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AGRICULTURAL IMPACT ASSESSMENT

Nelson Aggregate Co.
Burlington Quarry Expansion
City of Burlington, Region of Halton

Date:

April 2020

Prepared for:

Nelson Aggregate Co.

Prepared by:
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Our File 9135J

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

MacNaughton Hermsen Britton Clarkson Planning Ltd. has been retained by Nelson Aggregate Co. (Nelson) to complete an Agricultural Impact Assessment for a proposed expansion to their existing aggregate extraction operation, on lands located on the east side of Guelph Line, north of Sideroad 2 in the City of Burlington (2433 No. 2 Sideroad). The lands are legally addressed as: Part Lot 1 & 2, Concession 2 and Part Lot 17 & 18, Concession 2 in the City of Burlington, Region of Halton. The existing quarry (known as the Burlington Quarry - Licences #5657 and 5499) is owned and operated by Nelson Aggregate Co. The proposed quarry on the subject lands will act as an extension to the existing licenced quarry (**See Figure 1**).

The proposed additional licenced area is 78.3 hectares, with a proposed extraction area of 50.2 hectares. The expansion is comprised of two expansion areas: Agricultural lands south of the existing quarry (south of Sideroad 2); and an existing golf course located west of the existing quarry (Burlington Springs Golf and Country Club). The total area proposed to be licenced and extracted is summarized in the table below:

Table 1: Proposed licenced boundaries and areas of extraction

Extension Area	Licenced Boundary	Extraction Area
South Extension (Agricultural lands)	18.3 hectares / 45.2 acres	14.5 hectares / 35.8 acres
West Extension (Golf Course lands)	60 hectares / 148.3 acres	35.7 hectares / 88.2 acres

The proposed extension includes six (6) phases. Phases 1 and 2 will take place in the south extension area; and phases 3 to 6 will take place in the west extension area. The proposed expansions will operate as a quarry below the water table. For the purposes of this report, the agricultural area shall be referred to as the *South Extension* and the golf course lands shall be referred to as *West Extension*.

The South Extension lands are currently used for agriculture (currently cash crop production), which include treed hedgerows and scrublands where rural residential dwellings were previously located. There are no agricultural buildings/infrastructure (barns) remaining on the South Extension lands. The surrounding lands include the licenced quarry operated by Nelson, rural residential uses primarily along Sideroad 2, a golf course (Camisle Golf) and natural heritage features.

The West Extension lands are used for recreational purposes (Burlington Spring Golf and Country Club, 5235 Cedar Springs Road), with a portion of the lands fronting onto Sideroad 2 occupied by a residential dwelling, barn (used as storage for the golf club) and small tree nursery. The West Extension lands are not considered agricultural lands given their existing non-agricultural use.

