Limited, Violet Hill Pit Application, 2020.
- Ontario Municipal Board (OMB) Hearing, Burl's Creek Event Grounds 2018-2019.
- 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 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

- Union Gas/Enbridge Gas 20" Gas Pipeline Construction Monitoring – Kingsville – 2019 - 2020.
- Union Gas/Enbridge Gas – Gas Pipeline Construction Monitoring for Tree Clearing. Kingsville Project. February/March 2019.
- CAEPLA – Union Gas 36" Gas Pipeline Construction Monitoring and Post Construction Clean Up – Agricultural Monitoring Panhandle Project. 2017 – 2018.
- CAEPLA – Union Gas 36" Gas Pipeline Construction Clearing Panhandle Project (Dawn Station to Dover Station) – Agricultural Monitoring, 2017 (Feb-March).
- City of Kitchener, Soil Sampling and data set analysis, 2017 – On-going.
- GAPLO – Union Gas 48" Gas Pipeline (Hamilton Station to Milton) Construction Soil and Agricultural Monitoring, 2016 – 2017.
- GAPLO – Union Gas 48" Gas Pipeline (Hamilton –Milton) Clearing – Agricultural Monitoring, 2016.

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.

Appendix B: Curriculum Vitae

MHBC
PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE

CURRICULUM**VITAE**

Pierre Chauvin, BSc(Agr.), MA, MCIP, RPP

EDUCATION

1997
Masters of Arts, Regional Planning and Resource Development
University of Waterloo

1993
Bachelor of Science in Agriculture
University of Guelph

Pierre Chauvin joined the firm as a Planner in 1998. Mr. Chauvin provides urban planning analysis and research services for public and private sector projects across Ontario.

His professional activities include project management, community planning, and land development. Pierre's experience ranges from residential and commercial development, environmental and recreational planning and resource management.

Pierre also has specific expertise in rural and agricultural planning. He has prepared agricultural impact assessments as part of settlement area expansions and development proposals. He also has experience with MDS and the Nutrient Management Act, and has provided expert agricultural and planning evidence at the Ontario Municipal Board and other tribunals.

Pierre holds a Masters degree in Regional Planning and Resource Development and a Bachelor of Science in Agriculture degree with a major in Natural Resources Management. Pierre is also a full member of the Canadian Institute of Planners and Ontario Professional Planners Institute.

PROFESSIONAL ASSOCIATIONS

Full Member, Canadian Institute of Planners
Full Member, Ontario Professional Planners Institute
Past Member, Committee of Adjustment for the Township of Centre Wellington
Past Member (Build Committee), Habitat for Humanity - Centre Wellington
Past Member, Grand River Conservation Authority, Recreation Working Group
Past Vice-Chair, Village of Elora Planning Advisory Committee
Past Member, Heritage Centre Wellington Committee (LACAC)
Past Board of Directors, Guelph & District Homebuilders' Association
Past Chair of the Industry Luncheon Committee, Guelph & District Homebuilders' Association
Member of the Waterloo Region Homebuilders' Association Liaison Committee with the Region of Waterloo
Member of the Guelph & District Homebuilders' Association Liaison Committee with the Grand River Conservation Authority

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CURRICULUM**VITAE**

Pierre Chauvin, BSc(Agr.), MA, MCIP, RPP

PROFESSIONAL HISTORY

2013 – Present	Partner, MacNaughton Hermsen Britton Clarkson Planning Limited
2004 - 2013	Associate, MacNaughton Hermsen Britton Clarkson Planning Limited
1998 - 2004	Planner, MacNaughton Hermsen Britton Clarkson Planning Limited
1997 - 1998	Assistant Planning Officer, Upper Grand District School Board
1993 - 1995	Research Assistant (Nutrient Management), Land Resource Science Department, University of Guelph

SELECTED PROJECT EXPERIENCE

Parks & Recreation

Project lead and consultant to the City of Port Colborne to complete a Parks and Recreation Master Plan (on-going).

Project lead and consultant to the Town of Collingwood to complete a Parks and Recreation Master Plan.

Project lead and consultant to the Town of Grimsby to complete a Parks and Recreation Master Plan.

Project lead and consultant to the City of Kitchener to undertake a Business Case for the Doon Pioneer Park Community Centre Expansion.

Project lead and consultant to the Town of Cobourg for the Cobourg Community Centre and YMCA Northumberland Joint Facility Needs Assessment.

Project lead and consultant to the Town of Cobourg for the preparation a Recreation Strategy and Implementation Plan.

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CURRICULUM**VITAE**

Pierre Chauvin, BSc(Agr.), MA, MCIP, RPP

Project Lead and Consultant to the Town of Caledon in the preparation of a Parks and Recreation Visioning Plan.

Consultant to the Township of West Lincoln in the preparation of a Parks and Recreation Master Plan.

Project planner, Township of Guelph-Eramosa Parks, Recreation and Culture Master Plan.

Source Water Protection

Prepared Official Plan Amendment and policies as well as implementing Zoning By-law to implement the Source Water Protection Plan policies for the Counties of Norfolk, Elgin and Middlesex.

Prepared Official Plan Amendment and policies to implement the Source Water Protection Plan policies for the County of Wellington.

Consultant to Grand River Conservation Authority, County of Wellington and County of Perth in the development of Source Water Protection water quality policies for the Lake Erie Region Source Protection Plan.

Prepared Official Plan Amendment and policies to implement the Groundwater Protection Strategy for the County of Wellington.

Official Plan/Zoning By-laws

Project lead and consultant for the preparation of an Official Plan Update for the Municipality of Kincardine (on-going).

