Supporting Document 1-12

Agriculture Existing Conditions Report

Eastern Ontario Waste Handling Facility Future Development Environmental Assessment

GFL Environmental Inc.

Moose Creek, Ontario

August 14, 2021

Prepared by:

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Acknowledgements

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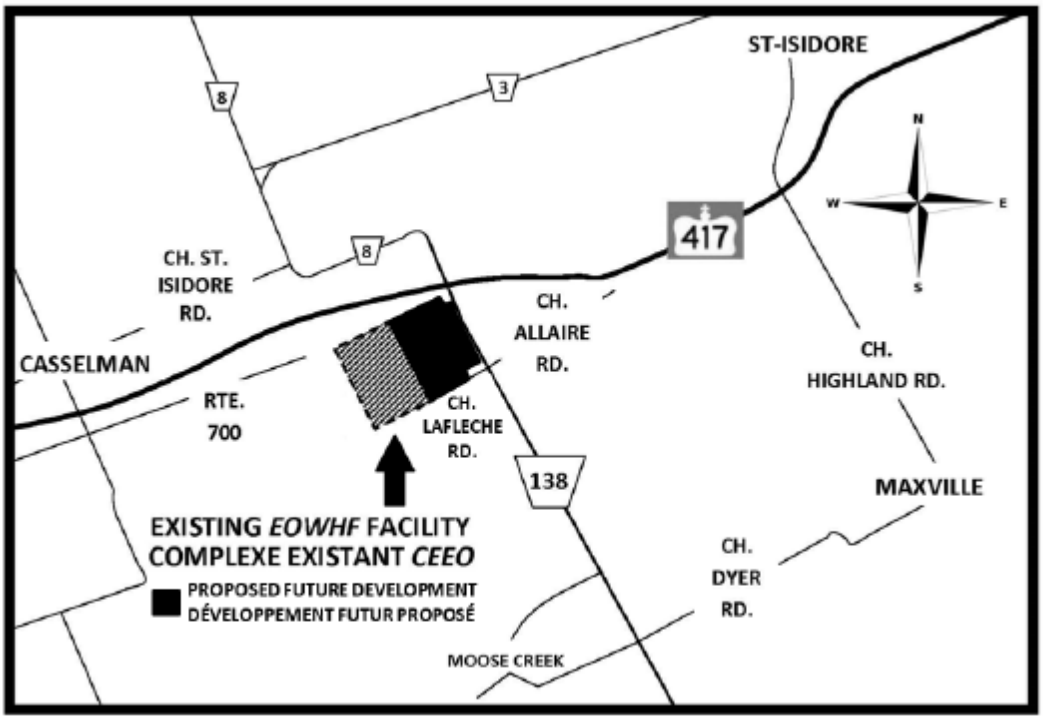
1 BACKGROUND

DBH Soil Services Inc was retained to complete a description of the existing agricultural conditions and an Agricultural Impact Assessment (AIA) for the proposed future development of the Eastern Ontario Waste Handling Facility (EOWHF) near Moose Creek, Ontario. The existing landfill is located at17125 Laflèche Road. The proposed future development of the EOWHF will continue to make use of the existing transportation routes and road network.

Figure 1 illustrates the location of the existing EOWHF and of the proposed future development of that facility. For the purposes of this AIA, both the existing and the proposed future development of the EOWHF are considered as the Study Area.

Figure 1 Eastern Ontario Waste Handling Facility and Future Development



The proposed future development of this facility will require an Environmental Assessment (EA), which will be carried out in accordance with the requirements of *the Environmental Assessment Act*. This AIA will form part of the EA. The existing landfill was initially approved under the *Environmental Assessment Act* in 1999 for solid non-hazardous municipal, industrial, commercial, and institutional waste. The existing landfill also diverts additional waste for composting.

The purpose of this AIA is to document the existing agricultural character, identify agricultural impacts (potential or real), and to provide avoidance or mitigative measures as necessary to offset any impacts.

In the greater County wide context, the Study Area is located south of Highway 417 and west of Highway 138. The Study Area is located wholly within the United Counties of Stormont, Dundas and Glengarry. The Study Area is located within and abuts the northern edge of the Township of North Stormont, sharing a boundary with the Nation Municipality in the United Counties of Prescott and Russell.

The Study Area is located approximately 5.0 km east of the village of Casselman, 4.5 km north of the hamlet of Moose Creek, and approximately 45 km east of Ottawa, Ontario.

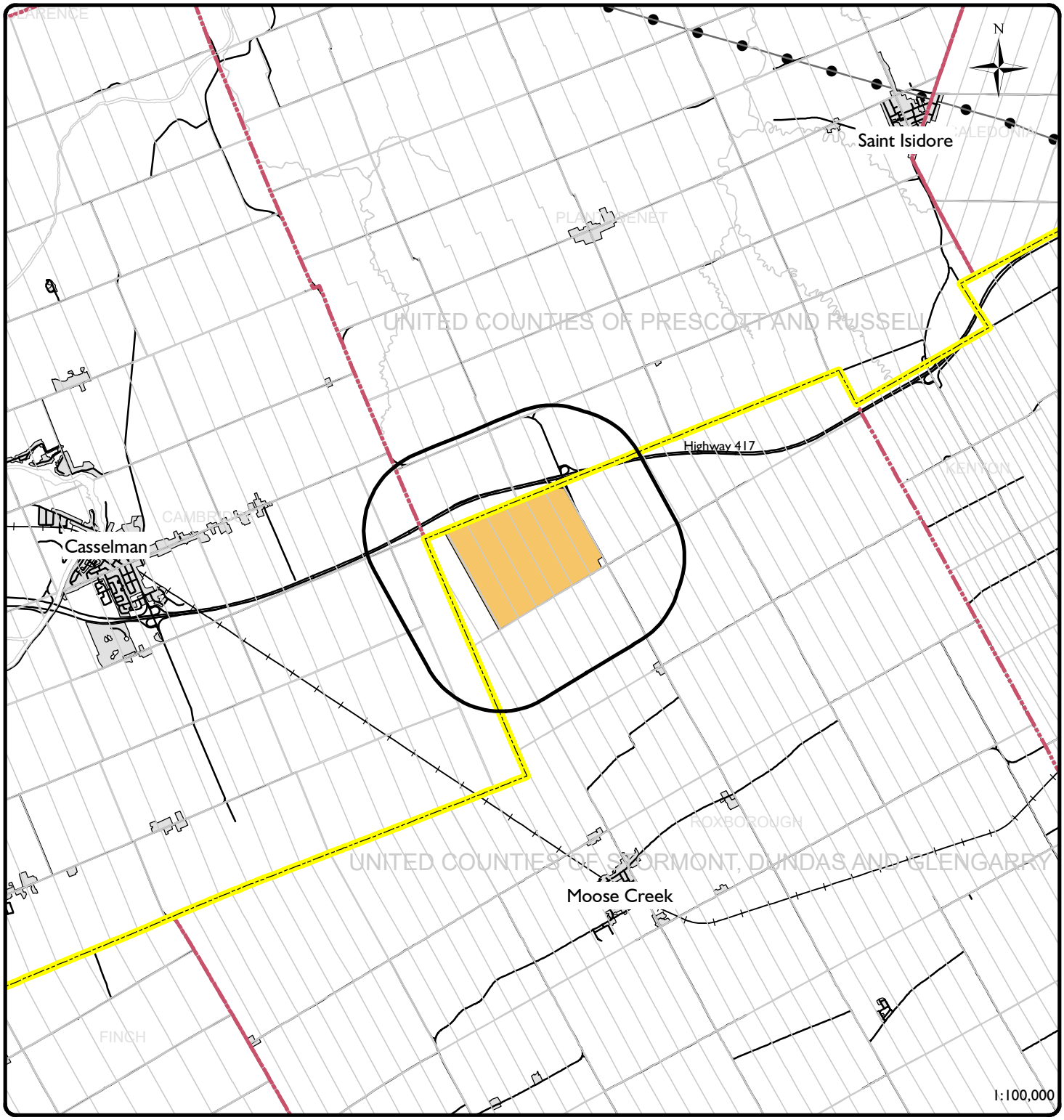
For the purpose of an Agricultural Impact Assessment (AIA) report, agricultural operations and activities are evaluated in a larger area, the Secondary Study Area, described as a potential zone of impact extending a minimum of 1500 m (1.5 km) beyond the boundary of the Study Area.

This minimum 1500 m (1.5 km) area of potential impact outside the Study Area is used to allow for characterization of the agricultural community and the assessment of impacts adjacent both on and in the immediate vicinity of the Study Area.

The Study Area and the Secondary Study Area comprise a mix of land uses including rural residential, agricultural lands, quarry operations, transportation corridors, and woodlots.

Figure 2 illustrates the relative location and shape of the Study Area and the Secondary Study Area with respect to the above-mentioned community features.

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



Legend

- Hydro Line
- Roads (MNRF)
- 1500 m Secondary Study Area
- Built Up Areas (MNRF)
- Lot Lines (MNRF)
- Lower Municipal Boundary
- Study Area
- Upper Municipal Boundary

Figure 1

Location

DBH Soil Services Inc.

September 2020

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 Study Area and the surrounding Secondary Study Area that may occur as a result of the proposed future development of the EOWHF.

A review of the United Counties of Stormont, Dundas and Glengarry, and the Township of North Stormont policies and guidelines was completed to determine if there are specific local guidelines and/or requirements for the completion of an Agricultural Impact Assessment study. It was noted that neither the United Counties of Stormont, Dundas, and Glengarry, nor the Township of North Stormont have specific guidelines for completing an Agricultural Impact Assessment (AIA). Therefore, a review was completed to determine the existence and use of Agricultural Impact Assessment Guidelines in Ontario.

The review on the existence and use of Agricultural Impact Assessment 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 document is considered as "Draft for Discussion Purposes" and does not have status. Prior to the release of the OMAFRA AIA guidelines, the standard for completing Agricultural Impact Assessments in Southern Ontario, were the Region of Halton *Agricultural Impact Assessment Guidelines, October 1985*, and the updated version from June 2014. The Region of Halton has specific standards and guidelines for completing Agricultural Impact Assessments (AIA) within the boundaries of the Region of Halton. The Halton Region guidelines are comprehensive and require considerable detail to complete.

As a result of the review on the existence and use of Agricultural Impact Assessment guidelines in Ontario, this Agricultural Impact Assessment report has been completed with regard to the *Region of Halton Agricultural Impact Assessment Guidelines (2014)*, a review/reference to the OMAFRA "*Draft Agricultural Impact Assessment (AIA) Guidance Document, March 2018*" and through discussion with staff from the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA).

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

- Description of the proposal
- Purpose
- Applicable Planning Policies
- Onsite and Surrounding Area Physical Resource Inventory (including: soils; climate; slope; topography; drainage)
- Minimum Distance Separation (MDS) calculations

- On-site features (including: past farming practices; type and intensity of existing agricultural production; nonagricultural land use; parcel size, shape and accessibility; existing farm management; capital investment related to agriculture)
- Offsite Land Use Features (including: surrounding land use types; existing and potential constraints to onsite agriculture; regional land use, lot and tenure patterns)
- Agricultural Viability
- Assessment of Impact on Agriculture
- Mitigative Measures/Avoidance/Minimizing impact
- Conclusions

These tasks are also identified and presented in the OMAFRA "*Draft Agricultural Impact Assessment (AIA) Guidance Document, March 2018*". As a result, this AIA will follow the above referenced task list.

2.1 DATA SOURCES

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

- 1:10000 scale Ministry of Natural Resources and Forestry (MNRF) Aerial Photography, 1978,
- 1:10000 scale Ontario Base Map (1983) Ministry of Natural Resources and Forestry (MNRF):
  10 18 4950 50200
  10 18 5000 50200
  10 18 4950 50150
  10 18 5000 50150
  10 18 4950 50100
  10 18 5000 50100
- 1:50000 scale NTS Map No 31 G/6 and 31 G/7. 1984. Ministry of Energy Mines and Resources, Canada,
- 1:50000 scale NTS Map No 31 G/6 and 31 G/7. Canada Land Inventory (CLI) Capability Mapping (date unknown),
- *Agricultural Impact Assessment (AIA) Guidelines. Regional Official Plan Guidelines*. Halton Region. June 18, 2014,
- *Agricultural Information Atlas* online resource (OMAFRA, September 2020),
- Agricultural Resource Inventory, Ontario Ministry of Agriculture and Food, 1988,
- Agricultural System Portal online resource (OMAFRA, September 2020),
- Birdseye Online Imagery (September 2020),
- *Constraints Plan Schedule B3 Township of North Stormont (July 2009),*
- *Guideline D-4 Land Use on or Near Landfills and Dumps,*
- *Environmental Assessment Act*, R.S.O. 1990, (July 21, 2020, e-Laws),
- Google Earth Pro Online Imagery (September 2020),
- *Greenbelt Plan* (2017),
- *Growth Plan for the Greater Golden Horseshoe* (2019),
- *Guide to Agricultural Land Use*, Ontario Ministry of Agriculture, Food and Rural Affairs, March 1995,

- *Guidelines on Permitted Uses in Ontario's Prime Agricultural Areas, 2016 (Publication 851*),
- *Land Use Schedule A3 Township of North Stormont (Interim – In effect Schedules as of September 2018),*
- Ontario Ministry of Agriculture and Food - Land Use Systems Mapping Online (December 2019),
- Ontario Ministry of Agriculture and Food - Artificial Drainage Mapping Online (December 2019),
- *Provincial Policy Statement*, 2020,
- *The Canadian System of Soil Classification*. 3rd ed. Agric. Can. Publ. 1646. Agriculture Canada Expert Committee on Soil Survey. 1998,
- *The Corporation of the Township of North Stormont Comprehensive Zoning By*-Law # 08-2014,
- *The Corporation of the Township of North Stormont Comprehensive Zoning By*-Law No. 40-2015,
- *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,*
- *Online Zoning By-Law, The Nation Municipality Comprehensive Zoning By-Law (2-2006),*
- *The Physiography of Southern Ontario* 3rd Edition, Ontario Geological Survey Special Volume 2, Ministry of Natural Resources, 1984,
- *The Soil Survey of Stormont (Report No. 20 of the Ontario Soil Survey. B.C. Matthews and N.R. Richards, 1954,*
- *United Counties of Prescott and Russell Official Plan (Office Consolidation November 2018),*
- *United Counties of Stormont, Dundas and Glengarry Official Plan (July 18, 2018 Consolidation),*
- Windshield and field surveys by DBH Soil Services staff June 18 and June 19, 2020.

2.2 DATA COLLECTION

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), the Growth Plan for the Greater Golden Horseshoe (2019), the Oak Ridges Moraine Conservation Plan (2017), and the United Counties of Stormont, Dundas and Glengarry Official Plan (July 18, 2018 Consolidation)*.

The review also included a search of *The Corporation of the Township of North Stormont Comprehensive Zoning By*-Law # 08-2014.

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 the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), the Ministry of Natural Resources and Forestry (MNRF) Land Information Warehouse (Land Information Ontario (LIO)), the United Counties of Stormont, Dundas and Glengarry website, combined with telephone, email and in person communication was used to derive a list of relevant policy, by-law and guidelines. Each relevant policy, by-law and guideline was collected in digital or paper format for examination for this study.

2.2.2 PHYSIOGRAPHY

A review of the *Physiography of Southern Ontario 3rd Edition, Ontario Geological Survey Special Volume 2, Ministry of Natural Resources (1984)* 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 2009)*.

2.2.4 AGRICULTURAL LAND USE

Agricultural land use data was collected through observations made during roadside reconnaissance surveys and field surveys conducted on June 18 and June 19, 2020. Data collected included the identification of land use (both agricultural and non-agricultural), the documentation of the location and type of agricultural facilities, the location of non-farm residential units and the location of non-farm buildings (businesses, storage facilities, industrial, commercial and institutional usage).

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

2.2.5 MINIMUM DISTANCE SEPARATION

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

Guideline #10 states "*An MDS1 setback is required for all proposed amendments to rezone or redesignate land to permit development in prime agricultural areas and rural lands presently zoned or*

designated for agricultural use." MDS setbacks are calculated to separate uses so as to reduce incompatibility concerns about odour from livestock facilities.

A review of the Minimum Distance Separation (MDS) Document – Formulae and Guidelines for Livestock Facility and Anaerobic Digester Odour Setbacks (Publication 853. Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). 2016) revealed that Guideline # 3 pertains and that MDS1 setbacks are not required. Guideline # 3 – For What, and When, is an MDS setback NOT Required states:

> "Certain proposed uses are not reasonably expected to be impacted by *existing livestock facilities* or *anaerobic digesters* and as a result, do not require an MDS I setback. Such uses may include, but are not limited to:
> • extraction of minerals, petroleum resources and mineral aggregate resources;
> • *infrastructure;* and
> • landfills."

Landfills are defined as part of the infrastructure in 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) as: "Physical structures (facilities and corridors) that form the foundation for development. Infrastructure includes: sewage and water systems, septage treatment systems, stormwater management systems, waste management systems, electricity generation facilities, electricity transmission and distribution systems, communications/telecommunications, transit and transportation corridors and facilities, and oil and gas pipelines and associated facilities."

This study relates to the proposed future development of an existing waste management facility (infrastructure - landfill).

Therefore, MDS 1 calculations are **NOT** required for this study.

2.2.6 LAND FRAGMENTATION AND LAND TENURE

Land fragmentation data was collected through a review of online interactive mapping on the Agricultural Information Atlas (OMAFRA) website, the Agricultural System Portal (OMAFRA), the United Counties of Stormont, Dundas and Glengarry assessment data, and The Nation assessment data. This data was used to determine the extent, location and relative shape of each parcel/property within the Secondary Study Area.

2.2.7 SOIL SURVEY

Soil survey data and Canada Land Inventory (CLI) data was provided by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) in digital format through the Land Information Ontario 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 report and map (*The Soil Survey of Stormont* (Report No. 20 of the Ontario Soil Survey. B.C. Matthews and N.R. Richards, 1954) to determine if the digital soils data has been modified from the original soil survey data.

2.2.8 AGRICULTURAL SYSTEM

The Ontario Ministry of Agriculture, Food and Rural Affairs online Agricultural Systems mapping were reviewed to determine the extent of agriculture on the Study Area, in the Secondary Study Area and within United Counties of Stormont, Dundas and Glengarry, and the Township of North Stormont.

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

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

2.2.9 AGRICULTURAL STATISTICS

Agricultural statistics were provided by and downloaded from the OMAFRA website. The statistics were provided in Excel format for Eastern Ontario, and with the data for the United Counties of Stormont, Dundas and Glengarry (including the Township of North Stormont). The data documents up to the 2016 Census.

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: *Greenbelt Plan (2017); the Oak Ridges Moraine Conservation Plan (2017); the Niagara Escarpment Plan (2017); and the Growth Plan for the Greater Golden Horseshoe (GGH) (2019)* support the long-term protection of farmland. The four provincial land use plans have policy plans that require the completion of Agricultural Impact Assessment (AIA) studies for changes in agricultural land use.

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

With this in mind, the: *Provincial Policy Statement (2020); Greenbelt Plan (2017); the Oak Ridges Moraine Conservation Plan (2017); the Niagara Escarpment Plan (2017); and the Growth Plan for the Greater Golden Horseshoe (GGH) (2019)* were reviewed for this study.

With respect to this AIA and the four provincial land use plans, a review of the boundaries of the Greenbelt Plan Area, the Oak Ridges Moraine Area, the Niagara Escarpment Plan Area, and the Growth Plan for the Greater Golden Horseshoe Area was completed. It was determined that the Study Area (and Secondary Study Area) were not located within any of those land use plan policy areas. Therefore, the policies associated with those plans do not apply and will not affect this study.

A review of the agricultural policies in the United Counties of Stormont, Dundas and Glengarry Official Plan (July 18, 2018 Consolidation) were completed. A review of the Corporation of the Township of North Stormont online data, and email with the Planning Department of the Corporation of the Township of North Stormont indicated that the Corporation of the Township of North Stormont relies on the United Counties of Stormont, Dundas and Glengarry Official Plan (July 18, 2018 Consolidation) for planning policies.

The Corporation of the Township of North Stormont Comprehensive Zoning By-Law # 08-2014 was also reviewed for this study.

It was determined through these reviews, that neither the Study Area nor the Secondary Study Area are located in a Provincially 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 proposed future development of the EOWHF, the following policies may apply.

Section 1.6.10 – Waste Management.

1.6.10.1 *Waste management systems* need to be provided that are of an appropriate size and type to accommodate present and future requirements, and facilitate, encourage and promote reduction, reuse and recycling objectives.

Waste management systems shall be located and designed in accordance with provincial legislation and standards.

Agricultural policies are addressed within Section 2.3 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.

3.2 OFFICIAL PLAN POLICY

Official Plan policies are prepared under the Planning Act, as amended, of the Province of Ontario. Official Plans generally provide policy comment for land use planning while taking into consideration the economic, social and environmental impacts of land use and development concerns. For the purpose of this AIA study, the United Counties of Stormont, Dundas and Glengarry Official Plan (July 18, 2018 Consolidation) was reviewed. As stated previously, the Corporation of the Township of North Stormont relies on the United Counties of Stormont, Dundas and Glengarry Official Plan (July 18, 2018 Consolidation) for policy.

3.3 UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY OFFICIAL PLAN 2018

The *United Counties of Stormont, Dundas and Glengarry Official Plan (July 18, 2018 Consolidation*) was reviewed for agricultural policy as it relates to the development of infrastructure.

Figure 3 - Land Use Schedule A3 – Township of North Stormont (Interim – In effect Schedules as of September 2018) identifies that portions of the Study Area and Secondary Study Area are designated as Agriculture Resource Lands. Further, that the western portion of the Study Area (the existing landfill area) is considered as Rural District, while the eastern portion of the Study Area is designated as Employment District.

