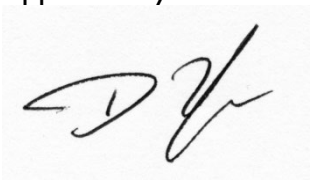
DOCUMENT TRANSMITTAL

Document:	**WHITECHURCH SECONDARY PLAN** **CITY OF HAMILTON** **AGRICULTURAL IMPACT ASSESSMENT**		
Prepared for:	Mr. Scott Beedie Planner Urban Solutions Planning & Land Development 3 Studebaker Place, Unit 1 Hamilton, ON L8L 0C8	Date Our Ref. No. Your Ref. No.	December 6, 2023 2023-21
Attention:	Mr. Beedie	DRAFT	FINAL ☑

DISTRIBUTION

COPIES	TO
1 pdf file via email	Mr. Beedie

Approved by:



President

DBH Soil Services Inc.

WHITECHURCH SECONDARY PLAN
CITY OF HAMILTON
AGRICULTURAL IMPACT ASSESSMENT

DBH Soil Services Inc.

December 6, 2023

WHITECHURCH SECONDARY PLAN
CITY OF HAMILTON
AGRICULTURAL IMPACT ASSESSMENT

Prepared for:

Mr. Scott Beedie
Planner
Urban Solutions
Planning & Land Development
3 Studebaker Place, Unit 1
Hamilton, ON
L8L 0C8

December 6, 2023

Prepared by:

DBH Soil Services Inc.

TABLE OF CONTENTS

1 Introduction 1
2 Methodology 3
2.1 Consultation 3
2.2 Data Collection 3
2.2.1 Policy 4
2.2.2 Physiography 4
2.2.3 Topography and Climate 4
2.2.4 Agricultural Land Use 5
2.2.5 Minimum Distance Separation 5
2.2.6 Land Fragmentation/Severance 6
2.2.7 Soil Survey 6
2.2.8 Agricultural System 6
2.2.9 Agrcultural Statistics 7
3 Policy Review 8
3.1 Provincial Agricultural Policy 9
3.2 The Growth Plan for the Greater Golden Horseshoe 10
3.1 The Greenbelt Plan 12
3.1 The Niagara Escarpment Plan 14
3.2 The Oak Ridges Moraine Conservation Plan 14
3.3 Official Plan Policy 14
3.3.1 City of Hamilton Rural Official Plan 14
3.3.2 Zoning By-Law 16
3.3.2.1 The Corporation of the Township of Glanbrook By-law No. 464 17
4 Agricultural Resource Potential 19
4.1 Physical Characteristics 19
4.1.1 Physiography 19
4.1.2 Topography and Climate 19
4.2 Land Use 22
4.2.1 Existing Land Use – PSA 25
4.2.2 Existing Land Use – SSA 25
4.3 Agricultural Investment 26
4.3.1 Agricultural Buildings 27
4.3.2 Artificial Drainage 29
4.3.3 Water Wells 30
4.3.4 Irrigation 30
4.3.5 Landforming 31
4.4 Minimum Distance Separation (MDS 1) 31
4.5 Fragmentation 33
4.6 Parcel or Land Severance 37
4.7 Soils and Canada Land Inventory (CLI) 38
4.7.1 Soil Capability for Agriculture 38
4.7.1.1 Canada Land Inventory (CLI) Class 38
4.7.1.2 Canada Land Inventory (CLI) Subclass 40
4.8 Agricultural Systems Portal 42
4.9 Agricultural System and Agricultural Network 43

4.10 Agricultural Census Data 46
4.10.1 Hamilton Division 46
5 Resource Allocation and Conflict Potential 49
5.1 Impacts, Assessment and Compatability with Surrounding Land Uses 49
5.2 Traffic, Trespass and Vandalism 53
5.3 Agricultural Infrastructure 53
5.4 Mitigation Measures 54
5.4.1 Avoidance 54
5.4.2 Minimizing Impacts 54
5.4.3 Mitigating Impacts 54
6 Summary and Conclusions 56
7 References 60

LIST OF FIGURES

Figure 1 Location Map 2
Figure 2 Provincial Agricultural Land Base Mapping 11
Figure 3 Greenbelt Plan Mapping 13
Figure 4 City of Hamilton Rural Official Plan Schedule D 15
Figure 5 Zoning 18
Figure 6 Physiography 20
Figure 7 Crop Heat Units Map 21
Figure 8 OMAFRA Climate Zone Map 22
Figure 9 Existing Land Use 23
Figure 10 Agricultural Investment 28
Figure 11 Minimum Distance Separation (MDS 1) 34
Figure 12 Fragmentation 36
Figure 13 Canada Land Inventory (CLI) 39
Figure 14 OMAFRA Agricultural Systems Mapping Livestock, Fish and Poultry 44
Figure 15 Agricultural Systems Portal Mapping 45

LIST OF TABLES

Table 1 Typical Land Use Designations 25
Table 2 Land Use – PSA and SSA 26
Table 3 Minimum Distance Separation (MDS 1) 32
Table 4 Parcel Size and Parcel Count 37
Table 5 Canada Land Inventory – Percent Occurrence 42
Table 6 Hamilton Division Census 2021 Data – Land Use 46
Table 7 Hamilton Division Census 2021 Data – Crops 47
Table 8 Hamilton Division Census Data (2021) – Livestock 48
Table 9 Potential Impacts 50

APPENDICIES

APPENDIX A Agricultural Building List
APPENDIX B Unique Soil Symbols List
APPENDIX C Dave Hodgson Curriculum Vitae

1 INTRODUCTION

DBH Soil Services Inc was retained to complete an Agricultural Impact Assessment (AIA) Report for the Whitechurch Secondary Plan area. The proposed future development of this area required the completion of an AIA. Due to scheduling, this AIA was completed as a desktop assessment, with the full AIA to be completed as scheduling permits. This desktop AIA identifies and assesses agricultural impacts (direct or indirect) from online resources only and provides avoidance or mitigative measures as necessary to offset or lessen any impacts.

This AIA report identified the Whitechurch Secondary Plan area as the Primary Study Area (PSA). Similarly, a Secondary Study Area (SSA) was created as a 1500 m buffer beyond the boundaries of the PSA.

The 1500 m (1.5 km) area of potential impact outside the PSA was used for the characterization of the agricultural community and the assessment of potential impacts both on and in the immediate vicinity of the PSA. The 1500 m SSA was chosen based on the PSA being a proposed future development within a designated Urban Boundary whereby the potential direct impacts could be related to the loss of agricultural land, impacts to tile drainage and/or surface drainage systems, ground water, noise, lighting, and fugitive emissions (salt spray, particulate matter) on the immediately adjacent properties.

In the regional/city context, the PSA is roughly bounded by Upper James Street on the west, White Church Road East on the south, Miles Road on the east, and Airport Road East on the north. It is noted that the PSA also extends north of Airport Road East near the intersection of Miles Road and Airport Road East, and to the east of Miles Road, north of Airport Road East.

The PSA abuts the urban area of Mount Hope on the west.

The PSA and the SSA comprise a mix of land uses including urban uses, rural uses, agricultural lands, transportation corridors, and woodlands. The western portion of the SSA includes portions of the John C. Munro Hamilton International Airport, a portion of the urban area of Mount Hope, and a portion of Highway 6.

Figure 1 illustrates the relative location and shape of the PSA and SSA with respect to the above-mentioned geographical and community features.

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

Legend

- Hydro Line (MNRF)
- Railway Corridor Trail (MNRF)
- Roads (MNRF)
- City of Hamilton Urban Boundary (CoH)
- Lot Lines (MNRF)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1500m)

John C. Munro Hamilton International Airport

- John C. Munro Hamilton International Airport
- John C. Munro Hamilton International Airport Runway

Figure 1

Location

DBH Soil Services Inc.

November 2023

2 METHODOLOGY

A variety of data sources were evaluated to characterize the extent of agriculture resources and to assess any potential existing (or future) impacts to agriculture within the PSA and the surrounding SSA that may occur as a result of the proposed future development of the PSA.

In an effort to determine the requirements for completion of an AIA, a review of the *City of Hamilton Rural Official Plan (February 2021)* and associated schedules was completed. The review of the official plan determined that there was no specific information on the requirements of how to complete an AIA. As a result, a further review was completed to determine the existence and use of AIA Guidelines in Ontario.

The review determined that the Region of Halton has created a document titled "*Agricultural Impact Assessment Guidelines, October 1985"*, and has updated those guidelines with a newer version from June 2014. The Region of Halton has specific standards and guidelines for completing AIAs within the boundaries of the Region of Halton.

The review on the existence and use of AIA Guidelines revealed that the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) had released draft Agricultural Impact Assessment guidelines in a document titled "*Draft Agricultural Impact Assessment (AIA) Guidance Document, March 2018*". This OMAFRA document is considered as "Draft for Discussion Purposes" and does not have status but is the basis for how OMAFRA addresses agricultural impacts and mitigation.

As a result of the review on the existence and use of AIA guidelines in Ontario, this AIA report has been completed with regard to the review/reference and requirements of the OMAFRA "*Draft Agricultural Impact Assessment (AIA) Guidance Document, March 2018*".

2.1 CONSULTATION

Agriculture is an important component of the economy in the City of Hamilton. As such, consultation with various agencies, provincial and municipal offices, and local farm community, including the Hamilton-Wentworth Federation of Agriculture and Ontario Federation of Agriculture would be appropriate to collect information from the farm community to determine the agricultural practices/farming operations and farm/field access.

At the time of writing this report it is unknown the extent of consultation with the local agricultural community. This will need to be addressed in the full AIA report.

2.2 DATA COLLECTION

A variety of data sources were utilized in the assessment of agriculture in the PSA and SSA. Data was collected in a variety of formats including digital (shapefiles and imagery), paper copy, and

through correspondence (telephone, meetings, email, etc), as necessary. A synopsis of the type of data and the collection of the relevant data is provided below.

2.2.1 POLICY

Relevant policy, by-laws and guidelines related to agriculture and infrastructure development were reviewed for this study.

The review included an examination of Provincial and Municipal policy as is presented in the *Provincial Policy Statement (2020), the Greenbelt Plan (2017, updated mapping 2022), the Growth Plan for the Greater Golden Horseshoe (Office Consolidation 2020), the Oak Ridges Moraine Conservation Plan (2017),* and the *City of Hamilton Rural Official Plan (February 2021).*

The review also included a review of the Corporation of the Township of Glanbrook By-law No. 464 (Consolidated November 2022).

Further, the review included an assessment of *the Minimum Distance Separation (MDS) Document – Formulae and Guidelines for Livestock Facility and Anaerobic Digester Odour Setbacks. Publication 853. Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA, 2016).* The MDS document was reviewed to determine the applicability of the document's use for this study.

An assessment of online data resources including OMAFRA, the Ministry of Natural Resources and Forestry (MNRF) Land Information Warehouse (Land Information Ontario (LIO)), and the City of Hamilton website. Further, this assessment included telephone, email and in person communication/correspondence to derive a list of relevant policy, by-law and guidelines. Each relevant policy, by-law and guideline was collected in digital or paper format for examination for this study.

2.2.2 PHYSIOGRAPHY

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

2.2.3 TOPOGRAPHY AND CLIMATE

Topographic information was reviewed from the 1:10000 scale Ontario Base Mapping, Land Information Ontario digital contour mapping and windshield surveys.

Climate data was taken from the OMAFRA document titled *Agronomy Guide for Field Crops – Publication 811 (June 2017)* and online OMAFRA data sources. The use of this climate information is consistent with the description within the *Draft OMAFRA Agricultural Impact Assessment (AIA) Guidance Document (March 2018)* where there is a requirement to provide a

general description of climatic features (crop heat units, frost free days, and general climatic patterns of the area).

The *Draft OMAFRA Agricultural Impact Assessment (AIA) Guidance Document (March 2018)* indicates the need to provide greater detail on climate only in specialty crop areas.

2.2.4 AGRICULTURAL LAND USE

Agricultural land use data was collected through observations made from online imagery only. Data collected included the identification of land use (both agricultural and non-agricultural), the documentation of the location and type of agricultural facilities/services, the location of non-farm residential units and the location of non-farm buildings (businesses, storage facilities, industrial, commercial, and institutional usage).

Agricultural land use designations were correlated to the *Agricultural Resource Inventory* (ARI) and the information provided in the Agricultural System Portal (OMAFRA) for the purpose of updating the OMAFRA Land Use Systems mapping for both the PSA and SSA.

2.2.5 MINIMUM DISTANCE SEPARATION

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

This project, the proposed future development of an existing urban area does not specifically require the completion of MDS 1 for agricultural buildings that have the capacity to house livestock. MDS guideline #36 – *Non-application of MDS within Settlement Areas* states:

> *MDS I setbacks are NOT required for proposed land use changes (e.g., consents, rezonings, redesignations, etc.) within approved settlement areas, as it is generally understood that the long-term use of the land is intended to be for non-agricultural purposes.*

MDS 1 calculations were completed as a best practice to protect lands for agricultural use as long as possible during the development phases.

Agricultural facilities were assessed through a review of online imagery for agricultural buildings that appeared to have the potential capability to house livestock. In some instances, livestock were observed in online imagery.

MDS calculations were not specifically required for this study but were completed (based on a review of online imagery only. No landowners were contacted as part of this AIA evaluation.

2.2.6 LAND FRAGMENTATION/SEVERANCE

Land fragmentation data was collected through a review of online interactive mapping on the Agmaps (OMAFRA) website, the Agricultural System Portal (OMAFRA), and the City of Hamilton websites. This data was used to determine the extent, location, relative shape of each parcel/property within both the PSA and the SSA.

Land fragmentation can be defined as the increase in the number of smaller parcels, which are generally non-agricultural uses, within a predominantly agricultural area. Over time the increase in smaller non-agricultural land uses creates a patchwork-like distribution of rural land uses, resulting in lands lost to agricultural production. Generally, good productive areas of farmland are comprised of larger parcels with few (if any) smaller parcels interspersed.

The assessment of fragmentation looked at the size, shape and number of parcels within a given area, and provided comments on the potential effect on agriculture.

Land severance is the severing or dividing of a parcel into multiple sections. An assessment of land severance was completed to determine the extent of parcels that may be severed as a result of the proposed future development of the PSA.

2.2.7 SOIL SURVEY

Soil survey data and Canada Land Inventory (CLI) data was provided by OMAFRA in digital format through the LIO website warehouse. The soils/CLI data is considered the most recent iteration of the soil information from OMAFRA.

The digital soil survey data was also correlated to the printed soil survey reports and maps (Soils of Wentworth County, Report No. 32 of the Ontario Soil Survey (Presant, E.W., R.E. Wicklund, and B.C. Matthews, 1965)) to determine if the digital soils data have been modified from the original soil survey data.

Further, discussions with OMAFRA indicated that the Provincial soils data base has been updated to include some slope information in an effort to provide the digital data at a scale of 1:50000. The original reports and associated mapping were generally completed to a scale of 1:63360 or 1 inch to 1 mile.

2.2.8 AGRICULTURAL SYSTEM

The Ontario Ministry of Agriculture, Food and Rural Affairs online Agricultural Systems mapping was reviewed to determine the extent of agriculture in the PSA, in the SSA, and the City of Hamilton in general.

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

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

The review of the Agricultural Network included a visual assessment of any agricultural services and transportation networks within the PSA and the SSA, and a review of the OMAFRA Agricultural Systems Portal mapping.

2.2.9 AGRCULTURAL STATISTICS

Agricultural statistics were provided by Statistics Canada and downloaded from the OMAFRA website. The statistics were provided in Excel format for the City of Hamilton. The data sets provide information up to (and including) the 2021 Census.

The OMAFRA draft AIA Guidelines indicates that the background data collection and review should include:

- *Agricultural crop statistics, over several recent census periods (Statistics Canada, Census of Agriculture).*

It is understood that the Census of Agriculture data is very extensive and detailed. This AIA utilized the Census of Agriculture data to provide a review of basic crop statistics over a minimum of three census periods extending from 2006 to 2021.

It is noted that the Census of Agriculture data does not always provide the most recent or updated municipality name. For the purposes of this AIA the review and assessment of the Census of Agriculture made use of the municipality name as was stated in the Census of Agriculture data sets.

3 POLICY REVIEW

Clearly defined and organized environmental practices are necessary for the conservation of land and resources. The long-term protection of quality agricultural lands is a priority of the Province of Ontario and has been addressed in the *Provincial Policy Statement (2020)*. Further, in an effort to protect agricultural lands, the Province of Ontario has adopted policy and guidelines to provide a framework for managing growth. These four provincial land use plans: *the Growth Plan for the Greater Golden Horseshoe (Office Consolidation 2020), the Greenbelt Plan (2017 and updated mapping 2022); the Niagara Escarpment Plan (2017), and the Oak Ridges Moraine Conservation Plan (2017)* support the long-term protection of farmland. The provincial land use plans have policies that require the completion of AIA studies for changes in agricultural land use.

With this in mind, the: *Provincial Policy Statement (2020); the Growth Plan for the Greater Golden Horseshoe (Office Consolidation 2020); the Greenbelt Plan (2017 and updated mapping 2022); the Niagara Escarpment Plan (2017); and the Oak Ridges Moraine Conservation Plan (2017)* were reviewed.

With respect to this AIA and the four provincial land use plans, a review of the boundaries of the Growth Plan for the Greater Golden Horseshoe Area, the Greenbelt Plan Area, the Niagara Escarpment Plan and the Oak Ridges Moraine Conservation Area was completed. It was determined that the PSA (and SSA) were located within the Growth Plan for the Greater Golden Horseshoe. The PSA was located outside the boundaries of the Greenbelt Plan mapping, the Niagara Escarpment Plan mapping and the Oak Ridges Moraine Conservation Plan mapping, therefore those policy plans do not apply to this AIA. The SSA comprised portions of the Greenbelt Plan mapping area, and was outside the boundaries of the Niagara Escarpment Plan mapping and the Oak Ridges Moraine Conservation Plan mapping areas.

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

A review of municipal policy was based on an examination of the *City of Hamilton Rural Official Plan (February 2021)*.

The review also included a review of the *Zoning By-law of the Town of Ancaster (now City of Hamilton) (November 2022),* and the *Corporation of the Township of Glanbrook By-law No. 464 (Consolidated November 2022)*.

It was determined through these reviews, that no portions of the PSA or the SSA were located in a Provincially or municipally designated specialty crop area.

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

3.1 PROVINCIAL AGRICULTURAL POLICY

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. With respect to the potential future widening of development of the PSA, the following policies may apply. Agricultural policies are addressed within *Sections 2.3 (Agriculture) of the Provincial Policy Statement (2020)*.

2.3.1 Prime agricultural areas shall be protected for long-term use for agriculture.
Prime agricultural areas are areas where prime agricultural lands predominate. Specialty crop areas shall be given the highest priority for protection, followed by Canada Land Inventory Class 1, 2, and 3 lands, and any associated Class 4 through 7 lands within the prime agricultural area, in this order of priority.

2.3.2 Planning authorities shall designate prime agricultural areas and specialty crop areas in accordance with guidelines developed by the Province, as amended from time to time. Planning authorities are encouraged to use an agricultural system approach to maintain and enhance the geographic continuity of the agricultural land base and the functional and economic connections to the agri-food network.

2.3.3 Permitted Uses

2.3.3.1 In prime agricultural areas, permitted uses and activities are: agricultural uses, agriculture-related uses and on-farm diversified uses. Proposed agriculture-related uses and on-farm diversified uses shall be compatible with, and shall not hinder, surrounding agricultural operations. Criteria for these uses may be based on guidelines developed by the Province or municipal approaches, as set out in municipal planning documents, which achieve the same objectives.

2.3.3.2 In prime agricultural areas, all types, sizes and intensities of agricultural uses and normal farm practices shall be promoted and protected in accordance with provincial standards.

2.3.3.3 New land uses in prime agricultural areas, including the creation of lots and new or expanding livestock facilities, shall comply with the minimum distance separation formulae.

2.3.4 Lot Creation and Lot Adjustments

2.3.4.1 Lot creation in prime agricultural areas is discouraged and may only be permitted for:

- *a) agricultural uses, provided that the lots are of a size appropriate for the type of agricultural use(s) common in the area and are sufficiently large to maintain flexibility for future changes in the type or size of agricultural operations;*
- *b) agriculture-related uses, provided that any new lot will be limited to a minimum size needed to accommodate the use and appropriate sewage and water services;*
- *c) a residence surplus to a farming operation as a result of farm consolidation, provided that:*
  1. *the new lot will be limited to a minimum size needed to accommodate the use and appropriate sewage and water services; and*
  2. *the planning authority ensures that new residential dwellings are prohibited on any remnant parcel of farmland created by the severance. The approach used to ensure that no new residential dwellings are permitted on the remnant parcel may be recommended by the Province, or based on municipal approaches which achieve the same objective; and*
- *d) infrastructure, where the facility or corridor cannot be accommodated through the use of easements or rights-of-way.*

2.3.4.2 Lot adjustments in prime agricultural areas may be permitted for legal or technical reasons.

2.3.4.3 The creation of new residential lots in prime agricultural areas shall not be permitted, except in accordance with policy 2.3.4.1(c).

2.3.5 Removal of Land from Prime Agricultural Areas

2.3.5.1 Planning authorities may only exclude land from prime agricultural areas for expansions of or identification of settlement areas in accordance with policy 1.1.3.8.

2.3.6 Non-Agricultural Uses in Prime Agricultural Areas

2.3.6.1 Planning authorities may only permit non-agricultural uses in prime agricultural areas for:

- *a) extraction of minerals, petroleum resources and mineral aggregate resources; or*

b) limited non-residential uses, provided that all of the following are demonstrated:

1. the land does not comprise a specialty crop area;

2. the proposed use complies with the minimum distance separation formulae;

3. there is an identified need within the planning horizon provided for in policy 1.1.2 for additional land to accommodate the proposed use; and

4. alternative locations have been evaluated, and

i. there are no reasonable alternative locations which avoid prime agricultural areas; and

ii. there are no reasonable alternative locations in prime agricultural areas with lower priority agricultural lands.

2.3.6.2 Impacts from any new or expanding non-agricultural uses on surrounding agricultural operations and lands are to be mitigated to the extent feasible.

Further, the PPS Policy 2.3.2 indicates the use of the Agricultural System approach to planning. The Agricultural System has been defined as:

Agricultural System: A system comprised of a group of inter-connected elements that collectively create a viable, thriving agricultural sector. It has two components:

a) An agricultural land base comprised of prime agricultural areas, including specialty crop areas, and rural lands that together create a continuous productive land base for agriculture; and

b) An agri-food network which includes infrastructure, services, and assets important to the viability of the agri-food sector.

3.2 THE GROWTH PLAN FOR THE GREATER GOLDEN HORSESHOE

A review of the boundaries of the Growth Plan for the Greater Golden Horseshoe area was completed. An assessment of the Agricultural Land Base mapping (online and in digital shapefile format) was completed for the PSA and the SSA.

It was determined that the PSA and much of the SSA lands comprise Prime Agricultural Areas. Within the SSA (west of Upper James Street – Mount Hope Urban Area) are identified as non-agricultural lands.

Figure 2 illustrates the relative location of the PSA and the SSA with respect to the Growth Plan for the Greater Golden Horseshoe and the Provincial Agricultural Land Base Mapping.

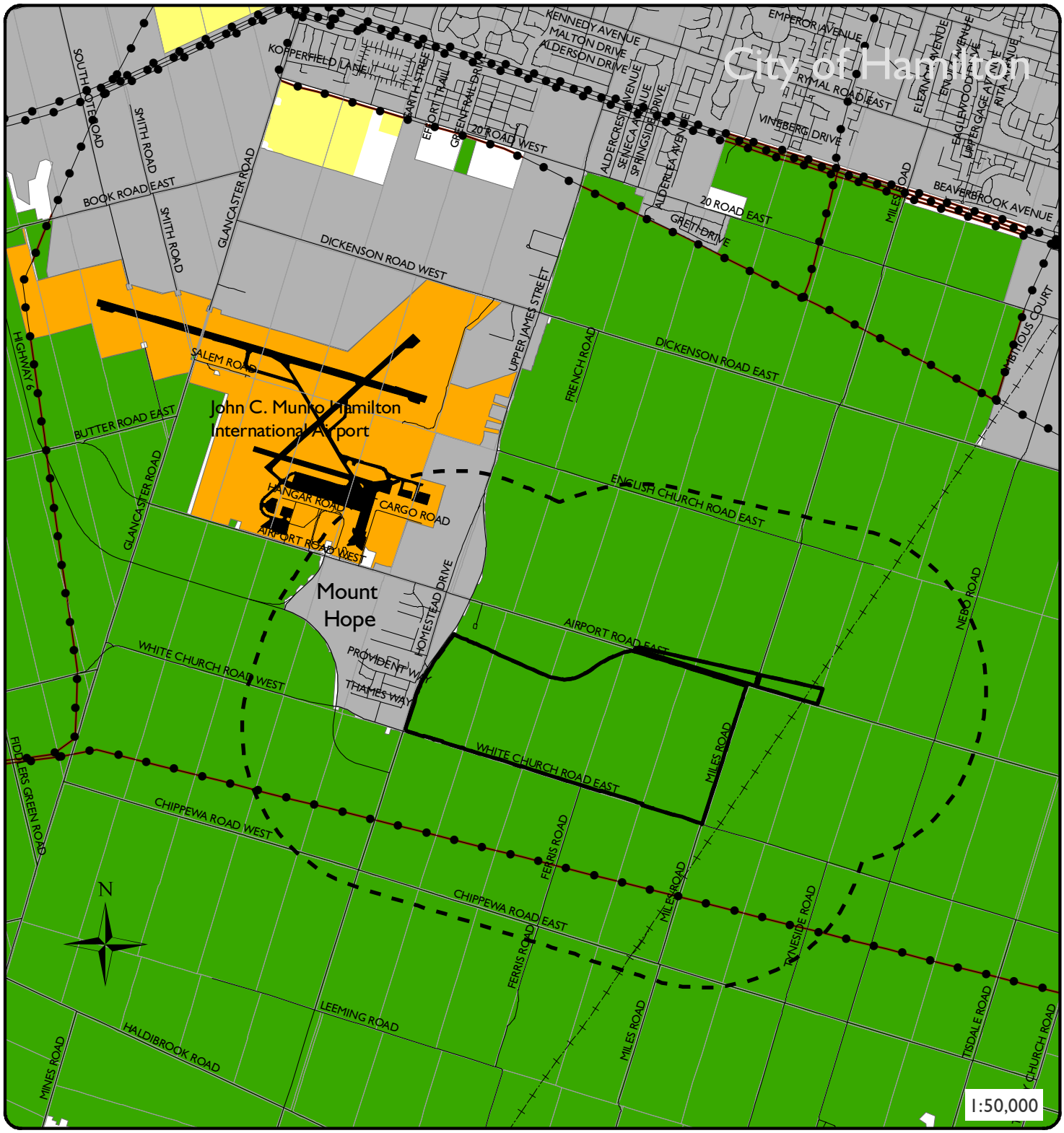
As identified previously in Section 2.1.8, the provincial land use plans require the implementation of an agricultural system. The Agricultural System comprises two parts: Agricultural Land Base; and the Agri-Food Network. The respective policies for the Agricultural System are as follows:

4.2.6 Agricultural System

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.



Legend

- Hydro Line (MNRF)
- Railway Corridor Trail (MNRF)
- Roads (MNRF)
- City of Hamilton Urban Boundary (CoH)
- Lot Lines (MNRF)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1500m)

John C. Munro Hamilton International Airport

- John C. Munro Hamilton International Airport
- John C. Munro Hamilton International Airport Runway

Provincial Land Base (OMAFRA)

- Candidate Area
- Prime Agricultural Area
- Specialty Crop Area

Figure 2

Provincial Agricultural Land Base Mapping

DBH Soil Services Inc.