Project lead and consultant to the Township of Huron-Kinloss for the preparation of a Comprehensive Zoning By-law Review.

Project lead and consultant for the preparation of an Official Plan Update for the Township of Huron-Kinloss.

Project lead and consultant to the County of Norfolk to prepare an Issues and Report for the Hastings Drive Zoning By-law Study.

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CURRICULUM**VITAE**

Pierre Chauvin, BSc(Agr.), MA, MCIP, RPP

Project planner for preparation of a Consolidated Zoning By-law for the City of Kawartha Lakes (involved consolidating 17 By-laws).

Agricultural/Rural Planning

Project planner to undertake a review of the Minimum Distance Separation formulae for the Region of Peel and Town of Caledon as part of their LEAR Study.

Review and provided opinion to the Township of Guelph-Eramosa regarding the revised Minimum Distance Separation Formulae.

Project planner for the preparation of an agricultural assessment of potential growth areas as part of the City of Brantford Growth Strategy/Official Plan Review.

Preparation of agricultural impact statements/assessments including MDS I & II assessments on behalf of various private sector clients in support of development and aggregate applications.

Preparation of an agricultural assessment on behalf of the Township of Guelph/Eramosa to explore the feasibility and potential of a dual Agricultural/Rural designation approach in the Official Plan.

Special Studies & Other

Project planner for the Municipality of North Perth to complete a Secondary Plan and Master Servicing Plan for North-East Listowel (on-going).

Project Lead and planner for the Upper Grand District School Board for the approval of new secondary school in the City of Guelph (on-going).

Consultant to the Upper Grand District School Board regarding the justification and approval of a new secondary school in the Township of Centre Wellington, including a settlement area expansion.

Consultant to the Huron-Perth Catholic District School Board regarding the justification and approval of a new elementary school in the Town of North Perth, including an agricultural impact assessment for a proposed expansion of the settlement boundary to accommodate the school.

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CURRICULUM**VITAE**

Pierre Chauvin, BSc(Agr.), MA, MCIP, RPP

Justification of an urban expansion in the former Town of Listowel (Municipality of North Perth) and preparation of a Plan of Subdivision for a 50 acre property. The justification included an assessment of agricultural impacts and servicing considerations.

Consultant to the City of Woodstock regarding the justification and approval of the East Woodstock Secondary Plan & Design Study. Prepared Official Plan Amendment and policies to implement the Secondary Plan.

Consultant to the Town of North Perth on the Southeast Listowel Community Plan.

Project planner providing planning services to the Township of Guelph-Eramosa. Review of applications, and preparation and presentation of planning reports to Council.

Research assistant/project planner, Town of Hawkesbury Downtown Enhancement Plan.

Review and/or preparation of numerous planning approvals relating to draft plan of subdivisions, draft plan of condominiums, site plans, Official Plan amendments, Zoning By-law amendments, consents and minor variances throughout the Region of Waterloo, the Counties of Wellington, Perth, Oxford, Huron and surrounding areas.

Advisor to various aggregate producers regarding the review of new Official Plan policies in the Region of Durham and County of Oxford.

Project Planner to the Aggregate Producers' Association of Ontario on the review of the Oak Ridges Moraine Conservation Plan.

Coordinating the design and preparation of site plans under the Aggregate Resources Act. Research and preparation of Planning Reports and Aggregate Resources Act Reports for license and permit applications, including work for companies such as Lafarge Canada, Dufferin Aggregates, Federal White Cement and Beachville Lime Limited.

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CURRICULUM**VITAE**

Pierre Chauvin, BSc(Agr.), MA, MCIP, RPP

AWARDS / PUBLICATIONS / PRESENTATIONS

2017	Designing Public Spaces to Support Vibrant Communities – Presentation on Park Land Dedication and Implications of Bill 73, September 15, 2017
2012	OPPI – Southwest District – Presentation on Source Water Protection Planning and Implementation, October 25, 2012
2012	Ontario Sand and Gravel Association – Presentation on Implications of Source Water Protection on Aggregate Operations, November 8, 2012.
2004	B. Hermsen and P. Chauvin, 2004. Elementary Schools and Residential Absorption Rates in New Neighbourhoods. Spring 2004 Ontario Expropriation Association Newsletter.
2003	Nutrient Management Act - Presentation to the Municipal Law Seminar Series, in co-operation with Kearns McKinnon LLP, February 26, 2003.
1997	Planning and Development of Recreational Trails on Private Lands: A Case Study of the Grand Valley Trails Association. Unpublished M.A. Thesis, School of Urban and Resource Development Planning, Faculty of Environmental Studies, University of Waterloo, Ontario.

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CURRICULUM**VITAE**

Dawson McKenzie, BA, MSc (Candidate)

Dawson McKenzie joined MHBC as a Planner in 2021. Prior to joining MHBC, Mr. McKenzie worked as a researcher at the University of Guelph and as a Research Associate in the private sector. Mr. McKenzie provides a range of planning services to municipal and private sector clients including land use planning advice, policy review, preparation of planning justification reports, as well as obtaining development approvals for a range of development applications

EDUCATION

2015 - 2019
Bachelor of Arts, Honours
Princeton University

2020 - Present
Masters of Science (Planning)
University of Guelph

PROFESSIONAL ASSOCIATIONS

Student Member, Canadian Institute of Planners (CIP)
Student Member, Ontario Professional Planners Institute (OPPI)

PROFESSIONAL HISTORY

2021 - Present	Planner, MacNaughton Hermsen Britton Clarkson Planning Limited
2020 - 2021	Research Assistant, University of Guelph
2019 - 2021	Research Associate, Wilton Consulting Group

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