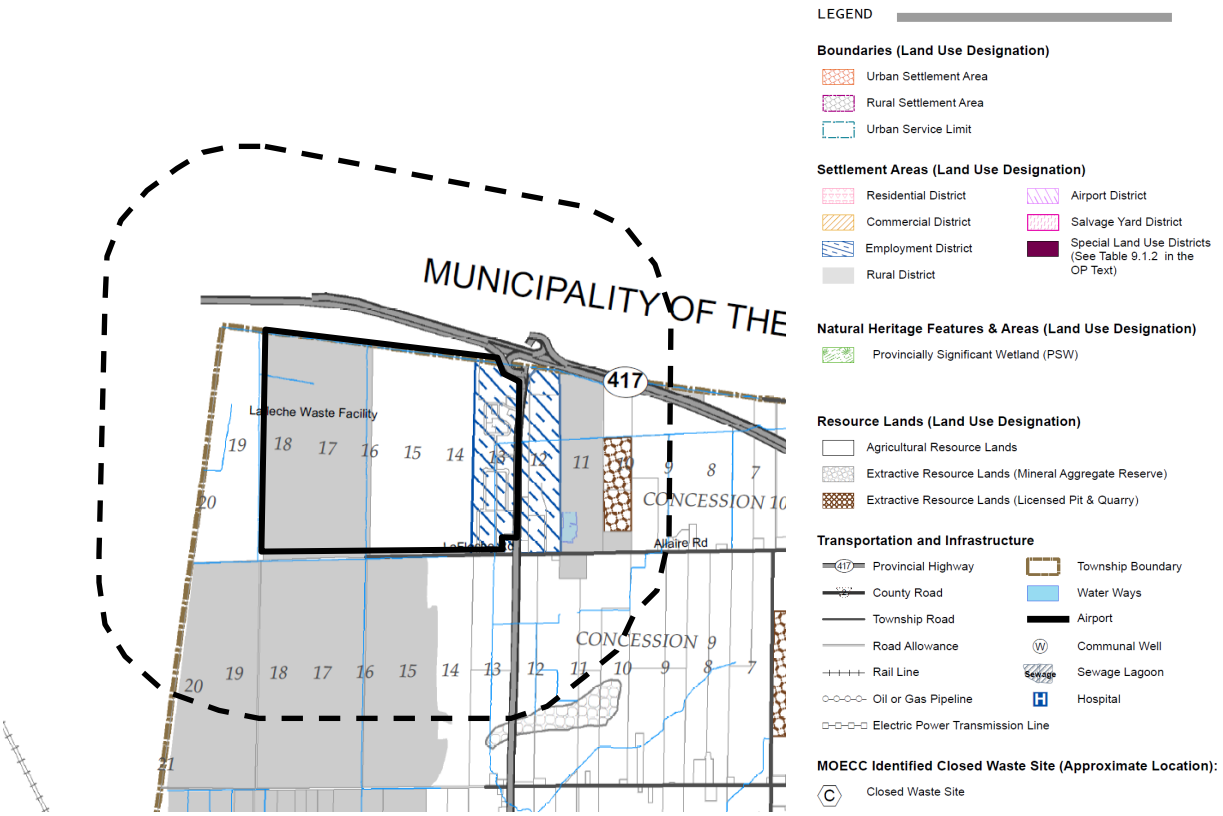
The Secondary Study Area comprises Rural District, Employment District, Agriculture Resource Lands, Extractive Resource Lands (Mineral Aggregate Reserve) and Extractive Resource Lands (Licensed Pit & Quarry).

The approximate location of the Study Area is presented as a solid black line, while the approximate location of the Secondary Study Area is presented as a dashed line.

Neither the Study Area nor the Secondary Study Area is located within a Municipality designated Specialty Crop Area.

The review of the *United Counties of Stormont, Dundas and Glengarry Official Plan (July 18, 2018 Consolidation*) identified that Agriculture Resource Lands policy is provided in Section 5.3, while Waste Management Systems policy is provided in Section 4.3.5, and policy related to the Environmental Assessment Act is provided in Section 8.5. These policy Sections are provided in Appendix A, while select policy is provided as follows.

Figure 3 Land Use Schedule A3 – Township of North Stormont



Source: Land Use Schedule A3 Township of North Stormont, United Counties of Stormont, Dundas and Glengarry Official Plan (July 18, 2018 Consolidation)

Section 4.3.5.2 states "existing active or new sites (public or private) may only be operated, expanded or closed in accordance with current provincial environmental standards and approvals."

Section 4.3.5.5 states "Local Municipalities will use a 500-m radius, or such other distance recommended by the Ministry of the Environment, as a guideline for assessing the impact of a landfill site and requiring impact studies". While 500 m is recognized as a required distance for evaluating impacts from a landfill site, a 1500 m distance was used for the characterization of agriculture in this study. A 1500 m distance also relates to the upper distance limit when conducting the OMAFRA Minimum Distance Separation calculations.

Section 5.3.1 states "Agricultural Resource lands generally include lands which are Class 1-3 in the Canada Land Inventory for agricultural capability, specialty crop land, and lands used for, or related to, agricultural productivity. This may also include lands of lesser agricultural capability, woodlands, lands identified as a ***natural heritage features*** or other lands considered important to food production."

Section 5.3.2 states "Existing lots of record on prime agricultural lands may be used for non-***agricultural uses*** listed in Table 5.2 - Agricultural Resource Lands - Permitted Uses provided there are no reasonable alternate locations which avoid ***prime agricultural areas*** and where

the requirements of the Provincial Policy Statement, section 2.3.6.1, are met." Further that "The removal of top soil on prime agricultural lands shall be discouraged."

Section 5.3.4 states "
Agricultural lots shall be of a size appropriate for the type of ***agricultural uses*** common in the area and sufficiently large to maintain flexibility for future changes in operations. In this regard, the minimum lot size for new lots will be generally 40 ha in size for each of the severed and retained parcels."

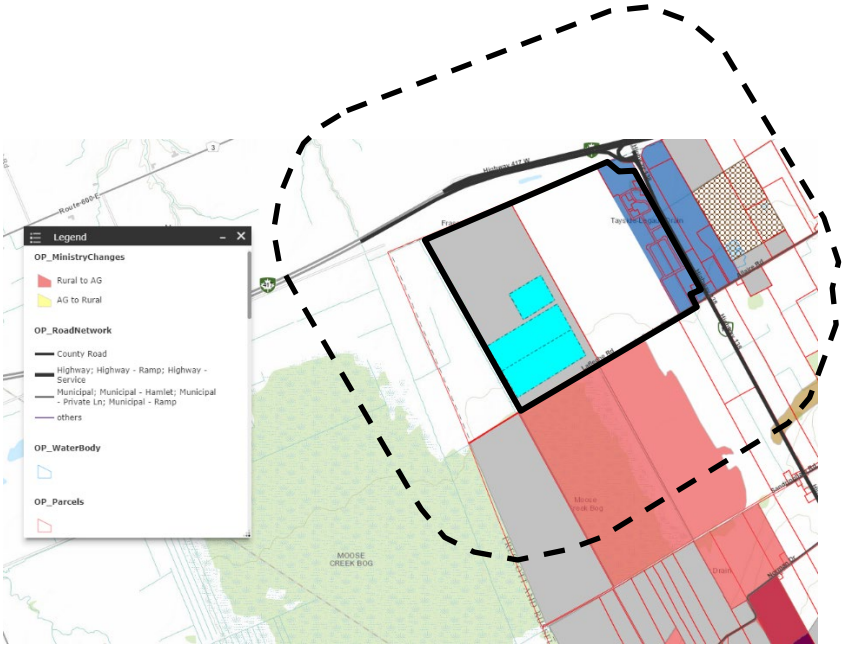
Section 8.5 states "Prior to the construction of public works or undertakings such as roads, sewage works, waste disposal facilities, and water filtration plants, a Municipality shall follow procedures under the Environmental Assessment Act. Some types of undertakings may fall into a class environmental assessment which is a more streamlined process in reviewing the environmental impacts of the proposed work."

Section 8.5.2 states "Consider reasonable alternatives: planning must consider alternatives to the undertaking which fulfill the purpose of the undertaking in functionally different ways and alternative methods of implementing a particular type of alternative. The 'do-nothing' alternative must also be considered."

The Official Plan of the United Counties of Stormont, Dundas and Glengarry was approved with modifications by the Minister on February 4, 2018 and was last consolidated on July 18, 2018. All the Land Use Schedules and a number of policies are under appeal with the Local Planning Appeal Tribunal (LPAT). Figure 4 identifies the land use designations that are under appeal (not in effect) at the time of the preparation of this Report.

The lands under appeal appear as red blocks south of Lafleche Road, immediately south of the Study Area (black outline) and are within portions of the Secondary Study Area (dashed black outline).

Figure 4 Lands Under Appeal



3.4 UNITED COUNTIES OF PRESCOTT AND RUSSEL OFFICIAL PLAN 2018

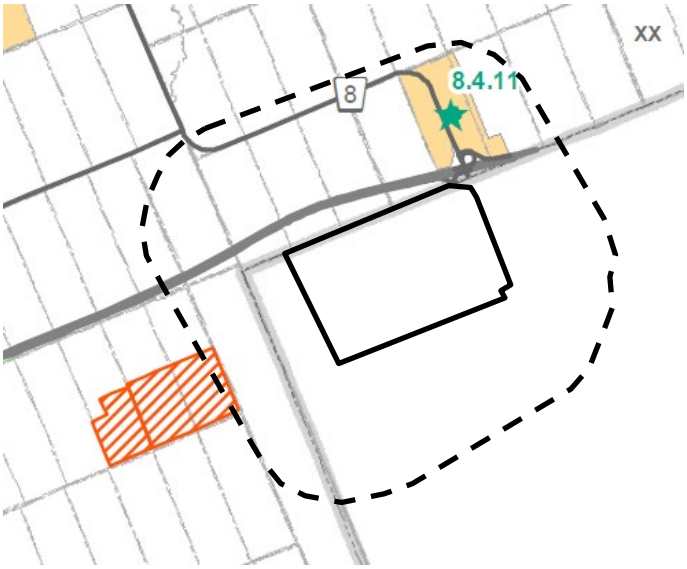
The *United Counties of Prescott and Russell Official Plan (approved February 4, 2018 – Under Appeal) (Office Consolidation November 2018)* was reviewed to determine the designated land uses within the portions of the Secondary Study Area that are within that municipality.

Figure 5 – Schedule A Land Use Designation identifies that portions of the Secondary Study Area were designated as Agriculture Resource Policy Area. Smaller areas of Rural Policy Area were noted both on the east and west sides of Highway 8 north of Highway 417. An area of Crown Land was noted to the west of the Study Area.

The approximate location of the Study Area is presented as a solid black line on Figure 5, while the approximate location of the Secondary Study Area is presented as a dashed line.

No portions of the Secondary Study Area are located within a Municipality designated Specialty Crop Area.

Figure 5 Schedule A – Land Use Designations United Counties of Prescott and Russell



COMMUNAUTÉS DURABLES - SUSTAINABLE COMMUNITIES

- Secteur des politiques urbaines - Urban Policy Area
- Secteur des politiques communautaires - Community Policy Area
- Secteur des politiques rurales - Rural Policy Area
- Secteur des politiques de commerce et industrie - Trade and Industry Policy Area
- Terres de la couronne - Crown Lands

POLITIQUES D'INFRASTRUCTURES - INFRASTRUCTURE POLICIES

SECTEUR DES POLITIQUES DE GESTION DES DÉCHETS
WASTE MANAGEMENT POLICY AREA

- Site d'enfouissement - Landfill Site
- Site de traitement des eaux usées - Waste Water Treatment Site

RESSOURCES - RESOURCES

SECTEUR DES POLITIQUES DES RESSOURCES AGRICOLES
AGRICULTURAL RESOURCE POLICY AREA

- Secteur des politiques des ressources agricoles - Agricultural Resource Policy Area

SECTEUR DES POLITIQUES DES RESSOURCES EN AGRÉGATS MINÉRAUX
MINERAL AGGREGATE RESOURCE POLICY AREA

- Sablière et/ou carrière active - Active Pit and/or Quarry

PATRIMOINE NATUREL - NATURAL HERITAGE

SECTEUR DES POLITIQUES DU PATRIMOINE NATUREL
NATURAL HERITAGE POLICY AREA

- Terre humide d'importance provinciale - Provincially Significant Wetland
- Parc Provincial Voyageur - Voyageur Provincial Park

EXCEPTIONS SPÉCIFIQUES - SITE SPECIFIC EXCEPTIONS

- 2111 Numéro de référence au texte du Plan officiel - Reference Number to the Official Plan

Source: Land Use Schedule A Land Use Designations, United Counties of Prescott and Russell Official Plan (Office Consolidation November 2018)

3.4.1 THE CORPORATION OF THE TOWNSHIP OF NORTH STOMONT ZONING BY-LAW

The *Corporation of the Township of North Stormont Zoning By-Law (#08-2014)* was reviewed to determine the extent of lands that were zoned as agriculture within the Study Area and the Secondary Study Area. The review of the zoning map (see Figure 6 below) illustrated that the Study Area is a mix of zoning that includes General Agriculture (AG), Waste Disposal (WD), and Locally Significant Wetlands (within the existing EOWHF area). Further, a review of By-Law No. 40-2015 was reviewed where it was determined that a portion of the Study Area within the existing EOWHF had a site specific application to amend the Comprehensive Zoning By-Law 08-2014 to change zoning from the "Rural (R)" and "Area of Natural and Scientific Interest (ANSI) zones to the "Waste Disposal – Exception Two (WD-2)" zone. The application was approved on July 14, 2015.

The Secondary Study Area (within the United Counties of Stormont, Dundas and Glengarry) is a mix of zoning that includes General Agricultural (AG), Highway Commercial (CH-7), Rural Industrial (MR-3), Rural (RU), Quarry in holding (H-MXQ), Quarry (MQ), Waste Disposal (WD-1), Highway Commercial (CH), Locally Significant Wetlands and an Area of Natural or Scientific Interest (ANSI)(south of the existing EOWHF and Lafleche Road).

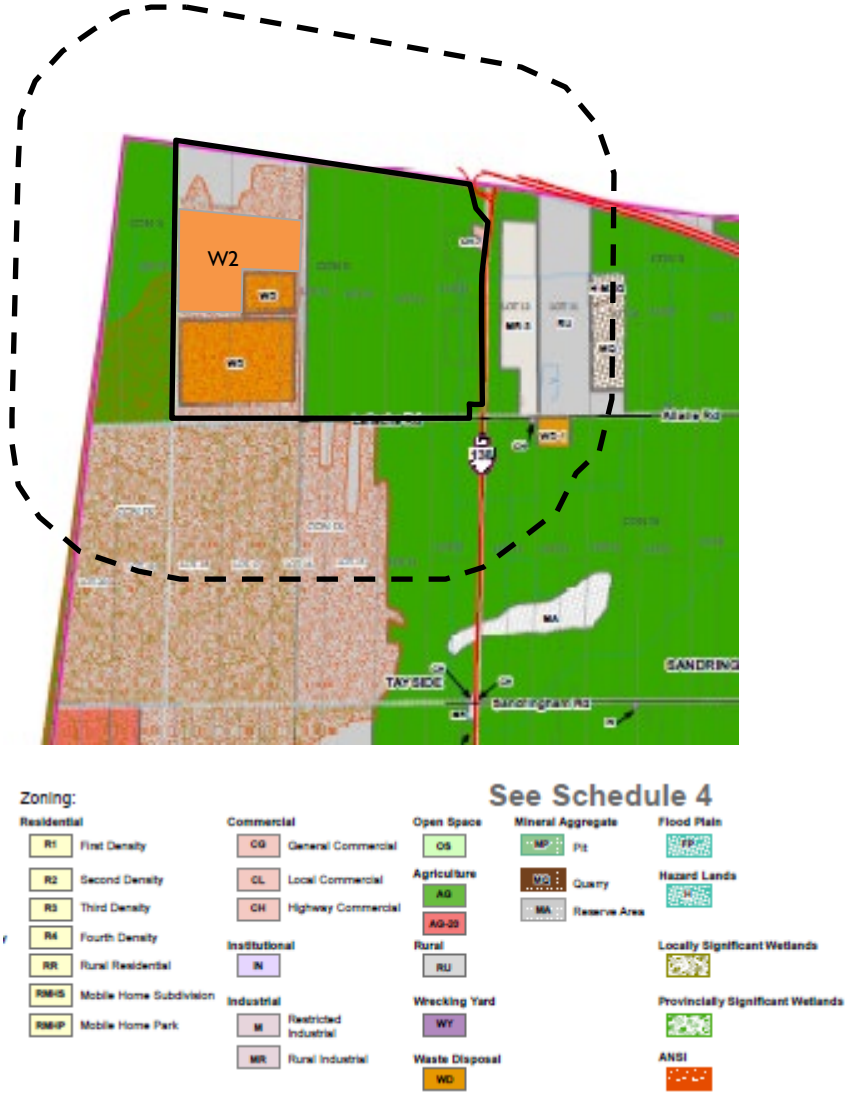
General zoning (Section 3.45) states that "Notwithstanding any provision of this By-law to the contrary, new dwellings will be prohibited in the following locations:
(1) within 150 m of any land zoned Wrecking Yard or for wrecking yard purposes
(2) within 500 m of any land zoned Waste Management."

Section 12-1-1 provides zoning information for General Agriculture. A minimum lot size was noted at 300,000 m2 (30.0 ha).

The approximate location of the Study Area is illustrated with a solid black line. The approximate location of the Secondary Study Area is illustrated with a dashed black line.

There is no zoning in place for Specialty Crop Lands.

Figure 6 Corporation of the Township of North Stormont Zoning By-Law



Source: Corporation of the Township of North Stormont Zoning By-Law (#08-2014)

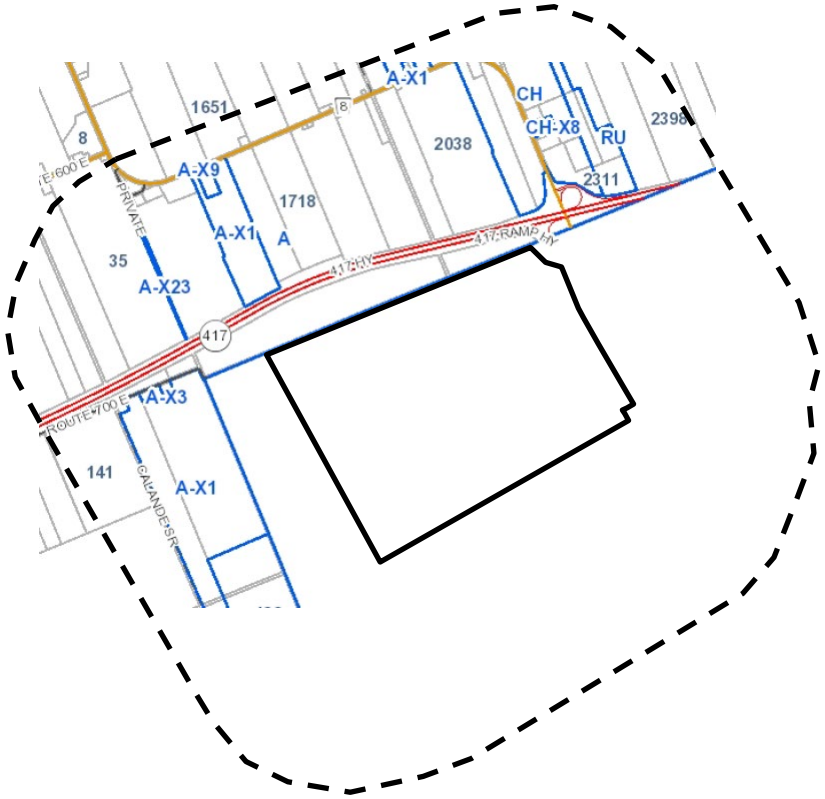
3.4.2 THE NATION MUNICIPALITY COMPREHENSIVE ZONING BY-LAW

The Nation Municipality Comprehensive Zoning By-Law (2-2006) was reviewed to determine the extent of lands that were zoned as agriculture within the Secondary Study Area located within the United Counties of Prescott and Russell. The review of the zoning map (see Figure 7 below) illustrated that the Secondary Study Area is a mix of zoning that includes Agricultural (A), Agricultural Exception (A-X), Highway Commercial Exception (CH-X), Highway Commercial (CH) and Rural (RU).

The approximate location of the Study Area is illustrated with a solid black line. The approximate location of the Secondary Study Area is illustrated with a dashed black line.

There is no zoning in place for Specialty Crop Lands.

Figure 7 The Nation Municipality Comprehensive Zoning By-Law



Source: Online Zoning By-Law, The Nation Municipality Comprehensive Zoning By-Law (2-2006)

4 AGRICULTURAL RESOURCE POTENTIAL

4.1 PHYSICAL CHARACTERISTICS

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

4.1.1 PHYSIOGRAPHY

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), the Study Area and the Secondary Study Area is located within the Winchester Clay Plain physiographic unit.

The Winchester Clay Plain is described as a clay plain that is located in an area of low relief lying almost entirely in the drainage basin of the South Nation River. Clay plains dominant the area, although there are sections of protruding till materials, a few low drumlins, shallow soils over bedrock and many hectares of bog.

The soils in the Winchester Clay Plain are mostly poorly drained, with some areas of imperfectly drained materials.

Municipal ditches have been cut to provide drainage within the clay plain.

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, aerial photo interpretation and windshield surveys.

The Study Area and the Secondary Study Area are a relatively simple mix of topography. The eastern portion of the Study Area includes very gently rolling lands, created through a process of landforming fields. The fields between the existing EOWHF and the Highway 138 consist of long narrow fields (roughly 55 m wide), with ditches between each field. The ditches are shallow to the south and are deeper to the northern portions of the Study Area. The fields between the ditches have been contoured with a slightly higher centre portion (0.5 – 1 m) that would extend higher than the edge of the fields near the ditches. This will allow for rapid surface water drainage to the nearby ditches.

The topography in the Secondary Study Area is similar to the eastern portions of the Study Area, with contoured (landformed) fields south of Lafleche Road. Relatively level to very gently

sloping lands were noted in all directions from the Study Area. The highest point of topography within the Study Area and the Secondary Study Area is located within the existing EOWHF area.

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

The Study Area and Secondary Study Area are located between the 2900 - 3100 Crop Heat Units (CHU-M1) available for corn production area in Ontario. The Crop Heat Units (CHU) index was originally developed for field corn and has been in use in Ontario for 30 years. The CHU ratings are based on the total accumulated crop heat units for the frost-free growing season in each area of the province. CHU averages range between 2500 near North Bay to over 3500 near Windsor. The higher the CHU value, the longer the growing season and greater are the opportunities for growing value crops.

Crop Heat Units for corn (based on 1971-2000 observed daily minimum and maximum temperature (OMAFRA, 2009)) map is illustrated on Figure 8. The approximate location of the Study Area and Secondary Study Area is marked with a blue star.