November 2023

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.

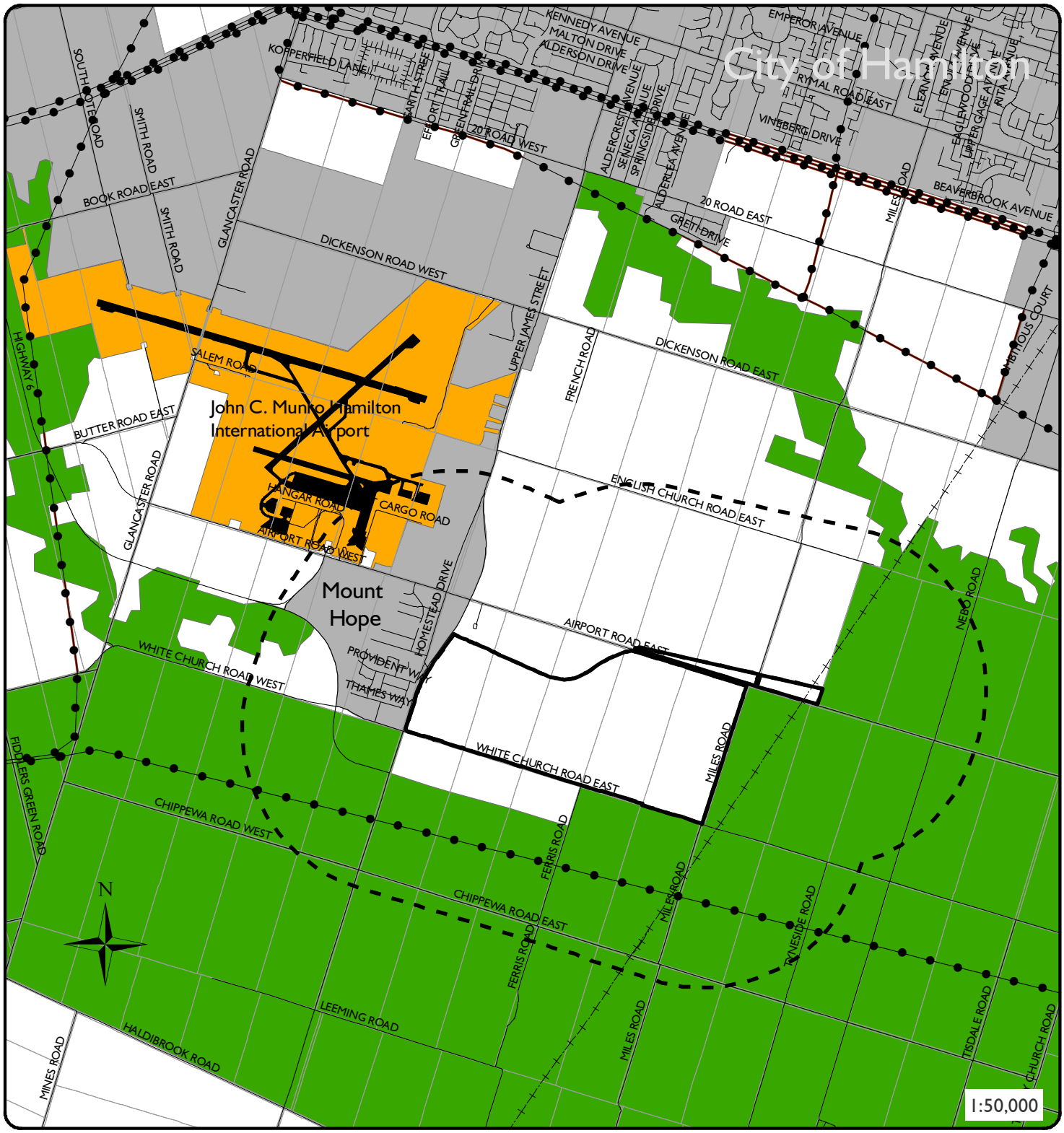
3.1 THE GREENBELT PLAN

A review of the Greenbelt Plan (2017) mapping indicated that the PSA and portions of the SSA are located outside the boundaries of the Greenbelt Plan area. The portions of the SSA that are within the Greenbelt Plan Area are considered as Protected Countryside. Figure 3 illustrates the relative location of the portions of the SSA that are within the Greenbelt Plan mapping.

The Greenbelt Plan has specific policies for Prime Agricultural Lands and provides the policies in Section 3.13. Section 3.1.3 states:

For lands falling within prime agricultural areas of the Protected Countryside, the following policies shall apply:

1. *All types, sizes and intensities of agricultural uses and normal farm practices shall be promoted and protected and a full range of agricultural uses, agriculture-related uses and on-farm diversified uses are permitted based on provincial Guidelines on Permitted Uses in Ontario's Prime Agricultural Areas. Proposed agriculture-related uses and on-farm diversified uses shall be compatible with and shall not hinder surrounding agricultural operations.*
2. *Lands shall not be redesignated in official plans for non-agricultural uses except for:*
   a) *Refinements to the prime agricultural area and rural lands designations, subject to the policies of section 5.3; or*
   b) *Settlement area boundary expansions, subject to the policies of section 3.4.*
3. *Non-agricultural uses may be permitted subject to the policies of sections 4.2 to 4.6. These uses are generally discouraged in prime agricultural areas and may only be permitted after the completion of an agricultural impact assessment.*



Legend

- Hydro Line (MNRF)
- Railway Corridor Trail (MNRF)
- Roads (MNRF)
- City of Hamilton Urban Boundary (CoH)
- Lot Lines (MNRF)
- Greenbelt Plan Mapping (2022)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1500m)

John C. Munro Hamilton International Airport

- John C. Munro Hamilton International Airport
- John C. Munro Hamilton International Airport Runway

Figure 3

Greenbelt Plan Mapping

DBH Soil Services Inc.

November 2023

4. *New land uses, including the creation of lots (as permitted by the policies of this Plan), and new or expanding livestock facilities, shall comply with the minimum distance separation formulae.*
5. *Where agricultural uses and non-agricultural uses interface, land use compatibility shall be achieved by avoiding or, where avoidance is not possible, minimizing and mitigating adverse impacts on the Agricultural System, based on provincial guidance. Where mitigation is required, measures should be incorporated as part of the non-agricultural uses, as appropriate, within the area being developed.*
6. *The geographic continuity of the agricultural land base and the functional and economic connections to the agri-food network shall be maintained and enhanced.*

This AIA will take into account agricultural land uses and minimizing impacts to agricultural activities and operations.

3.1 THE NIAGARA ESCARPMENT PLAN

A review of the boundaries of the Niagara Escarpment Plan (and associated digital mapping) was completed. The review indicated that no portions of the PSA or the SSA are located within the Niagara Escarpment Plan area. Therefore, the policies of the Niagara Escarpment Plan do not apply to this project.

3.2 THE OAK RIDGES MORAINE CONSERVATION PLAN

A review of the boundaries of the Oak Ridges Conservation Plan (and associated digital mapping) was completed. The review indicated that no portions of the PSA or the SSA are located within the Oak Ridges Conservation Plan area. Therefore, the policies of the Oak Ridges Moraine Conservation Plan do not apply to this project.

3.3 OFFICIAL PLAN POLICY

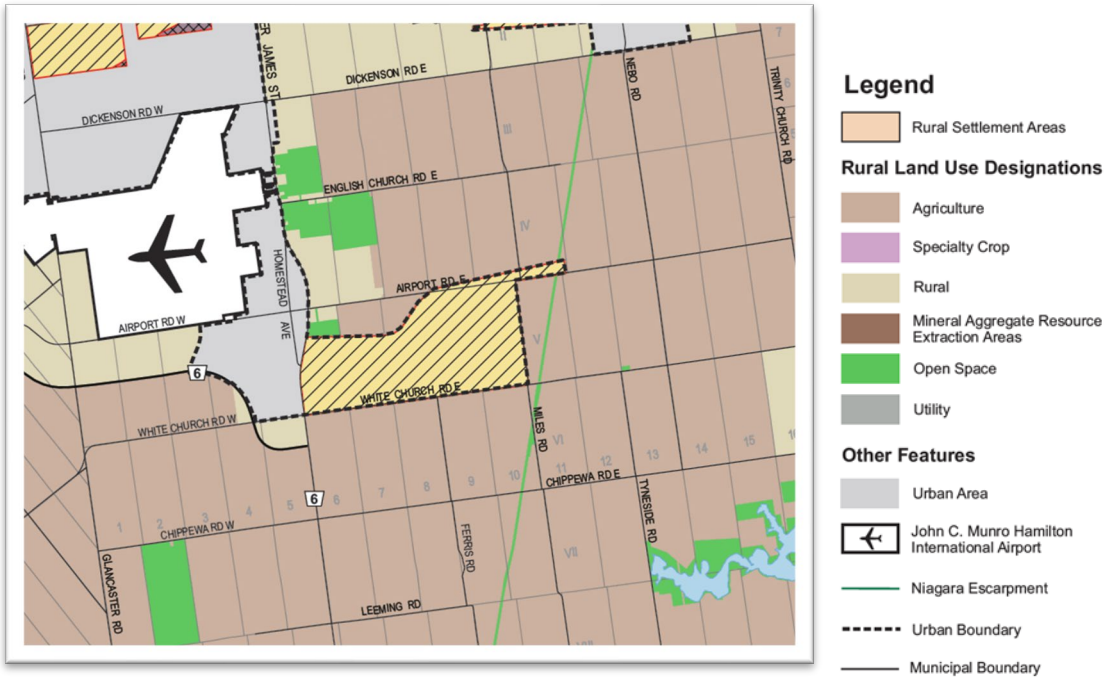
Official Plan policies are prepared under the Planning Act, as amended, of the Province of Ontario. Official Plans generally provide policy comments for land use planning while taking into consideration the economic, social, and environmental impacts of land use and development concerns. A review for Official Plan documents revealed that the City of Hamilton is a single-tier municipality. As a result, for the purpose of this AIA study, the review included an examination of the *City of Hamilton Rural Official Plan (February 2021)*.

3.3.1 CITY OF HAMILTON RURAL OFFICIAL PLAN

The review of the *City of Hamilton Rural Hamilton Official Plan (February 2021)* – Rural Hamilton Official Plan Schedule D, Rural Land Use Designations revealed that the PSA was designated as Urban Expansion Area Neighbourhoods and are located within the Urban Boundary. The SSA was comprised of lands designated as Agriculture, Rural, Open Space, and Utility areas.

Figure 4 illustrates a select portion of Schedule D showing the Land Use designations for the PSA and SSA.

Figure 4 City of Hamilton Rural Official Plan Schedule D



Source: *City of Hamilton Rural Hamilton Official Plan (February 2021)* – Rural Hamilton Official Plan Schedule D

The review of the *City of Hamilton Rural Hamilton Official Plan (February 2021)* indicated that the Land Use Designations are defined in Chapter D – Rural Systems, Designations and Resources. Select Agriculture Policies are provided as follows.

> *2.1 Permitted Uses*
> *Uses permitted in the Agriculture designation are limited to agricultural uses, agricultural-related commercial and agricultural-related industrial uses and on-farm secondary uses as set out in the following policies.*
>
> *Agricultural Uses*
>
> *2.1.1 Agricultural uses are permitted subject to the policies of this Plan.*
>
> *2.1.1.1 Mushroom operations, including the growing, harvesting, cleaning, packaging and shipping of mushrooms produced on the site and any other uses directly related to mushroom production including the creation of compost are permitted. The establishment of a new mushroom operation or the expansion of an existing operation shall be subject to Site Plan approval to address the appropriate building location, drainage, and any other matters.*
>
> *2.1.1.2 Tree farms are permitted, provided that any goods and materials offered for sale are limited to small scale retailing of agricultural products grown and produced primarily on-site in accordance with the policies of Section D.2.1.3.2 c) of this Plan for on-farm secondary uses.*
>
> *2.1.1.3 Farm greenhouses are greenhouses used primarily for the growing of crops for off-site wholesale. Farm greenhouses may be permitted provided the following conditions are met: (OPA 5)*
>
> *a) Site Plan approval shall be required to address appropriate building location, storm water management and drainage; and*

b) Any goods or materials offered for sale shall be limited to small scale retailing of products grown and produced primarily on site in accordance with the policies of Section D.2.1.3.2 c) of this Plan for on-farm secondary uses.

Agricultural-Related Uses

2.1.2 Agricultural-related uses are farm-related commercial and farm-related industrial uses that are small scale, producing products and services, wholly and directly related to a farming operation and which are required in close proximity to an agricultural use. They are uses necessary to support agricultural uses and are permitted provided the following conditions are met:

a) The use must produce products or services directly related to a farming operation and requires a location in close proximity to a farm operation. Permitted uses shall be limited to grain dryers, feed mills, grain and seed storage facilities, primary farm produce bulk storage and agricultural processing facilities, farm product supply dealers, livestock assembly points, agricultural research operations, and veterinary services for farm animals;(OPA 9)

b) The use shall be located to minimize the amount of land removed from agricultural production;

c) The use shall be located where access is by a road capable of handling the traffic generated. Access to the site shall not create a traffic hazard due to inadequate sight lines or any other traffic hazard;

d)The use shall not negatively affect environmental features in accordance with Section C.2.0, Natural Heritage System of this Plan; and

e) Agricultural-related uses shall be subject to Site Plan approval to address appropriate setbacks, building size and location, parking, lighting, drainage, buffering, screening and landscaping, and any other matter.

2.1.2.1 Appropriate development standards shall be established in the Zoning By-law regarding the maximum floor area for such uses, access, parking, outside storage, and any other appropriate requirements.

It is noted that the PSA is located within the existing Urban Boundary of the City of Hamilton and as such the Agriculture policies do not apply. The Agriculture policies apply to the portions of the SSA that comprise Agriculture designated areas.

3.3.2 ZONING BY-LAW

Official Plans set out a municipality's general policies for existing and future land use. Zoning bylaws specify permitted uses and standards for each municipally designated zone. The specific requirements identified within a zoning bylaw are legally enforceable. Local municipalities are the approval authority for zoning bylaws. As such, this AIA study reviewed the zoning bylaws for the *the Corporation of the Township of Glanbrook By-law No. 464 (Consolidated November 2022)*.

It is noted that the City of Hamilton, for most of the properties in the former municipalities, the zoning for institutional, industrial, parks and open spaces, as well as Downtown Hamilton relies on Zoning By-law No. 05-2000. The remaining areas in the City of Hamilton are regulated by the By-laws from the respective former municipal zoning by-laws. Therefore, with respect to this AIA study, *the Corporation of the Township of Glanbrook By-law No. 464 (Consolidated November 2022)*, and the online digital zoning information were reviewed. The City of Hamilton allows online access to digital information through the ArcGIS online data portal.

A review of online interactive mapping (and data from the data portal) illustrated that portions of the PSA were zoned as Agriculture, Rural, Conservation/Hazard Lands, and Open Space.

A similar review of online interactive mapping (and data from the data portal) illustrated that portions of the SSA were zoned as Agriculture, Open Space, Conservation/Hazard Lands, Rural, Commercial, Residential, Institutional, and Deferred Development.

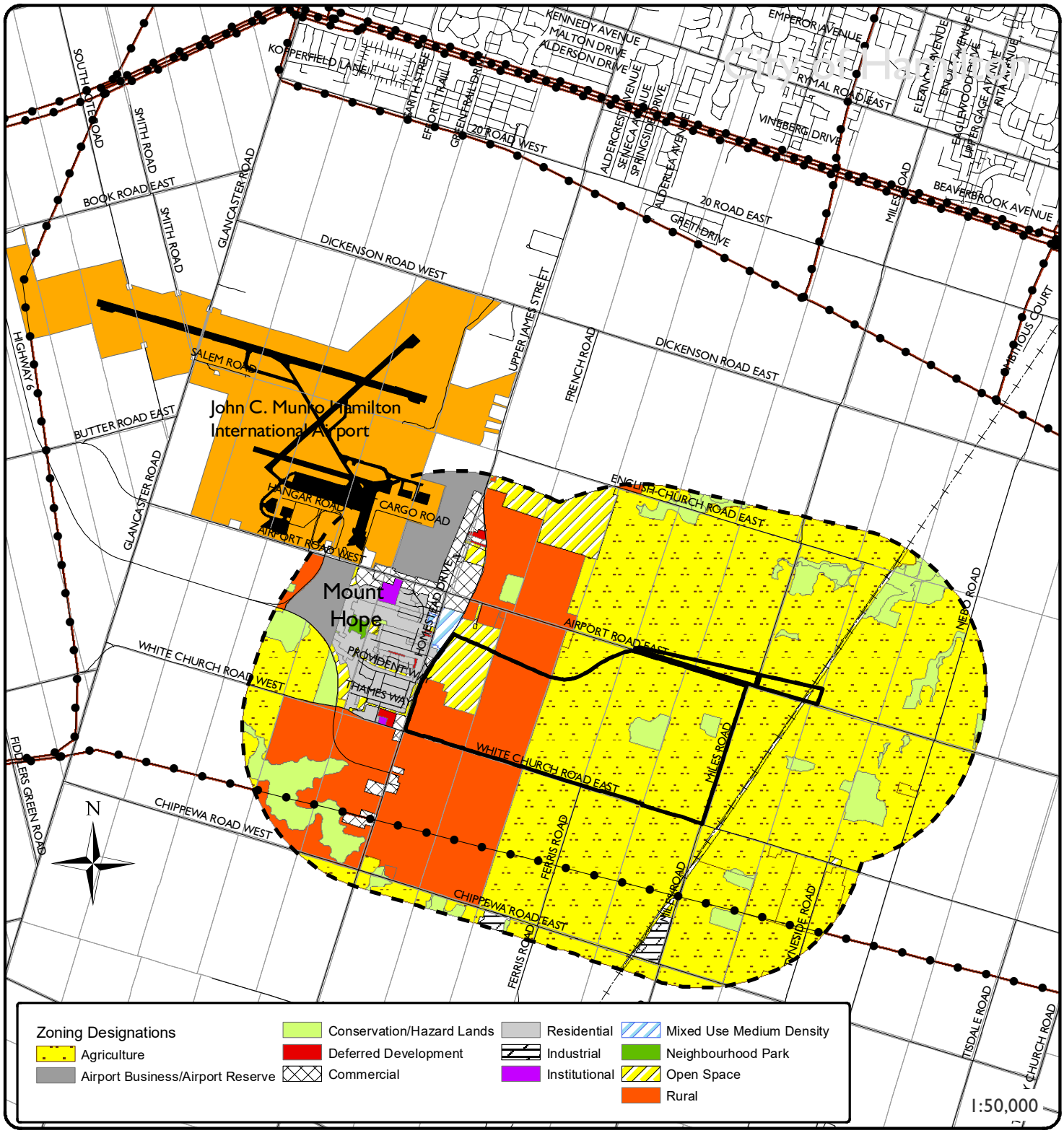
Figure 5 illustrates the respective zoning within both the PSA and SSA. The zoning information presented in Figure 5 was derived from the City of Hamilton online digital data from the ArcGIS portal that was available at the time of reporting.

3.3.2.1 The Corporation of the Township of Glanbrook By-law No. 464

The *Corporation of the Township of Glanbrook By-law No. 464 (November 2022)* was reviewed as part of this AIA study. As identified above, the PSA and SSA comprised areas zoned Agriculture.

Zone standards for Agriculture were provided in Section 8 – General Agricultural "A1" Zone, and Section 9 – Restricted Agricultural "A2" Zone. Select Agricultural Zone permitted uses and zone standards are provided below.

> *SECTION 8: GENERAL AGRICULTURAL "A1" ZONE*
> *8.1 PERMITTED USES*
>
> *(a) Agricultural uses, and buildings, structures and uses accessory thereto, including one (1) single detached dwelling for the farm owner or operator.*
> *(b) One (1) single detached dwelling on one (1) lot, and buildings, structures and uses accessory thereto.*
> *(c) Commercial Greenhouse Operations for horticultural purposes only (meaning only for the growing of flowers, plants, shrubs, trees and garden vegetables), and uses, buildings and structures accessory thereto, including one (1) single detached dwelling for the greenhouse owner or operator.*
> *(d) Kennels*
> *(e) Farm Help Houses*
> *(f) Seasonal Farm Produce Stands*
> *(g) Home Occupations and Home Professions*
> *(h) Home Industries*
> *(i) Bed and Breakfast Establishments*
> *(j) Outside Parking and Storage of Larger Vehicles*
> *(k) Fish, Wildlife and/or Forest Management*
>
> *SECTION 9: RESTRICTED AGRICULTURAL"A2" ZONE*
> *All uses permitted and the zone regulations of the General Agricultural "A1" shall apply to the Restricted Agricultural "A2" Zone, save and except for new intensive livestock operations and kennels, which shall not be permitted uses in the Restricted Agricultural "A2" Zone.*



Legend

- Hydro Line (MNRF)
- Railway Corridor Trail (MNRF)
- Roads (MNRF)
- Lot Lines (MNRF)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1500m)

John C. Munro Hamilton International Airport

- John C. Munro Hamilton International Airport
- John C. Munro Hamilton International Airport Runway

Figure 5

Zoning

DBH Soil Services Inc.

November 2023

4 AGRICULTURAL RESOURCE POTENTIAL

4.1 PHYSICAL CHARACTERISTICS

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

4.1.1 PHYSIOGRAPHY

On review of the Land Information Ontario (LIO) digital physiographic region data, and *The Physiography of Southern Ontario 3rd Edition*, (Ontario Geological Survey Special Volume 2, Ministry of Natural Resources, 1984), it was determined that the PSA and the SSA are located within the Haldimand Clay Plain physiographic region.

The Haldimand Clay Plain is described as an area that is located between the Niagara Escarpment and Lake Erie. The area is defined as a series of parallel belts, with the first belt on the high ground near the brow of the Niagara Escarpment. The first belt is comprised of recessional moraine materials with the exception of the Font Hills area where the materials are sand and gravel hills. The central belt is described as clay and silt materials. The southeastern belt is characterized by relatively level topography and poorly drained clay materials.

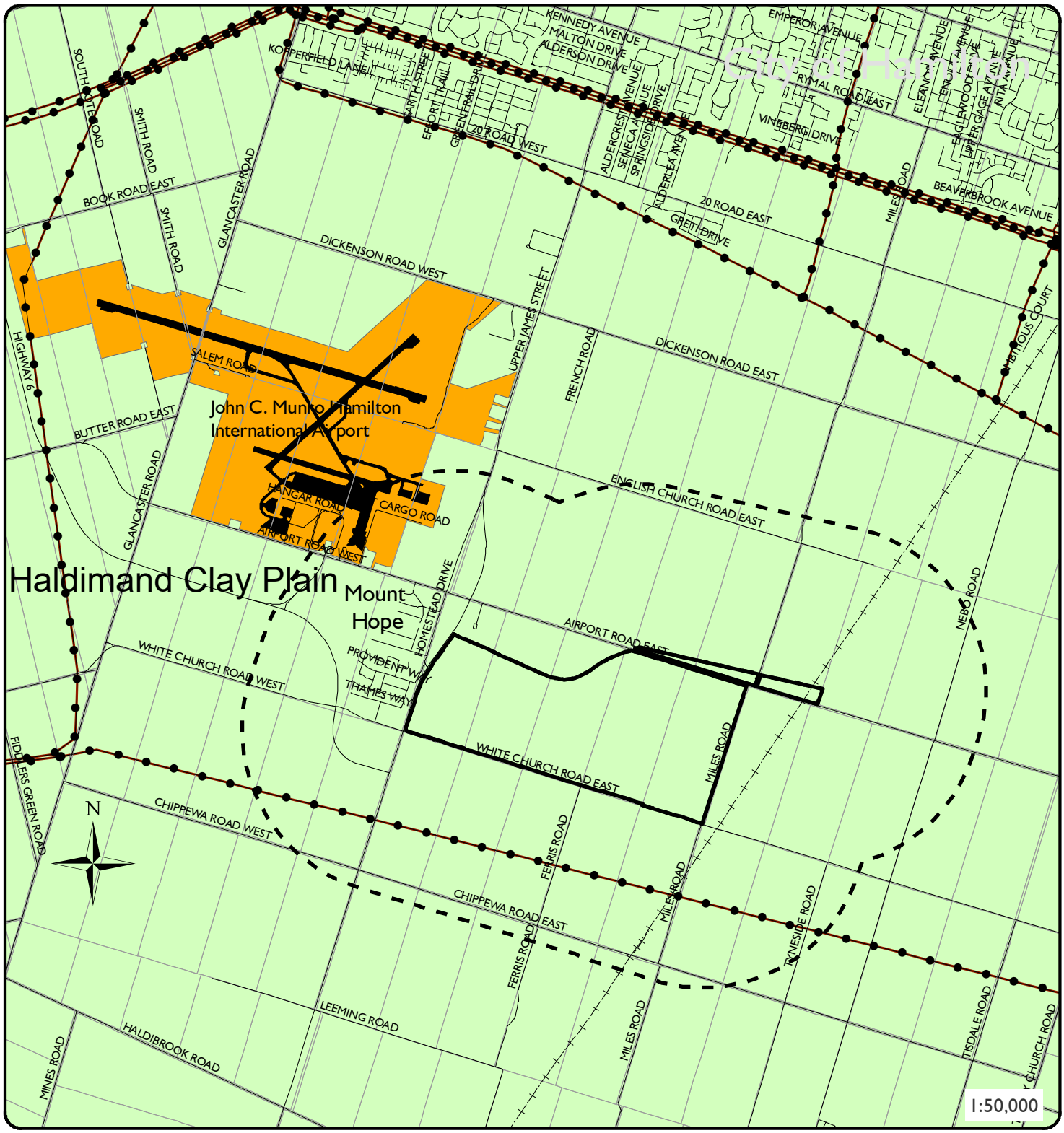
Figure 6 illustrates the geographic location and shape of the respective physiographic region as compared to the location and shape of the PSA and SSA.

4.1.2 TOPOGRAPHY AND CLIMATE

Topographic information was reviewed and correlated to the 1:10000 scale Ontario Base Mapping, Land Information Ontario digital contour mapping, and aerial photo interpretation. Contour mapping will be further refined during the roadside reconnaissance survey and windshield surveys to be completed as part of the full AIA.

The PSA and the SSA are a complex mix of topography. Based on the online topographic mapping there appears to be a ridge of lands at higher elevations extending from the intersection of Upper James Street and Airport Road West to the intersection of White Church Road East and the rail trail. The remaining lands within the PSA drop in elevation toward Lake Ontario to the north, and Lake Erie to the south from this ridge. The topography in the SSA lands continues to drop in elevation as distance from the PSA increases.

Climate data was taken from the OMAFRA document titled *Agronomy Guide for Field Crops – Publication 811 (June 2017)* 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.*



Legend

- Hydro Line (MNRF)
- Railway Corridor Trail (MNRF)
- Roads (MNRF)
- Lot Lines (MNRF)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1500m)

John C. Munro Hamilton International Airport

- John C. Munro Hamilton International Airport
- John C. Munro Hamilton International Airport Runway

Physiographic Region

- Haldimand Clay Plain

Figure 6

Physiography

DBH Soil Services Inc.

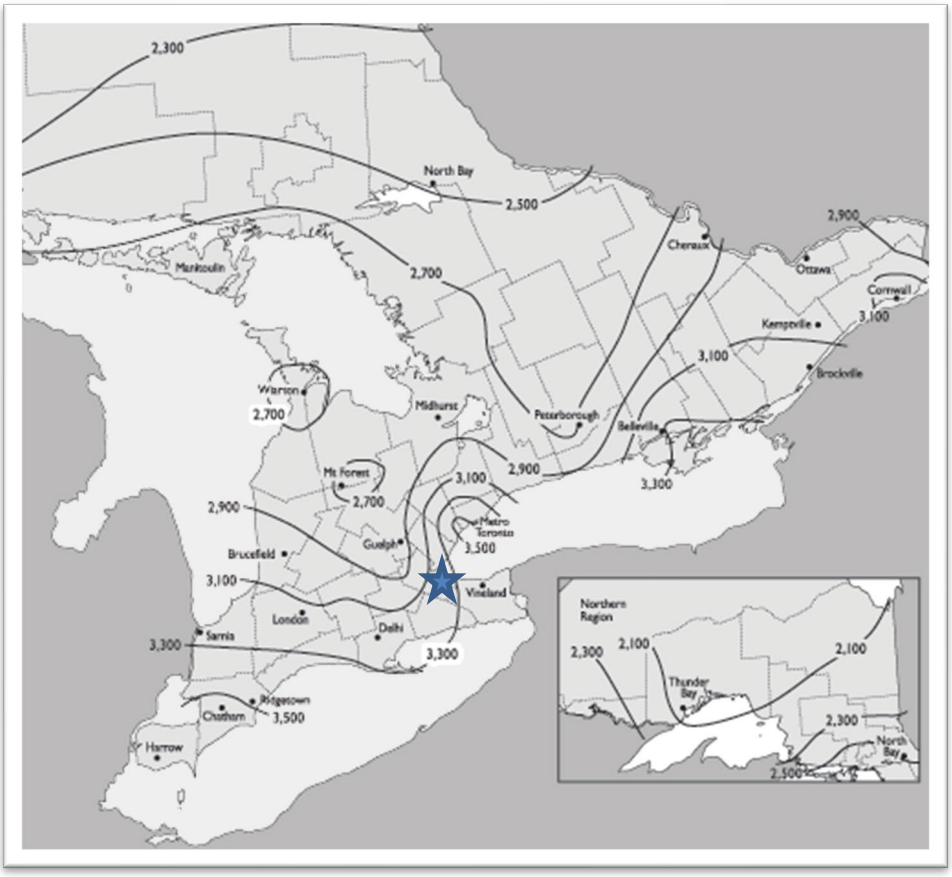
November 2023

The PSA and SSA are located between the 3100 and 3300 Crop Heat Units isolines (CHU-M1) available for corn production 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, 2017)) map is illustrated on Figure 7. The approximate location of the PSA and SSA was marked with a blue star.

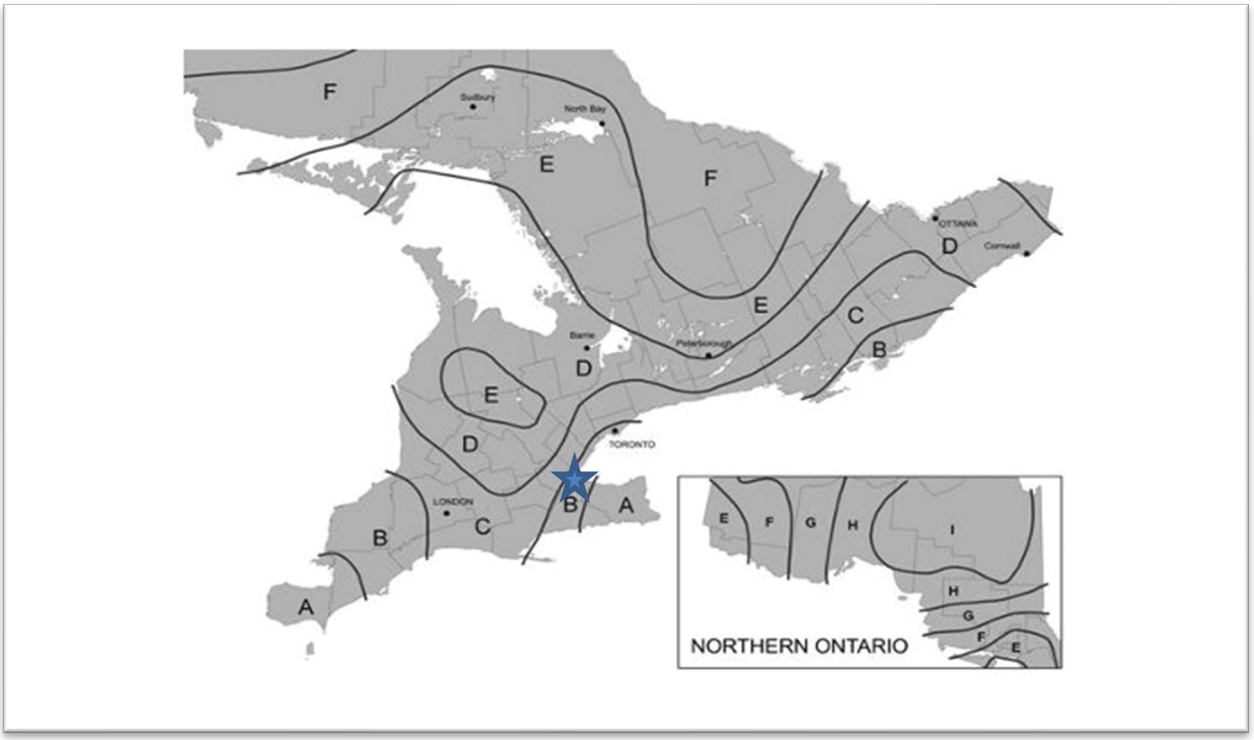
A review of OMAFRA Climate Zone Mapping (http://omafra.gov.on.ca/english/crops/facts/climzoneveg.htm) revealed that the PSA and the SSA are located within Zone B. Figure 8 from the OMAFRA website (link provided above) illustrates the Climate Zone Map of Ontario.

Figure 7 Crop Heat Units Map



Source: Figure 1-1 Crop Heat Units – Agronomy Guide for Field Crops (Publication 811)

Figure 8 OMAFRA Climate Zone Map



Source: OMAFRA Climate Zone Mapping (https://www.ontario.ca/page/climate-zones-and-planting-dates-vegetables-ontario)

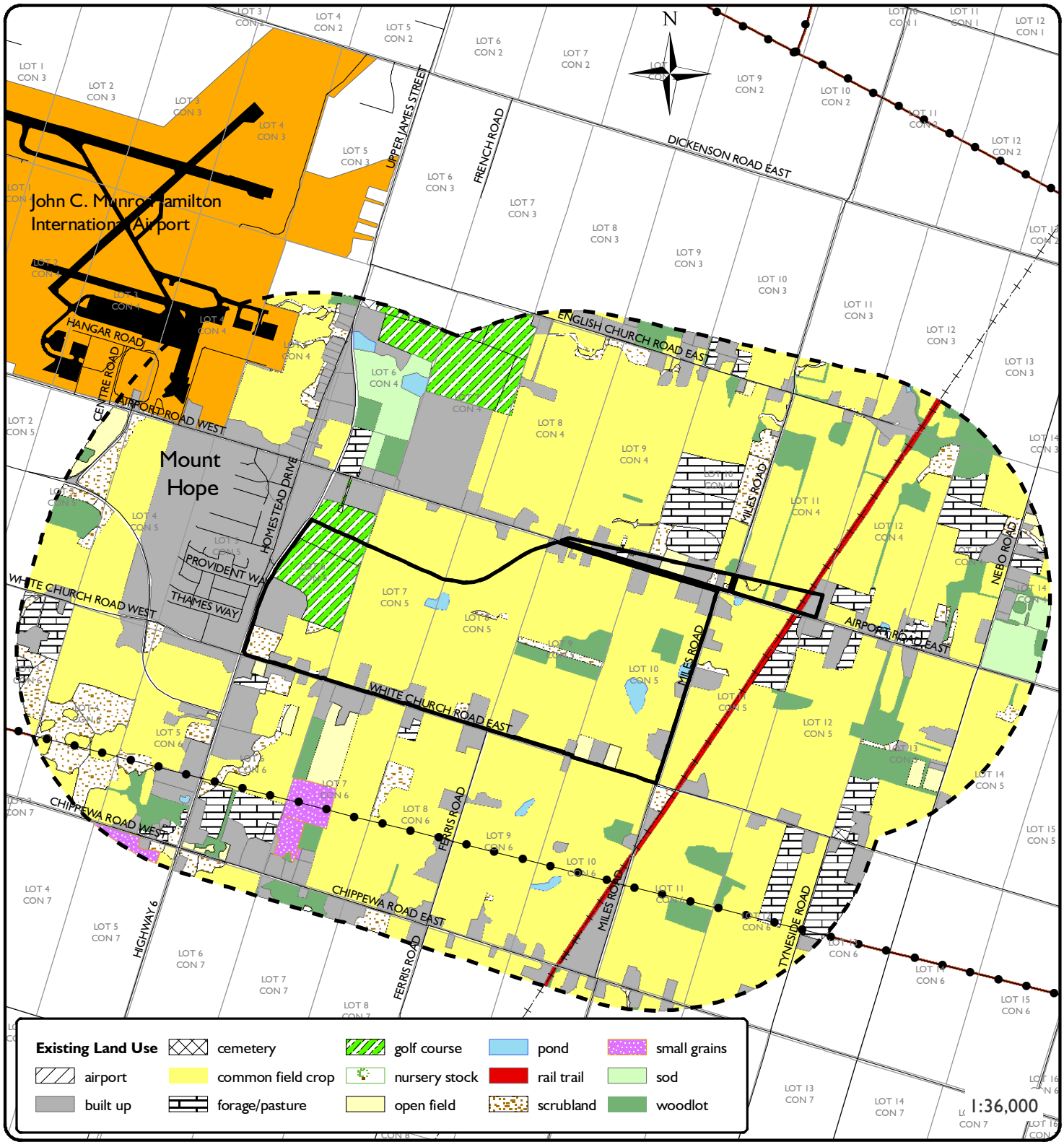
Zone B has an average Frost-Free period of 160-170 days, an Average Date of Last Spring Frost of April 30, and an Average Date of First Fall Frost of October 13.

4.2 LAND USE

The land use for both the PSA and the SSA was completed through a review of recent aerial photography, Google Earth Imagery, Bing Imagery, Birdseye Imagery, the City of Hamilton online imagery, and correlation to the OMAFRA Land Use Systems mapping. Agricultural and non-agricultural land uses are illustrated in Figure 9.

The terms used in the Agricultural Land Use assessment were derived from the OMAFRA Agricultural Resource Inventory (ARI) 1983 Coverage. It should be noted that not all terms were relevant or used in this desktop AIA. Only the terms that were appropriate for this area were utilized. For the purposes of this AIA additional terms or more relevant terms such as 'common field crop' were used. As example, 'common field crop' indicates crop production that includes corn and soybean. The ARI 1983 Coverage land use terms include:

- Built up
- Cherries
- Corn System
- Extraction Pits and Quarries



Legend

- Hydro Line (MNRF)
- Railway Corridor Trail (MNRF)
- Roads (MNRF)
- Lot Lines (MNRF)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1500m)

John C. Munro Hamilton International Airport

- John C. Munro Hamilton International Airport
- John C. Munro Hamilton International Airport Runway

Figure 9

Existing Land Use

DBH Soil Services Inc.

November 2023

- Grazing System
- Hay System
- Idle Agricultural Land (5 - 10 years)
- Idle Agricultural Land (> 10 years)
- Market Gardens/Truck Farms
- Mixed System
- Nursery
- Orchard
- Pasture System
- Recreation
- Reforestation
- Sod Farm
- Swamp/Marsh/Bog
- Unknown
- Vineyard
- Vineyard-Orchard
- Water
- Woodlands

The review of online data identified the types of land uses including farm and non-farm uses (built up areas, commercial, and roads). Farms were identified as livestock or cash crop. Livestock operations were further differentiated to the type of livestock based on the livestock seen in the online imagery, through a review of on farm infrastructure (type of buildings, manure system, feed (bins, bales), and types of equipment) or through any signage associated with the respective agricultural operation (as noted during the review of online data).

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

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

It is noted that this information is based on a desktop assessment and will need to be field verified and updated in the full AIA report yet to be completed.

Land Use information was digitized in Geographic Information System (GIS – Arcmap/ARCGIS Pro) to illustrate the character and extent of the Existing Land Use in both the PSA and the SSA. Area calculations for each land use polygon (area) were calculated within the GIS software and exported as tabular data. The data is presented as follows. Land use designations and land use definitions are provided in Table 1.

Table 1 Typical Land Use Designations

Land Use Designation	Land Use Definitions
Built Up/Disturbed Areas	Residential, commercial, industrial, man modified, existing road system and Velodrome area
Common Field Crop	Corn, Soybean, Cultivated
Forage/Pasture	Forage/Pasture
Market Garden	Vegetables, Garden Crops
Ponds	Ponds
Open Field	Unused field (<5 years)
Scrubland	Unused field (>5 years) – woody vegetation regrowth
Sod	Sod Production
Small Grains	Wheat, Oats, Barley
Woodlot	Forested Areas

4.2.1 EXISTING LAND USE – PSA

The PSA consisted of a variety of land uses including, but not limited to built-up/disturbed areas, common field crops, forage/pasture lands, open field, rail trail, recreation areas, ponded areas, scrubland, and woodlot areas.

The PSA comprised land use of approximately 12.0 percent as built up/disturbed areas, 70.5 percent as common field crop (soybean, corn), 0.2 percent as forage/pasture, 1.3 percent as open field areas, 0.2 percent as rail trail, 7.8 percent as recreational area (golf course), 1.3 percent as ponded areas, 2.8 percent as scrublands, and 3.9 percent as woodlot areas.

On review of the existing land use data (as based on an online imagery assessment), it was observed that the predominant land uses in the PSA included built up/disturbed areas and the production of common field crops.

4.2.2 EXISTING LAND USE – SSA

The SSA consisted of a variety of land uses including, but not limited to airport lands, built-up/disturbed areas, common field crops, forage/pasture lands, open field, plowed, rail trail recreation (golf course), scrubland, small grains, sod, and woodlot areas.

The SSA comprised land use of approximately 2.4 percent as airport lands, 18.9 percent as built up/disturbed areas, 0.1 percent as cemetery lands, 55.0 percent as common field crop (soybean, corn), 6.1 percent as forage/pasture lands, 1.3 percent as open field, 0.8 percent as rail trail, 2.4 percent as recreational (golf course), 0.3 percent as ponded, 5.0 percent as scrublands, 0.7 percent as small grains, 1.7 percent as sod, and 5.4 percent as woodland areas.

On review of the existing land use data, it was observed that the predominant land uses in the SSA include the built up/disturbed areas and the production of common field crops.

Table 2 illustrates the percentage occurrence of the land uses for both the PSA and SSA.

Table 2 Land Use – PSA and SSA

Land Use Designation	PSA Percent Occurrence	SSA Percent Occurrence
Airport Lands	-	2.4
Built Up/Disturbed Areas	12.0	18.9
Cemetery	-	0.1
Common Field Crop	70.5	55.0
Forage/Pasture	0.2	6.1
Open Field	1.3	1.3
Rail Trail	0.2	0.8
Recreation (golf course)	7.8	2.4
Pond	1.3	0.3
Scrubland	2.8	5.0
Small Grains	-	0.7
Sod	-	1.7
Woodlot	3.9	5.4
Totals	100.0	100.0

The relatively high amount of land in non-agricultural land use is typical of areas in close proximity to urban spaces, an airport, and an existing highway corridor (Highway 6).

The proposed future development of the PSA will result in the loss of the use of the lands within the PSA for agricultural production. It should be noted that the PSA (as stated previously in this AIA) is located within the Urban Boundary of the City of Hamilton and is designated as Urban Expansion Area – Neighbourhoods (a non-agricultural use). Therefore, the City of Hamilton has demonstrated that these lands will be included in the urban area and that the future use of these lands will be non-agricultural.

4.3 AGRICULTURAL INVESTMENT

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

As a result, the lands and facilities that have increased capital investment are often considered as having greater affinity for preservation than similar capability lands and facilities that are undergoing degradation and decline. Investment in agriculture is often readily identifiable through observations of the condition and type of the facilities, field observations and a review of OMAFRA artificial tile drainage mapping.

Investment in agriculture is illustrated in Figure 10 – Agricultural Investment.

4.3.1 AGRICULTURAL BUILDINGS

Agricultural buildings (including buildings that may be capable of housing livestock), barns, storage and processing facilities were identified through a combination of aerial photographic interpretation, a review of online digital imagery (Google Earth Pro, Bing Mapping, Provincial and municipal online imagery, and Birds Eye Imagery), and a review of Ontario Base Mapping. The agricultural facilities or potential livestock facilities that were identified on mapping and imagery included buildings used for the active housing of livestock, barns that were empty and not used to house livestock, barns in poor structural condition, barns used for storage and any other large building that had the potential to house livestock.

This AIA has identified the agricultural buildings from a review of online imagery. A roadside evaluation of agricultural buildings will need to be addressed in the full AIA yet to be completed.

Field investigations will reveal the extent of the capability of the existing agricultural buildings and will assist in the determination of the use of buildings for livestock, cash crops, commercial or other activities.

Further, field investigations will identify if any newer buildings have been constructed in the agricultural areas, or other agricultural buildings that may have been removed from agricultural use or torn down.

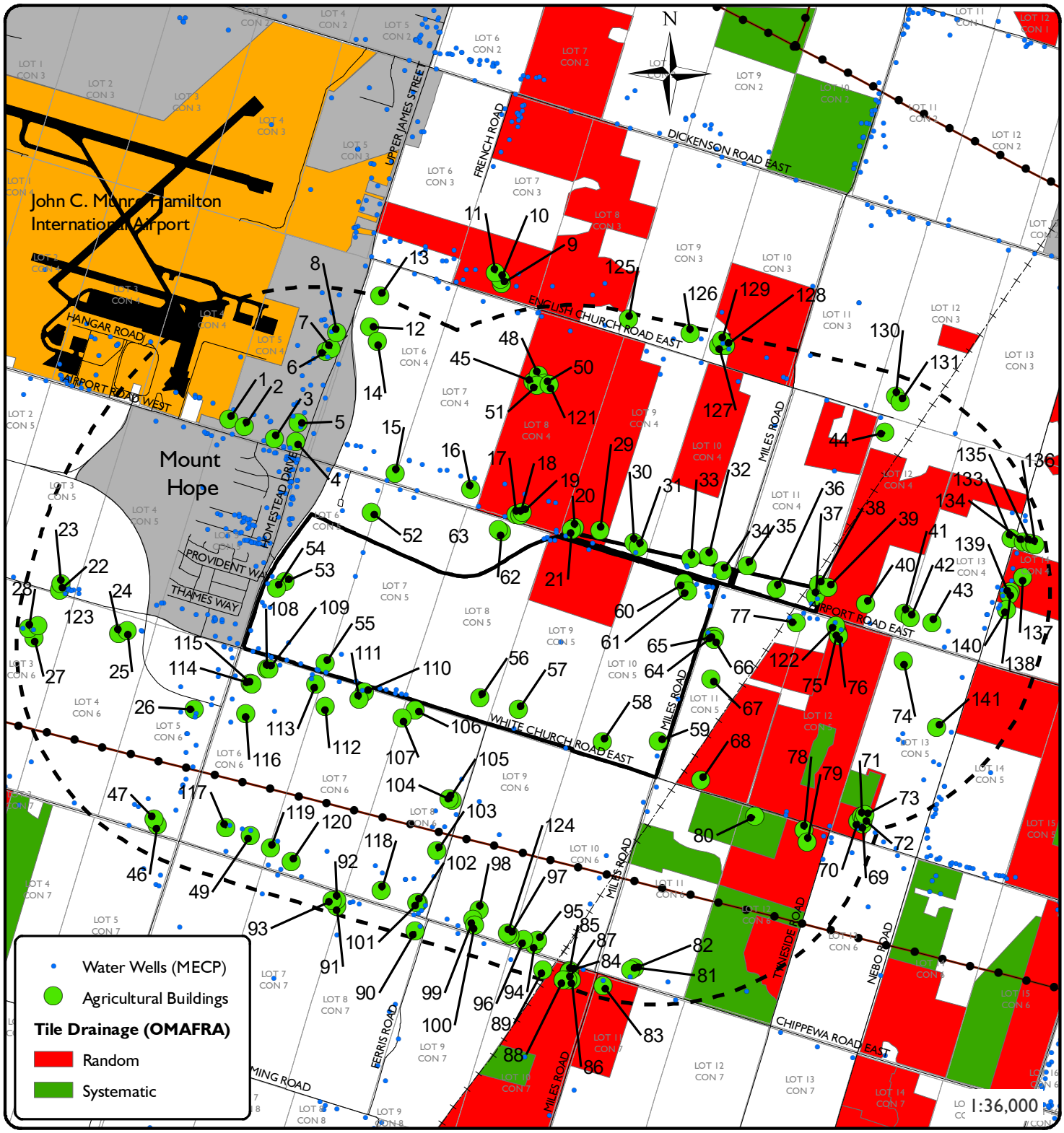
Agricultural building verification will be completed as part of the full AIA yet to be completed.

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

Some cash crop operations are considered as having a large investment in agriculture if they have facilities that include grain handling equipment such as storage, grain driers and mixing equipment that is used to support ongoing agricultural activities.

For the purposes of this AIA, all agricultural buildings that were identified through an online review in the PSA and the SSA were illustrated in Figure 10.

A total of 136 agricultural buildings were identified within the PSA and SSA. There were 12 agricultural buildings within the PSA. A total of 124 agricultural buildings were observed in the SSA. The online review also identified an additional 5 agricultural buildings just beyond the boundary of the SSA. These additional buildings were included in this AIA and will be reevaluated in the full AIA.



Legend

- Hydro Line (MNRF)
- Railway Corridor Trail (MNRF)
- Roads (MNRF)
- Lot Lines (MNRF)
- City of Hamilton Urban Boundary (CoH)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1500m)

John C. Munro Hamilton International Airport

- John C. Munro Hamilton International Airport
- John C. Munro Hamilton International Airport Runway

Figure 10

Investment

DBH Soil Services Inc.

November 2023

A listing of the agricultural buildings is provided in Appendix A.

Photographs and/or aerial photography/satellite imagery of the respective agricultural buildings will be provided in the full AIA.

4.3.2 ARTIFICIAL DRAINAGE

An evaluation of artificial drainage in the PSA and within the SSA was completed through a review of online aerial photographic/aerial imagery interpretation and a review of the Ontario Ministry of Agriculture and Food (OMAF) Artificial Drainage System Mapping.

Visual evidence supporting the use of subsurface tile drains included 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, often referred to as a 'herring bone' pattern. The light and dark tones relate to the moisture content in the surface soils at the time the aerial photograph was taken.

OMAFRA Artificial Drainage System Maps were downloaded from LIO in September 2023 and were reviewed to determine if an agricultural tile drainage system had been registered anywhere in the PSA, or in the SSA. The OMAFRA Artificial Drainage System data illustrates the location and type of tile drainage systems. The type of tile drainage system is defined as either 'random' or 'systematic'. A random tile drainage system is installed to drain only the low areas or areas of poor drainage within a field. A systematic tile drainage system refers to a method of installing drain tile at specific intervals across a field, in an effort to drain the entire field area. From a cost perspective, a systematic tile drainage system would be a greater cost, or investment in agriculture when compared to a random tile drainage system.

Figure 10 illustrates the OMAFRA Artificial Drainage Systems Mapping for the PSA, SSA, and the adjacent surrounding areas.

As observed in Figure 10, there were areas of tile drainage identified within the PSA. One area of random tile drainage was noted just south of Airport Road East (Lot 9, Concession 5), while a second area of random tile drainage was noted just north of Airport Road East (Lot 9, Concession 4).

Figure 10 illustrates that the SSA comprised areas of random tile drainage to the north of Airport Road East and east of Miles Road. Smaller areas of systematic tile drainage were noted to the east of rail trail between Airport Road East and White Church Road East, and east of the rail trail south of White Church Road East.

A review and calculation of the OMAFRA digital data indicated that approximately 27.8 ha of random tile drainage will be impacted by the proposed future development of the PSA.

There will be a net loss of tile drainage (random system) in the PSA as a result of the proposed future development of the PSA (27.8 ha). There will be no loss of tile drainage systems in the SSA as a result of the proposed future development of the PSA.

It should be noted that although there will be a loss of tile drainage systems in the PSA, the PSA is within an existing Urban Boundary and is designated as an area of future development.

4.3.3 WATER WELLS

A review was completed of the MECP Water Well records to determine the extent of water wells in the PSA and the SSA. The review of water well records involved a download of the latest version of the Water Well Records from the LIO data warehouse. The Water Well locations are identified in Figure 10. As illustrated in Figure 10, numerous water wells are located within both the PSA and the SSA.

The review of water well records was completed to determine the location and extent of water wells in the area, and to identify any potential concerns or impacts that may occur as a result of the proposed future development of the PSA. Generally, many livestock operations and some crop farms (nursery stock farms) use ground water for their livestock or crops, and any disruption to the water in terms of quality and/or quantity could have a significant impact to the operation.

There appears to be capital investment in water wells in the PSA and the SSA, as based on the review of the online water well record data. It is unknown if these wells are used in livestock production, or possibly irrigation purposes.

4.3.4 IRRIGATION

The desktop online review of land use and agricultural operations did not identify any irrigation systems within the PSA or the SSA.

The review of irrigation systems will be confirmed during the roadside reconnaissance surveys that will be completed as part of the full AIA.

Visual evidence supporting the use of irrigation equipment would include the presence of the irrigation equipment (piping, water guns, sprayers, tubing/piping, etc), the presence of a body of water (pond, lake, water course) capable of sustaining the irrigation operation and lands that are appropriate for the use of such equipment (large open and level fields).

4.3.5 LANDFORMING

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

No landforming for the purposes of enhancing an agricultural operation was noted in the online imagery review for the PSA or the SSA.

4.4 MINIMUM DISTANCE SEPARATION (MDS 1)

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

As stated previously, this project, the proposed future development of an existing urban area, does not specifically require the completion of MDS 1 for agricultural buildings that have the capacity to house livestock. MDS guideline #36 – *Non-application of MDS within Settlement Areas* states:

> *MDS I setbacks are NOT required for proposed land use changes (e.g., consents, rezonings, redesignations, etc.) within approved settlement areas, as it is generally understood that the long-term use of the land is intended to be for non-agricultural purposes.*

MDS 1 calculations were not completed for agricultural buildings within the PSA. However, MDS 1 calculations were completed for agricultural buildings within the SSA as a best practice to protect lands for agricultural use as long as possible during the development phases.

Agricultural facilities were assessed through a review of online imagery for agricultural buildings that appeared to have the potential capability to house livestock. In some instances, livestock were observed in online imagery.

Further to MDS Guidelines (MDS Guideline # 16 – Obtaining Required Information to Calculate the MDS Setbacks) every effort should be made to contact landowners in an attempt to collect accurate and site-specific data for each of the agricultural buildings that have the potential to house livestock within the Secondary Study Area. However, as this AIA was completed as desktop assessment, no landowners were contacted to collect MDS information. MDS information will be collected during the roadside evaluations that will be completed as part of the full AIA.

For this AIA the livestock potential was based on the most appropriate livestock for that particular livestock facility (ie: based on observed signage, manure piles, feed storage, barn type/style, neighbours/landowners). The respective size of the farm property was determined from Assessment data, while the amount of tillable land (in ha) was determined from measurements taken from online sources such as the Agricultural Information Atlas (OMAFRA),

further, that the relative size of the agricultural facility was measured from online sources such as Google Earth. The use of these data sources will provide a potentially greater MDS 1 distance then if the data is collected from the landowner, due to the measurement of the entire barn roof area (including eaves/overhang) and that the entire areas measured is used as potential livestock space (ie. No feed rooms, offices, tack rooms, etc).

Further, in instances where there was more than one building capable of housing livestock on a parcel, the sum total of barn area that could be used to house livestock is used for calculating MDS 1. This calculation based on the sum total of barn area results in a single MDS 1 distance which is measured from the closed portion of the agricultural facility to the PSA. (MDS guidelines 19 and 40).