Figure 8 Crop Heat Units Map

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

4.2 LAND USE

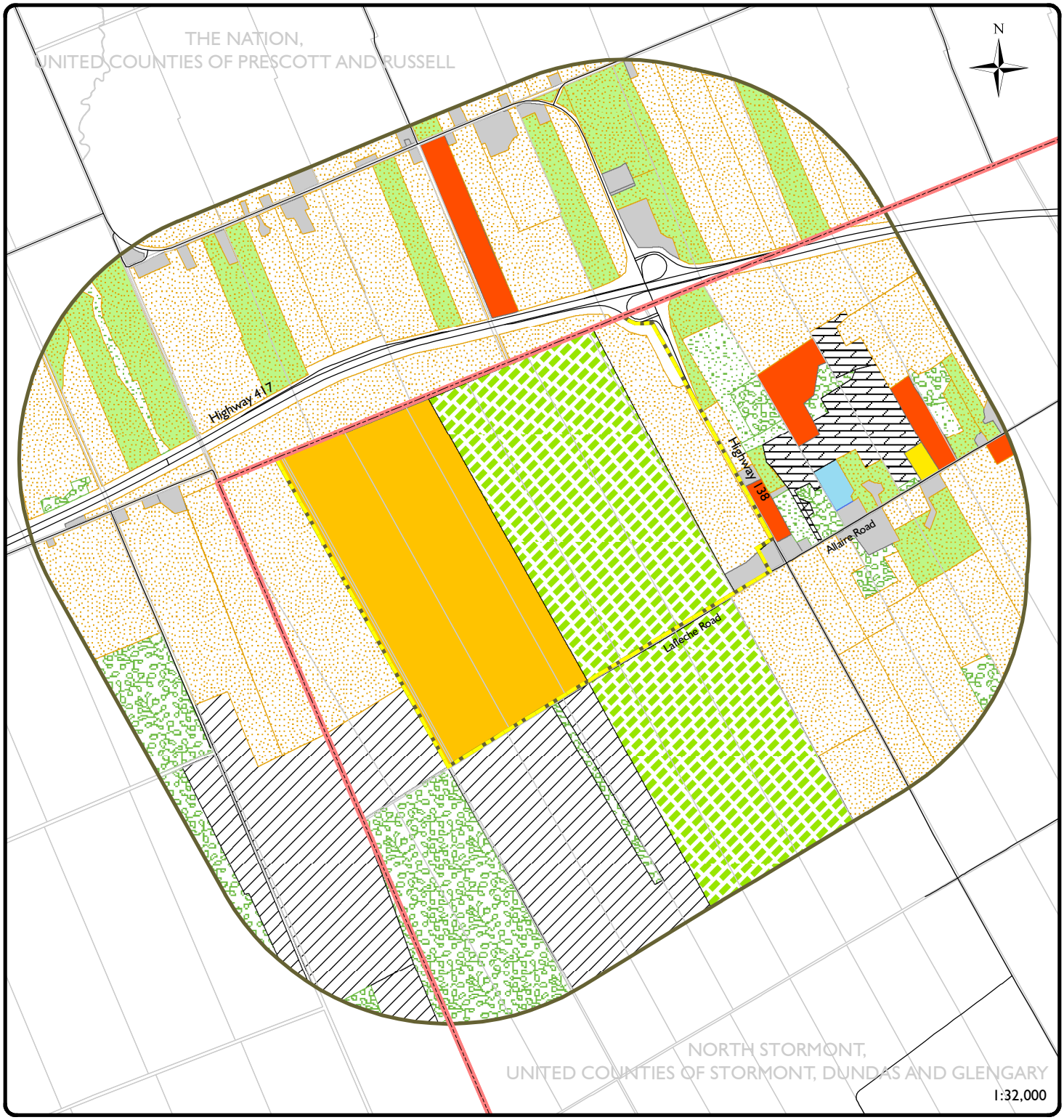
The land use for both the Study Area and the Secondary Study Area was completed through a

windshield survey (completed in September 2020) , a review of recent aerial photography, Google Earth Imagery, Bing Imagery, Birdseye Imagery, the United Counties of Stormont, Dundas and Glengarry online imagery, the United Counties of Prescott and Russell online imagery, and correlation to the OMAFRA Land Use Systems mapping. Agricultural and non-agricultural land uses are illustrated on Figure 9.

The terms used in this 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 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
- 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 windshield survey identified the types of land uses including farm and non-farm uses (built up areas, industrial, 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 at the time of the survey, through a review of on farm infrastructure (type of buildings,



Legend

- Roads
- County Boundary (MNRF)
- Lot Lines (MNRF)
- Secondary Study Area
- Study Area

Land Use

- Existing Landfill
- Built Up
- Common Field Crop
- Forage
- Grains
- Open Field
- Peat Production
- Pond
- Quarry Land
- Scrub
- Sod Production
- Woodlot

Figure 9

Land Use

DBH Soil Services Inc.

November 2020

manure system, feed (bins, bales), and types of equipment) or through any signage associated with the respective agricultural operation.

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

Agricultural cropping patterns were identified and mapped. Corn and soybean crops were mapped as common field crops. Small grains are typically characterized as including winter wheat, barley, spring wheat, oats and rye. 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).

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

Table 1 Typical Land Use Designations

Land Use Designation	Land Use Definitions
Built Up/Disturbed Areas	Residential, Commercial, Industrial, Man Modified, Existing EOWHF
Common Field Crop	Corn, Soybean, Cultivated
Forage/Pasture	Forage/Pasture
Quarry Lands	Quarry
Peat	Peat Extraction
Ponds	Ponds
Scrublands	Unused field (>5 years)
Sod	Sod Production
Small Grains	Wheat, Oats, Barley
Woodlands	Forested Areas

4.2.1 LAND USE – STUDY AREA

The Study Area land use comprises built up/disturbed areas, sod farming and smaller areas of common field crop production (corn). The western portion of the Study Area comprises a large disturbed area associated with the existing EOWHF and a constructed drain along the eastern

boundary of the existing EOWHF. The majority of the remaining lands to the east of the constructed drain (Richer & Freres Municipal Drain) are used for the production of sod. Small areas of corn (common field crop) were noted along the extreme eastern portions of the Study Area, adjacent to Highway 138. A second constructed drain was noted to the north of the mushroom farm (Tayside Legault Drain).

The Study Area comprises land uses of approximately 45.1 percent as built up areas, 11.1 percent as common field crop, and 43.8 percent as sod.

4.2.2 LAND USE – SECONDARY STUDY AREA

The Secondary Study Area consists of a variety of land uses including, but not limited to built up/disturbed areas, common field crops, forage/pasture lands, grains, open field, road corridors, open field, pond, peat extraction, quarry lands, and woodland areas.

The Secondary Study Area comprises land use of approximately 2.5 percent as built up, 45.9 percent as common field crop, 10.9 percent as forage/pasture, 2.3 percent as grains, 0.1 percent as open field, 15.8 percent as peat extraction, 0.2 percent as pond, 2.2 percent as quarry lands, 1.5 percent as scrubland, 9.0 percent as sod, and 9.6 percent as woodlands.

On review of the Land Use data it was observed that the predominant land uses in the Secondary Study Area include areas for the production of common field crops. The next greatest percent of land use is derived from forage/pasture lands, peat extraction, sod farming and woodlands.

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

Table 2 Land Use – Study Area and Secondary Study Area

Land Use Designation	Study Area Percent Occurrence	Secondary Study Area Percent Occurrence
Built Up/Disturbed Areas	45.1	2.5
Common Field Crop	11.1	45.9
Forage/Pasture	-	10.9
Grains	-	2.3
Open Field	-	0.1
Peat	-	15.8
Pond	-	0.2
Quarry Lands	-	2.2
Scrubland	-	1.5
Sod	43.8	9.0
Woodlands	-	9.6
Totals	100.0	100.0

The potential agricultural impact is the loss of lands used for the production of sod and common field crop.

4.3 AGRICULTURAL INVESTMENT

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

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

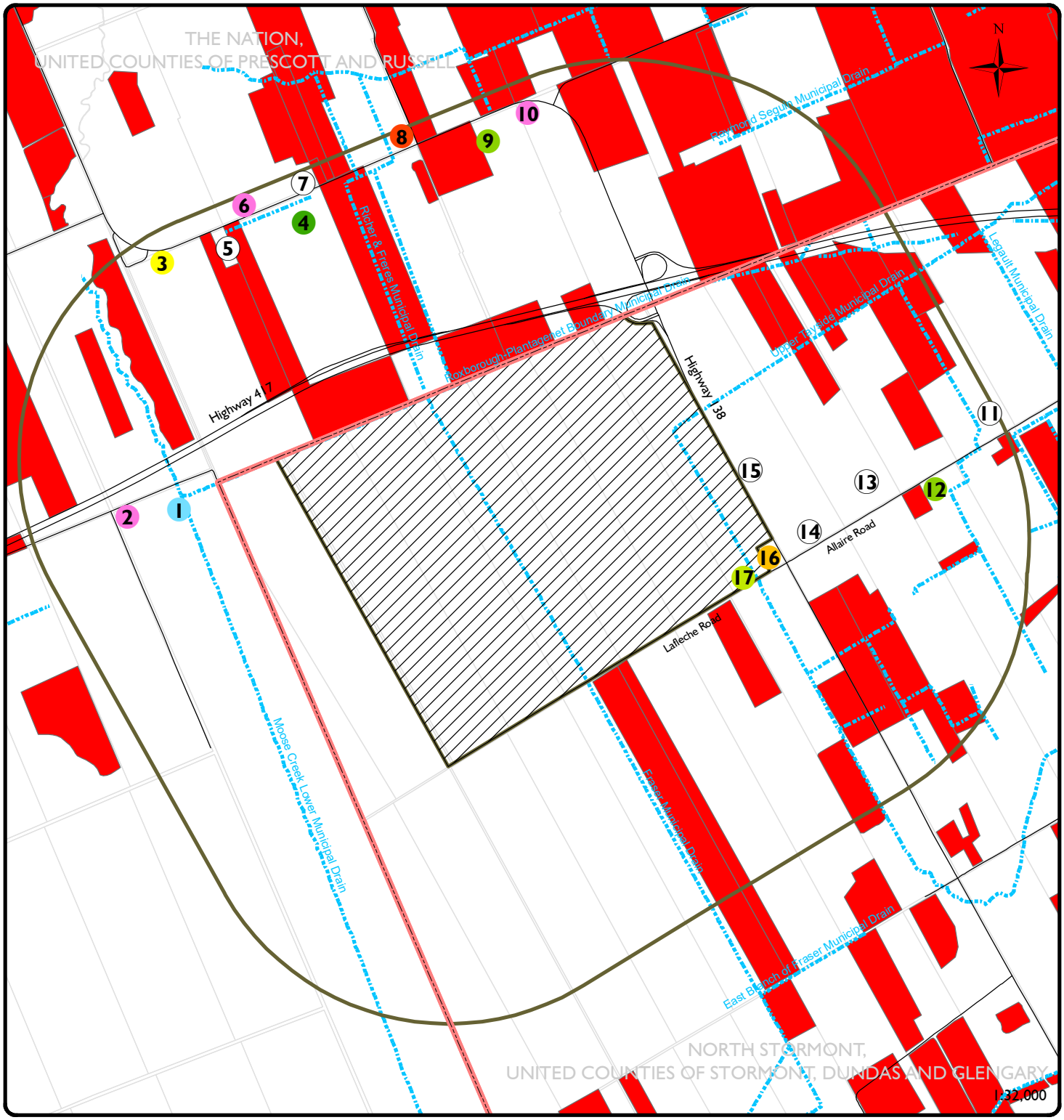
Investment in agricultural is illustrated in Figure 10 – Agricultural Investment.

4.3.1 AGRICULTURAL FACILITIES

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

Agricultural activities such as livestock rearing usually involve an investment in agricultural facilities. Dairy operations require extensive facilities for the production of milk. Poultry and hog operations require facilities specific for those operations. Beef production, hobby horse and sheep operations usually require less investment capital (when compared to dairy operations 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. Figure 10 illustrates the location of buildings, agricultural facilities and tile drainage for both the Study Area and the Secondary Study Area.



Legend

- Constructed Drains (MNRF)
- Roads
- County Boundary (MNRF)
- Lot Lines (MNRF)
- Secondary Study Area
- Study Area

Artificial Tile Drainage System Type

- Random
- Systematic

Agricultural Building Use

- Dairy
- Garage
- Grain bins/Machine Shed
- Machine Shed
- Mushroom Farm
- Old Dairy
- Poultry
- Retired
- Sod farm

Figure 10

Agricultural Investment

DBH Soil Services Inc.

September 2020

A total of 17 agricultural facilities or areas where facilities are located were identified within the Secondary Study Area.

4.3.1.1 Study Area

One building related to agricultural was observed within the Study Area (building number 17). This building is located just west of the Highway 138, along the north side of Lafleche Road, and is part of the Manderley Sod Farm.

The building is for equipment storage and maintenance of equipment for the production of sod at this location.

There are no buildings on the Study Area lands that are used for housing of or production of livestock.

4.3.1.2 Secondary Study Area

A total of 16 agricultural facility sites (active, remnant, vestige) were identified in the Secondary Study Area. These facility sites are identified on Figure 10.

Agricultural facility number 1 was located south of Concession Road 7, just west of the Study Area. This facility used to comprise a residential unit, barn, machine shed and grain handling structures. This would be considered a remnant site as the residential unit and barn have been removed, leaving the grain handling equipment and a machine shed at this location. There is no livestock at this location.

Agricultural facility number 2 was located just west of agricultural facility number 1, along the south side of Concession Road 7. There is a residential unit, a garage, and a machine shed at this location. The buildings are old and appear to be in reasonable condition (no missing roof panels or wall boards).

Agricultural facility number 3 was located along the south side of County Road 8, along the northern portion of the Secondary Study Area. This facility consists of a residential unit and a garage with upper living/storage area (outside staircase was noted). There is no livestock at this location.

Agricultural facility number 4 was located along the south side of County Road 8, along the northern portion of the Secondary Study Area. This facility consists of a residential unit, garage, machine shed, long pole barn with 2 feed bins, a smaller pole barn connected, large pole barn/machine shed. This agricultural facility appears to be a poultry facility. It is unknown if livestock are present in this facility.

Agricultural facility number 5 was located along the south side of County Road 8, along the northern portion of the Secondary Study Area. This facility comprises a residential unit, a garage/machine shed, a pole barn with extension and a concrete silo with cap. No livestock was

observed at this location. There are no pastures, pens, or fenced in yards. There are no hay bales.

Agricultural facility number 6 was located on the north side of County Road 8, along the northern portion of the Secondary Study Area. The facility is one building, a plastic covered machine shed. There are no livestock at this location.

Agricultural facility number 7 was located on the north side of County Road 8, along the north portion of the Secondary Study Area. This facility comprises a residential unit with garage, two metal grain bins, a concrete silo (capped), a pole barn with extensions, a large machine shed, two more machine sheds. A large open aired lagoon appears on the aerial imagery to the north of the facility. An overgrown pasture area was noted to the east of the barn. It appears that this location may have been a dairy operation and is now retired. There were no livestock observed at this location. There were no hay bales noted during the roadside survey.

Agricultural facility number 8 was located on the north side of County Road 8, west of Des Noyers Road. This facility comprises two residential units, a Quonset style machine shed, a pole barn with extension, a metal grain bin, two concrete silos (both capped) and an older machine shed. A large solid manure pile was noted on the aerial imagery to the north of the facility. Plastic wrapped hay bales were noted on the aerial imagery. No livestock were noted at this facility during the roadside survey. This facility may have been a dairy facility.

Agricultural facility number 9 was located on the south side of County Road 8. This facility is an active dairy operation. The facility comprises a residential unit with garage, large pole barn with extensions, a concrete silo (capped), two metal silos (capped), three metal feed bins, a metal grain bin, and two large machine sheds. A sign on the barn indicated "Ferme Piche, Westfalia, and Dairy Supplies Ltd".

Agricultural facility number 10 was located on the south side of County Road 8, along the northern portion of the Secondary Study Area. This facility comprises a residential unit and a machine shed. No livestock were noted during the roadside survey.

Agricultural facility number 11 was located along the north side of Allaire Road. This facility comprises a residential unit with garage, machine shed and pole barn. A fenced pasture area was noted between Allaire Road and the pole barn. No livestock were noted during the roadside survey. This appears to be a retired facility. This facility may have been used for horses.

Agricultural facility number 12 was located along the south side of Allaire Road. This is an active dairy operation. The facility comprises a residential unit with garage, a pole barn with extension, a concrete silo (capped), a metal silo (capped), a metal feed bin, a Quonset style machine shed, and a large plastic covered machine shed.

Agricultural facility number 13 was located along the north side of Allaire Road. This agricultural facility comprises a residential unit with garage, a machine shed and three smaller sheds. This

facility appears to be retired, with only the residential unit as the active component. No livestock were seen at this location during the roadside survey.

Agricultural facility number 14 was located along the north side of Allaire Road, just east of Highway 138. This facility comprises an overgrown pole barn with extension. This facility appears to be retired. No livestock were noted at this location during the roadside survey.

Agricultural facility number 15 was located along the east side of Highway 138, north of Allaire Road. This facility comprises a residential unit with garage and a pole barn/machine shed that appears to be used for storage. No livestock were noted during the roadside survey. No areas of pasture, pens or animal yards were observed. No feed bales or manure piles were noted.

Agricultural facility number 16 was located west of Highway 138, north of Lafleche Road. This building is a mushroom farm (Champion Mushrooms). There are no livestock at this location.

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

There is the potential loss of one agricultural building (sod farm maintenance building) as a result of a proposed future development of the EOWHF.

4.3.2 ARTIFICIAL DRAINAGE

An evaluation of artificial drainage in the Study Area and within the Secondary Study Area was completed through a correlation of observations noted during the reconnaissance roadside survey, 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 would have included observations of drain outlets to roadside ditches or surface waterways, and surface inlet structures (hickenbottom or French drain inlets). There was no observed evidence of artificial tile drainage in either the Study Area or the Secondary Study Area.

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 Land Information Ontario (LIO) in September 2020 and were reviewed to determine if an agricultural tile drainage system had been registered anywhere in the Study Area, or in the Secondary Study Area. 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 Study Area and Secondary Study Area.

As noted in Figure 10, there is no tile drainage registered to the Study Area. There is a constructed drain that crosses the Study Area from south to north along the eastern boundary of the existing EOWHF.

A review of Figure 10 illustrates the pattern of systematic tile drainage in the Secondary Study Area. There is no random tile drainage registered within the Secondary Study Area. Systematic tile drainage is noted on various lands to the north, east and south of the Study Area.

There is no net loss of tile drained lands as a result of the proposed expansion.

4.3.3 IRRIGATION

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

There is no capital investment related to irrigation systems identified within the Study Area or the Secondary Study Area.

There is not net loss of irrigation as a result of the proposed expansion.

4.3.4 LANDFORMING

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

There has been some landforming in the Study Area and the Secondary Study Area, particularly on the organic soils on the east side of the Study Area and the organic soils to the south of the Study Area, south of Lafleche Road. The landforming has been described previously in this report as a series of shallow ditches that run roughly north/south and spaced at approximately 55 m intervals. The lands between the ditches has been landformed to provide a centre ridge that forms slopes to the ditches on each side of the field.

The potential impact to agriculture due to the proposed future development of the EOWHF would be the loss of designated agricultural lands and the costs that were associated with the landforming of those lands for rapid drainage.

4.4 FRAGMENTATION

Assessment data was evaluated to determine the characteristics and the degree of land fragmentation in the Secondary Study Area. In order to evaluate land tenure, the most recent Assessment Roll mapping and Assessment Roll information from the United Counties of Stormont, Dundas and Glengarry, and the United Counties of Prescott and Russell were referenced on a property by property basis to determine the approximate location, shape and size of each parcel. The assessment of fragmentation looks at the numbers of and proximity of properties within the Study Area and the Secondary Study Area.

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."

The United Counties of Stormont, Dundas and Glengarry *Official Plan (July 18, 2018 Consolidation)* states in Section 5.3.4 Lot Sizes:

> "Agricultural lots shall be of a size appropriate for the type of ***agricultural uses*** common in the area and sufficiently large to maintain flexibility for future changes in operations. In this regard, the minimum lot size for new lots will be generally 40 ha in size for each of the severed and retained parcels. (Where SDG, NG, SG, SS, ND – Appeal Mod#13)"

The *Corporation of the Township of North Stormont Zoning By-Law (#08-2014)* states in Section 12-1-1, under zoning information for General Agriculture, that a minimum lot size is 300,000 m2 (30.0 ha).

Statistics Canada Census of Agriculture (2011) indicates 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).

Census of Agriculture (2016) data indicates 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).

In order to evaluate land fragmentation, the most recent Assessment Roll mapping and Assessment Roll information from the Corporation of the Township of North Stormont and from the Nation Municipality was referenced to determine the approximate location, shape, and size of each parcel. The approximate location and shape of each large property were provided in digital format (by HDR) to illustrate an overview of land fragmentation.