A total of 12 MDS calculations were made for agricultural buildings in the SSA that appeared to have the potential to house livestock. Figure 11 illustrates the potential MDS arcs and the potential overlap on the PSA. Table 3 provides the context for the MDS assessment of the 12 agricultural buildings.

Table 3 Minimum Distance Separation (MDS 1)

Agricultural Building Number	Type of Building	Use	Type of Livestock	MDS 1 Barn (m)	MDS 1 Manure Storage (m)
31	Bank Barn	Livestock	Horses	222	222
32	Pole Barn	Livestock	Horses	240	240
39	Pole Barn	Livestock	Beef	363	363
40	Pole Barn	Assumed Livestock	Assumed Horses	175	175
42	Bank Barn	Assumed Livestock	Assumed Horses	222	222
50	Pole Barn	Assumed Livestock	Assumed Dairy	-	-
51	Pole Barn	Assumed Livestock	Assumed Dairy	423	480
69	Pole Barn	Livestock	Beef	-	-
70	Bank Barn	Livestock	Beef	474	474
71	Pole Barn	Livestock	Beef	-	-
72	Pole Barn	Livestock	Beef	-	-
73	Pole Barn	Livestock	Beef	-	-
75	Bank Barn	Assumed Livestock	Assumed Dairy	523	571
76	Pole Barn	Assumed Livestock	Assumed Dairy	-	-
84	Pole Barn	Livestock	Beef	477	477
86	Pole Barn	Livestock	Beef	-	-

Agricultural Building Number	Type of Building	Use	Type of Livestock	MDS 1 Barn (m)	MDS 1 Manure Storage (m)
87	Pole Barn	Livestock	Beef	-	-
90	Pole Barn	Livestock	Chickens, Goats	162	162
98	Bank Barn	Livestock	Sheep	247	247
106	Pole Barn	Livestock	Horses	169	169
121	Pole Barn	Assumed Livestock	Assumed Dairy	-	-

As observed in Figure 11, there are five MDS 1 arcs that impact the PSA. It is noted that based on MDS guideline 36, MDS 1 is not required for the PSA lands as these lands are within a settlement area boundary.

The use of MDS in this instance is solely as a best management practice for the purposes of identifying areas within the PSA where the use of phasing of development (develop the MDS arc impact areas last), or to identify areas where passive land uses could be considered (parks, infrastructure (storm water management ponds, roads, parking areas)).

4.5 FRAGMENTATION

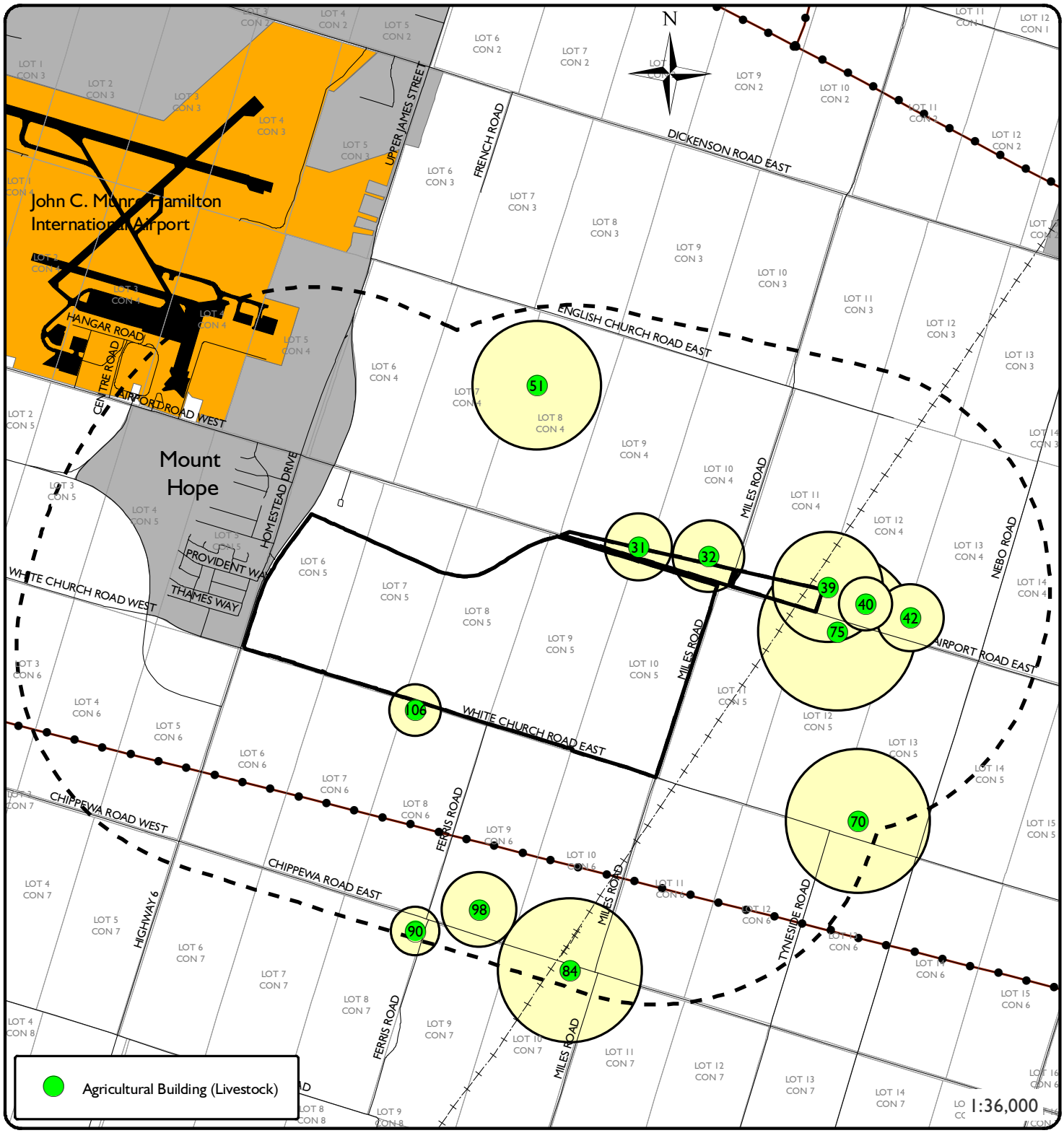
Assessment data was evaluated to determine the characteristics and the degree of land fragmentation in the PSA and the SSA.

In order to evaluate land fragmentation, the most recent Assessment Roll mapping and Assessment Roll information from the City of Hamilton was referenced on a property-by-property basis (for the PSA and the SSA) to determine the approximate location, shape and size of each parcel. The assessment of fragmentation looked at the numbers of and proximity of properties within the PSA and the SSA.

While a minimum size for an agricultural property is not specified in the *Provincial Policy Statement* (PPS, 2020), the PPS does state in Section 2.3.3.2 that:

> "In *prime agricultural areas*, all types, sizes and intensities of *agricultural uses* and *normal farm practices* shall be promoted and protected in accordance with provincial standards."

A review of the City of Hamilton Rural *Official Plan (February 2021)* did not provide a specific minimum lot size for an agricultural property.



Legend

- Hydro Line (MNRF)
- Railway Corridor Trail (MNRF)
- Roads (MNRF)
- City of Hamilton Urban Boundary (CoH)
- Lot Lines (MNRF)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1500m)

John C. Munro Hamilton International Airport

- John C. Munro Hamilton International Airport
- John C. Munro Hamilton International Airport Runway
- Minimum Distance Separation (MDS 1) Arc

Figure 11

Minimum Distance Separation (MDS 1)

DBH Soil Services Inc.

November 2023

A review of the *Corporation of the Township of Glanbrook Zoning By-law (By-law No. 464, consolidated November 2022)* was completed and identified a minimum lot area of 10.0 ha (25.0 acres) for an Agriculture zoning.

Historically, Statistics Canada Census of Agriculture (2011) indicated that the average farm size in Ontario was 98.7 ha (244 acres). This average size is based on the number of Census farms divided by the acreage of those Census farms (Total Farm Area). The Total Farm Area is land owned or operated by an agricultural operation and includes cropland, summer fallow, improved and unimproved pasture, woodlands and wetlands, and all other lands (including idle land, and land on which farm buildings are located) (Statistics Canada, 2017). It should be noted that the average farm size is based on farmland holdings, which may include more than one parcel (property). Further, the Census of Agriculture (2011) information indicated that the average farm size in the Hamilton Division is 59.7 ha (147.6 acres).

Further, the historical Census of Agriculture (2016) data indicated that the average farm size in Ontario (for Census farms) was 100.8 ha (249) acres. Again, the Census of Agriculture (2016) average farm size is based on farmland holdings, which may include more than one parcel (property). The Census of Agriculture (2016) information indicated that the average farm size in the Hamilton Division is 64.2 ha (158.7 acres).

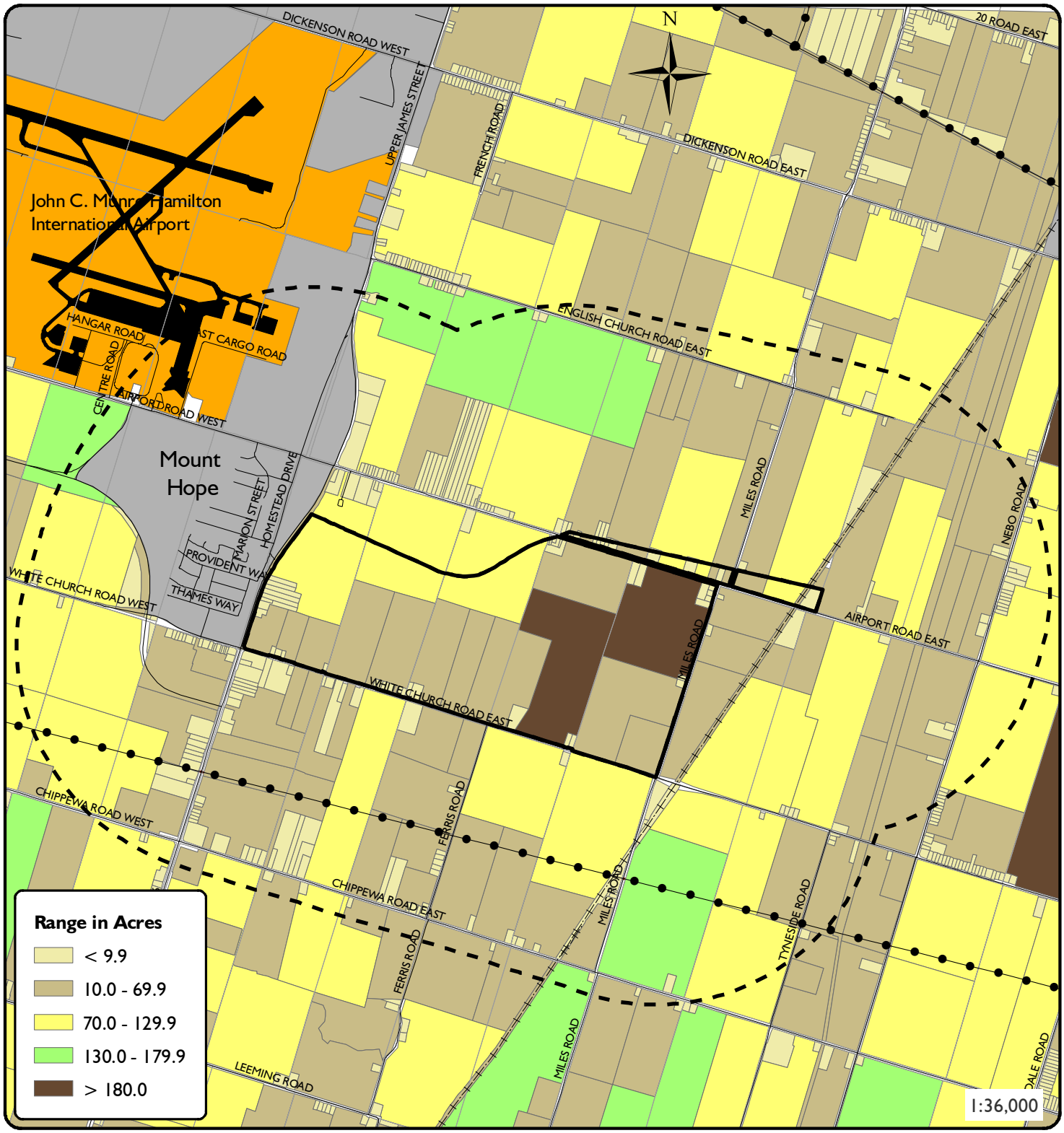
The more recent Census of Agriculture (2021) data indicated that the average farm size in Ontario (for Census farms) was 98.3 ha (243 acres). Again, the Census of Agriculture (2021) average farm size is based on farmland holdings, which may include more than one parcel (property). Further, the Census of Agriculture (2021) information indicates that the average farm size in the Hamilton Division is 70.4 ha (173.9 acres).

Figure 11 illustrates the complexity of the land fragmentation within the PSA and SSA. GIS was utilized to calculate the area (in acres) of each parcel within the PSA and SSA from which MPAC (Municipal Property Assessment Corporation) data was not available. Acre calculations were completed to allow an assessment or comparison of all the parcels within the PSA and the SSA. This assessment was not limited to only the agricultural properties but included all parcels.

The Census data provides detailed information on Census farms (farms which provided census data). Census data is provided in the unit format of acres, with the splits in the data at 0.0 – 9.9, 10.0 – 69.9, 70.0 – 129.9, 130.0 – 179.9 and greater than 180.0 acres. For the purposes of this AIA, similar splits in acre data were used for the comparison.

As illustrated in Figure 12, the PSA comprised of a variety of area sizes, ranging from 0.01 acres to > than 180 acres. It appears that much of the PSA is comprised of parcels in the range of 10.0 – 129.9 acres. Numerous smaller parcels (< 9.9 acres) were also noted along Upper James Street, Airport Road East and White Church Road East.

The review of fragmentation in the SSA revealed similar conditions and characteristics. Significant linear development (small individual parcels along roads/streets) was noted along White Church Road West, Upper James Street, Chippewa Road East and Ferris Road.



Legend

- Hydro Line (MNRF)
- Railway Corridor Trail (MNRF)
- Roads (MNRF)
- City of Hamilton Urban Boundary (CoH)
- Lot Lines (MNRF)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1500m)

John C. Munro Hamilton International Airport

- John C. Munro Hamilton International Airport
- John C. Munro Hamilton International Airport Runway

Figure 12

Fragmentation

DBH Soil Services Inc.

November 2023

The review of parcel data as a means of determining the existing fragmentation of the PSA and the SSA revealed that both areas comprised numerous parcels of varying sizes. Table 4 provides a comparison between the parcel count of the PSA, the SSA and the Census farm data. The parcel count for the City of Hamilton reflects the Census Farms from the 2021, 2016, and 2011 census. It should be noted that the parcel data for the urban areas around Mount Hope was not available at the time of writing this report. Therefore, those data are not provided in the following table.

As illustrated in Table 4, the parcel count for the PSA and the SSA indicates the presence of numerous small parcels, and fewer larger parcels. This type of fragmentation pattern is common in areas near urban boundaries and within the Greater Toronto Area (GTA) and Greater Golden Horseshoe (GGH) areas. It is noted that there are large clusters of smaller parcels associated with the urban areas of the City of Hamilton and urban areas nearer to Hamilton Airport.

Table 4 Parcel Size and Parcel Count

Parcel Size Range (Acre)	PSA	SSA	City of Hamilton (2021 Census)	City of Hamilton (2016 Census)	City of Hamilton (2011 Census)
0.0 – 9.9	50	252	92	119	104
10.0 – 69.9	18	82	282	334	375
70.0 – 129.9	5	31	138	148	182
130.0 – 179.9	-	5	39	64	66
>180	1	2	128	145	158

Although a direct comparison of the parcel size count of the PSA and SSA to the Census data cannot be made, as the census data only refers to census farms while the parcel data refers to all parcels, there are similarities in the proportion of the numbers between the PSA counts and the Census data. Table 4 shows a relative decrease in counts as the parcel size increases.

4.6 PARCEL OR LAND SEVERANCE

A parcel or land severance is defined as an authorized separation of a piece of land to form a new lot or parcel of land.

For the purposes of this AIA, GIS mapping was used to calculate the number of parcels that will lose a portion of the property to the PSA, and the number of parcels that will be severed (resulting in two separate portions).

A total of 6 properties will be severed, resulting in a portion of the parcel being included in the PSA, while the remaining portion of the parcel will be located in the SSA.

4.7 SOILS AND CANADA LAND INVENTORY (CLI)

A review was completed of the soils and Canada Land Inventory (CLI) data base for the PSA and the SSA. The review was completed to determine the extent and location of the high capability soils. Digital soils data was retrieved from the Land Information Ontario data warehouse in September 2023.

The review included a download of the latest version of the soils data from the Land Information Ontario website and discussions with OMAFRA staff to determine if the downloaded data set is the latest iteration of the soils data.

Due to the continual updates to the soil survey complex datasets, it is prudent to verify or at least confirm that the soil series data and CLI information within the datasets is accurate across the City of Hamilton. In an effort to confirm the correctness of the soils and the CLI data on a soil series basis, the dbase data file that is associated with the City of Hamilton soil survey complex file was exported to excel to run a unique symbols list based on Soil Series, topography (slope), CLI class and CLI subclass.

In the City of Hamilton soil data (2433 records), the unique symbols list (based on the SYMBOL1 column) provided 1152 unique symbols combined with the associated slope and CLI class and CLI subclass (CLI_1 and CLI_2). The unique symbols list is provided in Appendix B.

For the purposes of this AIA, the soil and CLI data presented on Figure 13 are considered appropriate in soil code and CLI rating.

4.7.1 SOIL CAPABILITY FOR AGRICULTURE

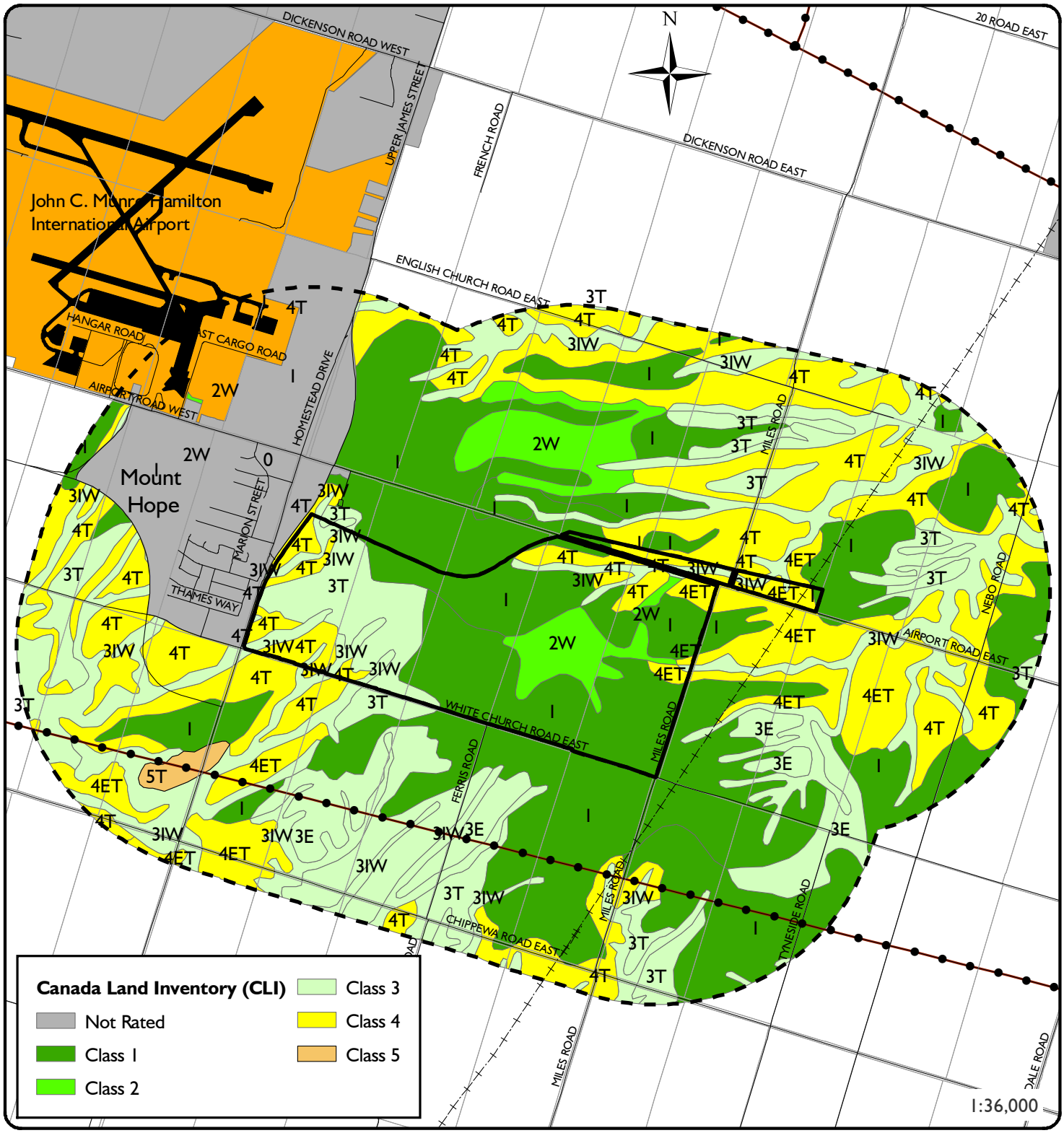
Basic information about the soils of Ontario is made more useful by providing an interpretation of the agricultural capability of the soil for various crops. The Canada Land Inventory (CLI)

system combines attributes of the soil to place the soils into a seven-class system of land use capabilities. The CLI soil capability classification system groups mineral soils according to their potentialities and limitations for agricultural use. The first three classes are considered capable of sustained production of common field crops, the fourth is marginal for sustained agriculture, the fifth is capable for use of permanent pasture and hay, the sixth for wild pasture and the seventh class is for soils or landforms incapable for use for arable culture or permanent pasture.

Organic (O) or Muck (M) soils are not classified under this system. Disturbed Soil Areas are not rated under this system.

4.7.1.1 Canada Land Inventory (CLI) Class

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:



Legend

- Hydro Line (MNRF)
- Railway Corridor Trail (MNRF)
- Roads (MNRF)
- Primary Study Area (PSA)
- Secondary Study Area (SSA) (1500m)
- Lot Lines (MNRF)

John C. Munro Hamilton International Airport

- John C. Munro Hamilton International Airport
- John C. Munro Hamilton International Airport Runway
- City of Hamilton Urban Boundary (CoH)

Figure 13

Canada Land Inventory (CLI)

DBH Soil Services Inc.

November 2023

"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."

4.7.1.2 Canada Land Inventory (CLI) Subclass

With respect to the soils and Canada Land Inventory (CLI) identified in the PSA and SSA, 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 D – Undesirable Structure and/or Low Permeability

Subclass D denotes soils which are difficult to till, or which absorb or release water very slowly, or in which the depth of rooting zone is restricted by conditions other than a high water table or consolidated bedrock. In Ontario this Subclass is based on the existence of critical clay contents in the upper soil profile. These soils are generally more susceptible to compaction than are lighter textured soils.

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

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

Subclass I – Inundation by Streams or Lakes

Subclass I denotes soils that are subject to periodic flooding by streams and lakes which causes crop damage or restricts agricultural use.

Subclass M – Moisture Deficiency

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

Subclass S – Adverse Soil Characteristics

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

Subclass T - Topography

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

Subclass W – Excess Water

The presence of excess soil moisture (other than that from inundation) may result from inadequate soil drainage, a high water table, seepage, or runoff from surrounding areas. This limitation only applies to soils classified as poorly drained or very poorly drained.

Disturbed soil areas (built up or developed areas) are considered as Not Rated within the Canada Land Inventory (CLI) classification system. Muck (organic soils) are not rated in the Canada Land Inventory (CLI) classification system.

Figure 13 – Canada Land Inventory (CLI) illustrated the OMAFRA digital soils data for the PSA and the SSA. The OMAFRA soils data base has not removed or discounted soils from roads, railways, urban or developed areas.

Table 5 illustrates the soils data as derived by percent occurrence within the respective polygons and summarizes the relative percent area occupied by each capability class for the PSA. Soil materials in the SSA will not be impacted as a result of the proposed development of the PSA. As a result, the relative percent occurrence of soil class is not provided in Table 5.

Table 5 Canada Land Inventory – Percent Occurrence

Canada Land Inventory Class (CLI)	PSA Percent Occurrence
Class 1	50.1
Class 2	9.9
Class 3	23.6
Class 4	16.4
Class 5	-
Class 6	-
Class 7	-
Not Rated	-
Organic Soil	-
Totals	100.0

The PSA comprised approximately 83.6 percent Canada Land Inventory (CLI) capability of Class 1 – 3, with approximately 50.1 percent as Class 1, 9.9 percent as Class 2, and 23.6 percent as Class 3. Approximately 16.4 percent of the PSA was Class 4 lands.

It is important to note that the PSA lands are located within the existing Urban Boundary of the City of Hamilton. There will be no loss of Agriculture designated lands as a result of the proposed future development of the PSA.

4.8 AGRICULTURAL SYSTEMS PORTAL

A review of the OMAFRA Agricultural System Portal online resource for agricultural services/agricultural network (markets, abattoirs, renderers, livestock auctions, investment, warehousing and storage, wineries and breweries) noted that all of the PSA and much of the SSA were located in the Prime Agricultural Area of the Agricultural Land Base of the Greater Golden Horseshoe as has been illustrated in Figure 2 of this AIA.

A review of the online Agricultural System Portal (OMAFRA) indicated that there were no registered farmers markets, pick your own operations, nurseries, frozen food manufacturing, refrigerated warehousing/storage, livestock assets, abattoirs, or other agricultural services in the PSA.

The review of agricultural services and agricultural operations from the Agricultural Systems Portal for the SSA revealed there are no registered agricultural resources/services in the SSA.

The closest transportation network (major roadway) is Highway 6 and Highway 403 which are located to the southwest and west of the PSA. Further, Hamilton international airport (John C. Munro Hamilton International Airport) is located west of the PSA.

Figure 14 provides an illustration of the agricultural resources (OMAFRA Livestock, Fish and Poultry) within the PSA as based on a search of the OMAFRA Agricultural Systems Portal website. Figure 15 provides an illustration of the agricultural resources (OMAFRA Field Crop) as based on the OMAFRA Agricultural Systems Portal.

As noted in Figures 14 and 15, there were no agricultural services identified in the PSA as based on the OMAFRA Agricultural Systems Portal mapping and online data.

4.9 AGRICULTURAL SYSTEM AND AGRICULTURAL NETWORK

The PPS (2020) required the implementation of an agricultural system. The Agricultural System comprises two parts: Agricultural Land Base; and the Agri-Food Network. The Agricultural Land Base was evaluated through a review of Canada Land Inventory (CLI) in Section 4.7 of this AIA.

This AIA has determined that both the PSA and the SSA comprised portions of Prime Agricultural Area and were comprised of a portions of high capability soil resources.

The Agricultural Network includes the services and infrastructure that are important components of the agricultural industry. Section 4.8 of this AIA provided comments on the agricultural services and infrastructure in the surrounding area. It was noted that there are no services in the PSA or the SSA.