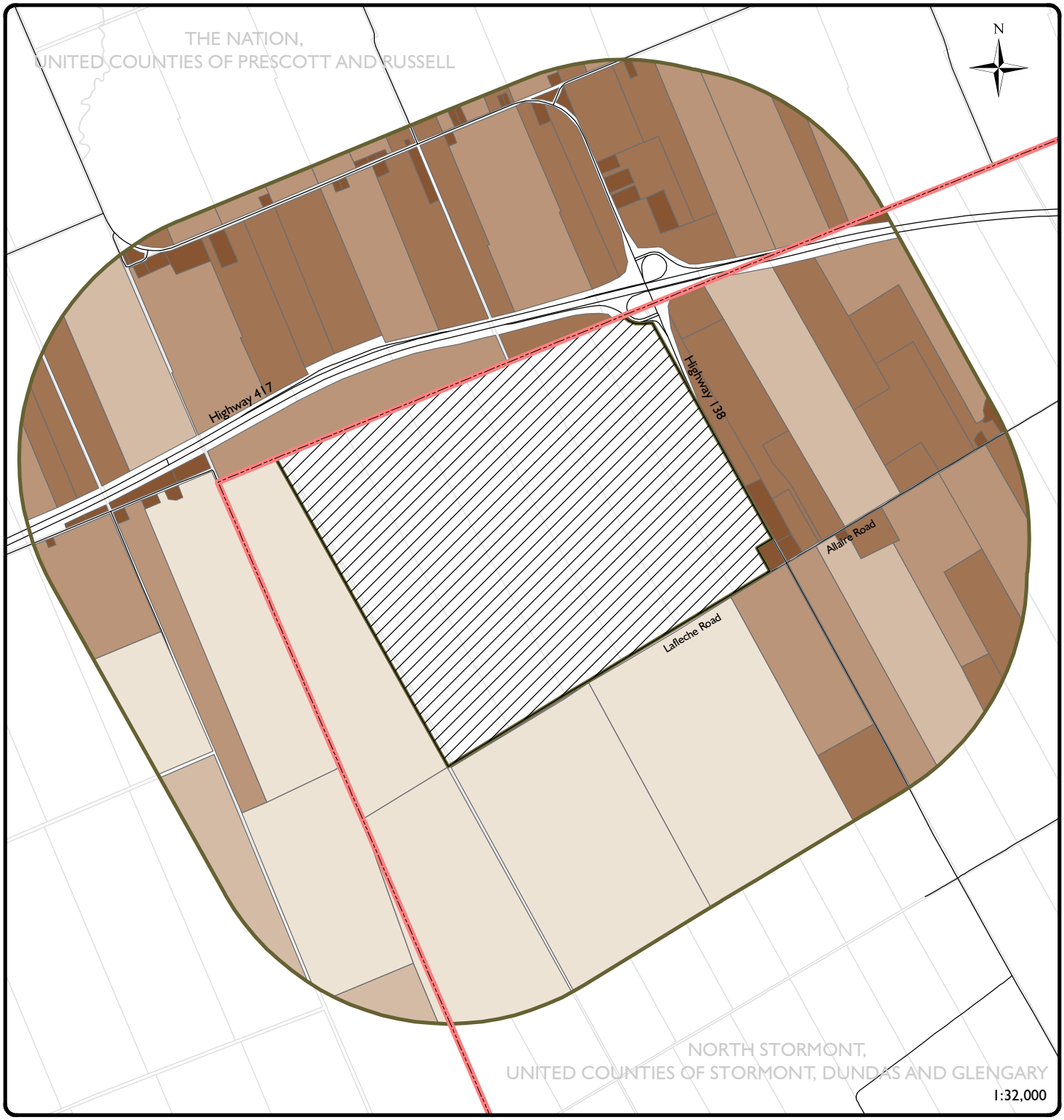
Figure 11 illustrates the complexity of the land fragmentation within the Secondary Study Area. GIS was utilized to calculate the area (in acres) of each parcel within the Secondary Study Area from which MPAC (Municipal Property Assessment Corporation) data was not available. Acre calculations were completed to allow an assessment of fragmentation in the Secondary Study Area. The Census data details information from Census farms, while the data within the Study Area and the Secondary Study Area refers to all parcel 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 11, the Secondary Study Area comprises numerous parcels of varying size. Table 3 provides a parcel count of the Secondary Study area. The parcel count for the Township reflects only the Census Farms in the 2016 census. The 2016 Census data for North Stormont recognizes a total of 224 census farms.

As illustrated in Table 3, the parcel count for the Secondary Study Area indicates the presence of numerous small parcels, and fewer larger parcels. A review of Figure 11 identifies that the majority of the smaller parcels are associated with linear development (or severed parcels) along County Road 8 in The Nation Municipality, and along Allaire Road in the Corporation of the Township of North Stormont. The larger parcels are located in the south and southwestern portions of the Secondary Study Area.

Table 3 Parcel Size and Count

Parcel Size Range	Parcel Count Secondary Study Area	Parcel Count Township of North Stormont (2016 Census)
0.0 – 9.9	58	8
10.0 – 69.9	35	37
70.0 – 129.9	14	35
130. – 179.9	1	17
>180	8	10



Legend

- Roads
- County Boundary (MNRF)
- Lot Lines (MNRF)
- Secondary Study Area
- Study Area

Acre Range

- 0 - 9.9
- 10.0 - 69.9
- 70.0 - 129.9
- 130.0 - 179.9
- > 180.0

Figure 11

Fragmentation

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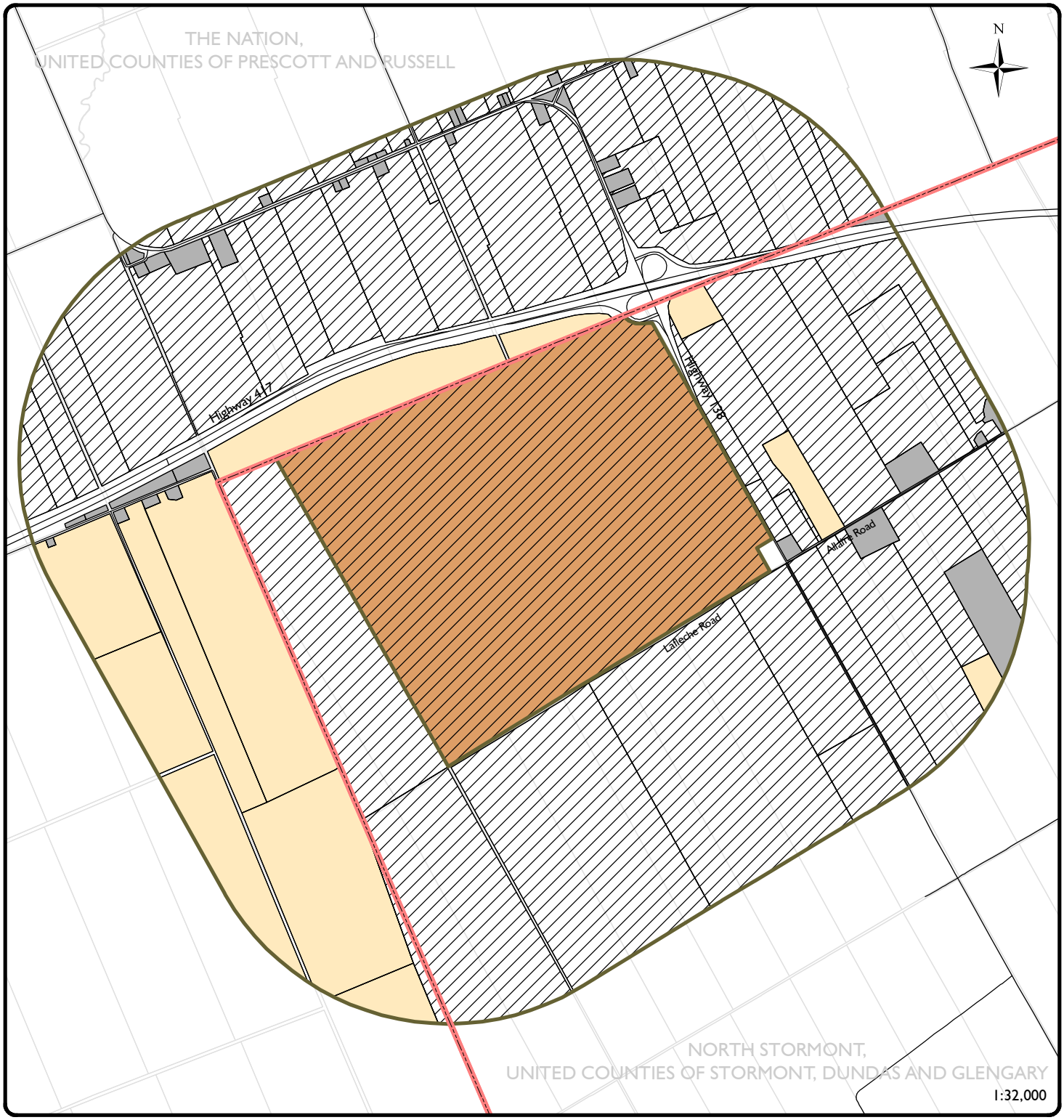
4.5 LAND TENURE

Land Tenure is the term used to define land ownership. For the purposes of an AIA, land tenure is reviewed to determine the extent of local vs non-local ownership. In order to evaluate land tenure, the most recent Assessment Roll mapping and Assessment Roll information from the Nation Municipality and the Corporation of the Township of North Stormont were referenced on a property by property basis for the Secondary Study Area, to determine the approximate location, shape and size of each parcel. The approximate location and shape of each large property were digitized into the Geographic Information System (GIS) to provide an overview of land tenure and land fragmentation.

A review of the assessment data identified that only land ownership could be determined. There was no additional data related to land rental or tenant farmers.

Locally owned parcels generally reflect the landowners desire to live and work in the immediate area. Non-locally owned parcels often reflect areas of properties purchased for speculation development. For the purposes of this study, locally owned parcels were considered as lands owned by people (or companies) who had mailing addresses, within approximately 20 km of the Study Area, while non-locally owned parcels are considered as parcels that were owned by people (or companies) that had mailing addresses that were more than 20 km from the Study Area.

As illustrated in Figure 12, the Study Area lands are considered locally owned. Within the Secondary Study Area the majority of the lands are also locally owned. A few smaller parcels located to the immediate north, and farther to the east of the Study Area are considered non-locally owned. Large blocks of land to the west of the Study Area were also noted as non-locally owned.



Legend

- Roads
- County Boundary (MNRF)
- Lot Lines (MNRF)
- Parcel/Property Boundary
- Secondary Study Area
- Study Area

Land Tenure

- Small Parcel
- Local Ownership
- Non-Local Ownership

Figure 12

Land Tenure

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4.6 SOILS AND CANADA LAND INVENTORY (CLI)

A review was completed of the soils and Canada Land Inventory (CLI) data base for the Study Area and the Secondary Study Area. 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 2020.

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 Canada Land Inventory (CLI) information within the datasets is accurate across the United Counties of Stormont, Dundas and Glengarry. In an effort to confirm the correctness of the soils and the Canada Land Inventory data on a soil series basis, the dbase data file that is associated with the United Counties of Stormont, Dundas and Glengarry soil survey complex file was exported to Excel to run a unique symbols list based on Soil Series, topography, CLI class and CLI subclass.

The unique symbols list (based on the SYMBOL1 column) provided 572 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 C. A review of this list indicated that there were some significant issues with many of the soils and the respective CLI class and/or subclass.

As noted in the list in Appendix C, the many symbols for a particular soil series would have two or more CLI classes listed for a mineral soil, and some of the classes indicated that the mineral soil was organic. Similar conditions were associated with the CLI subclass, where two or more CLI and CLI subclass combinations were associated with the soil series symbol. In many cases the difference between the CLI classification was related only to the subclass. Therefore, in those instances, the Canada Land Inventory (CLI) rating or classification for a particular soil did not change, only the subclass did which relates to a different limitation in the soil, but not a change in CLI class.

In other instances, the CLI class changed. In those instances, the change in some CLI class were related to topography. The greater the slope results in the lower the capability of the land. In those instances, the CLI class change was appropriate.

The digital soils data provided by OMAFRA has combined the soils data from three soil surveys: *The Soil Survey of Stormont County (Report No. 20 of the Ontario Soil Survey); The Soil Survey of Dundas County (Report No. 14 of the Ontario Soil Survey); and the Soil Survey of Glengarry County (Report No. 24 of the Ontario Soil Survey)*. The combination of the three surveys into one data set for the United Counties of Stormont, Dundas and Glengarry, may be the cause of the discrepancies in the CLI class and subclass ratings. The data shown on Figure 12, would illustrate the soils data from the *Soil Survey of Stormont County (Report No. 20 of the Ontario Soil Survey)* and would have the associated CLI class and subclass identified. For the purposes of this AIA, the soil and CLI data presented on Figure 12 is considered appropriate in soil code and CLI rating.

4.6.1 SOIL CAPABILITY FOR AGRICULTURE

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

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

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

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

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

Class 3 - Soils in this class have moderately severe limitations that reduce the choice of crops or require special conservation practices. The limitations are more severe than for Class 2 soils. They affect one or more of the following practices: timing and ease of tillage; planting and harvesting; choice of crops; and methods of conservation. Under good management these soils are fair to moderately high in productivity for a wide range of common field crops.

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

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

Feasible improvement practices may include clearing of bush, cultivation, seeding, fertilizing or water control.

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

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

With respect to the soils and Canada Land Inventory (CLI) identified in the Study Area and Secondary Study Area, 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 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 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 P - Stoniness

Class 2P: Surface stones cause some interference with tillage, planting and harvesting; stones are 15-60 cm in diameter, and occur in a range of 1-20 m apart, and occupy <3% of the surface area. Some stone removal is required to bring the land into production.

Class 3P: Surface stones are a serious handicap to tillage, planting, and harvesting; stones are 15-60 cm in diameter, occur 0.5-1m apart (20-75 stones/100 m), and

occupy 3-15% of the surface area. The occasional boulder >60 cm in diameter may also occur. Considerable stone removal is required to bring the land into production. Some annual removal is also required.

Class 4P: Surface stones and many boulders occupy 3-15% of the surface. Considerable stone and boulder removal is needed to bring the land into tillable production. Considerable annual removal is also required for tillage and planting to take place.

Class 5P: Surface stones 15-60 cm in diameter and/or boulders >60 cm in diameter occupy 15- 50% of the surface area (>75 stones and/or boulders/100 m).

Class 6P: Surface stones 15-60 cm in diameter and/or boulders >60 cm in diameter occupy >50% of the surface area.

Subclass R – Shallow to Bedrock

CLI Subclass R denotes soils where the depth of the rooting zone is restricted by consolidated bedrock. Consolidated bedrock, if it occurs within 100 cm of the surface, reduces available water holding capacity and rooting depth.

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.

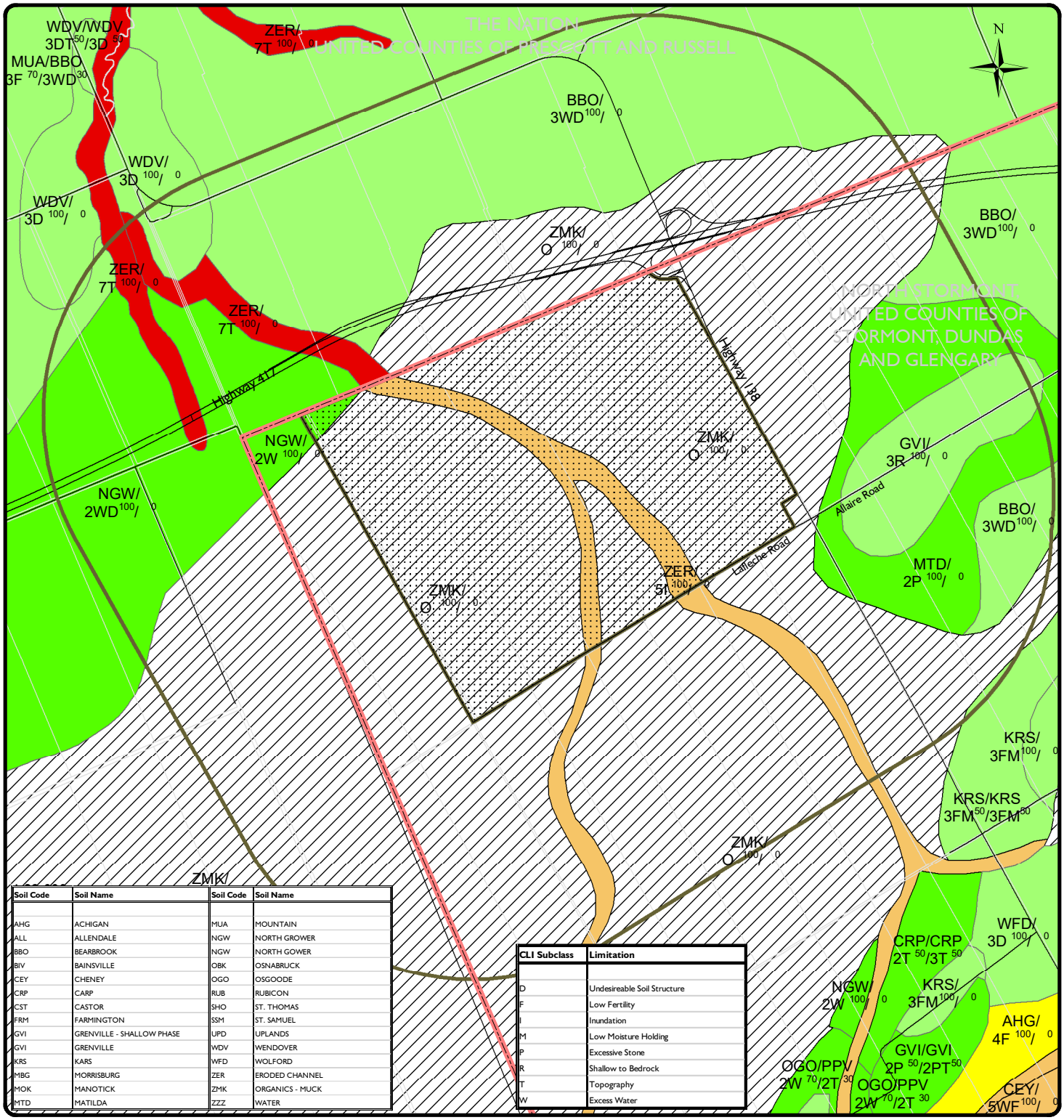
Subclass W – Excess Water

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 – Soils and Canada Land Inventory (CLI) illustrates the OMAFRA digital soils data for the Study Area and the Secondary Study Area. The OMAFRA soils data base has not removed or discounted soils from roads, rails, urban or developed areas.

It should also be noted that the soils data presented by OMAFRA includes a primary and secondary component. Figure 13 illustrates the primary and secondary components as labels



Soil Code	Soil Name	Soil Code	Soil Name
AHG	ACHIGAN	MUA	MOUNTAIN
ALL	ALLENDALE	NGW	NORTH GROWER
BBO	BEARBROOK	NGW	NORTH GOWER
BIV	BAINSVILLE	OBK	OSNABRUCK
CEY	CHENEY	OGO	OSGOODE
CRP	CARP	RUB	RUBICON
CST	CASTOR	SHO	ST. THOMAS
FRM	FARMINGTON	SSM	ST. SAMUEL
GVI	GRENVILLE - SHALLOW PHASE	UPD	UPLANDS
GVI	GRENVILLE	WDV	WENDOVER
KRS	KARS	WFD	WOLFORD
MBG	MORRISBURG	ZER	ERODED CHANNEL
MOK	MANOTICK	ZMK	ORGANICS - MUCK
MTD	MATILDA	ZZZ	WATER

CLI Subclass	Limitation
D	Undesireable Soil Structure
F	Low Fertility
I	Inundation
M	Low Moisture Holding
P	Excessive Stone
R	Shallow to Bedrock
T	Topography
W	Excess Water

Legend

- Roads
- County Boundary (MNRF)
- Lot Lines (MNRF)
- Secondary Study Area
- Study Area

Canada Land Inventory

- Class 1
- Class 2
- Class 3
- Class 4
- Class 5
- Class 6
- Class 7
- Organic Soil
- Water Body

Soil Code 1 — KRS/KRS — Soil Code 2

Percent Occurrence in Polygon

3FM50/3FM50

Canada Land Inventory (CLI) Class — Canada Land Inventory (CLI) Subclass

Figure 13

OMAFRA Soils
and
Canada Land Inventory (CLI)

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within each soil polygon. As an example, a label of $2T^{50}/1^{50}$ indicates that the soil polygon has a primary and secondary component, with the primary component a CLI class 2T of 50 percent area, and a secondary component of CLI class 1 also at 50 percent of the area. Some soil polygon labels may show a $2FM^{100}/^{0}$, which indicates that the soil polygon has only a primary soil component at 100 percent, and the secondary component at 0 percent.

For the purposes of the comparison of soils data between the Study Area and the Secondary Study Area, Table 4 illustrates the soils data as derived by percent occurrence within the respective polygons. Table 4 summarizes the relative percent area occupied by each capability class for the Study Area and Secondary Study Area.

Table 4 Canada Land Inventory – Study Area and Secondary Study Area

Canada Land Inventory Class (CLI)	Study Area Percent Occurrence	Secondary Study Area Percent Occurrence
Class 1	-	-
Class 2	0.8	16.0
Class 3	-	25.3
Class 4	-	-
Class 5	9.2	1.9
Class 6	-	-
Class 7	-	2.3
Not Rated	90.0	54.5
Totals	100.0	100.0

The Study Area comprises approximately 0.8 percent Canada Land Inventory (CLI) capability of Class 1 – 3. Approximately 9.2 percent of the Study Area is CLI Class 5 land. Approximately 90.0 percent of the Study Area is considered as Not Rated lands including built up areas, roads, landfill areas and organic soils.

The Secondary Study Area comprises approximately 41.3 percent Canada Land Inventory (CLI) capability of Class 1 - 3. Approximately 1.9 percent of the Secondary Study Area is Class 5 lands, 2.3 percent as Class 7 lands, and the remaining 54.5 percent as Not Rated including built up areas, roads, landfill areas and organic soils.

4.6.2 DETAILED SOIL SURVEY OF THE STUDY AREA

Basic soils (and Canada Land Inventory classification (CLI)) information was provided in the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) soils and mapping report titled the *Soil Survey of Stormont County*, Report No. 20 of the Ontario Soil Survey (Matthews, B.C, and N.R. Richards, 1954). Digital mapping was provided by the Ontario Ministry of Agricultural, Food and Rural Affairs (OMAFRA) through the Land Information Ontario (LIO) warehouse website. The digital mapping was provided at a scale of 1:50000. Mapping at this scale is of a general nature when referring to site-specific planning; therefore, detailed soils or

soil verification assessments are often required for farm scale or lot size planning initiatives and applications for amendments to Official Plans and /or Zoning By-Laws.

With this in mind, a detailed soil survey was completed for the area of the proposed future development of the Study Area. The detailed soil survey was completed by following the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) *Guidelines for Detailed Soil Surveys for Agricultural Land Use Planning* (May 31, 2004). These guidelines were created in response to concerns with the accuracy of published mapping and classification of soil materials and that the existing information is of too general a nature to adequately describe and interpret the soil properties for site-specific planning purposes. A detailed onsite soil survey and surrounding land reconnaissance survey were conducted over two days (June 18 and June 19, 2020).

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

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

Depth to free water within one metre of the soil surface was also recorded at inspection sites located on lower slope positions (or where applicable). Names for the soil series and the Canada Land Inventory (CLI) ratings were assigned to each soil polygon by correlating the soil series with soils information presented in *Soil Survey of Stormont County, Report No. 20 of the Ontario Soil Survey (Matthews, B.C, and N.R. Richards, 1954),* the digital soils data, and with the CLI information presented on the 1:50000 scale manuscript mapping.

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

- The majority of the Study Area lands associated with the proposed future development were used for the production of sod, with a smaller area, adjacent to Highway 138, used for the production of common field crop (corn) during the 2020 growing season.
- There was one building on the Study Area (associated with the sod production, equipment maintenance).
- The lands are very gently sloping, with predominantly long simple sloped areas.
- Shallow narrow ditches were located approximately 55 m apart running from roughly Lafleche Road to the north (parallel to Highway 138).

- The lands between these ditches have been modified with a higher centre area and lower areas near the ditches to facilitate surface water and shallow ground water runoff.
- The majority of the Study Area lands in the proposed future development area are deep organic soils (dry, due to the shallow ditches). Mineral soils were noted to the east side, nearer Highway 138.

A total of 115 soil inspection sites were examined on the proposed future development portion of the Study Area. The soil inspection information is provided in Appendix D. The soil inspection information was correlated with soil descriptions in *Soil Survey of Stormont County*, Report No. 20 of the Ontario Soil Survey (Matthews, B.C, and N.R. Richards, 1954) and the OMAFRA digital soils data (Land Information Ontario, 2018), prior to the production of the soils map in Figure 13. Soil names used in the identification of the soil series on Figure 14 were taken from the *Soil Survey of Stormont County*, Report No. 20 of the Ontario Soil Survey (Matthews, B.C, and N.R. Richards, 1954).

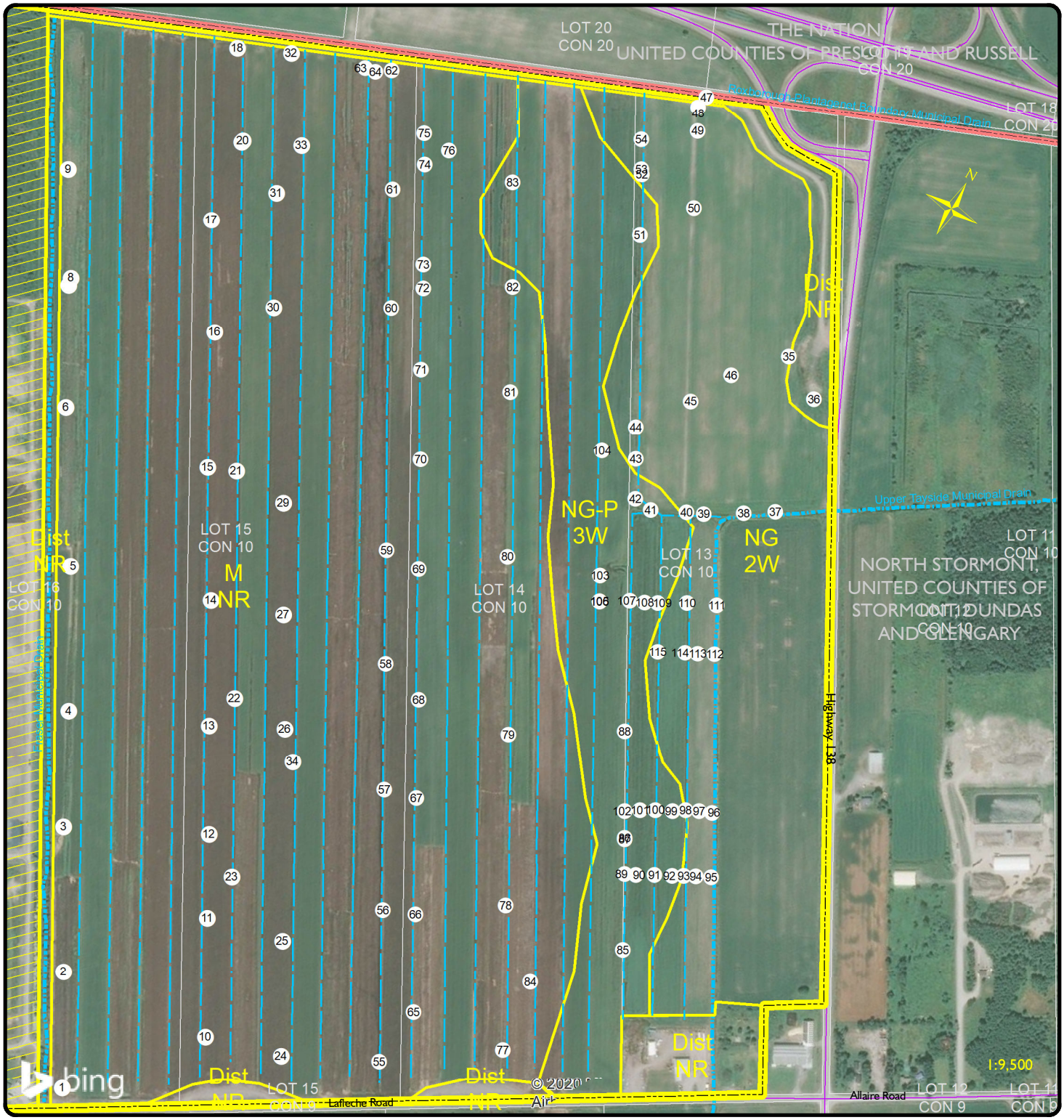
The onsite soil survey identified three soil series and one miscellaneous nonsoil group. The three soil series were identified as: Muck (Organic); North Gower – Peaty Phase; and North Gower. The miscellaneous nonsoil group comprised areas that have been disturbed (roads, loading areas, constructed drains, building footprint and areas associated with the building footprint (yard, parking areas)). For the purposes of this soil survey, the shallow narrow ditches were not pulled out as a disturbed area due to their relative size. The relative locations of the shallow narrow ditches have been identified on Figure 14 as a dashed line overlay.

Muck (Organic) soils are described as organic soils with more than 45.7 cm or organic material overlying mineral soils. The natural vegetation of these areas was generally elm, tamarack and cedar.

The North Gower soil series is the poorly drained member of the Carp soil series. The North Gower soils are fine textured (clay, clay loam) that occur on level to depressional topography. The parent materials are usually stone free.

The North Gower – Peaty Phase soil series is the poorly drained member of the Carp soil series with a thin organic soil cap (generally less than the 45.7 cm of organic material). The North Gower – Peaty Phase soils are fine textured (clay, clay loam) that occur on level to depressional topography. The parent materials are usually stone free.

A review of Figure 14 illustrates that the majority of the Study Area proposed future development lands are Muck or Organic soil materials. The Muck soils are located in the central and western portions of the proposed future development lands in the Study Area. The mineral soils are located to the eastern portions of the proposed future development land. There is a band of mineral soil with a peaty cap (Peaty Phase) located between the mineral soil and the organic soil.



Legend

- Soil Inspection Site
- Constructed Drains (MNRF)
- Field Surface Drains
- Roads
- County Boundary (MNRF)
- Existing Landfill Area
- Lot Lines (MNRF)
- Soil Polygon Boundary
- Study Area

Soil Code

NG - North Gower
NG-P - North Gower Peaty Phase
M - Muck (Organic)

NG — Soil Code 1
2W — Canada Land Inventory (CLI) Subclass / Canada Land Inventory (CLI) Class

CLI Subclass

W - Excess water
NR - Not Rated

Figure 14

Onsite Soils
and
Canada Land Inventory (CLI)

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North Gower soils on simple slopes were rated as 2W, while the North Gower – Peaty Phase soils were rated as CLI class 3W. Disturbed soil areas (associated with constructed drains, buildings, parking areas and work yards are not rated in the CLI system, but have been given a Not Rated designation.

Table 5, Canada Land Inventory (CLI) for the detailed soil survey of the proposed future development lands indicates that approximately 30.6 percent of the area is considered CLI Class 1-3 lands (Prime Agricultural Lands). The remaining portion (approximately 69.4 percent) is considered as Not Rated.

Table 5 Canada Land Inventory – Detailed Soil Survey Proposed Future Development Lands

Canada Land Inventory Class (CLI)	Area (ha)	Percent Occurrence
Class 1	-	-
Class 2	45.2	18.6
Class 3	29.1	12.0
Class 4	-	-
Class 5	-	-
Class 6	-	-
Class 7	-	-
Not Rated	168.3	69.4
Totals	242.6	100.0

4.7 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 the Study Area and Secondary Study Area were located outside the Prime Agricultural Area of the Agricultural Land Base of the Greater Golden Horseshoe.

A review of the online Agricultural System Portal (OMAFRA) indicated that there were no farmers markets, pick your own operations, nurseries, specialty farms (crop or livestock), frozen food manufacturing, refrigerated warehousing/storage, livestock assets or abattoirs in the Study Area or Secondary Study Area. A copy of the online image has been provided in Figure 15 – Agricultural Systems Portal Mapping. This figure includes a large area (Township scale coverage) around the Study Area and the Secondary Study Area, for the purposes of identifying agricultural services and networks in the local community.

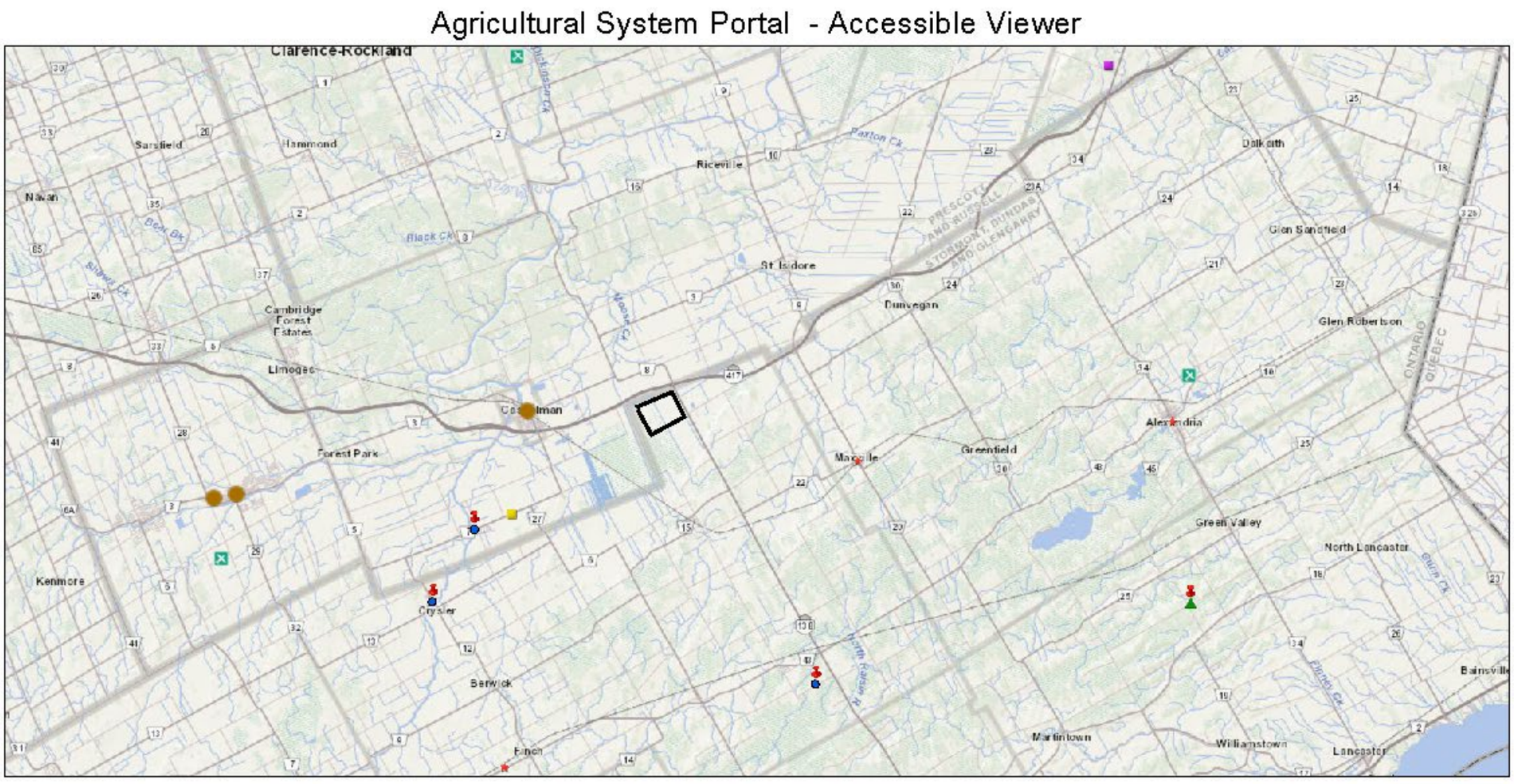
A brewery is identified in the hamlet of Casselman. Renders, meat plants and abattoirs were noted approximately 10 – 12 km to the west, while a farmer's market was noted in the hamlet of Maxville to the east.

As illustrated in this image there are no agricultural services within the Study Area or Secondary Study Area.

The closest transportation network (major roadway) is Highway 417 which is located immediately north of the existing EOWHF and the proposed future development area. Highway 138 runs immediately east of the proposed future development and has direct access to Highway 417.

The proposed expansion of the Eastern Ontario Waste Handling Facility should have no impact to the agricultural system or network.

Figure 15 Agricultural Systems Mapping (OMAFRA)



4.8 AGRICULTURAL CENSUS DATA

A review of the Census of Agricultural data (Census 2016, including 2006 and 2011 data) was completed to determine the agricultural characteristics of the United Counties of Stormont, Dundas and Glengarry and the Corporation of the Township of North Stormont, and to allow comparison to the agricultural characteristics on the Study Area and Secondary Study Area.

4.8.1 UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY

Table 6 provides Census 2016 data for agricultural land use in the United Counties of Stormont, Dundas and Glengarry and provides a comparison to the Provincial Census 2011 agricultural data. As indicated in the census data, the United Counties of Stormont, Dundas and Glengarry comprise approximately 3.85 percent of the total area of farms in Ontario (Census 2016).

Table 6 United Counties of Stormont, Dundas and Glengarry Census 2016 Data – Land Use

Item	Stormont, Dundas and Glengarry	Province	Percent of province	Percent from 2011
Land Use, 2016 Census (acres)				
Land in crops	367,943	9,021,298	4.08	2.85
Summerfallow land	1,102	15,885	6.94	109.90
Tame or seeded pasture	11,539	514,168	2.24	-22.63
Natural land for pasture	16,099	783,566	2.05	-32.07
Christmas trees, woodland & wetland	62,249	1,542,637	4.04	-2.56
All other land	16,639	470,909	3.53	-1.11
Total area of farms	475,571	12,348,463	3.85	-0.43

Table 7 provides a more detailed inventory of agricultural lands and it is evident from this data that United Counties of Stormont, Dundas and Glengarry comprises a large land base for common field crops (corn and soybean) and forage/hay crops (as based on Census farm data). Winter wheat is also a major crop within United Counties of Stormont, Dundas and Glengarry. A further review indicates that United Counties of Stormont, Dundas and Glengarry is a significant producer of strawberries and raspberries, accounting for over 4.01 percent and 4.41percent of the provincial acreage in production.

Table 7 United Counties of Stormont, Dundas and Glengarry Census 2016 Data - Crops

Item	Stormont, Dundas & Glengarry	Province	Percent of province	Percent from 2011
Major Field Crops, 2016 Census (acres)				
Winter wheat	2,974	1,080,378	0.28	292.87
Oats for grain	1,462	82,206	1.78	-14.10
Barley for grain	4,871	103,717	4.70	-12.47
Mixed grains	590	92,837	0.64	0.68
Corn for grain	130,660	2,162,004	6.04	2.17

Corn for silage	14,562	295,660	4.93	8.61
Hay	67,876	1,721,214	3.94	-19.78
Soybeans	132,991	2,783,443	4.78	22.81
Potatoes	45	34,685	0.13	275.00
Major Fruit Crops, 2016 Census (acres)				
Total fruit crops	403	51,192	0.79	6.61
Apples	216	15,893	1.36	1.89
Sour Cherries	0	2,121	0.00	-100.00
Peaches	0	5,232	0.00	-
Grapes	27	18,718	0.14	3.85
Strawberries	118	2,915	4.05	51.28
Raspberries	30	680	4.41	-30.23
Major Vegetable Crops, 2016 Census (acres)				
Total vegetables	x	135,420	-	-
Sweet corn	129	22,910	0.56	-29.51
Tomatoes	28	15,744	0.18	33.33
Green peas	3	16,268	0.02	-75.00
Green or wax beans	24	9,732	0.25	-40.00

Table 7 also illustrates the change in production (percent) from 2011. The Census data indicates a significant reduction in grain production (oats and barley), and a reduction in hay, while there has been an increase in the production of soybeans and winter wheat.

Table 8 illustrates the 2016 livestock census data. As shown in Table 8, United Counties of Stormont, Dundas and Glengarry provides a significant portion of the total cattle and calves and dairy cows for the Province. When compared to the 2011 Census data, there have been decreases in all livestock inventories. There has been an increase in total hens and chicken production since 2011.

Table 8 United Counties of Stormont, Dundas and Glengarry Census 2016 Data - Livestock

Item	Stormont, Dundas & Glengarry	Province	Percent of province	Percent from 2011
Livestock Inventories, 2016 Census (number)				
Total cattle and calves	57,741	1,623,710	3.56	-17.26
Steers	1,502	305,514	0.49	-0.33
Beef cows	4,380	236,253	1.85	-19.40
Dairy cows	24,284	311,960	7.78	-10.25
Total pigs	46,553	3,534,104	1.32	-12.71
Total sheep and lambs	8,874	321,495	2.76	-16.96
Poultry Inventories, 2016 Census (number)				
Total hens and chickens	981,687	50,759,994	1.93	45.38
Total turkeys	x	3,772,146	-	-

4.8.2 CORPORATION OF THE TOWNSHIP OF NORTH STORMONT

A review of Census 2016 data for the Corporation of the Township of North Stormont reveals that the total area in farms is 87,515 acres, as based on Census Farms. The majority of the farmed land is in crops with a total of 71, 281 acres. The remaining lands are listed as tame or seed pasture, natural land for pasture, and Christmas trees, woodlands and wetlands.

Table 9 provides Census 2016 data for agricultural land use in the Corporation of the Township of North Stormont and provides a comparison to the Provincial Census 2011 agricultural data. As indicated in the census data, the Corporation of the Township of North Stormont comprise approximately 0.71 percent of the total area of farms in Ontario (Census 2016).

Table 9 Corporation of the Township of North Stormont Census Data (2016)

Item	North Stormont	Province	Percent of province	Percent from 2011
Land Use, 2016 Census (acres)				
Land in crops	71,281	9,021,298	0.79	15.35
Summerfallow land	x	15,885	-	-
Tame or seeded pasture	1,450	514,168	0.28	-22.50
Natural land for pasture	1,793	783,566	0.23	-34.71
Christmas trees, woodland & wetland	9,704	1,542,637	0.63	9.29
All other land	x	470,909	-	-
Total area of farms	87,515	12,348,463	0.71	12.12

Table 10 provides a breakdown of the major field crops in the Corporation of the Township of North Stormont and provides a comparison of the Townships contribution to the Provincial totals.

The 2016 Census data illustrates that corn for silage, and soybeans are the major field crops grown in Corporation of the Township of North Stormont. In comparison to the 2011 Census data there has been a decrease in oats for grain, mixed grains and hay. There have been increases in the production of soybean, corn for grain and corn for silage. The Corporation of the Township of North Stormont has limited production in major fruit crops and major vegetable crops.

Table 10 Corporation of the Township of North Stormont Census 2016 - Crops

Item	North Stormont	Province	Percent of province	Percent from 2011
Major Field Crops, 2016 Census (acres)				
Winter wheat	982	1,080,378	0.09	-
Oats for grain	221	82,206	0.27	-12.65
Barley for grain	1,194	103,717	1.15	-2.69
Mixed grains	0	92,837	0.00	-100.00
Corn for grain	26,736	2,162,004	1.24	13.04
Corn for silage	2,824	295,660	0.96	20.22
Hay	9,804	1,721,214	0.57	-16.80
Soybeans	26,999	2,783,443	0.97	51.43
Potatoes	0	34,685	0.00	-
Major Fruit Crops, 2016 Census (acres)				
Total fruit crops	x	51,192	-	-
Apples	24	15,893	0.15	71.43
Sour Cherries	x	2,121	-	-
Peaches	0	5,232	0.00	-
Grapes	0	18,718	0.00	-
Strawberries	x	2,915	-	-
Raspberries	7	680	1.03	-
Major Vegetable Crops, 2016 Census (acres)				

Total vegetables	47	135,420	0.03	123.81
Sweet corn	x	22,910	-	-
Tomatoes	x	15,744	-	-
Green peas	0	16,268	0.00	-
Green or wax beans	1	9,732	0.01	-

Table 11 illustrates the census data (2016) for livestock for the Corporation of the Township of North Stormont. As indicated below, the Corporation of the Township of North Stormont accounts for approximately 1.49 percent of the provincial Dairy Cow inventory and has limited input to other livestock or poultry inventories.

Table 11 Corporation of the Township of North Stormont Census 2016 - Livestock

Item	North Stormont	Province	Percent of province	Percent from 2011
Livestock Inventories, 2016 Census (number)				
Total cattle and calves	10,452	1,623,710	0.64	-6.58
Steers	376	305,514	0.12	210.74
Beef cows	538	236,253	0.23	9.57
Dairy cows	4,645	311,960	1.49	-8.18
Total pigs	x	3,534,104	-	-
Total sheep and lambs	1,136	321,495	0.35	2.25
Poultry Inventories, 2016 Census (number)				
Total hens and chickens	x	50,759,994	-	-
Total turkeys	x	3,772,146	-	-

Table 12 provides a side by side comparison of the Corporation of the Township of North Stormont and the United Counties of Stormont, Dundas and Glengarry 2016 Census data. Table 12 also provides a calculation of the percent occurrence of the Corporation of the Township of North Stormont agricultural census data as a comparison to the United Counties of Stormont, Dundas and Glengarry agricultural census data.

As illustrated in Table 12, the Corporation of the Township of North Stormont provides significant contribution to the major field crop agricultural crops in United Counties of Stormont, Dundas and Glengarry, as evidenced by values of 14.4 to 33.3 percent of the county totals. The Corporation of the Township of North Stormont contribution to the major fruit crops production in United Counties of Stormont, Dundas and Glengarry illustrates input limited to apples and raspberries, with contributions of 11.1 and 23.3 percent of the county total. The Corporation of the Township of North Stormont contribution to the major vegetable crop production is limited to green beans with 1 acre of the county total of 24 acres.