Figure 14 OMAFRA Agricultural Systems Mapping Livestock, Fish and Poultry

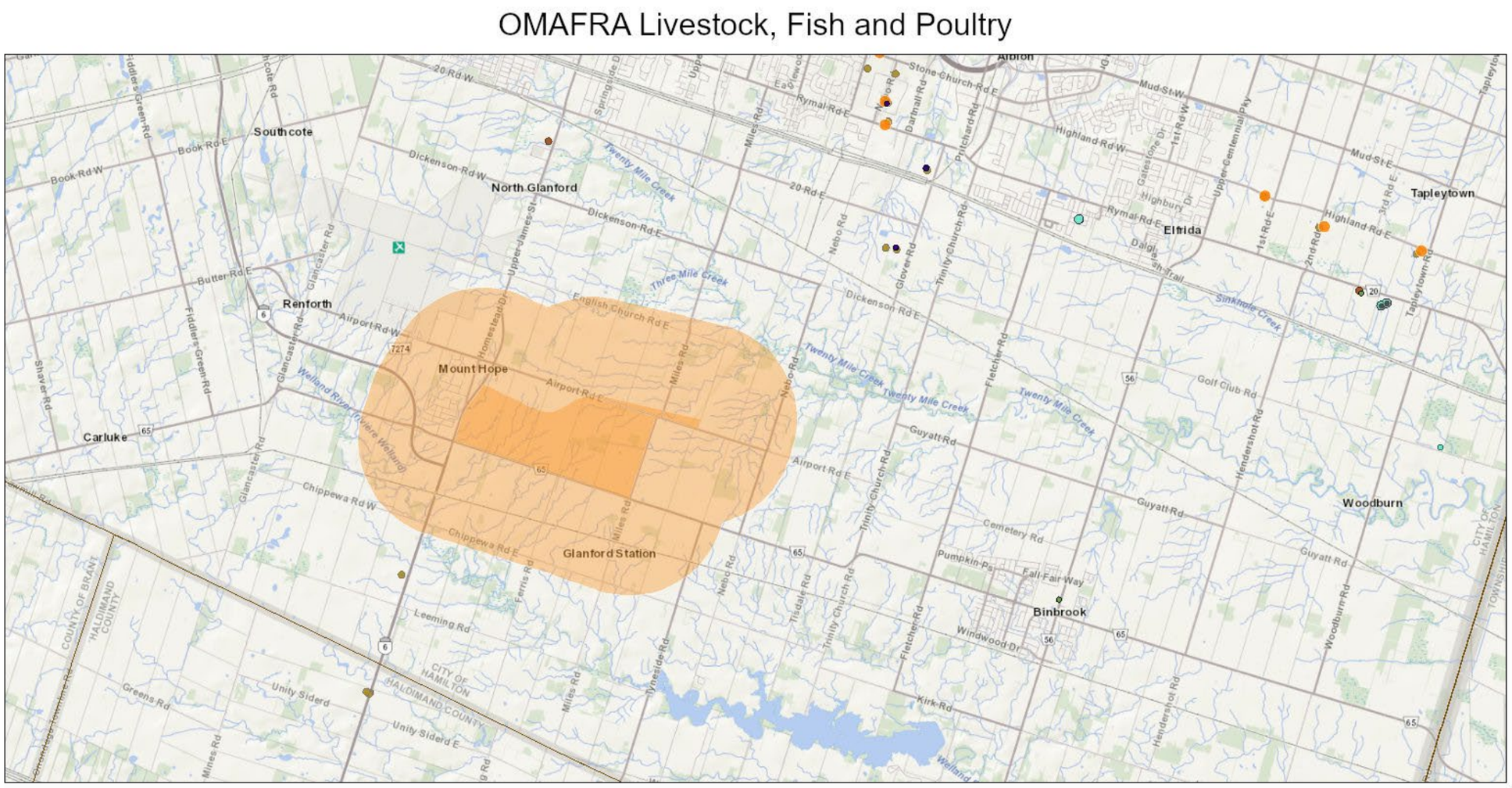
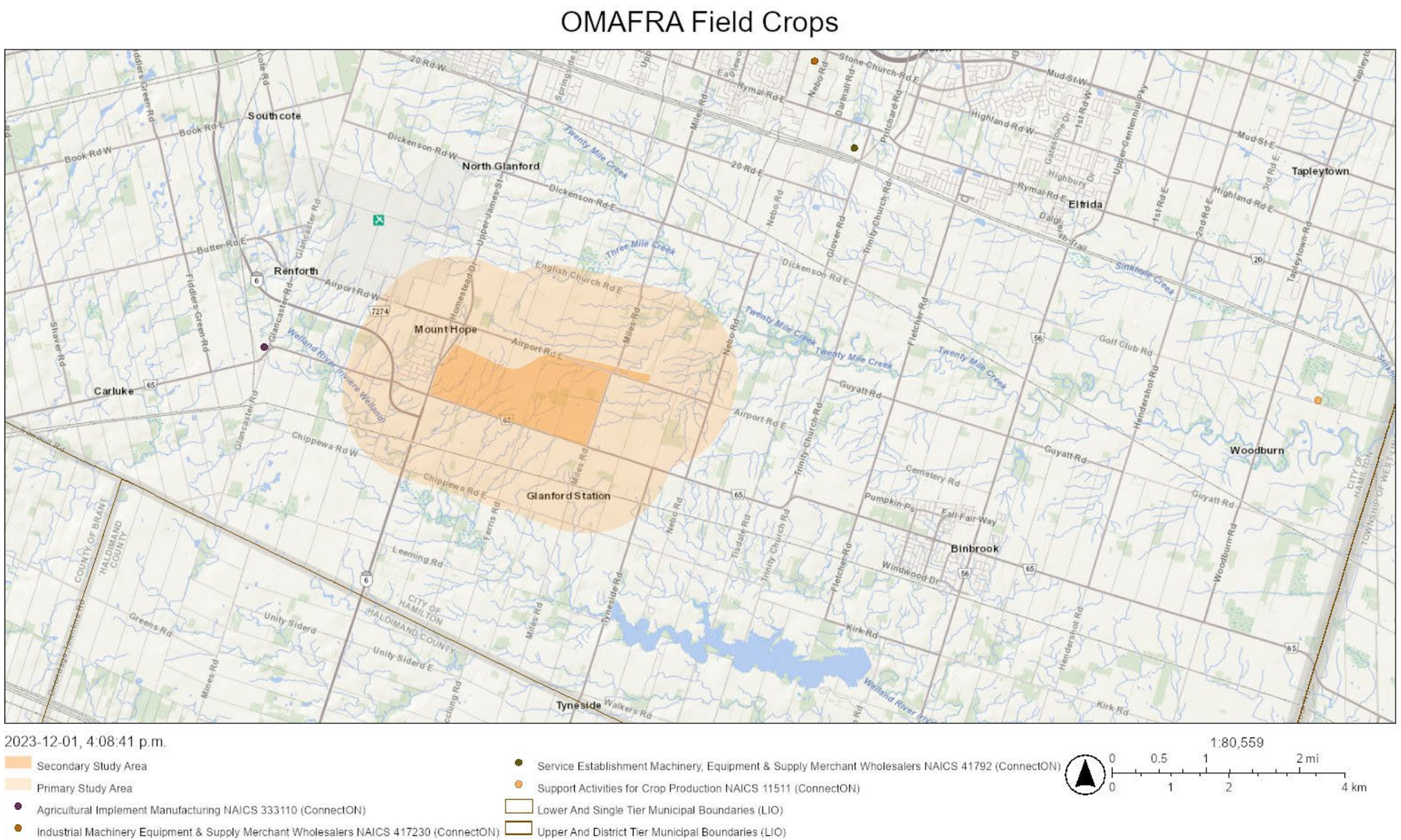


Figure 15 Agricultural Systems Portal Mapping



4.10 AGRICULTURAL CENSUS DATA

A review of the Census of Agricultural data (Census 2021, including 2016, 2011 and 2006 data) was completed to determine the agricultural characteristics of Hamilton Division and to allow comparison to the agricultural characteristics of the Province.

4.10.1 HAMILTON DIVISION

Table 6 provides Census 2021 data for agricultural land use in Hamilton Division and provides a comparison to the Provincial Census 2021, 2016, 2011 and 2006 agricultural data. As indicated in the census data, Hamilton Division comprises approximately 1.00 percent of the total area of farms in Ontario (Census 2021).

A review of Census 2021 data for Hamilton Division reveals that the total area in farms is 118,070 acres (Census Farms). Much of the farmed land is in crops with a total of 100,089 acres. The remaining lands are listed as summerfallow land, tame or seeded pasture, Christmas trees, woodlands and wetlands and all other land.

Table 6 Hamilton Division Census 2021 Data – Land Use

Item	Hamilton Division	Province	Percent of Province 2021	Percent of Province 2016	Percent of Province 2011	Percent of Province 2006
Land Use, 2021 Census (acres)						
Land in crops	100,089	9,051,011	1.11	1.15	1.17	1.13
Summerfallow land	393	13,964	2.81	4.71	5.21	2.00
Tame or seeded pasture	3,219	400,480	0.80	0.56	0.60	0.53
Natural land for pasture	F	626,366	-	0.39	0.33	0.42
Christmas trees, woodland & wetland	7,200	1,269,535	0.57	0.62	0.69	0.72
All other land	4,673	404,714	1.15	1.71	1.39	1.52
Total area of farms	118,070	11,766,071	1.00	1.04	1.03	1.00

F – too unreliable to be published
Sources: 2021 & 2016 Census of Agriculture, OMAFRA

Table 6 illustrates that a fluctuation in acreage has occurred over the last 15 years in total area farms and now reflects the same acreage as 2006. Fluctuations in acreage have also been noted in land in crops, summerfallow land, tame or seeded pasture and all other land. Decreases in acreage have occurred for Christmas trees, woodland and wetland. Data with respect to natural land for pasture was too unreliable to be published therefore a comparison could not be made to 2021 data. However, the general trend in data from 2006 to 2016 indicates fluctuations in acreage.

Table 7 provides a more detailed inventory of agricultural lands, and it is evident from this data that Hamilton Division contributes a limited amount to the Provincial totals for production in major field crops (As based on Census farm data).

Table 7 Hamilton Division Census 2021 Data – Crops

Item	Hamilton Division	Province	Percent of Province 2021	Percent of Province 2016	Percent of Province 2011	Percent of Province 2006
Major Field Crops, 2021 Census (acres)						
Winter wheat	10,528	1,144,406	0.92	0.98	0.92	0.77
Oats for grain	F	84,320	-	0.58	0.42	1.68
Barley for grain	887	68,756	1.29	0.37	0.35	0.67
Mixed grains	200	59,961	0.33	0.55	0.45	0.63
Corn for grain	23,637	2,202,465	1.07	1.16	1.24	1.28
Corn for silage	1,383	289,678	0.48	0.70	0.63	0.70
Hay	14,100	1,704,017	0.83	0.91	0.90	0.94
Soybeans	34,420	2,806,255	1.23	1.28	1.29	1.25
Potatoes	923	39,193	2.36	2.93	3.43	3.34
Major Fruit Crops, 2021 Census (acres)						
Total fruit crops	F	48,661	-	-	2.52	3.39
Apples	F	16,008	-	2.18	2.99	3.14
Sour Cherries	F	1,383	-	1.18	1.07	0.90
Peaches	F	4,608	-	1.59	-	0.28
Grapes	F	18,432	-	1.92	2.30	4.20
Strawberries	F	2,633	-	3.57	4.29	4.03
Raspberries	15	438	3.42	3.09	2.66	2.17
Major Vegetable Crops, 2021 Census (acres)						
Total vegetables	2,229	127,893	1.74	-	2.66	3.14
Sweet corn	F	20,518	-	1.24	1.40	1.45
Tomatoes	F	14,614	-	0.32	0.41	0.96
Green peas	47	14,044	0.33	0.34	0.28	0.57
Green or wax beans	375	8,709	4.31	-	-	5.24

F – too unreliable to be published
Sources: 2021 & 2016 Census of Agriculture, OMAFRA

Table 7 also illustrates the percentage of province in Hamilton County and provides a comparison from 2021, 2016, 2011 and 2006. The census data indicates there have been fluctuations in all major field crop production in the last 15 years with the exception of corn for grain where there have been decreases in acreage. Data with respect to oats for grain was too unreliable to be published therefore a comparison could not be made to 2021 data. However, the general trend in data from 2006 to 2016 indicates fluctuations in production.

With respect to fruit crops, Hamilton Division is a small contributor to the Provincial totals for major fruit crops. There have been increases in Hamilton Division (as a percent of the Provincial totals) in acreage of raspberries since 2006. Data with respect to total fruit crops, apples, sour cherries, peaches, grapes, and strawberries was too unreliable to be published therefore a comparison could not be made to 2021 data. However, the general trend in data from 2006 to 2016 indicates decreases for acreage in total fruit crops, apples, and grapes. Increases in acreage were noted for sour cherries, and fluctuations in acreage for peaches and strawberries.

Hamilton Division contributes a limited amount to the Provincial totals for production of vegetables. There have been decreases in Hamilton Division (as a percentage of the Provincial totals) for total vegetables and green or wax beans since 2006. Fluctuations were noted in acreage of green peas over the last 15 years. Data with respect to sweet corn and tomatoes was too unreliable to be published therefore a comparison could not be made to 2021 data. However, the general trend in data from 2006 to 2016 indicates a decrease in production.

Table 8 illustrates the Census 2021 data for livestock. Hamilton division is a small contributor to the provincial totals for livestock inventories. Fluctuations were noted in inventory for total cattle and calves, beef and dairy cows, and total sheep and lambs in the last 15 years. Data with respect to steers and total pigs was too unreliable to be published therefore a comparison could not be made to 2021 data. However, the general trend in data from 2006 to 2016 indicates a decrease in inventory.

It was also noted that Hamilton Division is not a significant producer of total hens and chickens and turkeys. Decreases have also been noted in poultry inventories since 2006.

Table 8 Hamilton Division Census Data (2021) – Livestock

Item	Hamilton Division	Province	Percent of Province 2021	Percent of Province 2016	Percent of Province 2011	Percent of Province 2006
Livestock Inventories, 2021 Census (number)						
Total cattle and calves	8,817	1,604,810	0.55	0.49	0.55	0.61
Steers	F	299,540	-	0.20	0.20	0.32
Beef Cows	1,365	224,194	0.61	0.51	0.60	0.69
Dairy Cows	2,280	327,272	0.70	0.72	0.77	0.70
Total Pigs	F	4,071,902	-	0.16	0.22	0.44
Total sheep and lambs	1,530	322,508	0.47	0.65	1.74	1.02
Poultry Inventories, 2021 Census (number)						
Total hens and chickens	699,282	53,802,772	1.30	1.43	2.15	3.67
Total turkeys	F	2,453,126	-	0.03	0.25	3.70

F – too unreliable to be published
Sources: 2021 & 2016 Census of Agriculture, OMAFRA

5 RESOURCE ALLOCATION AND CONFLICT POTENTIAL

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

5.1 IMPACTS, ASSESSMENT AND COMPATABILITY WITH SURROUNDING LAND USES

The identification and assessment of potential impacts is paramount to determining potential mitigation measures to either eliminate or offset the impact to the extent feasible. The following list includes potential impacts to agriculture that were identified in the OMAFRA 2018 draft AIA Guidance Document, and includes other impacts identified by farmers and landowners. This list is a basis for documenting potential impacts within AIA's and can be modified as necessary to suit the local agricultural community, operations, and services. The determination of impacts due to the proposed future development of the PSA related to this list of potential impacts to infrastructure development projects on agricultural lands may include the following:

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

It should be noted that this AIA report should be read in conjunction with any and all other discipline reports in an effort to provide an adequate evaluation of the above-mentioned potential impacts.

The agricultural character of both the PSA and the SSA has been documented in this AIA. It has been determined that the PSA and the SSA comprise portions of active agricultural land uses (including livestock, and cash crop operations), built areas (urban land uses), commercial enterprises, rural residential use, recreational uses, woodlands, and scrublands.

It has been documented in this AIA report that the PSA and portions of the SSA include built areas of the City of Hamilton.

The PSA and the SSA comprise a mix of land fragmentation. Numerous small parcels (associated with the urban areas of the City of Hamilton) were noted in the PSA and the SSA.

These types of fragmentation (and business/commercial intrusions) are a clear indication of an area impacted by non-agricultural uses. These types of uses provide an indication of lands that are in transition from an agricultural land base to a more rural environment. The large number of small parcels and commercial/industrial lands provide an indication as to the lack of long-term intensions for agriculture in those portions of the PSA and the SSA.

With respect to the potential impacts as listed on the previous page of this report, and the proposed future development of the PSA lands, Table 9 provides some context as to the extent of the potential impacts.

Table 9 Potential Impacts

Potential Impact	Impacts Associated with the Proposed Future Development of the PSA Lands Before Mitigation
Interim or permanent loss of agricultural lands	There will be a permanent loss of the use of agricultural lands within the PSA. There will be no loss of agricultural lands in the SSA. The impact is applicable for both the construction and the future use of the PSA.
Fragmentation, severing or land locking of agricultural lands and operations	This project is a proposed future development of the PSA lands which will fragment the land base. The impact is applicable for both the construction and the future use of the PSA.

Potential Impact	Impacts Associated with the Proposed Future Development of the PSA Lands Before Mitigation
The loss of existing and future farming opportunities	There will be a loss of existing and future farming opportunities on the portions of the PSA lands which were utilized for agricultural production. It is noted that the PSA lands are within the Urban Boundary of the City of Hamilton and are designated for nonagricultural use. The impact is applicable for both the construction and the future use of the PSA.
The loss of infrastructure, services or assets The loss of investments in structures and land improvements	There will be no loss of infrastructure or services as a result of the project. There is no net loss of investment in agricultural buildings in the PSA. There will be a net loss of tile drainage. The impact is applicable for both the construction and the future use of the PSA.
The loss of use of ground water wells	There exists the potential for impact from the loss of the use of ground water wells due to lack of quantity and/or quality. The impact is applicable for the construction of the project.
Disruption or loss of functional drainage systems	There will be a net loss of artificial tile drainage on the PSA, and there is no net loss or disruption to artificial tile drainage systems in the SSA. The impact is applicable for the construction and future use of the PSA.
Disruption or loss of irrigation systems	There does not appear to be a loss of irrigation systems in the PSA.
Changes to soil drainage	There will be no net change in soil drainage in the SSA as a result of future development of the PSA lands.
Changes to surface drainage	There will be no net change in surface drainage within the SSA as a result of future development of the PSA lands.

Potential Impact	Impacts Associated with the Proposed Future Development of the PSA Lands Before Mitigation
Changes to landforms	There will be no changes to landforms (with respect to agriculture) in the SSA as a result of future development of the PSA lands.
Changes to hydrogeological conditions	Any potential changes in hydrogeological conditions would need to be addressed under separate cover in future stages of the project.
Disruption to surrounding farm operations	There will be limited disruption for surrounding/adjacent farms. The impact is applicable for both the construction and the future use of the PSA.
Effects of noise, vibration, dust	There should be limited potential for additional vibration and dust during the construction of the future development of the PSA lands. The impact is applicable for both the construction and the future use of the PSA.
Potential compatibility concerns	There should be limited potential for compatibility concerns with the proposed future development of the PSA and the adjacent agricultural lands in the SSA as the PSA lands are within the existing Urban Boundary of the City of Hamilton.
Traffic concerns	It is noted that this project is the future development of the PSA lands which will result in an increase in human occupancy. Increased traffic will occur as a result of an increase in human occupancy. A traffic study will address those concerns.
Changes to adjacent cropping due to light pollution	There is potential for changes in cropping due to light pollution, as it is assumed that the proposed future development of the PSA will include lighting. Any use of lighting should take into consideration the impact on adjacent agricultural lands. The impact is applicable for both the construction and the future use of the PSA.

5.2 TRAFFIC, TRESPASS AND VANDALISM

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

It may be necessary to reduce conflicts by designing roads and traffic controls to accommodate the heavy, wide, slow-moving farm equipment (e.g. wide shoulders, no curbs, reduced speed limits, and if traffic circles (roundabouts) are to be used, then they need to accommodate large slow moving farm equipment. Discussions with farm groups in various parts of Ontario have indicated that roundabouts in agricultural areas are a poor consideration due to difficulties maneuvering large tractors pulling multiple trailers through tight turns. Further, due to the slow speed of farm equipment, roundabouts do not allow adequate time for the equipment to move with the flow of traffic. Comments from the farm groups suggest that traffic lights or stop signs (hard stops) would better serve the farm community and farm traffic by forcing traffic to stop and allowing controlled access to the local road system.

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

Trespassing and vandalism are more often a concern with specialty crop operations and livestock operations. The location of the proposed future development of the PSA is not located in a Provincially designated specialty crop area.

Therefore, the proposed development of the PSA lands will have limited impact with respect to trespassing and vandalism on adjacent agricultural operations.

5.3 AGRICULTURAL INFRASTRUCTURE

The review of the OMAFRA Agricultural System Portal was completed to identify the presence of any registered livestock assets and services (renderers, meat plants, abattoirs), refrigerated warehousing and storage, frozen food manufacturing, farm markets, wineries, or cideries within the PSA. None of these features were identified within either the PSA, or the SSA.

The proposed development of the PSA will not impact any registered agricultural assets and services (renderers, meat plants, abattoirs), refrigerated warehousing and storage, frozen food manufacturing, farm markets, wineries, or cideries.

5.4 MITIGATION MEASURES

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

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

With respect to this AIA, the following sections provide comments with regard to the avoidance, minimization, and mitigation of any potential adverse impacts.

5.4.1 AVOIDANCE

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

The first method of addressing potential impacts is to avoid the potential impact. In this study, the proposed future development of the PSA will be a permanent use in an Urban Area. As a result, there will be no designated agricultural lands lost.

5.4.2 MINIMIZING IMPACTS

When avoidance is not possible, the next priority would be to minimize impacts to the extent feasible. Mitigation measures should be developed to lessen the potential impacts. The minimization of impacts can often be achieved during the design process and through proactive planning measures that provide for the separation of incompatible land uses.

5.4.3 MITIGATING IMPACTS

Potential mitigation measures may include:

- The use of berms, vegetated features, or fencing, where feasible, between the different types and intensities of land uses to reduce the potential for trespassing and potential vandalism. These types of buffers reduce impacts by preventing trespassing and associated problems such as litter and vandalism.
- The use of buffers between agriculture and transportation/urban uses may combine a separation of uses, vegetation/plantings, windbreaks, and berms. Vegetated buffers should include the use of deciduous and coniferous plants, with foliage from base to crown to mitigate against dust, light trespass, and litter.

- The use of salt management plans to reduce the amount of salt required for de-icing (liquid de-icers, broad casting and selective broad casting).
- The use of plantings/vegetation as screens and buffers to reduce visual impacts. Consideration of plantings/vegetation barriers within the PSA as visual screening where appropriate.
- Design new structures and side road improvements to be compatible with farm equipment.
- Further assessment of potential impacts to existing groundwater and surface water monitoring and providing new well or water access to those potentially impacted by groundwater disruption in future stages of the Project.
- Restore tile drainage systems in the SSA that may be impacted by the proposed future development of the PSA (as necessary).
- Restore impacts to irrigation systems (as necessary).
- Create a traffic plan that identifies closures and open routes to minimize impacts to local traffic during construction.
- Maintain local roads to allow access for the movement of oversized agricultural equipment.
- Due to the locations and numbers of water wells in the PSA and the SSA, it will be important to either preserve the existing wells, or properly engineer the closing/capping of any water well, where necessary, to prevent potential groundwater contamination.
- Field entrances and farm accesses that may be impacted by the proposed future development of the PSA will be relocated and/or accommodated to the extent possible.

This AIA has provided comments on the avoidance (if possible), minimizing potential impacts and mitigation measures in the instances where avoidance is not possible.

6 SUMMARY AND CONCLUSIONS

DBH Soil Services Inc was retained to complete an Agricultural Impact Assessment (AIA) Report for the Whitechurch Secondary Plan area. The proposed development of this area required the completion of an AIA. Due to scheduling, this AIA was completed as a desktop assessment, with the full AIA to be completed as scheduling permits. This desktop AIA identified and assessed agricultural impacts (direct and/or indirect) from online resources only and provided potential avoidance or mitigative measures as necessary to offset or lessen any impacts.

This AIA report identified the Whitechurch Secondary Plan area as the Prime Agricultural Study Area (PSA). Similarly, a Secondary Study Area (SSA) was created as a 1500 m buffer beyond the boundaries of the PSA.

The 1500 m (1.5 km) area of potential impact outside the PSA was used for the characterization of the agricultural community and the assessment of potential impacts both on and in the immediate vicinity of the PSA.

In the regional/city context, the PSA is roughly bounded by Upper James Street on the west, White Church Road East on the south, Miles Road on the east, and Airport Road East on the north. It is noted that the PSA also extends north of Airport Road East near the intersection of Miles Road and Airport Road East, and to the east of Miles Road, north of Airport Road East. The PSA abuts the urban area of Mount Hope on the west.

A summary of the results of this desktop AIA are presented below:

- **Geographical Limits**

  The PSA and the SSA are located within the Haldimand Clay Plain physiographic region.

  The Haldimand Clay Plain is described as an area that is located between the Niagara Escarpment and Lake Erie. The area is defined as a series of parallel belts, with the first belt on the high ground near the brow of the Niagara Escarpment. The first belt comprised recessional moraine materials with the exception of the Font Hills area where the materials are sand and gravel hills. The central belt is described as clay and silt materials. The southeastern belt is characterized by relatively level topography and poorly drained clay materials.

  The PSA and the SSA are a complex mix of topography. Based on the online topographic mapping there appears to be a ridge of lands at higher elevations extending from the intersection of Upper James Street and Airport Road West to the intersection of White Church Road East and the rail trail. The remaining lands within the PSA drop in elevation toward Lake Ontario to the north, and Lake Erie

to the south from this ridge. The topography in the SSA lands continues to drop in elevation as distance from the PSA increases.

The PSA and SSA are located between the 3100 and 3300 Crop Heat Units isolines (CHU-M1) available for corn production in Ontario.

The PSA and SSA are located in the OMAFRA Climate Zone B and have an average Frost-Free period of 160-170 days, an Average Date of Last Spring Frost of April 30, and an Average Date of First Fall Frost of October 13

The PSA comprised approximately 83.6 percent Canada Land Inventory (CLI) capability of Class 1 – 3, with approximately 50.1 percent as Class 1, 9.9 percent as Class 2, and 23.6 percent as Class 3. Approximately 16.4 percent of the PSA was Class 4 lands.

- **Agricultural Policy**

A review of the boundaries of the Growth Plan for the Greater Golden Horseshoe (Office consolidation 2020) area determined that much of the PSA and the SSA lands comprise Prime Agricultural Areas. No areas of provincially designated specialty crop lands were identified in either the PSA or the SSA.

A review of the Greenbelt Plan (2017) mapping indicated that no portions of the PSA were located in the Greenbelt Plan Area, while portions of the SSA are located within the Greenbelt Plan area. The portions of the SSA that are within the Greenbelt Plan Area are considered as Protected Countryside.

A review of the *City of Hamilton Rural Hamilton Official Plan (February,2021)* - Rural Hamilton Official Plan Schedule D, Rural Land Use Designations revealed that the PSA was designated as Urban Expansion Area Neighbourhoods and are located within the Urban Boundary. The SSA was comprised of lands designated as Agriculture, Rural, Open Space, and Utility areas.

A review of the *Corporation of the Township of Glanbrook By-law No. 464 (Consolidated November 2022)*, and the online digital zoning information identified that portions of the PSA and the SSA were zoned Agriculture.

No portions of the PSA or the SSA were within any provincially or municipally designated specialty crop area.

- **Agricultural Land Use**

The PSA comprised land use of approximately 12.0 percent as built up/disturbed areas, 70.5 percent as common field crop (soybean, corn), 0.2 percent as forage/pasture, 1.3 percent as open field areas, 0.2 percent as rail trail, 7.8 percent

as recreational area (golf course), 1.3 percent as ponded areas, 2.8 percent as scrublands, and 3.9 percent as woodlot areas.