Table 12 Comparison of Township and County Census Data 2016 - Crops

Item	North Stormont	Stormont, Dundas and Glengarry	Percent of Stormont, Dundas and Glengarry
Major Field Crops, 2016 Census (acres)			
Winter wheat	982	2,974	**33.0**
Oats for grain	221	1,462	15.1
Barley for grain	1,194	4,871	24.5
Mixed grains	0	590	0.
Corn for grain	26,736	130,660	20.5
Corn for silage	2,824	14,562	19.4
Hay	9,804	67,876	14.4
Soybeans	26,999	132,991	20.3
Potatoes	0	45	0.0
Major Fruit Crops, 2016 Census (acres)			
Total fruit crops	x	403	0.0
Apples	24	216	11.1
Sour Cherries	x	0	0.0
Peaches		0	0.0
Grapes	0	27	0.0
Strawberries	x	118	0.0
Raspberries	7	30	23.3
Major Vegetable Crops, 2016 Census (acres)			
Total vegetables	47	x	0.0
Sweet corn	x	129	0.0
Tomatoes	x	28	0.0
Green peas	0	3	0.0
Green or wax beans	1	24	4.2

Table 13 provides a comparison of the Corporation of the Township of North Stormont and the United Counties of Stormont, Dundas and Glengarry Census (2016) data for livestock inventories. As illustrated in Table 13, the Corporation of the Township of North Stormont is a significant contributor to the overall livestock inventories of the United Counties of Stormont, Dundas and Glengarry. The Corporation of the Township of North Stormont contribution to the livestock totals for pigs, hens, chickens and turkeys in the United Counties of Stormont, Dundas and Glengarry is limited/non-existent with respect to the county totals.

Table 13 Comparison of Township and County Census Data 2016 – Livestock

	North Stormont	Stormont, Dundas and Glengarry	Percent of Stormont, Dundas and Glengarry
Livestock Inventories, 2016 Census (number)			
Total cattle and calves	10,452	57,741	18.1
Steers	376	1,502	25.0
Beef cows	538	4,380	12.3
Dairy cows	4,645	24,284	19.1
Total pigs	x	46,553	0.0
Total sheep and lambs	1,136	8,874	12.8
Total hens and chickens	x	981,687	0.0
Total turkeys	x	x	0.0

5 RESOURCE ALLOCATION AND CONFLICT POTENTIAL

Land use planning decisions involve 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. A review of the OMAFRA draft Agricultural Impact Assessment guidance document identified numerous potential impacts to agriculture which may include:

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

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

It has been documented within this report, the agricultural character of both the Study Area and the Secondary Study Area. It has been determined that the Study Area and Secondary Study

Area comprise portions of active agricultural land uses including sod farming and cash crop operations.

The Secondary Study Area comprise a mix of land fragmentation, with large areas of agricultural lands to the south and west, in close proximity to areas of smaller parcels and fragmented lands in the eastern portions. Fragmented lands (smaller parcels) were noted along Highway 138, Allaire Road and County Road 8 in the Nation Municipality, particularly north of Highway 417. Many of the fragmented lands along Allaire Road and County Road 8 are associated with commercial or industrial uses.

These types of fragmentation are a clear indication of an area in transition from an agricultural land base to a more rural environment. The lack of, or low numbers of large agricultural properties plus the large number of small parcels and commercial/industrial lands provide an indication as to the lack of long-term intentions for agriculture in those portions of the Secondary Study Area.

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

- Interim or permanent loss of agricultural lands – there may be a permanent loss of the use of agricultural lands depending on the proposed after use of the lands.
- There will be no fragmentation, severing or landlocking of agricultural lands as a result of the proposed future development of the EOWHF.
- The loss of existing and future farming opportunities – there may be loss of existing and future farming opportunities.
- The loss of infrastructure, services or assets – there is no loss of infrastructure, services or assets.
- The loss of investments in structures and land improvements – there is a potential loss of a sod farm maintenance building with the proposed future development of the EOWHF.
- Disruption or loss of functional drainage systems – there is no net loss of artificial tile drainage on the Study Area.
- Disruption or loss of irrigation systems – there is no loss of investment in irrigation systems.
- Changes to soil drainage – there will be no net change in soil drainage.
- Changes to surface drainage – there may be changes to surface drainage depending on the final design and what will happen with the constructed drain that runs north/south along the eastern boundary of the existing EOWHF site. Further, it has been noted that the Tayside Legault Drain (north of the mushroom farm) will be affected and may require realignment.
- Changes to landforms – there should be no changes to landforms (with respect to agriculture).
- Changes to hydrogeological conditions are addressed under separate cover by the hydrogeological consultant.

- Disruption to surrounding farm operations – there should be no to limited disruption for surrounding/adjacent farms as the proposed future development would be an extension of an existing landfill facility.
- Effects of noise, vibration, dust - there should be limited potential for additional noise, vibration and dust during the operations of the proposed future development. There is a potential for noise, vibration and dust during the initial construction phase.
- Potential compatibility concerns – there should be no potential for compatibility concerns as this would be an extension of an existing landfill facility.
- Traffic concerns - Traffic issues should be limited in scope as this is a proposed extension of an existing facility that will make use of the existing road systems.
- Changes to adjacent cropping due to light pollution – there is no potential for changes in cropping due to light pollution, as the proposed extension will not include light sources.

5.2 TRAFFIC, TRESPASS AND VANDALISM

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

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

Traffic patterns for the proposed future development of the EOWHF will remain consistent with the existing traffic pattern. Vehicle traffic will use the existing road network with quick access to the Highway 417 from the interchange at Highway 417 and Highway 138.

Highway 138 is a wide paved highway with wide gravel shoulders. There should be minimal traffic concerns.

Trespassing and vandalism are not typically a concern with a landfill operation. As a result, there should be no opportunity trespass or vandalism at these facilities.

5.3 AGRICULTURAL INFRASTRUCTURE

The reconnaissance level land use survey failed to identify any agricultural equipment dealers, seed dealers/cleaning/drying services or farm equipment maintenance service businesses within the Study Area or Secondary Study Area.

A review of the OMAFRA Agricultural System Portal was completed to identify the presence of any livestock assets and services (renderers, meat plants, abattoirs), refrigerated warehousing and storage, frozen food manufacturing, farm markets, wineries, or cideries within the Study

Area. None of these features was identified within the agricultural areas of the Study Area or the Secondary Study Area.

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

5.4 MITIGATION MEASURES

Mitigation measures are designed and integrated to offset any potential negative impact that may occur as the result of a development. The following provides comment and context on mitigation measures.

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 EOWHF will be a permanent use within an agricultural area.

The type of change in land use does not allow for an avoidance of Agricultural Lands.

5.4.2 MINIMIZING IMPACTS

When avoidance is not possible, the next priority would be to minimize impacts to the extent feasible. As a result, mitigation measures should be developed to lessen any potential impacts. The minimization of impacts may be achieved during the design process and through proactive planning measures that provide for the separation of land uses.

Potential methods of minimizing impacts may include:

- Aligning the proposed development along the existing property boundaries. The proposed future development will align with the existing road network and will abut the mushroom farm at the north west corner of Lafleche Road and Highway 138.
- Aligning traffic routes with wide shoulders to allow safe transportation of agricultural equipment, along haul routes. The proposed future development will make use of existing traffic corridors.

5.4.3 MITIGATING IMPACTS

When avoidance techniques and minimizing potential impacts to agriculture have not achieved the desired effect the next priority is to mitigate any further impact.
Potential mitigation measures may include:

- The creation of berms or vegetated feature between the different types and intensities of land uses to reduce the potential for trespassing and vandalism.
- The use of adequate fencing to reduce the potential for trespassing and potential vandalism.
- The use of signage between the different types and intensities of land uses to indicate No Trespassing or Private Property.
- The use of plantings/vegetation as buffers to reduce visual impacts and sounds.
- The use of reduced speed limits in the agricultural areas.
- Implementation of surface and/or groundwater monitoring in areas where agricultural operations make use of surface or groundwater as part of their normal farm practices.
- Limit the use of tall streetlights or use lighting that is directed down and away from agricultural lands.

This AIA has provided comment 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) for the future development of the Eastern Ontario Waste Handling Facility (EOWHF) near Moose Creek, Ontario. The existing landfill is located at17125 Laflèche Road. The proposed future development of the EOWHF will continue to make use of the existing transportation routes and road network.

In the greater County wide context, the Study Area is located south of Highway 417 and west of Highway 138. The Study Area is located wholly within the United Counties of Stormont, Dundas and Glengarry. The Study Area lies within and abuts the northern edge of the Township of North Stormont, sharing a boundary with the Nation Municipality in the United Counties of Prescott and Russell.

The Study Area is located approximately 5.0 km east of the village of Casselman, 4.5 km north of the hamlet of Moose Creek, and approximately 45 km east of Ottawa, Ontario.

The proposed future development of the EOWHF necessitated this study.

The results of this Agricultural Impact Assessment are presented below:

- **Geographical Limits**

  The Study Area and the Secondary Study Area are located within the Winchester Clay Plain physiographic unit.

  The Winchester Clay Plain is described as a clay plain that is located in an area of low relief lying almost entirely in the drainage basin of the South Nation River. Clay plains dominate the area, although there are sections of protruding till materials, a few low drumlins, shallow soils over bedrock and acres of bog.

  The soils in the Winchester Clay Plain are mostly poorly drained, with some areas of imperfectly drained materials.

  The Study Area and the Secondary Study Area are a relatively simple mix of topography. The eastern portion of the Study Area includes very gently rolling lands, created through a process of landforming fields. The fields between the existing landfill and the Highway 138 consist of long narrow fields (roughly 55 m wide), with ditches between each field. The ditches are shallow to the south and are deeper to the northern portions of the Study Area. The fields between the ditches have been contoured with a slightly higher centre portion (0.5 – 1 m) higher than the edge of the fields near the ditches. This will allow for rapid surface water drainage.

The topography in the Secondary Study Area is similar to the eastern portions of the Study Area, with contoured fields south of Lafleche Road. Relatively level to very gently sloping lands were noted in all directions from the Study Area.

The Study Area and Secondary Study Area are located between the 2900 - 3100 Crop Heat Units (CHU-M1) available for corn production area in Ontario. The Crop Heat Units (CHU) index was originally developed for field corn and has been in use in Ontario for 30 years. The CHU ratings are based on the total accumulated crop heat units for the frost-free growing season in each area of the province. CHU averages range between 2500 near North Bay to over 3500 near Windsor. The higher the CHU value, the longer the growing season and greater are the opportunities for growing value crops.

A review of the OMAFRA soils and Canada Land Inventory (CLI) digital data indicated that the Study Area comprises approximately 0.8 percent Canada Land Inventory (CLI) capability of Class 1 – 3. Approximately 9.2 percent of the Study Area is CLI Class 5 land. Approximately 90.0 percent of the Study Area is considered as Not Rated lands including built up areas, roads, landfill areas and organic soils.

The Secondary Study Area comprises approximately 41.3 percent Canada Land Inventory (CLI) capability of Class 1 - 3. Approximately 1.9 percent of the Secondary Study Area is Class 5 lands, 2.3 percent as Class 7 lands, and the remaining 54.5 percent as Not Rated including built up areas, roads, landfill areas and organic soils.

A detailed soil survey of the proposed future development EOWHF lands indicated that North Gower soils on simple slopes were rated as 2W, while the North Gower – Peaty Phase soils were rated as CLI class 3W. Disturbed soil areas (associated with constructed drains, buildings, parking areas and work yards are not rated in the CLI system but have been given a Not Rated designation.

Canada Land Inventory (CLI) for the detailed soil survey of the proposed future development lands indicates that approximately 30.6 percent of the area is considered CLI Class 1-3 lands (Prime Agricultural Lands). The remaining portion (approximately 69.4 percent) is considered as Not Rated.

- **Agricultural Policy**

No portions of the Study Area or the Secondary Study Area are located in any of the four provincial land use plans: *Greenbelt Plan (2017); the Oak Ridges Moraine Conservation Plan (2017); the Niagara Escarpment Plan (2017); and the Growth Plan for the Greater Golden Horseshoe (GGH) (2019)*.

No lands within the Study Area or Secondary Study Area are located within any Provincially designated Specialty Crop areas or zones.

The Corporation of the Township of North Stormont relies on the *United Counties of Stormont, Dundas and Glengarry Official Plan (July 18, 2018 Consolidation*) for planning policy.

Land Use Schedule A3 – Township of North Stormont (Interim – In effect Schedules as of September 2018) identifies that portion of the Study Area and Secondary Study Area are designated as Agriculture Resource Lands. Further, that the western portion of the Study Area (the existing EOWHF area) is considered as Rural District, while the eastern portion of the Study Area is designated as Employment District.

The Secondary Study Area comprises Rural District, Employment District, Agriculture Resource Lands, Extractive Resource Lands (Mineral Aggregate Reserve) and Extractive Resource Lands (Licensed Pit & Quarry).

The *Corporation of the Township of North Stormont Zoning By-Law (#08-2014)* was reviewed to determine the extent of lands that were zoned as agriculture within the Study Area and the Secondary Study Area. The review of the zoning map illustrated that the Study Area is a mix of zoning that includes General Agriculture (AG), Waste Disposal (WD), and Locally Significant Wetlands (within the existing EOWHF area). Further, a review of By-Law No. 40-2015 determined that a portion of the Study Area, within the existing EOWHF, had a site-specific application to amend the Comprehensive Zoning By-Law 08-2014 to change zoning from the "Rural (R)" and "Area of Natural and Scientific Interest (ANSI) zones to the "Waste Disposal – Exception Two (WD-2)" zone. The application was approved on July 14, 2015.

The Secondary Study Area (within the United Counties of Stormont, Dundas and Glengarry) is a mix of zoning that includes General Agricultural (AG), Highway Commercial (CH-7), Rural Industrial (MR-3), Rural (RU), Quarry in holding (H-MXQ), Quarry (MQ), Waste Disposal (WD-1), Highway Commercial (CH), Locally Significant Wetlands and an Area of Natural or Scientific Interest (ANSI)(south of the existing EOWHF and Lafleche Road).

- **Agricultural Land Use**

The Study Area land use comprises built up/disturbed areas, sod farming and smaller areas of common field crop production (corn). The western portion of the Study Area comprises a large, disturbed area associated with the existing EOWHF and a constructed drain along the eastern boundary of the existing EOWHF. The majority of the remaining lands to the east of the constructed drain are used for the production of sod. Small areas of corn (common field crop) were noted along the extreme eastern portions of the Study Area, adjacent to Highway 138.

The Study Area comprises land uses of approximately 45.1 percent as built up areas, 11.1 percent as common field crop, and 43.8 percent as sod.

The Secondary Study Area consists of a variety of land uses including, but not limited to

built up/disturbed areas, common field crops, forage/pasture lands, grains, open field, road corridors, open field, pond, peat extraction, quarry lands, and woodland areas.

The Secondary Study Area comprises land use of approximately 2.5 percent as built up, 45.9 percent as common field crop, 10.9 percent as forage/pasture, 2.3 percent as grains, 0.1 percent as open field, 15.8 percent as peat production, 0.2 percent as pond, 2.2 percent as quarry lands, 1.5 percent as scrubland, 9.0 percent as sod, and 9.6 percent as woodlands.

It was observed that the predominant land uses in the Secondary Study Area include areas for the production of common field crops.

- **Agricultural Investment**

One building related to agricultural was observed within the Study Area (building number 17). This building is located just west of the Highway 138, along the north side of Lafleche Road, and is part of the Manderley Sod Farm.

The building is for equipment storage and maintenance of equipment for the production of sod at this location.

There are no buildings on the Study Area lands that are used for housing of or production of livestock.

A total of 16 agricultural facility sites (active, remnant, vestige) were identified in the Secondary Study Area. These facilities include cash crop, livestock, unused and machine shed buildings.

There is no investment in artificial tile drainage or irrigation on the Study Area.

Within the Secondary Study Area, systematic tile drainage was noted on various lands to the north, east and south of the Study Area.

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

There is some investment in landforming on both the Study Area and the Secondary Study Area as a result of the creation of shallow narrow ditches, long narrow fields and the contoured lands between the narrow ditches.

A review of the online Agricultural System Portal (OMAFRA) indicated that there were no farmers markets, pick your own operations, nurseries, specialty farms (crop or livestock), frozen food manufacturing, refrigerated warehousing/storage, livestock assets or abattoirs in the Study Area or Secondary Study Area.

A brewery is identified in the hamlet of Casselman. Renders, meat plants and abattoirs were noted approximately 10 – 12 km to the west, while a farmer's market was noted in the hamlet of Maxville to the east.

There are no agricultural services within the Study Area or Secondary Study Area.

The closest transportation network (major roadway) is Highway 417 which is located immediately north of the existing EOWHF and the proposed future development area. Highway 138 runs immediately east of the proposed future development and has direct access to Highway 417.

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

  The Secondary Study Area comprises numerous parcels of varying size. The majority of the smaller parcels are associated with linear development (or severed parcels) along County Road 8 in The Nation Municipality, and along Allaire Road in the Corporation of the Township of North Stormont. The larger parcels are located in the south and southwestern portions of the Secondary Study Area.

  A review of Land Tenure in the Study Area indicated that those lands are locally owned. Within the Secondary Study Area, the majority of the lands are also locally owned. A few smaller parcels located to the immediate north, and farther to the east of the Study Area are considered non-locally owned. Large blocks of land to the west of the Study Area were also noted as non-locally owned.

The foregoing represents a comprehensive Agricultural Impact Assessment with the purpose of evaluating the Study Area and Secondary Study Area to document the existing agricultural character and to determine any potential impacts to agriculture as a result of the proposed future development of the EOWHF.

The proposed change in Official Plan designation to Rural District is consistent with the Provincial Policy Statement (2020) Section 2.3.6 (Non-Agricultural Uses in Prime Agricultural Areas. Section 2.3.6.1a refers to mineral extraction and does not apply. Section 2.3.61b identifies limited non-residential uses, provided that:

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

It has been demonstrated that these lands are not a Provincially or Municipally designated specialty crop area.

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

It has been demonstrated that Minimum Distance Separation is not required for infrastructure, including waste disposal sites.

3. there is an identified need within the planning horizon.

This AIA does not include a 'need' study. A 'need' study has been presented under a separate planning cover.

4. alternative locations have been evaluated, and
   1. there are no reasonable alternative locations which avoid prime agricultural areas; and
   2. there are no reasonable alternative locations in prime agricultural areas with lower priority agricultural lands.

It has been demonstrated that this proposal is to expand an existing operation, to make use of the existing infrastructure and road system. It has also been demonstrated that the majority of the lands are organic soil which are not rated in the Canada Land Inventory (CLI) system, giving these lands a lower priority. Therefore, as the proposed expansion of an existing facility is to be located on not rated (low priority lands), the Study Area lands can reasonably be removed from an agricultural designation.

Sincerely
DBH Soil Services Inc.

Dave Hodgson, P. Ag
President

7 REFERENCES

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- Windshield and field surveys by DBH Soil Services staff June 18 and June 19, 2020.

APPENDIX A

UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY
OFFICIAL PLAN POLICIES

4.3.5 Waste Management Systems

4.3.5.1 Scope

Waste management includes landfills, recycling facilities, septage haulage and disposal sites, and waste materials haulage and disposal sites.

4.3.5.2 Existing and New Landfills, Septage Sites, and Transfer Stations

Existing active or new sites (public or private) may only be operated, expanded or closed in accordance with current provincial environmental standards and approvals. New sites shall be located where they are compatible with adjacent land uses (existing and designated). New waste disposal sites will be prohibited in ***designated vulnerable areas*** where they pose a
significant threat to drinking water. Site development shall provide for progressive rehabilitation and reuse of the site.

Waste management systems may include facilities for recycling, composting, hazardous waste control, transfer sites, and ancillary activities operated in accordance with a valid Environmental Compliance Approval. New sites will require an amendment to this Plan and will require approval under the Environmental Protection Act before an amendment is considered. Provincial and municipal approvals will be required for the hauling and disposal of waste materials and sewage and septage.

Prohibited wastes shall include nuclear wastes and hazardous or pathological wastes. Sites may include transfer sites used for the temporary storage of waste materials. Local Municipalities should monitor waste sites to ensure that there are no off- site adverse impacts (see also Section 3.5.1.5).

The "D-4 Land Use on or Near Landfills and Dumps" guideline shall be used as a guide when assessing land use on or near any open or closed landfill site which contains municipal solid waste, industrial solid waste and/or sewage sludges. Separation distances will apply on a reciprocal basis for existing ***sensitive land uses***.

The County may assume responsibility for waste management on behalf of one or more Local Municipalities without requiring an amendment to this plan.

4.3.5.3 Closed or Inactive Sites

Closed or inactive sites, whether public or private, may be used for other purposes subject to meeting requirements of the Environmental Protection Act (Section 46 Order). In general, land used as a waste management facility cannot be developed within a period of 25 years from the date the site was closed without approval from the Minister of the Environment and Climate Change. Closure plans for waste sites should include progressive rehabilitation of the site.

4.3.5.4 Design Capacity

Local Municipalities shall ensure that there is sufficient capacity to accommodate waste disposal for all new development. Local Municipalities should be proactive in reducing solid waste generation to protect the environment and extend the life of existing landfill sites within the County.

4.3.5.5 Influence Area and Separation Distances

Local Municipalities will use a 500-m radius, or such other distance recommended by the Ministry of the Environment, as a guideline for assessing the impact of a landfill site and requiring impact studies.

Local Municipalities may use zoning By-laws or use site plan control to establish an appropriate separation distance from a landfill site. Development proposals near ***sensitive land uses*** within the influence study area must include, but are not limited to, landfill generated gases, ground and surface water contamination by leachate, odour, litter, vehicular traffic, dust, noise, vectors and vermin and visual impact (see Section 3.5.1.5).

5.3 AGRICULTURAL RESOURCE LANDS

5.3.1 Determination of *Prime agricultural area*

The Agricultural Resource Lands shown on the Land Use Schedules of this Plan were identified as ***prime agricultural area*** by the Land Evaluation and Area Review Committee. These lands were further evaluated in the 2016 Agricultural Resource Lands Review. This most recent evaluation was not a comprehensive Land Evaluation and Area Review in conjunction with Ontario Ministry of Agriculture, Food and Rural Affairs but served to refine the agricultural resource lands which were previously identified. Agricultural Resource lands generally include lands which are Class 1-3 in the Canada Land Inventory for agricultural capability, specialty crop land, and lands used for, or related to, agricultural productivity. This may also include lands of lesser agricultural capability, woodlands, lands identified as a ***natural heritage features*** or other lands considered important to food production.