The SSA comprised land use of approximately 2.4 percent as airport lands, 18.9 percent as built up/disturbed areas, 0.1 percent as cemetery lands, 55.0 percent as common field crop (soybean, corn), 6.1 percent as forage/pasture lands, 1.3 percent as open field, 0.8 percent as rail trail, 2.4 percent as recreational (golf course), 0.3 percent as ponded, 5.0 percent as scrublands, 0.7 percent as small grains, 1.7 percent as sod, and 5.4 percent as woodland areas.

The predominant land uses in the PSA include built up/disturbed areas and the production of common field crops.

It should be noted that the PSA (as stated previously in this AIA) is located within the Urban Boundary of the City of Hamilton and is designated as Urban Expansion Area – Neighbourhoods (a non-agricultural use). Therefore, the City of Hamilton has demonstrated that these lands will be included in the urban area and that the future use of these lands will be non-agricultural.

- **Agricultural Investment**

A total of 136 agricultural buildings were identified within the PSA and SSA. There were 12 agricultural buildings within the PSA. A total of 124 agricultural buildings were observed in the SSA.

There is investment in artificial tile drainage in the PSA.

Systematic and random tile drainage were noted on various lands within the SSA.

There is no investment in landforming for agricultural purposes in either the PSA or the SSA.

Minimum Distance Separation 1 (MDS 1) calculations were completed (although not required) for this AIA, as MDS is not required for in areas of settlement area boundaries. MDS 1 calculations were completed as a best practice to protect lands for agricultural use as long as possible during the development phases.

A review of the online Agricultural System Portal (OMAFRA) indicated that there were no registered nurseries, specialty farms (crop or livestock), frozen food manufacturing, refrigerated warehousing/storage, livestock assets or abattoirs in the PSA or SSA.

There are no registered agricultural services within the PSA.

The review of agricultural services and agricultural operations from the Agricultural Systems Portal for the SSA revealed there are no registered agricultural resources/services in the SSA.

The closest transportation network (major roadway) is Highway 6 and Highway 403 which are located to the southwest and west of the PSA. Further, Hamilton international airport (John C. Munro Hamilton International Airport) is located west of the PSA.

- **Land Fragmentation – Land fragmentation represents a major impact to the long-term viability of agriculture in the SSA and is typical of areas under pressure from non-agricultural land uses.**

  A review of parcel data for property size within the PSA revealed a variety of area sizes, ranging from 0.01 acres to > than 180 acres. It appears that much of the PSA is comprised of parcels in the range of 10.0 – 129.9 acres. Numerous smaller parcels (< 9.9 acres) were also noted along Upper James Street, Airport Road East and White Church Road East.

  The review of fragmentation in the SSA revealed similar conditions and characteristics. Significant linear development (small individual parcels along roads/streets) was noted along White Church Road West, Upper James Street, Chippewa Road East and Ferris Road.

The foregoing represents a desktop Agricultural Impact Assessment with the purpose of evaluating the PSA and SSA to document the existing agricultural character and to determine any potential impacts to agriculture as a result of the proposed future development of the PSA.

Given the geographical location of the PSA lands (within the Urban Boundary of the City of Hamilton), it is the conclusion of this study that the proposed future development of the PSA would have minimal impact on the surrounding agricultural activities within the SSA.

Sincerely
DBH Soil Services Inc.

Dave Hodgson, P. Ag
President

7 REFERENCES

1:10000 scale Ontario Base Map Index. (2021, September). Ontario GeoHub. https://geohub.lio.gov.on.ca/datasets/mnrf::ontario-base-map-index

1:50000 scale NTS Maps. Canada Land Inventory (CLI) Capability Mapping. (n.d.). Government of Canada. https://open.canada.ca/data/en/dataset/ec17a923-e760-49e2-a62e-928e19bb1e33

1:50000 scale NTS Maps. Ministry of Energy Mines and Resources, Canada. (1984). Indexes of the National Topographic System of Canada. Indexes of the National Topographic System of Canada - Open Government Portal

2016 Census of Agriculture. (2021, November). Statistics Canada. https://www.statcan.gc.ca/eng/ca2016

A Place to Grow: Growth Plan for The Greater Golden Horseshoe. (Office Consolidation 2020). Ministry of Municipal Affairs and Housing. https://www.ontario.ca/document/place-grow-growth-plan-greater-golden-horseshoe

Agricultural Impact Assessment (AIA) Guidelines Regional Official Plan Guideline. (2014). Halton Region. https://www.halton.ca/Repository/Agricultural-Impact-Assessment-(AIA)-Guidelines

Agricultural Resource Inventory. (1983) https://geohub.lio.gov.on.ca/documents/cf961d62ee1345c7b191808c9d60a4d7/about

Agricultural System Portal. (2021, November). OMAFRA. https://agriculture-systems-portal-ontarioca11.hub.arcgis.com/

Agriculture Canada Expert Committee on Soil Survey. (1998). *The Canadian System of Soil Classification, 3rd edition. Agriculture of Canada Publication 1646*. Government of Canada. https://sis.agr.gc.ca/cansis/taxa/cssc3/index.html

Agronomy Guide for Field Crops - Publication 811. (June 2017). OMAFRA. http://www.omafra.gov.on.ca/english/crops/pub811/p811toc.html

Artificial Drainage Mapping Dataset. (2022, November). Land Information Ontario. (OMAFRA) https://www.ontario.ca/page/land-information-ontario

Birdseye Online Imagery. (2023, November). Bing Imagery. https://hub.arcgis.com/datasets/43318299f16a4b1893e2291f4f7a398e

Canada Land Inventory (CLI). (2022, November). Government of Canada. https://sis.agr.gc.ca/cansis/nsdb/cli/index.html

City of Hamilton website. (2022). https://www.hamilton.ca/

Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for Application of the Canada Land Inventory in Ontario. (2021, February 12). OMAFRA. https://omafra.gov.on.ca/english/landuse/classify.htm

Draft Agricultural Impact Assessment Guidance Document. (2018, March). OMAFRA. http://www.omafra.gov.on.ca/english/landuse/aiagd.pdf

Google Earth Pro. (2022, July). Google Earth. https://earth.google.com/

Greenbelt Plan (2017). Ministry of Municipal Affairs and Housing. https://www.ontario.ca/document/greenbelt-plan-2017

Guidelines on Permitted Uses in Ontario's Prime Agricultural Areas Publication 851. (2016). OMAFRA. http://www.omafra.gov.on.ca/english/landuse/facts/permitteduseguide.pdf

Implementation Procedures for the Agricultural System in Ontario's Greater Golden Horseshoe Supplementary Direction to A Place to Grow: Growth Plan for the Greater Golden Horseshoe Publication 856. (2020, March). OMAFRA. www.ontario.ca

Land Use Systems Mapping Dataset (LIO). (2022, November). Land Information Ontario. https://www.ontario.ca/page/land-information-ontario

Niagara Escarpment Plan. (2017). Niagara Escarpment Commission. "niagara " - Niagara Escarpment Commission (NEC)

Oak Ridges Moraine Conservation Plan. (2017). Ministry of Municipal Affairs and Housing. https://www.ontario.ca/page/oak-ridges-moraine-conservation-plan-2017

OMAFRA. (2021, July). *Agricultural Information Atlas*. AgMaps Geographic Information Portal. http://www.omafra.gov.on.ca/english/landuse/gis/portal.htm

Provincial Policy Statement (PPS), 2020. (2020, May 1). Ministry of Municipal Affairs and Housing. https://www.ontario.ca/page/provincial-policy-statement-2020

Rural Hamilton Official Plan (February 2021). https://www.hamilton.ca/build-invest-grow/planning-development/official-plan/rural-hamilton-official-plan

Soils of Wentworth County, Report No. 32 of the Ontario Soil Survey (Presant, E.W., R. E. Wicklund and B.C. Matthews, 1965). *https://sis.agr.gc.ca/cansis/publications/surveys/on/on32/index.html*

The Corporation of the Township of Glanbrook Zoning By-Law, By-Law No. 464 (Consolidated November 2022. https://www.hamilton.ca/sites/default/files/2022-08/glanbrook-zoning-by-law-464-aug2022.pdf

The Minimum Distance Separation (MDS) Document: Formulae and Guidelines for Livestock Facility and Anaerobic Digester Odour Setbacks - Publication 853. (2016). OMAFRA. http://www.omafra.gov.on.ca/english/landuse/mds.htm

The Physiography of Southern Ontario. Ontario Geological Survey Special (3rd ed., Vol. 2). (1984). Ministry of Natural Resources.

APPENDIX A

AGRICULTURAL BUILDING LIST

2023 – 21 Property Information			Online Imagery Survey								Roadside Reconnaissance Survey (Date)					
Agricultural Building Number	Address	Roll Number	Residential Unit	Type of Building	"Line of Sight" Restriction	Additional Details	Evidence of Livestock	Type of Livestock	Evidence of Feed Storage	Evidence of Manure Storage	Findings	Visual Evidence of Livestock	Type of Livestock	Visual Evidence of Feed Storage	Visual Evidence of Manure Storage	Additional Details
1	9174 Airport Road	251890231030600	N	Pole Barn	Y		N		N	N						
2	9132 Airport Road	251890231029600	Y	Pole Barn	Y		N		N	N						
3	9066 Airport Road	251890231027800	Y	Garage	N	Mount Hope Custom Fabrication Plastic Wood & Metal Fabrication	N		N	N						
4	3144 Homestead Drive	251890231026400	Y	Pole Barn	Y		N		N	N						
5	3114 Homestead Drive	251890231025600	Y	Garage	Y		N		N	N						
6	2976 Homestead Drive	251890231025600	Y	Assumed second residence	Y		N		N	N						
7	2966 Homestead Drive	251890231022600	Y	Garage	Y		N		N	N						
8	2942 Homestead Drive	251890231022000	Y	Garage	N		N		N	N						
9	8360 English Church Road East	251890232017200	Y	Pole Barn	Y	Assumed retired, uncapped silo Grain bin	N		N	N						
10	8360 English Church Road East	251890232017200	Y	Bank Barn	Y	With extension Assumed retired	N		N	N						
11	8250 English Church Road East	251890232061800	Y	Remnant Pole Barn	Y	Roof collapsed and boards missing. Assumed retired	N		N	N						
12	2907 Highway 6	251890232050600	N	Commerical	N	Green Horizons Farm Fresh Sod and More! Big Yellow Bag	N		N	N						
13	8229 English Church Road	251990232052350	N	Tension Fabric Structure	Y	Willow Valley Golf Course	N		N	N						
14	2907 Highway 6	251890232050600	N	Commerical	N	Green Horizons Farm Fresh Sod and More! Big Yellow Bag	N		N	N						

2023 – 21 Property Information			Online Imagery Survey								Roadside Reconnaissance Survey (Date)					
Agricultural Building Number	Address	Roll Number	Residential Unit	Type of Building	"Line of Sight" Restriction	Additional Details	Evidence of Livestock	Type of Livestock	Evidence of Feed Storage	Evidence of Manure Storage	Findings	Visual Evidence of Livestock	Type of Livestock	Visual Evidence of Feed Storage	Visual Evidence of Manure Storage	Additional Details
15	8378 Airport Road	251890232062400	Y	Pole Barn (Possible second residence)	Y		N		N	N						
16	8214 Airport Road	251890232059100	Y	Pole Barn	Y		N		N	N						
17	8010 Airport Road	251890232056400	Y	Machine Shed		2 capped silos, 3 grain bins Assumed retired	N		N	N						
18	8010 Airport Road	251890232056400		Pole Barn		With extensions Assumed retired	N		N	N						
19	8010 Airport Road	251890232056400		Bank Barn		With extensions Assumed retired	N		N	N						
20	Airport Road	251890232055900	N	Bank Barn		Assumed retired	N		N	N						
21	Airport Road	251890232055900	N	Pole Barn		Assumed retired	N		N	N						
22	9370 White Church Road	251890251021400	Y	Machine Shed		Century Farm Uncapped silo, grain bin Assumed retired	N		N	N						
23	9370 White Church Road	251890251021400	Y	Bank barn		With extensions Century Farm Assumed retired	N		N	N						
24	9370 White Church Road	251890251001400	Y	Machine Shed		Assumed retired	N		N	N						
25	9370 White Church Road	251890251001400	Y	Bank Barn		With extensions 2 grain bins Assumed retired	N		N	N						
26	3738 Highway 6	251890231005600	Y	Pole Barn	Y		N		N	N						
27	9485 White Church Road	251890261001200	Y	Pole Barn	Y	Pearce Farms Uncapped silo	Y	Beef	Y	Y	4 or more					
28	9485 White Church Road	251890261001200	Y	Machine Shed	Y	Pearce Farms	Y	Beef	Y	Y	4 or more					
29																
30	7220 Airport Road	189023205520000	Y	Pole Barn	N	Concordia Farms	Y	Horses	N	Y						
31*	7220 Airport Road	189023205520000	Y	Bank Barn	N	Concordia Farms With riding arena extension					MDS on bank barn portion only					
32*	7060 Airport Road East	25189023205480		Pole Barn	Y	Several paddocks, run-in shed, outdoor riding ring	Y	Horses	N	Y						

2023 – 21 Property Information			Online Imagery Survey								Roadside Reconnaissance Survey (Date)					
Agricultural Building Number	Address	Roll Number	Residential Unit	Type of Building	"Line of Sight" Restriction	Additional Details	Evidence of Livestock	Type of Livestock	Evidence of Feed Storage	Evidence of Manure Storage	Findings	Visual Evidence of Livestock	Type of Livestock	Visual Evidence of Feed Storage	Visual Evidence of Manure Storage	Additional Details
33	7098 Airport Road	251890232054600	N	Machine Shed	N	Hamilton Public Works Department Operations and Maintenance Road District East Satellite Yard 905-546-2424 ext 2038	N		N	N						
34	7030 Airport Road	No roll number	Y	Garage	N		N		N	N						
35	1839 Miles Road	251890233000200	Y	Pole Barn	N		N		N	N						
36	6430 Airport Road	251890233009600	Y	Machine Shed	N	Uncapped silo, grain silo	N		N	N						
37	6380 Airport Road	251890233009400	Y	Machine Shed	Y	Carluke Automotive Repair Service	N		N	N						
38	6360 Airport Road East	25189023300900	Y	Tension Fabric Structure	N		Y	Beef	N	Y						
39*	6360 Airport Road East	25189023300900	Y	Pole Barn	N	With extension	Y	Beef	N	Y						
40*	6280 Airport Road East	251890233008800	Y	Pole Barn	N	Several paddocks	Y	Assumed horses	N	N						
41	6180 Airport Road	251890233008400	Y	Machine Shed	Y	Grain bin	N		N	Y						
42*	6180 Airport Road	251890233008400	Y	Bank Barn	N	With extension	N	Assumed horses	N	Y						
43	6100 Airport Road	251890233008200	Y	Shed	Y		N		N	N						
44	6331 English Church Road	251890233000800	Y	Machine Shed	N		N		N	N						
45	8149 English Church Road East	251890232052600	Y	Machine Shed	N	3 capped silos, several grain bins, liquid manure storage	N	Assumed dairy operation	N	Y						
46	9090 Chippewa Road	2518902610074 00	Y	Quonset	Y		N		N	N						
47	9090 Chippewa Road	2518902610074 00	Y	Unknown	Y		N		N	N						

2023 – 21 Property Information			Online Imagery Survey								Roadside Reconnaissance Survey (Date)					
Agricultural Building Number	Address	Roll Number	Residential Unit	Type of Building	"Line of Sight" Restriction	Additional Details	Evidence of Livestock	Type of Livestock	Evidence of Feed Storage	Evidence of Manure Storage	Findings	Visual Evidence of Livestock	Type of Livestock	Visual Evidence of Feed Storage	Visual Evidence of Manure Storage	Additional Details
48	8149 English Church Road East	2518902320526000	Y	Machine Shed	N		N	Assumed dairy operation	N	Y						
49	8500 Chippewa Road	2518902610216000		Pole Barn	N	Run-in shed, outdoor riding ring	Y	horses	N	Y						
50*	8149 English Church Road East	2518902320526000	Y	Pole Barn	N		N	Assumed dairy operation	N	Y						
51*	8149 English Church Road East	2518902320526000	Y	Pole Barn	N	With extensions	N	Assumed dairy operation	N	Y						
52	8453 Airport Road	2518902510426000	N	Machine Shed	Y	Southern Pine Golf and Country Club	N		N	N						
53	3417 Highway 6	2518902510414000	Y	Possible second residence	Y		N		N	N						
54	3431 Highway 6	2518902510410000	Y	Shed	Y		N		N	N						
55	8392 White Church Road	2518902510502000	Y	Pole Barn	Y	Goats/sheep, hobby farm	Y		N	N						
56	8064 White Church Road	2518902510478000	Y	Quonset	Y		N		N	N						
57	7340 White Church Road	2518902510476000	Y	Machine Shed	Y		N		N	N						
58	7156 White Church Road	2518902310472000	Y	Bank Barn	Y	With extension. Used as tree farm and cash crop as per: https://www.zolo.ca/hamilton-real-estate/7156-white-church-road	N		N	N						
59	2450 Miles Road	2518902510470000	Y	Garage	N		N		N	N						
60	7055 Airport Road	2518902510460000	Y	Commercial	N	Vanderwoude Sod Farm	N		N	N						
61	7055 Airport Road	2518902510460000	Y	Commercial	N	Vanderwoude Sod Farm	N		N	N						
62	8113 Airport Road	2518902510440000	N	Feed Storage	N	Assumed retired	N		N	N						
63	8113 Airport Road	2518902510440000	N	Pole Barn	N	Assumed retired	N		N	N						

2023 – 21 Property Information			Online Imagery Survey								Roadside Reconnaissance Survey (Date)					
Agricultural Building Number	Address	Roll Number	Residential Unit	Type of Building	"Line of Sight" Restriction	Additional Details	Evidence of Livestock	Type of Livestock	Evidence of Feed Storage	Evidence of Manure Storage	Findings	Visual Evidence of Livestock	Type of Livestock	Visual Evidence of Feed Storage	Visual Evidence of Manure Storage	Additional Details
64	2119 Miles Road	2518902510602 00	Y	Machine Shed	N		N		N	N						
65	2119 Miles Road	2518902510602 00	Y	Pole Barn	N		N		N	N						
66	2119 Miles Road	2518902510602 00	Y	Pole Barn	N		N		N	N						
67	2211 Miles Road	2518902510600 00	Y	Pole Barn	N		N		N	N						
68	6500 White Church Road	2518902510642 00	Y	Machine Shed	Y		N		N	N						
69*	6146 White Church Road	2518902510634 00	Y(2)	Pole Barn	N	Run-in shed	Y	beef	Y	Y						
70*	6146 White Church Road	2518902510634 00	Y(2)	Bank Barn	N		Y	beef	Y	Y						
71*	6146 White Church Road	2518902510634 00	Y(2)	Pole Barn	N		Y	beef	Y	Y						
72*	6146 White Church Road	2518902510634 00	Y(2)	Pole Barn	N		Y	beef	Y	Y						
73*	6146 White Church Road	2518902510634 00	Y(2)	Pole Barn	N		Y	beef	Y	Y						
74	6169 Airport Road	2518902510620 00	Y	Pole Barn	Y		N		N	N						
75*	6305 Airport Road East	2518902510616 00	Y	Bank Barn	N	With extensions, liquid manure storage Don Mair Farms, The Smith Family, several grain bins, capped silo	N	Assumed dairy	Y	Y						
76*	6305 Airport Road East	2518902510616 00	Y	Pole Barn	N											
77	6395 Airport Road East	2518902510612 00	Y	Pole Barn	N	Several run-in sheds, paddocks	N	Assumed horses	N	N						
78	6225 White Church Road	2518902610614 00	Y	Machine Shed	N		N		N	N						
79	6225 White Church Road	2518902610614 00	Y	Bank Barn	N		N		N	N						
80	6355 White Church Road	2518902610612 00	Y	Pole Barn	N		N		N	N						
81	6520 Chippewa Road	2518902610602 00	Y	Pole Barn	N	Schaefer's Auto Care	Y	Possible goats	N	N	4 or more					

2023 – 21 Property Information			Online Imagery Survey								Roadside Reconnaissance Survey (Date)					
Agricultural Building Number	Address	Roll Number	Residential Unit	Type of Building	"Line of Sight" Restriction	Additional Details	Evidence of Livestock	Type of Livestock	Evidence of Feed Storage	Evidence of Manure Storage	Findings	Visual Evidence of Livestock	Type of Livestock	Visual Evidence of Feed Storage	Visual Evidence of Manure Storage	Additional Details
82	6520 Chippewa Road	251890261060200	Y	Pole Barn	N	Schaefer's Auto Care	Y	Possible goats	N	N						
83	6575 Chippewa Road	251890271060400	Y	Pole Barn	N		N		N	N						
84*	7049 Chippewa Road	251890271032600	Y	Pole Barn	N	2 grain bins	Y	Beef	Y	Y						
85	7049 Chippewa Road	251890271032600	Y	Pole Barn	N		Y	Beef	Y	Y						
86*	7049 Chippewa Road	251890271032600	Y	Pole Barn	N		Y	Beef	Y	Y						
87*	7049 Chippewa Road	251890271032600	Y	Pole Barn	N	With extension	Y	Beef	Y	Y						
88	7049 Chippewa Road	251890271032600	Y	Machine Shed	N		Y	Beef	Y	Y						
89	7111 Chippewa Road	251890271032200	Y	Pole Barn	Y		N		N	N						
90*	4030 Ferris Road	251890271030200	Y	Pole Barn	N	With extensions Assumed hobby farm Grain bin	Y	Chickens, goats(8)	N	N						
91	8211 Chippewa Road	251890271029800	Y	Pole Barn	N	Assumed retired	N		N	N						
92	8211 Chippewa Road	251890271029800	Y	Pole Barn	N	Assumed retired	N		N	N						
93	8211 Chippewa Road	251890271029800	Y	Machine Shed/Feed Storage	N	Assumed retired	N		N	N						
94	7134 Chippewa Road	251890261035200	Y	Pole Barn	N	With extensions	N		N	N						

2023 – 21 Property Information			Online Imagery Survey								Roadside Reconnaissance Survey (Date)					
Agricultural Building Number	Address	Roll Number	Residential Unit	Type of Building	"Line of Sight" Restriction	Additional Details	Evidence of Livestock	Type of Livestock	Evidence of Feed Storage	Evidence of Manure Storage	Findings	Visual Evidence of Livestock	Type of Livestock	Visual Evidence of Feed Storage	Visual Evidence of Manure Storage	Additional Details
95	Chippewa Road	251890261035000	N	Pole Barn	Y		N		N	N						
96	7170 Chippewa Road	251890251035230	Y	Garage	N		N		N	N						
97	7196 Chippewa Road	251890261035250	Y	Pole Barn	Y		N		N	N						
98*	7242 Chippewa Road	251890261035400	Y	Bank Barn	N		Y	sheep	N	Y						
99	7284 Chippewa Road	251890261035800	Y	Machine Shed	Y		N		N	N						
100	7242 Chippewa Road	251890261035400	Y	Quonset	N		Y	sheep	N	Y						
101	3400 Ferris Road	251890261029000	Y	Pole Barn	Y		N		N	N						
102	3400 Ferris Road	251890261029000	Y	Pole Barn	Y		N		N	N						
103	3298 Ferris Road	251890261028400	Y	Pole Barn	N		N		N	N						
104	3180 Ferris Road	251890261027800	Y	Pole Barn	Y		N		N	N						
105	3180 Ferris Road	251890261027800	Y	Pole Barn	Y		N		N	N						
106*	8211 White Church Road	251890261027200	Y	Pole Barn	N	Run-in shed, horse trailer	Y	horse	Y	Y						
107	8211 White Church Road	251890261027200	Y	Pole Barn	N		Y	horse	Y	Y						
108	8489 White Church Road	251890261025000	Y	Machine Shed	N		N		N	N						
109	8489 White Church Road	251890261025000	Y	Garage	N		N		N	N						
110	8295 White Church Road	251890261027000	Y	Machine Shed/Garage	N		N		N	N						

2023 – 21 Property Information			Online Imagery Survey								Roadside Reconnaissance Survey (Date)					
Agricultural Building Number	Address	Roll Number	Residential Unit	Type of Building	"Line of Sight" Restriction	Additional Details	Evidence of Livestock	Type of Livestock	Evidence of Feed Storage	Evidence of Manure Storage	Findings	Visual Evidence of Livestock	Type of Livestock	Visual Evidence of Feed Storage	Visual Evidence of Manure Storage	Additional Details
111	8299 White Church Road	2518902610268000	Y	Garage	N		N		N	N						
112	8341 White Church Road	2518902610260000	Y	Unknown	Y		N		N	N						
113	8395 White Church Road	2518902610254000	Y	Quonset	N	Used as garage	N		N	N						
114	3659 Highway 6	2518902610242000	Y	Pole Barn	Y	Assumed hobby farm	N		N	N	4 or more					
115	3659 Highway 6	2518902610242000	Y	Pole Barn	Y	Assumed hobby farm	N		N	N						
116	3751 Hwy 6	2518902610228000	Y	Bank Barn	Y		N		N	N						
117	8500 Chippewa Road	2518902610216000		Machine Shed	N		N		N	N						
118	8110 Chippewa Road	2518902610300000	Y	Machine Shed	N		N		N	N						
119	8366 Chippewa Road	2518902610316000	Y	Garage	Y		N		N	N						
120	8310 Chippewa Road	2518902610308000	Y	Machine Shed	Y		N		N	N						
121*	8149 English Church Road East	2518902320526000	Y	Pole Barn	N		N	Assumed dairy operation	N	Y						
122	6305 Airport Road East	2518902510616000	Y	Machine Shed	N	Don Mair Farms, The Smith Family	N	Assumed dairy	Y	Y						
123	9845 White Church Road	2518902610012000	Y	Pole Barn	Y	Pearce Farms	Y	Beef	Y	Y	4 or more					
124	7196 Chippewa Road	2518902610352500	Y	Garage	Y		N		N	N						
125	7374 English Church Road	2518902320166000	Y	Bank Barn	Y	Kammerer Heritage Farm https://www.kammererheritagefarms.com/about	Y	Chickens (as per website)	N	N	No mds, personal use					

2023 – 21 Property Information			Online Imagery Survey								Roadside Reconnaissance Survey (Date)					
Agricultural Building Number	Address	Roll Number	Residential Unit	Type of Building	"Line of Sight" Restriction	Additional Details	Evidence of Livestock	Type of Livestock	Evidence of Feed Storage	Evidence of Manure Storage	Findings	Visual Evidence of Livestock	Type of Livestock	Visual Evidence of Feed Storage	Visual Evidence of Manure Storage	Additional Details
126	7230 English Church Road	251890232016000	Y	Pole Barn	Y		N		N	N						
127	7166 English Church Road	251890232015800	Y	Pole Barn	N	Assumed retired dairy, roof missing on building 128, 2 capped silos, several grain bins, https://www.realtor.ca/real-estate/26091168/7166-english-church-road-e-mount-hope	N		N	N						
128	7166 English Church Road	251890232015800	Y	Pole Barn	N	With extensions	N		N	N						
129	7166 English Church Road	251890232015800	Y	Machine Shed	N	SOF Paintball	N		N	N						
130	6320 English Church Road	251890233001200	Y	Pole Barn	N	Grain bin	N		N	N						
131	6320 English Church Road	251890233001200	Y	Pole Barn	N		N		N	N						
132	Removed (house)															
133	1610 Nebo Road	251990233007000	Y	Machine Shed	N		N		N	N						
134	1623 Nebo Road	251890233051800	Y	Bank Barn	N	Uncapped silo, Don Maple Farm D. Hal and Son, Assumed retired from livestock, hobby farm	Y	Possible beef	N	N	4 or more					
135	1623 Nebo Road	251890233051800	Y	Pole Barn	N		Y	Possible beef	N	N	4 or more					
136	1623 Nebo Road	251890233051800	Y	Pole Barn	N		Y	Possible beef	N	N	4 or more					
137	1685 Nebo Road	251890233051425	Y	Commercial	Y	NTD Window Tint	N		N	N						
138	1723 Nebo Road	251890233051000	Y	Garage	Y		N		N	N						
139	1731 Nebo Road	251890233050800	Y	Shed	Y		N		N	N						