5.3.2 Scope of Permitted Uses

The scope of permitted uses on Agricultural Resource Lands on the Land Use Schedules are described in Table 5.2.

Agricultural uses are defined in the Provincial Policy Statement and include grow crops; raising livestock and animals for food, fur or fiber; aquaculture; apiaries; agro-forestry; maple syrup production; and associated on-farm buildings and structures, including accommodation for full-time labour when the operation requires additional employment.

A ***mineral aggregate operation*** is a permitted interim use in the ***prime agricultural area***. The site or lands must be rehabilitated to substantially the same area and same average soil quality for agriculture that existed prior to extraction. Complete agricultural restoration is not required if a substantial portion of the property is extracted below the water table or if the depth of the planned extraction in a quarry makes restoration unfeasible. In these cases, other alternatives must be considered by the applicant to ensure agriculture in the remaining areas will be maximized. This policy shall only apply to ***mineral aggregate operation***s which are licensed under the Aggregate Resources Act for extraction below the water table.

Existing lots of record on prime agricultural lands may be used for non-***agricultural uses*** listed in Table 5.2 - Agricultural Resource Lands - Permitted Uses provided there are no reasonable alternate locations which avoid ***prime agricultural areas*** and where the requirements of the Provincial Policy Statement, section 2.3.6.1, are met.

Existing non-***agricultural uses***, buildings or structures may be expanded provided they will be compatible with farm operations. If proposals are made for a non-agricultural use, an Official Plan Amendment would be required to permit the use. The lands would

remain in an Agricultural designation however site-specific provisions would permit the specific use identified in the proposal. Should approval be obtained it would only permit the use specified in the proposal and is not intended to establish a 'general approval' for a series of uses.

Where there is a conflict between a proposed (new) agricultural use and a natural heritage feature and area, the agricultural use will be subject to the relevant requirements of Section 5.5, including the requirement for an Environmental Impact Study. While existing ***agricultural uses*** shall be permitted to continue, agricultural operators are encouraged to protect or conserve ***natural heritage features*** and areas. The removal of top soil on prime agricultural lands shall be discouraged.

5.3.2.1 Agriculture-related uses

Agriculture-related uses on prime agricultural lands are encouraged to strengthen and diversify the agricultural industry and to supplement farm income. For the purposes of this section, ***agriculture-related uses*** are farm-related commercial and industrial uses directly related to farm operations in the area that support agriculture, and benefit from being close to farm operations. This can include home industries, and uses that produce value added agricultural products such as custom meat shops, wineries, pick-your-own operations, produce market, and packing operations, or a grain drying handling and storage facility.

Local Municipalities shall ensure that such uses are compatible with ***agriculture uses*** and shall not hinder surrounding agricultural operations. Criteria used to evaluate compatibility include: the type and scale of use; that the use, where it is located on a farm, is clearly secondary to the main farm operation; that on-site farm-related uses are not likely to generate a future land severance; that the use does not interfere with ***normal farm practices***; and that the use can be satisfactorily serviced with individual on-site water and sewage disposal systems. Impacts on agricultural operations from any ***agriculture-related uses*** that are secondary to the principal use of the property shall be mitigated (Section 3.5.1 shall apply for these purposes) (see Section 3.5.4.6 - Home Based Businesses and Bed and Breakfast Establishments.)

A large-scale ***agriculture-related use*** should be directed to an Employment District where it will reinforce local municipal investment or policies for a commercial or industrial area, or if not feasible, to lands having lesser soil capability for agriculture. Abattoirs, livestock markets or sales yards, a seed cleaning plant, an agricultural produce warehouse or similar agri-business are permitted provided there are no reasonable alternative locations which avoid ***prime agricultural areas***; and there are no reasonable locations in ***prime agricultural areas*** with lower priority agricultural lands

On-farm diversified uses are secondary to the principal agricultural use of the property, and are limited in area. ***On-farm diversified*** uses include, but are not limited to, home occupations, home industries, ***agri-tourism uses***, and uses that produce value-added agricultural products. These uses shall be compatible with, and shall not hinder, surrounding agricultural operations.

5.3.4 Lot Sizes

Agricultural lots shall be of a size appropriate for the type of ***agricultural uses*** common in the area and sufficiently large to maintain flexibility for future changes in operations. In

this regard, the minimum lot size for new lots will be generally 40 ha in size for each of the severed and retained parcels.
Lots which include an ***agriculture-related use*** shall be designed to minimize the use of land within the ***prime agricultural area***. Where applicable, the lot shall be adequate for all setbacks, parking and loading facilities, storage and display areas, signs, lighting, landscaping, buffering or screening, ***infrastructure*** and safe access and egress, individual on-site systems and shall comply with Section 3.5.1 of this Plan.

5.3.5 New Lot Creation

New lot creation on Agricultural Resource Lands shall be governed by Section 8.12.13.3 of this Plan.

5.3.6 Expansion of Settlement Areas

Expansion of settlement areas within the Agricultural Resource Lands shall be governed by Section 3.5.3 – Secondary Plans, or Section 3.2.1.7 of this Plan.

5.3.7 Minimum Distance Separation Formulae I and II

The Ministry of Agriculture and Food and Rural Affairs Minimum Distance Separation (MDS) Formulae I and II, as amended from time-to-time, shall be applied to reduce incompatibility concerns about odour from livestock facilities and/or manure storage facilities and any non-farm uses. The MDS Formulae II will not apply to the rebuilding of a building destroyed by natural causes (e.g. fire, flood), if the rebuilding does not further diminish the applicable distance separation (see Section 3.5.1.5) or result in higher MDS factors (type of livestock, number of livestock, type of manure storage, etc.).

5.3.8 Normal farm practices

Normal farm practices will be promoted and protected in ***prime agricultural areas***.

8.5 ENVIRONMENTAL ASSESSMENT ACT

Prior to the construction of public works or undertakings such as roads, sewage works, waste disposal facilities, and water filtration plants, a Municipality shall follow procedures under the Environmental Assessment Act. Some types of undertakings may fall into a class environmental assessment which is a more streamlined process in reviewing the environmental impacts of the proposed work. Generally, the intent of this Plan is to ensure that the following are followed prior to the construction of a project:

1. Consult with affected parties: a. Involve affected parties early in the process and continuously throughout;

b. Encourage the identification and resolution of issues before an EA is formally submitted; and

c. Promote mutually acceptable, environmentally sound solutions through consultation.

2. Consider reasonable alternatives: planning must consider alternatives to the undertaking which fulfill the purpose of the undertaking in functionally different ways and alternative methods of implementing a particular type of alternative. The ‘do-nothing’ alternative must also be considered.

3. Consider all aspects of the environment: the planning process must consider the effects on the natural or biophysical environment as well as effects on the social, economic and cultural conditions that influence the lives of humans of a community.

4. Systematically evaluate net environmental effects: evaluate alternatives in light of their advantages and disadvantages and the effects remaining after mitigation or enhancement measures have been addressed.
5. Provide clear, complete documentation: the EA should strive to represent accurately the process that was followed in a clear and understandable way and to communicate the results of that process.

APPENDIX B

POTENTIAL AGRICULTURAL FACILITIES PHOTOGRAPHS

Agricultural Facility #1

Agricultural Facility #2

Agricultural Facility #3

Agricultural Facility #4

Agricultural Facility #5

Agricultural Facility #6

Agricultural Facility #7

Agricultural Facility #8

Agricultural Facility #9

Agricultural Facility #10

Agricultural Facility #11

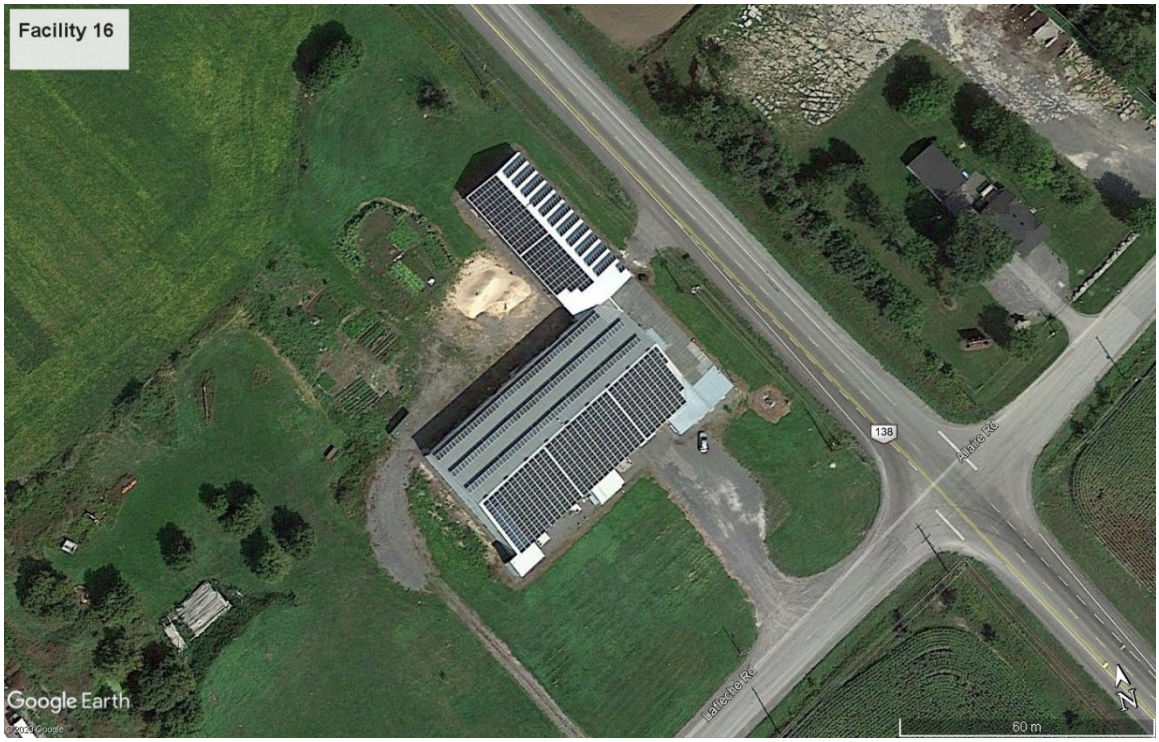
Agricultural Facility #12

Agricultural Facility #13

Agricultural Facility #14

Agricultural Facility #15

Agricultural Facility #16



Agricultural Facility #17

APPENDIX C

United Counties of Stormont, Dundas and Glengarry Unique Soil Symbols and Canada Land Inventory (CLI) List

Soil Code	CLI Code		Cli Subclass
AHG		1	
AHG		2	D
AHG		2	F
AHG		2	P
AHG		2	PT
AHG		2	W
AHG		2	W
AHG		3	D
AHG		3	FM
AHG		3	W
AHG		3	WD
AHG		3	WP
AHG		4	F
AHG		5	I
AHG		5	P
AHG		5	WF
AHG		6	R
AHG	O		
ALL		1	
ALL		2	D
ALL		2	F
ALL		2	FT
ALL		2	P
ALL		2	PT
ALL		2	T
ALL		2	W
ALL		3	D
ALL		3	FM
ALL		3	R
ALL		3	W
ALL		3	WD
ALL		3	WP
ALL		4	F
ALL		4	FM
ALL		4	W
ALL		5	I
ALL		5	W
ALL	O		
BBO		0	

Soil Code	CLI Code		Cli Subclass
BBO		1	
BBO		2	D
BBO		2	DT
BBO		2	F
BBO		2	P
BBO		2	PT
BBO		2	W
BBO		3	D
BBO		3	FM
BBO		3	W
BBO		3	WD
BBO		3	WP
BBO		4	F
BBO		4	FM
BBO		4	W
BBO		5	I
BBO		5	W
BBO		5	WF
BBO	O		
BBO	W		
BDO		1	
BDO		2	D
BDO		2	F
BDO		2	P
BDO		2	PT
BDO		2	W
BDO		3	D
BDO		3	W
BDO		3	WD
BDO		4	F
BDO		4	FM
BDO		5	I
BDO		5	W
BDO	O		
BIV		1	
BIV		2	D
BIV		2	F
BIV		2	P
BIV		2	PT
BIV		2	W

Soil Code	CLI Code		Cli Subclass
BIV		3	D
BIV		3	FM
BIV		3	W
BIV		3	WD
BIV		3	WP
BIV		4	F
BIV		4	FM
BIV		5	I
BIV		5	WF
BIV	O		
BIV	W		
BMD		0	
BMD		1	
BMD		2	D
BMD		2	F
BMD		2	P
BMD		2	PT
BMD		2	W
BMD		3	D
BMD		3	FM
BMD		3	WD
BMD		4	F
BMD		4	W
BMD		5	I
BMD		5	WF
BMD		6	R
BMD	O		
BU		2	F
BU		2	P
BU		2	W
BU		3	FM
BU		4	W
CEY		1	
CEY		2	D
CEY		2	F
CEY		2	P
CEY		2	W
CEY		3	D
CEY		3	FM
CEY		3	WD

Soil Code	CLI Code		Cli Subclass
CEY		4	F
CEY		5	I
CEY		5	P
CEY		5	WF
CEY	O		
CRP		1	
CRP		2	D
CRP		2	F
CRP		2	P
CRP		2	PT
CRP		2	W
CRP		3	D
CRP		3	FM
CRP		3	R
CRP		3	W
CRP		3	WD
CRP		3	WP
CRP		4	F
CRP		4	FM
CRP		4	W
CRP		5	I
CRP		5	P
CRP		6	R
CRP	O		
CST		0	
CST		2	D
CST		2	F
CST		2	P
CST		2	PT
CST		2	W
CST		3	D
CST		3	FM
CST		3	W
CST		3	WD
CST		3	WP
CST		4	F
CST		4	FM
CST		4	W
CST		5	I
CST		5	P

Soil Code	CLI Code		Cli Subclass
CST		5	W
CST	O		
DHU		2	PT
EMR		0	
EMR		1	
EMR		2	D
EMR		2	F
EMR		2	FT
EMR		2	P
EMR		2	PT
EMR		2	T
EMR		2	W
EMR		3	D
EMR		3	FM
EMR		3	R
EMR		3	W
EMR		3	WD
EMR		3	WP
EMR		4	F
EMR		4	FM
EMR		4	W
EMR		5	I
EMR		5	P
EMR		5	W
EMR		5	WF
EMR	O		
EMR-b		2	P
EMR-b		3	FM
EMR-b		3	WD
EMR-b	O		
FRM		2	F
FRM		2	P
FRM		2	PT
FRM		2	W
FRM		3	D
FRM		3	FM
FRM		3	WD
FRM	O		
GVI		0	
GVI		1	

Soil Code	CLI Code		Cli Subclass
GVI		2	D
GVI		2	DT
GVI		2	F
GVI		2	FT
GVI		2	P
GVI		2	PT
GVI		2	T
GVI		2	W
GVI		3	D
GVI		3	F
GVI		3	FM
GVI		3	FT
GVI		3	R
GVI		3	W
GVI		3	WD
GVI		3	WP
GVI		4	F
GVI		4	FM
GVI		4	W
GVI		5	I
GVI		5	P
GVI		5	W
GVI		5	WF
GVI		6	R
GVI	O		
GVI	W		
GVI-b		2	D
GVI-b		2	F
GVI-b		2	P
GVI-b		3	D
GVI-b	O		
GVI-sh		2	D
GVI-sh		2	DT
GVI-sh		2	P
GVI-sh		2	W
GVI-sh		3	FM
GVI-sh		3	T
GVI-sh		4	F
GVI-sh		4	FM
GVI-sh		4	W

Soil Code	CLI Code		Cli Subclass
GVI-sh		5	I
GVI-sh		5	WF
GVI-sh	O		
KRS		0	
KRS		1	
KRS		2	D
KRS		2	F
KRS		2	FT
KRS		2	P
KRS		2	PT
KRS		2	T
KRS		2	W
KRS		3	D
KRS		3	FM
KRS		3	R
KRS		3	W
KRS		3	WD
KRS		3	WP
KRS		4	F
KRS		4	FM
KRS		4	W
KRS		5	I
KRS		5	P
KRS		5	W
KRS		5	WF
KRS		6	R
KRS	O		
LYS		2	D
LYS		2	P
LYS		2	W
LYS		3	D
LYS		3	FM
LYS		3	W
LYS		3	WD
LYS		3	WP
LYS		4	F
LYS		4	FM
LYS		4	W
LYS		5	I
LYS		5	WF
LYS	O		
MBG		0	
MBG		1	
MBG		2	D
MBG		2	F
MBG		2	FT
MBG		2	P
MBG		2	PT
MBG		2	T
MBG		2	W
MBG		3	D
MBG		3	FM
MBG		3	R
MBG		3	W
MBG		3	WD
MBG		3	WP
MBG		4	F
MBG		4	FM
MBG		4	W
MBG		5	I
MBG		5	P
MBG		5	W
MBG		5	WF
MBG		6	R
MBG	O		
MBG	W		
MDL		2	PT
MDL		2	W
MDL		3	WD
MOK		1	
MOK		2	F
MOK		2	P
MOK		2	W
MOK		3	FM
MOK		3	WD
MOK		4	W
MOK		5	I
MOK		5	W
MOK	O		
MTD		0	
MTD		1	
MTD		2	D
MTD		2	F
MTD		2	P
MTD		2	PT
MTD		2	T
MTD		2	W
MTD		3	D
MTD		3	FM
MTD		3	T
MTD		3	W
MTD		3	WD
MTD		3	WP
MTD		4	F
MTD		4	FM
MTD		4	W
MTD		5	I
MTD		5	P
MTD		5	W
MTD		5	WF
MTD		6	R
MTD	O		
MUA		0	
MUA		1	
MUA		2	D
MUA		2	DT
MUA		2	F
MUA		2	P
MUA		2	PT
MUA		2	T
MUA		2	W
MUA		3	D
MUA		3	FM
MUA		3	W
MUA		3	WD
MUA		4	FM
MUA		5	I
MUA		5	W
MUA	O		
NGW		1	

Soil Code	CLI Code		Cli Subclass
NGW		2	D
NGW		2	DT
NGW		2	F
NGW		2	P
NGW		2	PT
NGW		2	T
NGW		2	W
NGW		3	D
NGW		3	FM
NGW		3	R
NGW		3	W
NGW		3	WD
NGW		3	WP
NGW		4	F
NGW		4	FM
NGW		4	W
NGW		5	I
NGW		5	P
NGW		5	W
NGW		5	WF
NGW		6	R
NGW	O		
OBK		2	D
OBK		2	DT
OBK		2	FT
OBK		2	P
OBK		2	PT
OBK		2	W
OBK		3	D
OBK		3	FM
OBK		3	W
OBK		3	WD
OBK		3	WP
OBK		4	F
OBK		4	FM
OBK		5	I
OBK		5	WF
OBK	O		
OGO		0	
OGO		I	

Soil Code	CLI Code		Cli Subclass
OGO		2	D
OGO		2	F
OGO		2	FT
OGO		2	P
OGO		2	PT
OGO		2	W
OGO		3	D
OGO		3	FM
OGO		3	R
OGO		3	W
OGO		3	WD
OGO		3	WP
OGO		4	F
OGO		4	FM
OGO		4	W
OGO		5	I
OGO		5	P
OGO		5	W
OGO		5	WF
OGO	O		
OGO	W		
PPV		2	P
PPV		2	W
PPV		3	D
PPV		3	FM
PPV		4	F
PPV		5	WF
RUB		2	D
RUB		2	P
RUB		2	PT
RUB		2	W
RUB		3	D
RUB		3	R
RUB		3	W
RUB		3	WD
RUB		3	WP
RUB		4	F
RUB		5	I
RUB		5	W
RUB		5	WF

Soil Code	CLI Code		Cli Subclass
RUB	O		
SHO		2	D
SHO		2	P
SHO		2	W
SSM		0	
SSM		2	D
SSM		2	F
SSM		2	P
SSM		2	PT
SSM		2	W
SSM		3	FM
SSM		3	R
SSM		3	T
SSM		3	W
SSM		3	WD
SSM		4	F
SSM		4	W
SSM		5	I
SSM		5	W
SSM		5	WF
SSM	O		
STA		2	W
STA		3	WD
UN		I	
UN		2	PT
UN		3	WP
UN		4	F
UPD		I	
UPD		2	D
UPD		2	F
UPD		2	P
UPD		2	PT
UPD		2	W
UPD		3	D
UPD		3	FM
UPD		3	R
UPD		3	W
UPD		3	WP
UPD		4	F
UPD		4	FM

UPD		4	W
UPD		5	I
UPD		5	W
UPD		5	WF
UPD	O		
WDV		1	
WDV		2	D
WDV		2	F
WDV		2	P
WDV		2	PT
WDV		2	W
WDV		3	FM
WDV		3	W
WDV		3	WD
WDV		3	WP
WDV		4	W
WDV		5	WF
WDV	O		
WFD		0	
WFD		1	
WFD		2	D
WFD		2	DT
WFD		2	F
WFD		2	P
WFD		2	PT
WFD		2	T
WFD		2	W
WFD		3	D
WFD		3	FM
WFD		3	R
WFD		3	W
WFD		3	WD
WFD		3	WP
WFD		4	F
WFD		4	FM
WFD		4	W
WFD		5	I
WFD		5	P
WFD		5	W
WFD		5	WF
WFD	O		
WFD	W		
ZER		1	
ZER		2	D
ZER		2	F
ZER		2	P
ZER		2	PT
ZER		2	W
ZER		3	D
ZER		3	FM
ZER		3	R
ZER		3	W
ZER		3	WD
ZER		3	WP
ZER		4	F
ZER		4	FM
ZER		4	W
ZER		5	I
ZER		5	W
ZER		5	WF
ZER	O		
ZMK		0	
ZMK		1	
ZMK		2	D
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ZMK		2	F
ZMK		2	FT
ZMK		2	P
ZMK		2	PT
ZMK		2	T
ZMK		2	W
ZMK		3	D
ZMK		3	FM
ZMK		3	T
ZMK		3	W
ZMK		3	WD
ZMK		3	WP
ZMK		4	F
ZMK		4	FM
ZMK		4	W
ZMK		5	I
ZMK		5	P
ZMK		5	W
ZMK		5	WF
ZMK		6	R
ZMK	O		
ZOR		2	P
ZZ		2	D
ZZ		2	P
ZZ		2	PT
ZZ		3	FM
ZZ		4	W
ZZ		5	W