2023 – 21 Property Information			Online Imagery Survey								Roadside Reconnaissance Survey (Date)					
Agricultural Building Number	Address	Roll Number	Residential Unit	Type of Building	"Line of Sight" Restriction	Additional Details	Evidence of Livestock	Type of Livestock	Evidence of Feed Storage	Evidence of Manure Storage	Findings	Visual Evidence of Livestock	Type of Livestock	Visual Evidence of Feed Storage	Visual Evidence of Manure Storage	Additional Details
140	1765 Nebo Road	251890233050000	Y	Shop	N	30 x 40	N		N	N						
141	2174 Nebo Road	251890251062500	Y	Residence	N		N		N	N						

APPENDIX B

Unique Soil Symbols and Canada Land Inventory (CLI) List

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
ABO	A	0 - 0.5	0	2	W
ABO	A	0 - 0.5	0	7	I
ABO	b	0.5 - 2	0	1	
ABO	b	0.5 - 2	0	2	W
ABO	b	0.5 - 2	0	2	F
ABO	B	0.5 - 2	0	3	I
ABO	b	0.5 - 2	0	3	R
ABO	B	0.5 - 2	0	3	F
ABO	b	0.5 - 2	1	3	R
ABO	b	0.5 - 2	1	4	R
ABO	b	0.5 - 2	1	4	F
ABO	c	2 - 5	0	1	
ABO	c	2 - 5	0	2	F
ABO	c	2 - 5	0	2	D
ABO	c	2 - 5	0	6	R
ABO	c	2 - 5	1	1	
ABO	c	2 - 5	1	2	F
ABO	c	2 - 5	1	4	R
ABO	c	2 - 5	3	1	
ABO	c	2 - 5	3	3	R
ABO	C	2 - 5	4	7	P
ABO	d	5 - 9	0	3	T
ABO	d	5 - 9	0	3	E
ABO	d	5 - 9	1	3	S
ABO	d	5 - 9	4	6	P
ABO	e	9 - 15	0	4	T
ABO	E	9 - 15	1	4	E
ABO	f	15 - 30	0	5	T
ABO	F	15 - 30	1	5	T
ABO	f	15 - 30	3	6	S
ABO	N	N	N	0	
ACE	A	0 - 0.5	0	2	W
ACE	B	0.5 - 2	0	2	W
ACE	B	0.5 - 2	0	3	D
ACE	b	0.5 - 2	0	3	F
ACE	b	0.5 - 2	1	3	R
ACE	b	0.5 - 2	1	4	F
ACE	b	0.5 - 2	2	3	R
ACE	c	2 - 5	0	1	
ACE	c	2 - 5	0	2	D
ACE	c	2 - 5	0	2	F

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
ACE	c	2 - 5	1	1	
ACE	c	2 - 5	1	2	F
ACE	c	2 - 5	1	6	R
ACE	c	2 - 5	3	3	F
ACE	d	5 - 9	0	3	S
ACE	d	5 - 9	0	3	T
ACE	d	5 - 9	1	3	R
ACE	d	5 - 9	2	4	S
ACE	e	9 - 15	0	4	S
ACE	e	9 - 15	0	4	T
ACE	e	9 - 15	2	5	E
ACE	g	30 - 45	1	6	T
ACE	N	N	0	5	I
BFO	A	0 - 0.5	0	2	W
BFO	A	0 - 0.5	0	3	F
BFO	A	0 - 0.5	0	O	
BFO	A	0 - 0.5	1	4	D
BFO	b	0.5 - 2	0	1	
BFO	B	0.5 - 2	0	2	W
BFO	b	0.5 - 2	0	2	D
BFO	B	0.5 - 2	0	2	F
BFO	B	0.5 - 2	0	3	F
BFO	B	0.5 - 2	0	3	D
BFO	B	0.5 - 2	0	3	I
BFO	b	0.5 - 2	0	3	R
BFO	B	0.5 - 2	0	4	R
BFO	b	0.5 - 2	1	1	
BFO	B	0.5 - 2	1	2	W
BFO	b	0.5 - 2	1	3	R
BFO	B	0.5 - 2	1	3	D
BFO	B	0.5 - 2	1	4	R
BFO	B	0.5 - 2	2	2	W
BFO	b	0.5 - 2	2	3	R
BFO	B	0.5 - 2	3	5	P
BFO	c	2 - 5	0	1	
BFO	c	2 - 5	0	2	F
BFO	c	2 - 5	0	2	D
BFO	C	2 - 5	0	4	D
BFO	c	2 - 5	0	6	R
BFO	c	2 - 5	1	1	
BFO	C	2 - 5	1	2	F

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
BFO	c	2 - 5	1	3	R
BFO	c	2 - 5	2	2	F
BFO	c	2 - 5	2	3	R
BFO	c	2 - 5	2	3	P
BFO	c	2 - 5	2	3	F
BFO	c	2 - 5	2	6	R
BFO	c	2 - 5	3	3	F
BFO	c	2 - 5	3	7	P
BFO	C	2 - 5	4	7	P
BFO	d	5 - 9	0	3	T
BFO	d	5 - 9	0	3	E
BFO	d	5 - 9	0	3	S
BFO	d	5 - 9	1	1	
BFO	d	5 - 9	1	2	F
BFO	d	5 - 9	1	2	E
BFO	d	5 - 9	1	3	E
BFO	d	5 - 9	1	3	S
BFO	d	5 - 9	1	3	T
BFO	d	5 - 9	2	2	E
BFO	d	5 - 9	2	6	R
BFO	d	5 - 9	3	3	R
BFO	d	5 - 9	3	4	S
BFO	d	5 - 9	3	7	P
BFO	d	5 - 9	4	6	P
BFO	e	9 - 15	0	4	T
BFO	e	9 - 15	0	4	S
BFO	e	9 - 15	0	4	E
BFO	e	9 - 15	1	4	E
BFO	e	9 - 15	1	4	T
BFO	e	9 - 15	1	5	E
BFO	E	9 - 15	2	4	E
BFO	E	9 - 15	2	4	T
BFO	e	9 - 15	2	5	E
BFO	e	9 - 15	3	4	T
BFO	e	9 - 15	3	5	E
BFO	e	9 - 15	3	7	P
BFO	f	15 - 30	0	5	T
BFO	f	15 - 30	0	7	R
BFO	f	15 - 30	2	6	S
BFO	f	15 - 30	3	5	T
BFO	g	30 - 45	1	6	T

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
BFO	N	N	0	5	I
BFO	N	N	0	7	E
BFO	N	N	N	0	
BFO	N	N	N	W	
BNO	A	0 - 0.5	0	3	F
BNO	A	0 - 0.5	0	O	
BNO	b	0.5 - 2	0	2	F
BNO	b	0.5 - 2	0	2	D
BNO	B	0.5 - 2	0	2	W
BNO	B	0.5 - 2	0	3	D
BNO	B	0.5 - 2	0	3	F
BNO	B	0.5 - 2	0	4	D
BNO	B	0.5 - 2	0	4	R
BNO	B	0.5 - 2	1	2	W
BNO	B	0.5 - 2	2	2	W
BNO	b	0.5 - 2	2	3	R
BNO	B	0.5 - 2	2	4	R
BNO	c	2 - 5	0	1	
BNO	c	2 - 5	0	2	F
BNO	c	2 - 5	1	1	
BNO	c	2 - 5	1	3	R
BNO	c	2 - 5	1	4	R
BNO	c	2 - 5	2	1	
BNO	c	2 - 5	2	3	R
BNO	C	2 - 5	2	6	R
BNO	c	2 - 5	3	1	
BNO	c	2 - 5	3	3	F
BNO	c	2 - 5	3	7	P
BNO	d	5 - 9	0	3	T
BNO	d	5 - 9	0	3	S
BNO	d	5 - 9	0	3	E
BNO	d	5 - 9	1	2	F
BNO	d	5 - 9	1	2	E
BNO	d	5 - 9	1	3	S
BNO	d	5 - 9	2	4	S
BNO	d	5 - 9	2	6	R
BNO	e	9 - 15	0	4	E
BNO	e	9 - 15	0	4	T
BNO	e	9 - 15	0	4	S
BNO	e	9 - 15	3	5	E
BNO	f	15 - 30	0	5	T

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
BNO	f	15 - 30	0	7	R
BNO	f	15 - 30	1	5	E
BNO	N	N	0	5	I
BNO	N	N	0	7	E
BNO	N	N	N	0	
BRT	a	0 - 0.5	0	3	D
BRT	A	0 - 0.5	1	4	D
BRT	b	0.5 - 2	0	4	D
BRT	b	0.5 - 2	3	5	P
BRT	C	2 - 5	0	1	
BRT	c	2 - 5	0	2	F
BRT	C	2 - 5	1	1	
BRT	c	2 - 5	1	3	R
BRT	c	2 - 5	2	1	
BRT	d	5 - 9	0	3	T
BRT	D	5 - 9	0	3	D
BRT	d	5 - 9	1	2	F
BRT	d	5 - 9	1	6	R
BRT	d	5 - 9	3	7	P
BRT	e	9 - 15	0	4	T
BRT	e	9 - 15	1	4	T
BRT	e	9 - 15	2	4	E
BUF	A	0 - 0.5	0	3	D
BUF	B	0.5 - 2	0	2	W
BUF	b	0.5 - 2	0	2	F
BUF	B	0.5 - 2	0	3	D
BUF	b	0.5 - 2	2	1	
BUF	B	0.5 - 2	2	5	P
BUF	B	0.5 - 2	3	5	P
BUF	c	2 - 5	0	1	
BUF	c	2 - 5	1	1	
BUF	c	2 - 5	1	2	F
BUF	c	2 - 5	3	3	F
BUF	D	5 - 9	0	3	E
BUF	d	5 - 9	0	3	S
BUF	d	5 - 9	0	3	T
BUF	d	5 - 9	1	2	E
BUF	d	5 - 9	1	4	R
BUF	d	5 - 9	2	4	S
BUF	d	5 - 9	2	6	R
BUF	e	9 - 15	0	4	T

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
BUF	e	9 - 15	1	4	T
BUF	f	15 - 30	0	5	T
BUF	F	15 - 30	1	5	E
BUF	f	15 - 30	3	6	S
BVY	A	0 - 0.5	0	2	W
BVY	A	0 - 0.5	0	3	D
BVY	A	0 - 0.5	0	O	
BVY	B	0.5 - 2	0	2	W
BVY	B	0.5 - 2	0	2	F
BVY	B	0.5 - 2	0	3	I
BVY	B	0.5 - 2	0	3	D
BVY	b	0.5 - 2	0	3	F
BVY	b	0.5 - 2	0	3	R
BVY	b	0.5 - 2	0	4	R
BVY	b	0.5 - 2	1	1	
BVY	B	0.5 - 2	1	2	F
BVY	b	0.5 - 2	1	3	R
BVY	b	0.5 - 2	1	4	R
BVY	b	0.5 - 2	1	4	F
BVY	b	0.5 - 2	2	1	
BVY	B	0.5 - 2	2	2	W
BVY	b	0.5 - 2	2	3	R
BVY	B	0.5 - 2	2	5	P
BVY	b	0.5 - 2	3	4	R
BVY	B	0.5 - 2	3	5	P
BVY	c	2 - 5	0	1	
BVY	C	2 - 5	0	2	F
BVY	c	2 - 5	0	2	D
BVY	C	2 - 5	0	4	D
BVY	c	2 - 5	0	4	R
BVY	c	2 - 5	1	1	
BVY	c	2 - 5	1	2	F
BVY	c	2 - 5	1	3	R
BVY	c	2 - 5	1	3	F
BVY	c	2 - 5	1	4	R
BVY	c	2 - 5	2	1	
BVY	c	2 - 5	2	3	R
BVY	c	2 - 5	2	3	F
BVY	c	2 - 5	2	6	R
BVY	c	2 - 5	3	3	R
BVY	c	2 - 5	3	7	P

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
BVY	d	5 - 9	0	3	E
BVY	d	5 - 9	0	3	T
BVY	d	5 - 9	0	3	S
BVY	d	5 - 9	1	1	
BVY	d	5 - 9	1	3	S
BVY	d	5 - 9	2	2	E
BVY	d	5 - 9	2	2	F
BVY	d	5 - 9	2	3	T
BVY	d	5 - 9	2	4	S
BVY	d	5 - 9	2	6	R
BVY	d	5 - 9	3	3	R
BVY	d	5 - 9	3	4	S
BVY	d	5 - 9	3	5	R
BVY	d	5 - 9	3	7	P
BVY	d	5 - 9	4	6	P
BVY	e	9 - 15	0	4	T
BVY	e	9 - 15	0	4	E
BVY	e	9 - 15	0	4	S
BVY	e	9 - 15	1	4	T
BVY	e	9 - 15	1	4	E
BVY	e	9 - 15	1	5	E
BVY	e	9 - 15	2	4	E
BVY	e	9 - 15	2	5	E
BVY	e	9 - 15	2	6	S
BVY	E	9 - 15	2	6	R
BVY	e	9 - 15	3	4	T
BVY	e	9 - 15	3	5	E
BVY	f	15 - 30	0	5	T
BVY	f	15 - 30	1	5	T
BVY	f	15 - 30	3	5	T
BVY	g	30 - 45	1	6	T
BVY	g	30 - 45	1	6	S
BVY	N	N	0	5	I
BVY	N	N	0	7	E
BVY	N	N	N	0	
CGU	A	0 - 0.5	0	3	D
CGU	A	0 - 0.5	0	O	
CGU	B	0.5 - 2	0	2	W
CGU	b	0.5 - 2	0	3	R
CGU	B	0.5 - 2	0	3	I
CGU	B	0.5 - 2	1	3	D

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
CGU	b	0.5 - 2	1	6	R
CGU	b	0.5 - 2	2	4	R
CGU	b	0.5 - 2	2	6	R
CGU	c	2 - 5	0	1	
CGU	c	2 - 5	0	2	D
CGU	c	2 - 5	0	2	F
CGU	c	2 - 5	1	4	R
CGU	c	2 - 5	2	3	F
CGU	d	5 - 9	0	3	T
CGU	d	5 - 9	0	3	S
CGU	d	5 - 9	0	3	E
CGU	d	5 - 9	1	3	T
CGU	d	5 - 9	1	3	E
CGU	d	5 - 9	2	3	R
CGU	d	5 - 9	3	3	R
CGU	e	9 - 15	0	4	T
CGU	f	15 - 30	0	5	T
CGU	g	30 - 45	1	6	T
CGU	N	N	0	5	1
CWO	A	0 - 0.5	0	O	
CWO	B	0.5 - 2	0	1	
CWO	B	0.5 - 2	0	2	W
CWO	b	0.5 - 2	0	2	F
CWO	b	0.5 - 2	0	3	R
CWO	B	0.5 - 2	0	3	F
CWO	b	0.5 - 2	1	3	R
CWO	B	0.5 - 2	3	5	P
CWO	c	2 - 5	0	1	
CWO	c	2 - 5	0	2	F
CWO	c	2 - 5	1	1	
CWO	c	2 - 5	1	2	F
CWO	c	2 - 5	1	3	R
CWO	c	2 - 5	2	1	
CWO	c	2 - 5	3	7	P
CWO	d	5 - 9	0	3	S
CWO	d	5 - 9	0	3	T
CWO	d	5 - 9	0	3	E
CWO	d	5 - 9	1	3	S
CWO	e	9 - 15	0	4	T
CWO	e	9 - 15	0	5	E
CWO	e	9 - 15	1	5	E

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
CWO	f	15 - 30	0	7	R
CWO	f	15 - 30	1	5	T
DUF	A	0 - 0.5	0	2	W
DUF	A	0 - 0.5	0	3	D
DUF	A	0 - 0.5	0	O	
DUF	A	0 - 0.5	3	5	P
DUF	B	0.5 - 2	0	2	W
DUF	b	0.5 - 2	0	2	F
DUF	B	0.5 - 2	0	3	D
DUF	B	0.5 - 2	0	3	I
DUF	b	0.5 - 2	0	3	F
DUF	b	0.5 - 2	1	3	R
DUF	b	0.5 - 2	1	4	R
DUF	b	0.5 - 2	3	4	R
DUF	c	2 - 5	0	1	
DUF	c	2 - 5	0	2	D
DUF	c	2 - 5	0	2	F
DUF	C	2 - 5	0	3	R
DUF	c	2 - 5	1	2	F
DUF	c	2 - 5	1	3	R
DUF	c	2 - 5	1	4	D
DUF	c	2 - 5	2	3	R
DUF	c	2 - 5	2	6	R
DUF	d	5 - 9	0	3	T
DUF	d	5 - 9	0	3	E
DUF	d	5 - 9	0	3	S
DUF	d	5 - 9	1	1	
DUF	d	5 - 9	1	2	E
DUF	d	5 - 9	1	3	S
DUF	d	5 - 9	2	6	R
DUF	d	5 - 9	3	3	R
DUF	e	9 - 15	0	4	S
DUF	e	9 - 15	0	4	T
DUF	e	9 - 15	1	5	E
DUF	e	9 - 15	3	4	T
DUF	f	15 - 30	0	5	T
DUF	f	15 - 30	1	5	T
DUF	f	15 - 30	3	5	T
DUF	N	N	0	5	I
DUF	N	N	0	7	E
DYK	A	0 - 0.5	0	O	

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI I
DYK	b	0.5 - 2	0	I	
DYK	b	0.5 - 2	0	2	F
DYK	B	0.5 - 2	0	3	I
DYK	b	0.5 - 2	0	3	F
DYK	b	0.5 - 2	I	I	
DYK	c	2 - 5	0	I	
DYK	c	2 - 5	0	2	F
DYK	c	2 - 5	I	4	R
DYK	d	5 - 9	0	3	E
DYK	d	5 - 9	0	3	T
DYK	d	5 - 9	0	3	S
DYK	d	5 - 9	I	2	F
DYK	d	5 - 9	2	2	E
DYK	g	30 - 45	I	6	T
DYK	N	N	N	0	
FMB	A	0 - 0.5	0	2	W
FMB	A	0 - 0.5	0	3	D
FMB	A	0 - 0.5	0	O	
FMB	b	0.5 - 2	0	I	
FMB	B	0.5 - 2	0	3	I
FMB	b	0.5 - 2	0	3	D
FMB	b	0.5 - 2	I	I	
FMB	b	0.5 - 2	I	3	R
FMB	b	0.5 - 2	I	4	F
FMB	B	0.5 - 2	I	4	R
FMB	B	0.5 - 2	2	2	W
FMB	B	0.5 - 2	3	4	R
FMB	c	2 - 5	0	I	
FMB	c	2 - 5	0	2	F
FMB	c	2 - 5	0	3	R
FMB	c	2 - 5	I	I	
FMB	C	2 - 5	I	3	R
FMB	c	2 - 5	2	I	
FMB	c	2 - 5	2	6	R
FMB	d	5 - 9	0	I	
FMB	d	5 - 9	0	3	S
FMB	d	5 - 9	0	3	T
FMB	d	5 - 9	0	3	E
FMB	d	5 - 9	I	3	S
FMB	d	5 - 9	2	2	E
FMB	d	5 - 9	2	4	S

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
FMB	d	5 - 9	3	4	S
FMB	d	5 - 9	3	5	R
FMB	d	5 - 9	3	7	P
FMB	e	9 - 15	0	4	S
FMB	e	9 - 15	0	4	E
FMB	e	9 - 15	0	4	T
FMB	E	9 - 15	2	6	R
FMB	e	9 - 15	3	5	E
FMB	f	15 - 30	0	5	T
FMB	f	15 - 30	1	6	S
FMB	f	15 - 30	2	6	S
FMB	N	N	0	5	I
FMB	N	N	0	7	E
FRM	A	0 - 0.5	0	2	W
FRM	A	0 - 0.5	0	3	D
FRM	A	0 - 0.5	0	3	F
FRM	A	0 - 0.5	0	O	
FRM	A	0 - 0.5	1	4	R
FRM	b	0.5 - 2	0	1	
FRM	b	0.5 - 2	0	2	F
FRM	B	0.5 - 2	0	2	W
FRM	b	0.5 - 2	0	2	D
FRM	B	0.5 - 2	0	3	D
FRM	B	0.5 - 2	0	3	F
FRM	B	0.5 - 2	0	3	I
FRM	B	0.5 - 2	0	4	R
FRM	B	0.5 - 2	1	2	W
FRM	b	0.5 - 2	1	4	F
FRM	B	0.5 - 2	2	2	W
FRM	b	0.5 - 2	2	3	R
FRM	b	0.5 - 2	2	4	F
FRM	b	0.5 - 2	2	5	P
FRM	c	2 - 5	0	1	
FRM	c	2 - 5	0	2	F
FRM	c	2 - 5	1	1	
FRM	c	2 - 5	1	2	F
FRM	c	2 - 5	1	3	R
FRM	c	2 - 5	1	4	R
FRM	c	2 - 5	2	1	
FRM	c	2 - 5	2	2	F
FRM	c	2 - 5	2	3	F

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
FRM	c	2 - 5	3	7	P
FRM	d	5 - 9	0	3	T
FRM	d	5 - 9	0	3	E
FRM	d	5 - 9	0	3	S
FRM	d	5 - 9	1	2	F
FRM	d	5 - 9	1	4	R
FRM	d	5 - 9	1	6	R
FRM	d	5 - 9	2	2	E
FRM	d	5 - 9	2	4	S
FRM	d	5 - 9	3	5	R
FRM	d	5 - 9	3	7	P
FRM	e	9 - 15	0	4	T
FRM	e	9 - 15	0	4	S
FRM	e	9 - 15	2	4	E
FRM	f	15 - 30	0	5	T
FRM	f	15 - 30	1	5	T
FRM	f	15 - 30	1	5	E
FRM	f	15 - 30	2	5	T
FRM	f	15 - 30	2	6	S
FRM	f	15 - 30	3	5	T
FRM	N	N	0	5	I
GMY	A	0 - 0.5	0	2	W
GMY	A	0 - 0.5	0	3	F
GMY	A	0 - 0.5	0	3	D
GMY	A	0 - 0.5	0	7	I
GMY	A	0 - 0.5	0	O	
GMY	b	0.5 - 2	0	1	
GMY	b	0.5 - 2	0	2	F
GMY	B	0.5 - 2	0	2	W
GMY	B	0.5 - 2	0	3	D
GMY	B	0.5 - 2	0	3	I
GMY	B	0.5 - 2	0	3	F
GMY	B	0.5 - 2	1	2	W
GMY	b	0.5 - 2	1	3	R
GMY	B	0.5 - 2	1	4	R
GMY	B	0.5 - 2	1	6	R
GMY	b	0.5 - 2	2	2	W
GMY	b	0.5 - 2	2	3	R
GMY	B	0.5 - 2	3	4	R
GMY	B	0.5 - 2	3	5	P
GMY	c	2 - 5	0	1	

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
GMY	c	2 - 5	0	2	F
GMY	c	2 - 5	0	2	D
GMY	c	2 - 5	0	3	R
GMY	c	2 - 5	1	1	
GMY	c	2 - 5	1	2	F
GMY	c	2 - 5	1	3	R
GMY	c	2 - 5	1	4	R
GMY	c	2 - 5	1	4	F
GMY	c	2 - 5	1	6	R
GMY	c	2 - 5	2	1	
GMY	c	2 - 5	2	3	R
GMY	c	2 - 5	2	3	F
GMY	c	2 - 5	2	6	R
GMY	C	2 - 5	3	1	
GMY	c	2 - 5	3	3	F
GMY	c	2 - 5	3	7	P
GMY	C	2 - 5	4	7	P
GMY	d	5 - 9	0	3	T
GMY	d	5 - 9	0	3	S
GMY	d	5 - 9	0	3	E
GMY	d	5 - 9	0	3	R
GMY	d	5 - 9	1	1	
GMY	d	5 - 9	1	2	F
GMY	d	5 - 9	1	3	S
GMY	d	5 - 9	1	3	T
GMY	d	5 - 9	1	4	R
GMY	d	5 - 9	2	2	F
GMY	d	5 - 9	2	2	E
GMY	d	5 - 9	2	3	R
GMY	d	5 - 9	2	4	S
GMY	d	5 - 9	2	4	R
GMY	d	5 - 9	2	5	R
GMY	d	5 - 9	2	6	R
GMY	d	5 - 9	3	4	S
GMY	d	5 - 9	3	5	R
GMY	d	5 - 9	3	7	P
GMY	e	9 - 15	0	4	T
GMY	e	9 - 15	0	4	E
GMY	e	9 - 15	0	4	S
GMY	E	9 - 15	1	4	E
GMY	e	9 - 15	1	5	E

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
GMY	e	9 - 15	2	4	E
GMY	e	9 - 15	2	5	E
GMY	E	9 - 15	2	6	R
GMY	e	9 - 15	3	5	E
GMY	f	15 - 30	0	5	T
GMY	f	15 - 30	1	5	T
GMY	f	15 - 30	3	5	T
GMY	g	30 - 45	1	6	T
GMY	N	N	0	5	I
GMY	N	N	0	7	E
GMY	N	N	N	0	
GNY	c	2 - 5	1	1	
GUP	A	0 - 0.5	0	2	W
GUP	A	0 - 0.5	0	3	D
GUP	A	0 - 0.5	0	7	I
GUP	A	0 - 0.5	0	O	
GUP	b	0.5 - 2	0	1	
GUP	b	0.5 - 2	0	2	D
GUP	b	0.5 - 2	0	2	F
GUP	B	0.5 - 2	0	2	W
GUP	B	0.5 - 2	0	3	I
GUP	B	0.5 - 2	0	3	F
GUP	B	0.5 - 2	0	3	D
GUP	b	0.5 - 2	0	4	D
GUP	b	0.5 - 2	1	3	R
GUP	B	0.5 - 2	2	2	W
GUP	B	0.5 - 2	3	5	P
GUP	c	2 - 5	0	1	
GUP	c	2 - 5	0	2	F
GUP	c	2 - 5	0	2	D
GUP	c	2 - 5	0	6	R
GUP	c	2 - 5	1	1	
GUP	c	2 - 5	1	2	F
GUP	c	2 - 5	1	3	R
GUP	c	2 - 5	2	1	
GUP	c	2 - 5	2	3	F
GUP	c	2 - 5	2	3	R
GUP	c	2 - 5	2	6	R
GUP	c	2 - 5	3	7	P
GUP	d	5 - 9	0	3	T
GUP	d	5 - 9	0	3	S

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
GUP	d	5 - 9	0	3	E
GUP	d	5 - 9	1	2	E
GUP	d	5 - 9	1	3	T
GUP	d	5 - 9	1	3	S
GUP	d	5 - 9	2	2	E
GUP	d	5 - 9	2	2	F
GUP	d	5 - 9	2	4	S
GUP	d	5 - 9	2	6	R
GUP	d	5 - 9	3	4	S
GUP	e	9 - 15	0	4	T
GUP	e	9 - 15	0	4	S
GUP	e	9 - 15	0	4	E
GUP	e	9 - 15	1	4	S
GUP	e	9 - 15	1	4	E
GUP	e	9 - 15	1	5	E
GUP	e	9 - 15	3	4	T
GUP	f	15 - 30	0	5	T
GUP	f	15 - 30	1	5	T
GUP	f	15 - 30	2	5	T
GUP	f	15 - 30	3	5	T
GUP	N	N	0	5	I
HIM	A	0 - 0.5	0	3	D
HIM	A	0 - 0.5	0	O	
HIM	B	0.5 - 2	0	2	W
HIM	B	0.5 - 2	0	3	I
HIM	b	0.5 - 2	0	4	F
HIM	b	0.5 - 2	1	4	F
HIM	B	0.5 - 2	1	4	R
HIM	b	0.5 - 2	2	6	R
HIM	B	0.5 - 2	3	5	P
HIM	c	2 - 5	0	1	
HIM	c	2 - 5	0	2	F
HIM	c	2 - 5	0	2	D
HIM	c	2 - 5	1	1	
HIM	c	2 - 5	1	2	F
HIM	c	2 - 5	1	3	R
HIM	c	2 - 5	3	7	P
HIM	d	5 - 9	0	3	S
HIM	d	5 - 9	0	3	T
HIM	d	5 - 9	2	2	E
HIM	d	5 - 9	2	4	S

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
HIM	d	5 - 9	2	6	R
HIM	e	9 - 15	0	4	T
HIM	e	9 - 15	1	4	T
HIM	e	9 - 15	2	4	T
HIM	f	15 - 30	0	5	T
JDD	A	0 - 0.5	0	O	
JDD	b	0.5 - 2	0	2	F
JDD	B	0.5 - 2	0	3	F
JDD	b	0.5 - 2	1	3	R
JDD	b	0.5 - 2	1	4	R
JDD	c	2 - 5	0	1	
JDD	c	2 - 5	0	2	F
JDD	c	2 - 5	1	1	
JDD	c	2 - 5	1	3	F
JDD	c	2 - 5	2	1	
JDD	c	2 - 5	2	3	F
JDD	c	2 - 5	3	7	P
JDD	d	5 - 9	0	2	F
JDD	d	5 - 9	0	3	T
JDD	e	9 - 15	0	4	T
JDD	f	15 - 30	0	7	R
JDD	f	15 - 30	2	5	T
KIL	a	0 - 0.5	0	3	D
KIL	A	0 - 0.5	0	3	F
KIL	A	0 - 0.5	0	O	
KIL	A	0 - 0.5	1	4	D
KIL	b	0.5 - 2	0	2	F
KIL	b	0.5 - 2	1	2	F
KIL	B	0.5 - 2	1	4	R
KIL	c	2 - 5	0	1	
KIL	C	2 - 5	0	2	F
KIL	c	2 - 5	0	2	D
KIL	c	2 - 5	1	2	F
KIL	c	2 - 5	1	3	R
KIL	c	2 - 5	2	3	R
KIL	c	2 - 5	2	4	R
KIL	d	5 - 9	0	3	E
KIL	e	9 - 15	0	4	S
KIL	e	9 - 15	2	6	S
KIL	f	15 - 30	1	5	T
LIC	a	0 - 0.5	0	3	D

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
LIC	A	0 - 0.5	0	7	I
LIC	A	0 - 0.5	0	O	
LIC	B	0.5 - 2	0	2	W
LIC	B	0.5 - 2	0	3	I
LIC	B	0.5 - 2	0	4	R
LIC	B	0.5 - 2	I	I	
LIC	b	0.5 - 2	2	3	R
LIC	B	0.5 - 2	2	5	P
LIC	B	0.5 - 2	3	5	P
LIC	b	0.5 - 2	3	7	P
LIC	c	2 - 5	0	I	
LIC	c	2 - 5	0	2	F
LIC	C	2 - 5	I	I	
LIC	c	2 - 5	2	I	
LIC	c	2 - 5	2	3	R
LIC	C	2 - 5	2	6	R
LIC	d	5 - 9	0	3	E
LIC	d	5 - 9	0	3	T
LIC	d	5 - 9	I	2	F
LIC	d	5 - 9	I	3	S
LIC	d	5 - 9	3	5	R
LIC	e	9 - 15	0	4	T
LIC	e	9 - 15	I	5	E
LIC	f	15 - 30	0	5	T
LIC	f	15 - 30	I	5	T
LIY	A	0 - 0.5	0	2	W
LIY	A	0 - 0.5	0	O	
LIY	b	0.5 - 2	0	2	F
LIY	B	0.5 - 2	0	2	W
LIY	B	0.5 - 2	I	2	W
LIY	B	0.5 - 2	I	4	R
LIY	c	2 - 5	0	I	
LIY	c	2 - 5	0	2	F
LIY	c	2 - 5	I	I	
LIY	c	2 - 5	2	I	
LIY	c	2 - 5	3	3	F
LIY	d	5 - 9	0	3	S
LIY	d	5 - 9	I	3	S
LIY	d	5 - 9	I	6	R
LIY	d	5 - 9	3	4	S
LIY	d	5 - 9	3	5	R

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
LIY	e	9 - 15	0	4	T
LIY	e	9 - 15	2	6	S
LIY	f	15 - 30	0	5	T
LIY	f	15 - 30	3	6	S
LOD	A	0 - 0.5	0	3	D
LOD	A	0 - 0.5	0	3	F
LOD	A	0 - 0.5	0	O	
LOD	b	0.5 - 2	0	I	
LOD	B	0.5 - 2	0	2	W
LOD	b	0.5 - 2	0	2	F
LOD	B	0.5 - 2	0	3	F
LOD	B	0.5 - 2	0	3	D
LOD	b	0.5 - 2	1	3	R
LOD	B	0.5 - 2	1	4	R
LOD	B	0.5 - 2	1	6	R
LOD	b	0.5 - 2	2	3	R
LOD	c	2 - 5	0	1	
LOD	c	2 - 5	0	2	F
LOD	c	2 - 5	0	3	R
LOD	c	2 - 5	1	1	
LOD	c	2 - 5	1	2	F
LOD	c	2 - 5	1	3	R
LOD	c	2 - 5	1	4	R
LOD	c	2 - 5	2	1	
LOD	C	2 - 5	2	6	R
LOD	c	2 - 5	3	7	P
LOD	d	5 - 9	0	3	T
LOD	d	5 - 9	0	3	S
LOD	d	5 - 9	0	3	E
LOD	d	5 - 9	1	1	
LOD	d	5 - 9	1	2	F
LOD	d	5 - 9	1	2	E
LOD	d	5 - 9	2	2	E
LOD	d	5 - 9	2	2	F
LOD	d	5 - 9	3	4	S
LOD	d	5 - 9	3	7	P
LOD	d	5 - 9	4	6	P
LOD	e	9 - 15	0	4	T
LOD	e	9 - 15	0	4	S
LOD	e	9 - 15	1	4	S
LOD	e	9 - 15	1	4	E

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
LOD	e	9 - 15	1	5	E
LOD	e	9 - 15	2	4	E
LOD	e	9 - 15	2	5	E
LOD	f	15 - 30	1	5	E
LOD	f	15 - 30	1	5	T
LOD	F	15 - 30	3	1	
LOD	N	N	0	5	1
LOD	N	N	N	0	
MOY	B	0.5 - 2	3	5	P
MOY	C	2 - 5	0	1	
MOY	c	2 - 5	0	2	F
MOY	c	2 - 5	1	4	R
MOY	e	9 - 15	0	4	T
OID	A	0 - 0.5	0	2	W
OID	A	0 - 0.5	0	3	F
OID	b	0.5 - 2	0	2	F
OID	B	0.5 - 2	0	3	F
OID	B	0.5 - 2	0	3	I
OID	b	0.5 - 2	0	4	R
OID	b	0.5 - 2	1	1	
OID	b	0.5 - 2	2	3	R
OID	b	0.5 - 2	2	6	R
OID	c	2 - 5	0	1	
OID	c	2 - 5	0	2	F
OID	C	2 - 5	1	1	
OID	C	2 - 5	1	3	R
OID	c	2 - 5	1	4	R
OID	C	2 - 5	1	4	F
OID	c	2 - 5	2	6	R
OID	c	2 - 5	3	3	R
OID	c	2 - 5	3	7	P
OID	d	5 - 9	0	1	
OID	d	5 - 9	0	3	T
OID	d	5 - 9	0	3	E
OID	d	5 - 9	0	3	S
OID	D	5 - 9	1	3	T
OID	d	5 - 9	2	2	E
OID	d	5 - 9	2	6	R
OID	d	5 - 9	3	4	S
OID	e	9 - 15	0	4	T
OID	e	9 - 15	1	4	T

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
OID	e	9 - 15	3	7	P
OID	f	15 - 30	0	5	T
OID	N	N	0	5	I
PLL	A	0 - 0.5	0	3	D
PLL	A	0 - 0.5	0	O	
PLL	b	0.5 - 2	0	2	D
PLL	b	0.5 - 2	0	2	F
PLL	B	0.5 - 2	0	3	I
PLL	B	0.5 - 2	0	3	F
PLL	b	0.5 - 2	1	1	
PLL	B	0.5 - 2	1	2	W
PLL	b	0.5 - 2	1	3	R
PLL	b	0.5 - 2	1	4	F
PLL	b	0.5 - 2	3	4	R
PLL	c	2 - 5	0	1	
PLL	c	2 - 5	0	2	F
PLL	c	2 - 5	1	2	F
PLL	c	2 - 5	2	6	R
PLL	c	2 - 5	3	7	P
PLL	d	5 - 9	0	3	T
PLL	d	5 - 9	0	3	E
PLL	d	5 - 9	1	2	F
PLL	d	5 - 9	2	3	R
PLL	d	5 - 9	3	4	S
PLL	e	9 - 15	0	4	T
PLL	e	9 - 15	1	5	E
PLL	e	9 - 15	2	6	S
PLL	e	9 - 15	3	4	T
SHV	A	0 - 0.5	0	2	W
SHV	A	0 - 0.5	0	O	
SHV	b	0.5 - 2	0	1	
SHV	B	0.5 - 2	0	2	W
SHV	b	0.5 - 2	0	2	F
SHV	B	0.5 - 2	0	3	I
SHV	b	0.5 - 2	0	3	F
SHV	B	0.5 - 2	0	3	D
SHV	B	0.5 - 2	0	4	R
SHV	B	0.5 - 2	1	2	W
SHV	B	0.5 - 2	1	3	D
SHV	B	0.5 - 2	1	3	R
SHV	B	0.5 - 2	1	4	R

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
SHV	B	0.5 - 2	1	5	P
SHV	B	0.5 - 2	1	6	R
SHV	b	0.5 - 2	2	4	F
SHV	b	0.5 - 2	2	6	R
SHV	B	0.5 - 2	3	4	R
SHV	c	2 - 5	0	1	
SHV	c	2 - 5	0	2	F
SHV	c	2 - 5	0	2	D
SHV	c	2 - 5	1	2	F
SHV	c	2 - 5	1	3	R
SHV	C	2 - 5	1	4	F
SHV	c	2 - 5	2	1	
SHV	c	2 - 5	2	6	R
SHV	d	5 - 9	0	3	T
SHV	d	5 - 9	0	3	S
SHV	d	5 - 9	0	3	E
SHV	d	5 - 9	1	3	S
SHV	d	5 - 9	2	2	E
SHV	d	5 - 9	2	6	R
SHV	d	5 - 9	3	5	R
SHV	d	5 - 9	4	6	P
SHV	e	9 - 15	0	4	T
SHV	e	9 - 15	0	4	S
SHV	e	9 - 15	0	4	E
SHV	e	9 - 15	1	4	T
SHV	e	9 - 15	1	5	E
SHV	e	9 - 15	2	4	E
SHV	e	9 - 15	2	4	T
SHV	e	9 - 15	2	5	E
SHV	e	9 - 15	2	6	S
SHV	e	9 - 15	3	4	T
SHV	e	9 - 15	3	5	E
SHV	f	15 - 30	0	5	T
SHV	f	15 - 30	1	5	T
SHV	g	30 - 45	1	6	T
SHV	N	N	0	5	I
SHV	N	N	N	0	
SRI	A	0 - 0.5	0	4	D
SRI	b	0.5 - 2	0	2	W
SRI	B	0.5 - 2	0	3	F
SRI	B	0.5 - 2	1	2	W

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
SRI	B	0.5 - 2	1	4	R
SRI	b	0.5 - 2	2	1	
SRI	B	0.5 - 2	2	5	P
SRI	c	2 - 5	0	1	
SRI	c	2 - 5	1	3	R
SRI	c	2 - 5	2	3	F
SRI	c	2 - 5	3	7	P
SRI	C	2 - 5	4	7	P
SRI	d	5 - 9	0	3	T
SRI	d	5 - 9	0	3	E
SRI	d	5 - 9	1	1	
SRI	d	5 - 9	2	2	E
SRI	d	5 - 9	2	3	R
SRI	d	5 - 9	3	3	F
SRI	d	5 - 9	3	7	P
SRI	e	9 - 15	0	4	S
SRI	e	9 - 15	0	4	T
SRI	f	15 - 30	0	5	T
SRI	N	N	0	5	I
SRI	N	N	0	7	E
TFG	B	0.5 - 2	0	4	R
TFG	c	2 - 5	0	1	
TFG	d	5 - 9	0	3	T
TFG	d	5 - 9	0	4	R
TFG	d	5 - 9	1	1	
TFG	d	5 - 9	1	3	S
TFG	d	5 - 9	3	2	E
TFG	N	N	0	7	E
TLD	a	0 - 0.5	0	3	D
TLD	A	0 - 0.5	0	O	
TLD	A	0 - 0.5	2	5	P
TLD	b	0.5 - 2	0	1	
TLD	b	0.5 - 2	0	2	F
TLD	B	0.5 - 2	0	2	W
TLD	B	0.5 - 2	0	3	D
TLD	B	0.5 - 2	0	3	F
TLD	b	0.5 - 2	1	1	
TLD	b	0.5 - 2	1	2	F
TLD	B	0.5 - 2	1	2	W
TLD	b	0.5 - 2	2	2	F
TLD	B	0.5 - 2	2	5	P

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
TLD	B	0.5 - 2	3	5	P
TLD	c	2 - 5	0	I	
TLD	c	2 - 5	0	2	F
TLD	c	2 - 5	0	2	D
TLD	c	2 - 5	I	I	
TLD	c	2 - 5	I	3	R
TLD	c	2 - 5	I	6	R
TLD	C	2 - 5	2	I	
TLD	c	2 - 5	2	3	R
TLD	c	2 - 5	2	4	R
TLD	c	2 - 5	4	7	P
TLD	d	5 - 9	0	3	T
TLD	d	5 - 9	0	3	E
TLD	d	5 - 9	0	3	S
TLD	d	5 - 9	I	I	
TLD	d	5 - 9	I	2	F
TLD	d	5 - 9	I	3	S
TLD	d	5 - 9	I	3	R
TLD	d	5 - 9	3	5	R
TLD	d	5 - 9	3	7	P
TLD	D	5 - 9	4	5	P
TLD	d	5 - 9	4	6	P
TLD	e	9 - 15	0	4	T
TLD	e	9 - 15	0	4	S
TLD	e	9 - 15	0	4	E
TLD	E	9 - 15	2	4	E
TLD	e	9 - 15	3	4	T
TLD	e	9 - 15	4	6	P
TLD	f	15 - 30	0	5	T
TLD	f	15 - 30	2	5	T
TLD	N	N	0	5	I
TLD	N	N	0	7	E
TLD	N	N	N	0	
TUC	A	0 - 0.5	0	2	W
TUC	A	0 - 0.5	0	3	F
TUC	a	0 - 0.5	0	3	D
TUC	A	0 - 0.5	0	7	I
TUC	A	0 - 0.5	0	O	
TUC	b	0.5 - 2	0	I	
TUC	b	0.5 - 2	0	2	F
TUC	B	0.5 - 2	0	2	W

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
TUC	B	0.5 - 2	0	3	I
TUC	B	0.5 - 2	0	3	F
TUC	b	0.5 - 2	0	4	D
TUC	b	0.5 - 2	I	I	
TUC	b	0.5 - 2	I	4	R
TUC	B	0.5 - 2	3	4	R
TUC	C	2 - 5	0	I	
TUC	c	2 - 5	0	2	F
TUC	c	2 - 5	I	2	F
TUC	c	2 - 5	2	3	R
TUC	c	2 - 5	3	3	R
TUC	c	2 - 5	3	3	F
TUC	c	2 - 5	3	7	P
TUC	D	5 - 9	0	I	
TUC	d	5 - 9	0	3	T
TUC	d	5 - 9	0	3	S
TUC	d	5 - 9	I	2	F
TUC	d	5 - 9	I	2	E
TUC	d	5 - 9	I	3	R
TUC	d	5 - 9	I	3	T
TUC	d	5 - 9	2	3	R
TUC	d	5 - 9	4	7	P
TUC	e	9 - 15	0	4	E
TUC	e	9 - 15	0	4	T
TUC	e	9 - 15	I	4	E
TUC	f	15 - 30	I	5	T
VLD	A	0 - 0.5	0	2	W
VLD	A	0 - 0.5	0	O	
VLD	b	0.5 - 2	0	I	
VLD	b	0.5 - 2	0	2	F
VLD	B	0.5 - 2	0	2	W
VLD	B	0.5 - 2	0	3	F
VLD	B	0.5 - 2	0	3	I
VLD	B	0.5 - 2	0	3	D
VLD	b	0.5 - 2	0	4	D
VLD	B	0.5 - 2	I	2	W
VLD	b	0.5 - 2	I	2	F
VLD	B	0.5 - 2	I	3	R
VLD	B	0.5 - 2	I	4	R
VLD	B	0.5 - 2	I	6	R
VLD	B	0.5 - 2	2	2	W

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
VLD	b	0.5 - 2	2	3	R
VLD	b	0.5 - 2	2	4	R
VLD	B	0.5 - 2	3	5	P
VLD	c	2 - 5	0	1	
VLD	c	2 - 5	0	2	F
VLD	c	2 - 5	0	2	D
VLD	c	2 - 5	1	1	
VLD	c	2 - 5	1	2	F
VLD	c	2 - 5	2	1	
VLD	c	2 - 5	2	3	F
VLD	c	2 - 5	2	3	R
VLD	c	2 - 5	2	6	R
VLD	c	2 - 5	3	3	F
VLD	c	2 - 5	3	7	P
VLD	d	5 - 9	0	3	T
VLD	d	5 - 9	0	3	E
VLD	d	5 - 9	0	3	S
VLD	d	5 - 9	1	1	
VLD	d	5 - 9	1	3	S
VLD	d	5 - 9	2	2	E
VLD	d	5 - 9	2	3	R
VLD	d	5 - 9	2	4	R
VLD	d	5 - 9	2	4	S
VLD	d	5 - 9	2	6	R
VLD	d	5 - 9	3	2	E
VLD	d	5 - 9	3	3	R
VLD	d	5 - 9	3	7	P
VLD	e	9 - 15	0	4	S
VLD	e	9 - 15	0	4	T
VLD	e	9 - 15	0	4	E
VLD	e	9 - 15	1	4	S
VLD	e	9 - 15	1	5	E
VLD	e	9 - 15	2	4	E
VLD	e	9 - 15	2	6	S
VLD	e	9 - 15	3	5	E
VLD	f	15 - 30	0	5	T
VLD	f	15 - 30	0	7	R
VLD	f	15 - 30	1	5	T
VLD	f	15 - 30	2	6	S
VLD	N	N	0	5	I
VLD	N	N	0	7	E

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
WIO	A	0 - 0.5	0	O	
WIO	B	0.5 - 2	0	4	R
WIO	B	0.5 - 2	I	3	D
WIO	B	0.5 - 2	I	5	P
WIO	c	2 - 5	0	I	
WIO	C	2 - 5	0	2	F
WIO	c	2 - 5	0	3	R
WIO	c	2 - 5	I	2	F
WIO	c	2 - 5	I	4	R
WIO	d	5 - 9	0	3	T
WIO	e	9 - 15	2	6	R
WIO	f	15 - 30	2	6	S
WIO	F	15 - 30	3	6	P
ZES	B	0.5 - 2	0	3	F
ZES	c	2 - 5	0	I	
ZES	c	2 - 5	3	7	P
ZES	d	5 - 9	0	3	T
ZES	d	5 - 9	I	I	
ZES	d	5 - 9	3	4	S
ZES	N	N	0	5	I
ZMH	A	0 - 0.5	0	3	F
ZMH	b	0.5 - 2	0	2	F
ZMH	B	0.5 - 2	0	2	W
ZMH	B	0.5 - 2	0	3	I
ZMH	c	2 - 5	0	I	
ZMH	c	2 - 5	0	2	F
ZMH	d	5 - 9	I	3	E
ZMH	e	9 - 15	0	4	E
ZMK	A	0 - 0.5	0	3	F
ZMK	A	0 - 0.5	0	3	D
ZMK	A	0 - 0.5	0	O	
ZMK	b	0.5 - 2	0	2	F
ZMK	B	0.5 - 2	0	2	W
ZMK	B	0.5 - 2	0	3	I
ZMK	B	0.5 - 2	0	3	F
ZMK	b	0.5 - 2	I	2	F
ZMK	b	0.5 - 2	I	2	W
ZMK	b	0.5 - 2	I	3	R
ZMK	b	0.5 - 2	I	4	F
ZMK	c	2 - 5	0	I	
ZMK	c	2 - 5	0	2	F

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
ZMK	c	2 - 5	0	2	D
ZMK	c	2 - 5	1	1	
ZMK	c	2 - 5	1	3	R
ZMK	c	2 - 5	2	1	
ZMK	c	2 - 5	2	3	R
ZMK	c	2 - 5	2	6	R
ZMK	d	5 - 9	0	3	E
ZMK	d	5 - 9	0	3	S
ZMK	d	5 - 9	0	3	T
ZMK	d	5 - 9	1	1	
ZMK	d	5 - 9	1	2	F
ZMK	d	5 - 9	1	3	T
ZMK	d	5 - 9	1	3	E
ZMK	d	5 - 9	2	2	E
ZMK	d	5 - 9	2	4	S
ZMK	d	5 - 9	2	6	R
ZMK	d	5 - 9	3	4	S
ZMK	d	5 - 9	3	7	P
ZMK	e	9 - 15	0	4	T
ZMK	e	9 - 15	0	4	E
ZMK	e	9 - 15	0	4	S
ZMK	e	9 - 15	1	4	E
ZMK	e	9 - 15	3	5	E
ZMK	f	15 - 30	0	5	T
ZMK	f	15 - 30	2	5	T
ZMK	N	N	0	7	E
ZMK	N	N	N	0	
ZQY	C	2 - 5	0	1	
ZQY	d	5 - 9	0	3	E
ZQY	f	15 - 30	0	5	T
ZRV	A	0 - 0.5	0	3	D
ZRV	A	0 - 0.5	0	O	
ZRV	A	0 - 0.5	1	4	R
ZRV	b	0.5 - 2	0	2	F
ZRV	b	0.5 - 2	0	2	W
ZRV	B	0.5 - 2	0	3	F
ZRV	B	0.5 - 2	0	3	I
ZRV	B	0.5 - 2	2	2	W
ZRV	b	0.5 - 2	2	3	R
ZRV	c	2 - 5	0	1	
ZRV	c	2 - 5	0	2	F

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
ZRV	c	2 - 5	1	2	D
ZRV	c	2 - 5	1	4	F
ZRV	d	5 - 9	0	4	R
ZRV	e	9 - 15	0	4	T
ZRV	E	9 - 15	2	6	R
ZRV	e	9 - 15	3	5	E
ZST	A	0 - 0.5	0	2	W
ZST	A	0 - 0.5	0	O	
ZST	b	0.5 - 2	0	1	
ZST	b	0.5 - 2	0	2	F
ZST	B	0.5 - 2	0	2	W
ZST	b	0.5 - 2	1	1	
ZST	b	0.5 - 2	1	4	F
ZST	b	0.5 - 2	3	5	P
ZST	c	2 - 5	0	1	
ZST	c	2 - 5	0	2	F
ZST	c	2 - 5	1	1	
ZST	c	2 - 5	2	3	R
ZST	c	2 - 5	3	3	R
ZST	c	2 - 5	3	7	P
ZST	d	5 - 9	0	3	T
ZST	d	5 - 9	0	3	E
ZST	d	5 - 9	1	3	S
ZST	d	5 - 9	2	2	E
ZST	d	5 - 9	2	6	R
ZST	d	5 - 9	3	5	R
ZST	e	9 - 15	0	4	T
ZST	e	9 - 15	0	4	S
ZST	e	9 - 15	3	4	T
ZST	e	9 - 15	3	5	E
ZST	e	9 - 15	4	6	P
ZST	f	15 - 30	0	5	T
ZST	N	N	0	7	E
ZUR	A	0 - 0.5	0	4	D
ZUR	A	0 - 0.5	0	5	W
ZUR	A	0 - 0.5	0	7	I
ZUR	B	0.5 - 2	0	3	I
ZUR	B	0.5 - 2	3	2	W
ZUR	c	2 - 5	0	1	
ZUR	c	2 - 5	1	2	F
ZUR	d	5 - 9	0	3	S

Soil Code	Slope Code	Slope Range	Stoniness	CLI	CLI1
ZUR	f	15 - 30	0	7	R
ZZZ	c	2 - 5	0	2	F

APPENDIX C

DAVE HODGSON CURRICULUM VITAE

DBH Soil Services Inc
217 Highgate Court
Kitchener Ontario N2N 3N9

phone: (519) 578-9226
email: dhodgson@dbhsoilservices.ca

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 Highway 6 Widening Hamilton 2022 – ongoing.
- 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 – ongoing.
- Agricultural Component of the Greater Toronto Area West (GTAW) Highway 413 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 Impact Assessment/Minimum Distance Separation Studies

- Town of King Battery Energy Storage System (BESS) Agricultural Impact Assessment, 2023.
- City of London Agricultural Impact Assessment, 2023 - ongoing
- Caledonia Secondary Plan Agricultural Impact Assessment, 2023.
- Inglewood Well Agricultural Impact Assessment, 2023 – ongoing.
- Orangeville Battery Energy Storage System (BESS) Agricultural Impact Assessment, 2023.
- County Road 109 Realignment Agricultural Impact Assessment, 2023 – ongoing.
- Thornbury Acres Agricultural Impact Assessment, 2022 – 2023.
- Highway 6 Widening Hamilton Agricultural Impact Assessment, 2022 – ongoing.
- Whistle Bare Pit Agricultural Impact Assessment, 2022.
- Middletown Road Agricultural Impact Assessment, 2022.
- Claremont Minimum Distance Separation, Durham Region. 2022.
- Grand Valley Settlement Area Boundary Expansion 2022 -ongoing.
- Hagersville Minimum Distance Separation, 2022.
- East River Road Minimum Distance Separation, County of Brant, 2022.
- Brampton Brick Norval Quarry, Agricultural Impact Assessment, 2022 – ongoing.
- Northfield Drive Minimum Distance Separation, Waterloo Region, 2021
- 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.
- Reesor Road Minimum Distance Separation, Markham, 2021.
- Maclean School Road Minimum Distance Separation, County of Brant, 2021.
- 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 – 2021,
- 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 Survey and Canada Land Inventory Evaluation, Pinehurst Road, 2023.
- Soil Survey and Canada Land Inventory Evaluation, Paris Plains Church Road Site, 2022.
- Soil Survey and Canada Land Inventory Evaluation, Mulmur Site, 2022.
- Soil Survey and Canada Land Inventory Evaluation, Port Colborne Site, 2022.
- Soil Survey and Canada Land Inventory Evaluation, Pike Site, 2022.
- Soil Survey and Canada Land Inventory Evaluation, New Dundee Road Site, 2022.
- Soil Survey and Canada Land Inventory Evaluation, Gehl Farm, 2022
- 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.

Municipal Comprehensive Review and Mapping Studies (MCR)

- Bruce County 2022 – ongoing.
- Simcoe County, 2020 - ongoing.
- Northhumberland County, 2020 - ongoing.
- Halton Region, 2019 - ongoing.

Land Evaluation and Area Review Studies (LEAR)

- Mapping Audit Bruce County. Assessment of Prime and Non-Prime Agricultural Lands, 2022.
- 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.
- 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

- Ontario Stone, Sand, and Gravel Association (OSSGA) Rehabilitation Study, 2023 – ongoing.
- Enbridge Soil Sampling for Soybean Cyst Nematode, various sites Lambton County, 2022
- 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.