APPENDIX D

SOIL INSPECTION SITE CHARACTERISTICS

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
1	Of/Om	0 - 100+	Organic	VP	Muck
2	Of/Om	0 - 100+	Organic	VP	Muck
3	Of/Om	0 - 100+	Organic	VP	Muck
4	Of/Om	0 - 100+	Organic	VP	Muck
5	Of/Om	0 - 100+	Organic	VP	Muck
6	Of/Om	0 - 100+	Organic	VP	Muck
7	Of/Om	0 - 100+	Organic	VP	Muck
8	Of/Om	0 - 100+	Organic	VP	Muck
9	Of/Om	0 - 100+	Organic	VP	Muck
10	Of/Om	0 - 100+	Organic	VP	Muck
11	Of/Om	0 - 100+	Organic	VP	Muck
12	Of/Om	0 - 100+	Organic	VP	Muck
13	Of/Om	0 - 100+	Organic	VP	Muck
14	Of/Om	0 - 100+	Organic	VP	Muck
15	Of/Om	0 - 100+	Organic	VP	Muck
16	Of/Om	0 - 100+	Organic	VP	Muck
17	Of/Om	0 - 100+	Organic	VP	Muck
18	Of/Om	0 - 100+	Organic	VP	Muck
19	Of/Om	0 - 100+	Organic	VP	Muck
20	Of/Om	0 - 100+	Organic	VP	Muck
21	Of/Om	0 - 100+	Organic	VP	Muck
22	Of/Om	0 - 100+	Organic	VP	Muck
23	Of/Om	0 - 100+	Organic	VP	Muck
24	Of/Om	0 - 100+	Organic	VP	Muck
25	Of/Om	0 - 100+	Organic	VP	Muck
26	Of/Om	0 - 100+	Organic	VP	Muck
27	Of/Om	0 - 100+	Organic	VP	Muck
28	Of/Om	0 - 100+	Organic	VP	Muck
29	Of/Om	0 - 100+	Organic	VP	Muck
30	Of/Om	0 - 100+	Organic	VP	Muck
31	Of/Om	0 - 100+	Organic	VP	Muck
32	Of/Om	0 - 100+	Organic	VP	Muck
33	Of/Om	0 - 100+	Organic	VP	Muck
34	Of/Om	0 - 100+	Organic	VP	Muck
35	Ap Bg Cg	0 – 21 21 – 51 51 +	CL CL SiCL	P	North Gower
36	Construction debris, stone, concrete, asphalt	-	-	-	Disturbed
37	Ap Bg Cg	0 – 23 23 – 49 49 +	CL CL SiCL	P	North Gower
38	Ap Bg1 Bg2 Cg	0 – 22 22 – 50 50 – 65 65+	CL CL CL SiCL	P	North Gower
39	Ap Bg Cg	0 – 24 24 – 55 55 +	CL CL SiCL	P	North Gower
40	Ap Bg Cg	0 – 21 21 – 47 47 +	CL CL SiCL	P	North Gower

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
41	Of/Om Bg1 Bg2 Cg	0 – 30 30 – 45 45 – 61 61+	Organic CL CL SiCL	VP	North Gower - Peaty
42	Of/Om Bg1 Bg2 Cg	0 – 25 25 – 50 50 – 65 65+	Organic CL CL SiCL	VP	North Gower - Peaty
43	Ap Bg1 Bg2 Cg	0 – 22 22 – 55 55 – 70 70+	CL CL CL SiCL	P	North Gower
44	Ap Bg1 Bg2 Cg	0 – 25 25 – 52 52 – 66 66+	CL CL CL SiCL	P	North Gower
45	Ap Bg1 Bg2 Cg	0 – 22 22 – 50 50 – 65 65+	CL CL CL SiCL	P	North Gower
46	Ap Bg1 Bg2 Cg	0 – 20 20 – 45 45 – 65 65+	CL CL CL SiCL	P	North Gower
47	Ap Bg1 Bg2 Cg	0 – 23 23 – 48 48 – 71 71+	CL CL CL SiCL	P	North Gower
48	Ap Bg1 Bg2 Cg	0 – 20 20 – 50 50 – 70 70+	CL CL CL SiCL	P	North Gower
49	Ap Bg1 Bg2 Cg	0 – 23 23 – 46 46 – 65 65+	CL CL CL SiCL	P	North Gower
50	Ap Bg1 Bg2 Cg	0 – 25 25 – 50 50 – 70 70+	CL CL CL SiCL	P	North Gower
51	Of/Om Bg1 Bg2 Cg	0 – 20 20 – 45 45 – 70 70+	Organic CL CL SiCL	VP	North Gower - Peaty
52	Ap Bg1 Bg2 Cg	0 – 20 20 – 41 41 – 75 75+	CL CL CL SiCL	P	North Gower
53	Ap Bg1 Bg2 Cg	0 – 21 21 – 55 55 – 65 65+	CL CL CL SiCL	P	North Gower
54	Ap Bg1 Bg2 Cg	0 – 25 25 – 51 51 – 70 70+	CL CL CL SiCL	P	North Gower

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
55	Of/Om	0 - 100+	Organic	VP	Muck
56	Of/Om	0 - 100+	Organic	VP	Muck
57	Of/Om	0 - 100+	Organic	VP	Muck
58	Of/Om	0 - 100+	Organic	VP	Muck
59	Of/Om	0 - 100+	Organic	VP	Muck
60	Of/Om	0 - 100+	Organic	VP	Muck
61	Of/Om	0 - 100+	Organic	VP	Muck
62	Of/Om	0 - 100+	Organic	VP	Muck
63	Of/Om	0 - 100+	Organic	VP	Muck
64	Of/Om	0 - 100+	Organic	VP	Muck
65	Of/Om	0 - 100+	Organic	VP	Muck
66	Of/Om	0 - 100+	Organic	VP	Muck
67	Of/Om	0 - 100+	Organic	VP	Muck
68	Of/Om	0 - 100+	Organic	VP	Muck
69	Of/Om	0 - 100+	Organic	VP	Muck
70	Of/Om	0 - 100+	Organic	VP	Muck
71	Of/Om	0 - 100+	Organic	VP	Muck
72	Of/Om	0 - 100+	Organic	VP	Muck
73	Of/Om	0 - 100+	Organic	VP	Muck
74	Of/Om	0 - 100+	Organic	VP	Muck
75	Of/Om	0 - 100+	Organic	VP	Muck
76	Of/Om	0 - 100+	Organic	VP	Muck
77	Of/Om	0 - 100+	Organic	VP	Muck
78	Of/Om	0 - 100+	Organic	VP	Muck
79	Of/Om	0 - 100+	Organic	VP	Muck
80	Of/Om	0 - 100+	Organic	VP	Muck
81	Of/Om	0 - 100+	Organic	VP	Muck
82	Of/Om	0 - 100+	Organic	VP	Muck
83	Of/Om Bg1 Bg2 Cg	0 – 38 38 – 51 51– 67 67+	Organic CL CL SiCL	VP	North Gower - Peaty
84	Of/Om	0 - 100+	Organic	VP	Muck
85	Of/Om Bg1 Bg2 Cg	0 – 30 30 – 45 45 – 61 61+	Organic CL CL SiCL	VP	North Gower - Peaty
86	Of/Om Bg1 Bg2 Cg	0 – 20 20 – 40 40 – 70 70+	Organic CL CL SiCL	VP	North Gower - Peaty
87	Of/Om Bg1 Bg2 Cg	0 – 30 30 – 50 50 – 65 65+	Organic CL CL SiCL	VP	North Gower - Peaty
88	Of/Om Bg1 Bg2 Cg	0 – 20 20 – 40 40 – 70 70+	Organic CL CL SiCL	VP	North Gower - Peaty
89	Of/Om Bg1 Bg2 Cg	0 – 30 30 – 45 45 – 80 80+	Organic CL CL SiCL	VP	North Gower - Peaty

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
90	Of/Om Bg1 Bg2 Cg	0 – 40 40 – 55 55 – 70 70+	Organic CL CL SiCL	VP	North Gower - Peaty
91	Of/Om Bg1 Bg2 Cg	0 – 20 20 – 40 40 – 60 60+	Organic CL CL SiCL	VP	North Gower - Peaty
92	Of/Om Bg1 Bg2 Cg	0 – 35 35 – 50 50 – 65 65+	Organic CL CL SiCL	VP	North Gower - Peaty
93	Ap Bg Cg	0 – 23 23 – 65 65 +	CL CL SiCL	P	North Gower
94	Ap Bg Cg	0 – 20 20 – 58 58 +	CL CL SiCL	P	North Gower
95	Ap Bg Cg	0 – 21 21 – 50 50 +	CL CL SiCL	P	North Gower
96	Ap Bg Cg	0 – 25 25 – 70 70 +	CL CL SiCL	P	North Gower
97	Ap Bg Cg	0 – 22 22 – 55 55 +	CL CL SiCL	P	North Gower
98	Ap Bg Cg	0 – 25 25 – 65 65 +	CL CL SiCL	P	North Gower
99	Of/Om Bg1 Bg2 Cg	0 – 40 40 – 65 65 – 80 80+	Organic CL CL SiCL	VP	North Gower - Peaty
100	Of/Om Bg1 Bg2 Cg	0 – 20 20 – 45 45 – 50 50+	Organic CL CL SiCL	VP	North Gower - Peaty
101	Of/Om Bg1 Bg2 Cg	0 – 35 35 – 50 50 – 70 70+	Organic CL CL SiCL	VP	North Gower - Peaty
102	Of/Om Bg1 Bg2 Cg	0 – 25 25 – 45 45 – 70 70+	Organic CL CL SiCL	VP	North Gower - Peaty
103	Of/Om Bg1 Bg2 Cg	0 – 30 30 – 50 50 – 65 65+	Organic CL CL SiCL	VP	North Gower - Peaty
104	Of/Om Bg1 Bg2 Cg	0 – 25 25 – 45 45 – 70 70+	Organic CL CL SiCL	VP	North Gower - Peaty

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
105	Of/Om Bg1 Bg2 Cg	0 – 30 30 – 48 48 – 64 64+	Organic CL CL SiCL	VP	North Gower - Peaty
106	Of/Om Bg1 Bg2 Cg	0 – 30 30 – 44 44 – 60 60+	Organic CL CL SiCL	VP	North Gower - Peaty
107	Of/Om Bg1 Bg2 Cg	0 – 30 30 – 45 45 – 65 65+	Organic CL CL SiCL	VP	North Gower - Peaty
108	Of/Om Bg1 Bg2 Cg	0 – 25 25 – 40 40 – 60 60+	Organic CL CL SiCL	VP	North Gower - Peaty
109	Of/Om Bg1 Bg2 Cg	0 – 20 20 – 40 40 – 60 60+	Organic CL CL SiCL	VP	North Gower - Peaty
110	Ap Bg Cg	0 – 20 20 – 70 70 +	CL CL SiCL	P	North Gower
111	Ap Bg Cg	0 – 23 23 – 58 58 +	CL CL SiCL	P	North Gower
112	Ap Bg Cg	0 – 24 24 – 67 67 +	CL CL SiCL	P	North Gower
113	Ap Bg Cg	0 – 25 25 – 78 78 +	CL CL SiCL	P	North Gower
114	Ap Bg Cg	0 – 22 22 – 63 63 +	CL CL SiCL	P	North Gower
115	Ap Bg Cg	0 – 22 22 – 74 74 +	CL CL SiCL	P	North Gower

APPENDIX E

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 Bradford Bypass (Highway 400 to 404 link) 2021 – ongoing.
- Agricultural Component of the Green for Life (GFL) Environmental, Moose Creek, Eastern Ontario Waste Handling Facility (EOWHF) Expansion, 2020 – 2021.
- Agricultural Component of the Greater Toronto Area West (GTAW) Highway Corridor Assessment, 2019 – ongoing.
- Peer Review of the Walker Environmental Group (WEG) Inc. Southwestern Landfill Proposal, Ingersoll, 2013 – 2021.
- Agricultural Component for the High-Speed Rail Kitchener to London –Terms of Reference, 2018,
- Agricultural Component of the Mount Nemo Heritage District Conservation Study – City of Burlington, 2014 – 2015.
- Agricultural Component of the Greater Toronto Area West (GTAW) Highway Corridor Assessment – Phase 2, 2014 – 2016.
- Peer Review of the Agricultural Component of the Walker Group Landfill – Ingersoll, 2013 – 2015.
- Agricultural Component of the Highway 407 East Extension Design and Build Phase, 2012 – 2013.
- Agricultural Component of the Beechwood Road Environmental Centre (Landfill/Recycling) – Napanee,

2012 – 2013.
- Agricultural Component of the Clean Harbors Hazardous Waste Landfill Lambton County 2009 – 2015.
- Agricultural Component of the Highway 401 widening Cambridge to Halton Region 2009 – 2012.
- Agricultural Component of the Upper York Sanitary Sewer Study, York Region, 2009 – 2013.
- Agricultural Component of the Greater Toronto Area West Corridor Environmental Assessment Study 2007 – 2013 (Phase 1).
- Agricultural Component of the Niagara to GTA Planning and Environmental Assessment Study, 2007 – 2013.
- Agricultural Component of the Highway 401 widening, Chatham, 2006 - 2007.
- Agricultural Component of the Trafalgar Road study, Halton Region, 2005.
- Agricultural Component of the Highway 404 Extension North, 2004.
- Agricultural Component of the Highway 404 – 400 Bradford Bypass, 2004.
- Agricultural Component of the Highway 407 East Extension, 2002 – 2010.

Agricultural Impact Studies
- Bradford Bypass Highway 400- 404 Link, Agricultural Impact Assessment, 2021 – ongoing.
- Wilfrid Laurier Milton Campus, Agricultural Impact Assessment, 2021 – ongoing.
- Town of Lincoln Road Realignment, Agricultural Impact Assessment, 2021 – ongoing.
- Britannia Secondary Plan, Agricultural Impact Assessment, Milton, 2021 – ongoing.
- Petersburgh Sand Pit, Agricultural Impact Assessment, 2021 – ongoing.
- Milton, CRH Quarry Expansion, Agricultural Impact Assessment, 2020 – ongoing.
- Grimsby, Specialty Crop Area Redesignation, Agricultural Impact Assessment, 2020-ongoing.
- Halton Hills, Premier Gateway Phase 2 Employment Lands Secondary Plan, Agricultural Impact Assessment, 2020 - 2021.
- Milton Education Village Secondary Plan, Agricultural Impact Assessment, 2020 - 2021.
- Woodstock, Pattullo Avenue Realignment, Agricultural Impact Assessment, 2020 - 2021.
- Smithville, West Lincoln Master Community Plan, Agricultural Impact Assessment, AECOM, 2019 – On-going.
- Kirby Road Agricultural Impact Assessment, HDR, Vaughan, 2019 – 2021.
- Elfrida Lands, City of Hamilton, Agricultural Impact Assessment Update, WSP, 2019 – 2021.
- Dorsay Development – Durham Region High Level Agricultural Assessment, 2019.
- Stoney Creek Landfill AIA Update – GHD, 2019.
- Town of Wilmot, Agricultural Impact Assessment (AIA) Aggregate Pit Study (Hallman Pit), 2018, On-going.
- Courtice Area South East Secondary Plan (Clarington) Agricultural Impact Assessment (AIA), 2019,
- Town of Halton Hills, Minimum Distance Separation (MDS 1), August 2018,
- Cedar Creek Pit/Alps Pit (North Dumfries), Agricultural Impact Assessment (AIA), 2018 – On-going,
- Belle Aire Road (Simcoe County) Agricultural Impact Assessment (AIA) Study, 2019,
- Vinemount Quarry Extension (Niagara) Agricultural Impact Assessment (AIA) Study, December 2017.
- Grimsby – Agricultural Impact Assessment Opinion, November 2017.
- City of Hamilton, Urban Core Developments – Agricultural Capability Assessment, February 2017.
- Township of North Dumfries – Minimum Distance Separation (MDS 1), February 2017.
- Township of Erin, County of Wellington – Minimum Distance Separation 1(MDS1 Study), 2016.
- Halton Hills Employment Area Secondary Plan, Halton, 2015 - 2016.
- Peer Review of Agricultural Impact Assessment, Oro-Medonte Township, 2015.
- Greenwood Construction Aggregate Pit, Mono Township, 2014 - 2015.
- Innisfil Mapleview Developments, Town of Innisfil – Minimum Distance Separation (MDS 1), 2014.
- Loyalist Township – Minimum Distance Separation (MDS 1 & 2), 2014.
- Rivera Fine Homes, Caledon – Minimum Distance Separation (MDS 1), 2014.
- Town of Milton PanAm Velodrome – Minimum Distance Separation (MDS) 2012 – 2013.

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

- Soybean Cyst Nematode Soil Sampling, Enbridge, 2021.
- Soil Survey and Canada Land Inventory Evaluation, Max Becker Enterprises, City of Kitchener, 2021
- Soil Survey and Canada Land Inventory Evaluation, Max Beck Enterprises, City of Kitchener, 2021 – 2022.
- Soil Survey and Canada Land Inventory Evaluation, Burlington, Nelson Quarry, 2020-2021.
- City of Kitchener, City Wide Soil Studies, 2020-ongoing.
- Soil Survey, Fallowfield Drive, City of Kitchener Development Manual Study, 2020 - ongoing.
- Soil Survey, Williamsburg Estates, City of Kitchener Development Manual Study, 2020 - 2021.
- Soil Survey, South Estates, City of Kitchener Development Manual Study, 2020 - 2021.
- Soil Survey and Canada Land Inventory Evaluation, Burlington, Nelson Quarry, 2019.
- Soil Survey and Canada Land Inventory Evaluation, Maryhill Pit, 2019.
- Soil Survey and Canada Land Inventory Evaluation, Glen Morris Pit, Lafarge Canada, 2018,
- Soil Survey and Canada Land Inventory Evaluation, Brantford Pit Extension, Lafarge Canada, 2018,
- Soil Survey and Canada Land Inventory Evaluation, Pinkney Pit Extension, Lafarge Canada, May 2018,
- Soil evaluation and opinion, King-Vaughan Road, March 2018,
- Soil Sampling, Upper Medway Watershed, Agriculture and Agri-Food Canada. December 2017 – June 2018.
- Soil Survey and Canada Land Inventory Evaluation, Hillsburgh Pit Extension, SBM St Marys, December 2017.
- Soil Survey and Canada Land Inventory Evaluation, Erin South Pit Extension, Halton Crushed Stone, December 2017.
- City of Kitchener, City Wide Urban Soil Assessments, 2016 – On-going.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT) Program Study, 2016.
    - Bruce County (15 sites)
    - Grey County (4 sites)
- Soil Survey and Canada Land Inventory Evaluation, Wasaga Beach area, County of Simcoe, 2016.
- Soil Survey and Canada Land Inventory Evaluation Study, MHBC Bradford, Simcoe County, 2016.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), Carbon Foot Print Offsetters, Durham Region, 2015.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), Abundant Solar Energy (12 Sites – Peterborough, Madoc, Havelock, Belleville), 2015.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), City of Hamilton, 2015.

Municipal Comprehensive Review Studies (MCR)

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

Land Evaluation and Area Review Studies (LEAR)

- Mapping Audit Northumberland County. Comparison of Regional and Provincial Prime Agricultural Area Mapping – 2021 - ongoing.
- Mapping Audit Simcoe County. Comparison of Regional and Provincial Prime Agricultural Area Mapping – 2021 - ongoing.
- Mapping Audit Halton Region. Comparison of Regional and Provincial Prime Agricultural Area Mapping – 2019 - ongoing.
- Land Evaluation and Area Review – Soils Component, in Association with AgPlan Ltd, Kanata/Munster. December 2017 – July 2018.
- Land Evaluation and Area Review – Soils Component, Prince Edward County, 2016 – 2017.
- Land Evaluation and Area Review – Soils Component, Peel Region, 2013 - 2014.
- Land Evaluation and Area Review, Minto Communities, Ottawa, 2012 – 2013.
- GIS and LE component of Land Evaluation and Area Review, York Region 2008 – 2009.
- Land Evaluation and Area Review, Mattamy Homes, City of Ottawa – Orleans, 2008 – 2009.
- GIS for Manitoba Environmental Goods and Services (EG&S) Study. 2007 – 2008.

- GIS and LE component of Land Evaluation and Area Review, Halton Region 2007 - 2008.
- GIS and LE component of Land Evaluation and Area Review, City of Hamilton, 2003 – 2005.

Expert Witness

- Local Planning Appeal Tribunal (LPAT) Hearing, Greenwood Aggregates Limited, Violet Hill Pit Application, 2020.
- Ontario Municipal Board (OMB) Hearing, Burl's Creek Event Grounds 2018-2019.
- Town of Mono Council Meeting, Greenwood Aggregates Violet Hill Pit, January 2018.
- Ontario Municipal Board (OMB) Hearing, Burl's Creek Event Grounds, Simcoe County, 2015 – 2016.
- Ontario Municipal Board (OMB) Hearing, Town of Woolwich, Gravel Pit, 2012 – 2013.
- Ontario Municipal Board (OMB) Hearing, Mattamy Homes – City of Ottawa, 2011 – 2012.
- Ontario Municipal Board (OMB) Hearing, Town of Colgan, Simcoe County, 2010.
- Presentation to Planning Staff on behalf of Mr. MacLaren, City of Ottawa, 2005.
- Ontario Municipal Board (OMB) Hearing, Flamborough Severance, 2002.
- Preparation for an Ontario Municipal Board Hearing, Flamborough Golf Course, 2001.
- Ontario Municipal Board (OMB) Hearing, Stratford RV Resort and Campground – Wetland Delineation Assessment, 2000.
- Ontario Municipal Board (OMB) Hearing, Watcha Farms, Grey County, Agricultural Impact Assessment – Land Use Zoning Change, 1999-2000.
- Ontario Municipal Board (OMB) Hearing, Town of St. Vincent Agricultural Impact Assessment – Land Use Zoning Change, 1999 – 2000.
- Halton Agricultural Advisory Committee (HAAC), Halton Joint Venture Golf Course Proposal - Agricultural Impact Assessment for Zoning Change, 1999-2000
- Halton Agricultural Advisory Committee (HAAC), Sixteen Mile Creek Golf Course Proposal – Agricultural Impact Assessment for Zoning Change, 1999.
- Ontario Municipal Board (OMB) Hearing, Town of Flamborough, Environs Agricultural Impact Assessment for Zoning Change – Golf Course Proposal, 1999.
- Ontario Municipal Board (OMB) Hearing, Stratford RV Resort and Campground – Agricultural Impact Assessment, 1998.

Monitoring Studies

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

Publications

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