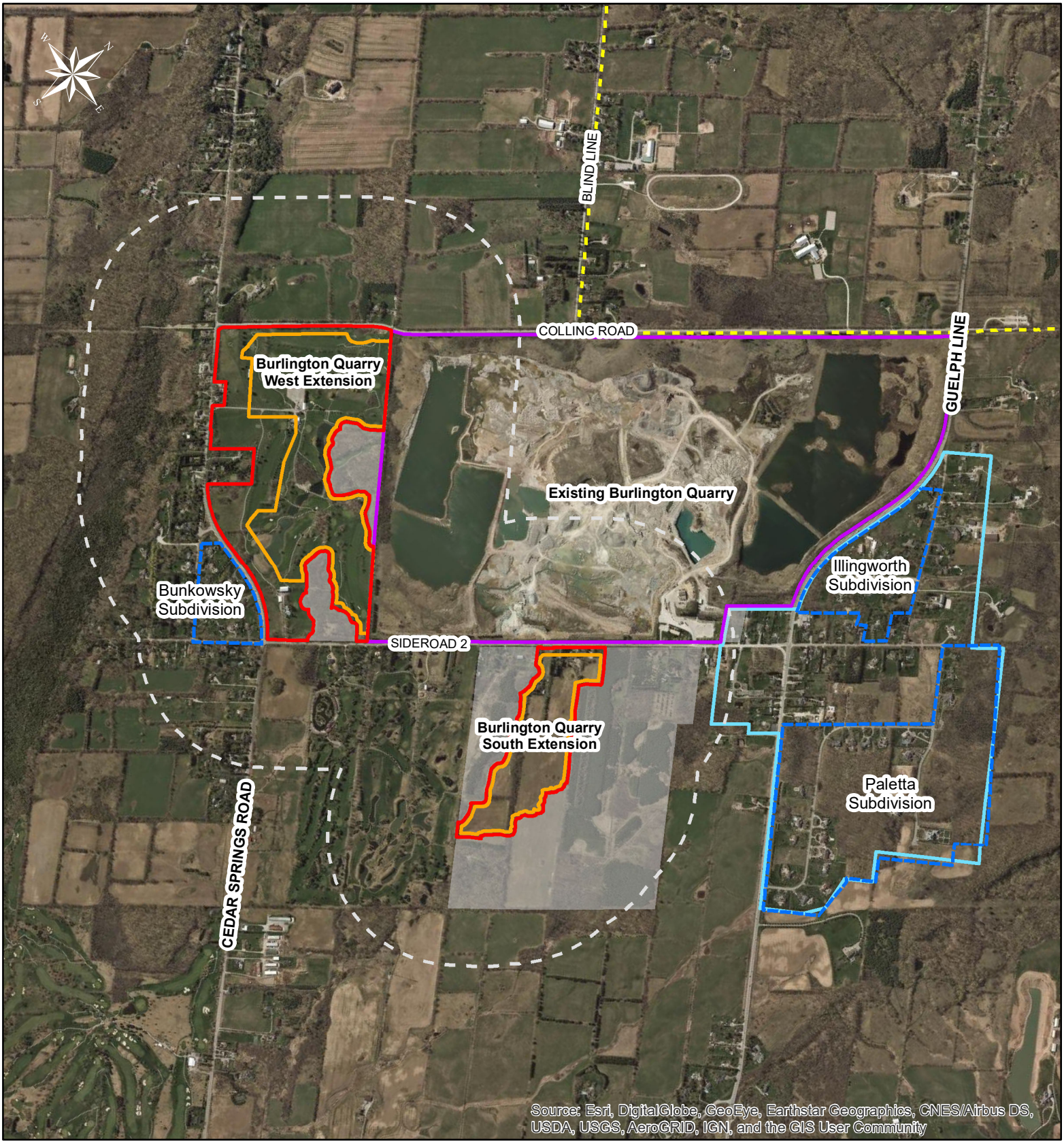

Figure # 1

Existing Land Use

Burlington Quarry Extension
Part Lots 1 & 2, Concession 2 and
Part Lot 17 & 18, Concession 2 NDS
City of Burlington
Region of Halton

Legend

- Proposed Licence Boundaries
- Proposed Limit of Extraction
- Existing Burlington Quarry
- 500m Offset
- Additional Land Owned or Controlled by Nelson Aggregates
- Boundary of Approved Subdivisions
- Mount Nemo Settlement Boundary
- Bruce Trail

DATE
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Nelson is filing an application with the Ministry of Natural Resources and Forestry (MNRF) for a Class 'A' Licence (Category 2 – Quarry Below Water) under the Aggregate Resources Act, Niagara Escarpment Plan Amendment and Development Permit, and Regional and City Official Plan Amendments to permit aggregate extraction on the subject lands.

The Niagara Escarpment Plan (2017) requires an AIA for aggregate operations located in prime agricultural areas (Section 2.9.3(f)):

> *In prime agricultural areas, undertake an Agricultural Impact Assessment to determine how to avoid, minimize and mitigate impacts on agricultural lands and operations.*

The Province and Halton Region designates the subject lands as a Prime Agricultural Area, therefore this report is intended to satisfy the criteria for an Agricultural Impact Assessment as per the requirements of the Niagara Escarpment Plan, Halton Region's Official Plan and the City of Burlington's Official Plan.

This report has been prepared to be consistent with the Province's *Draft Agricultural Impact Assessment Guidelines*, released in March 2018 by the Ministry of Agriculture, Food and Rural Affairs. This AIA is also consistent with the Region of Halton's Agricultural Impact Assessment Guidelines, which preceded the Province's Guidelines.

1.1 Data Collection and Review

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

- Provincial Policy Statement (2020);
- Niagara Escarpment Plan (2017);
- Region of Halton Official Plan (2018 consolidation);
- Region of Halton Agricultural Impact Assessment Guidelines (2014);
- Aggregate Resources Reference Manual, Region of Halton (2014); and,
- City of Burlington Official Plan (October 2017 consolidation).

A number of plans and reports were prepared in support of the applications and below is a list of reports that were also reviewed as part of the preparation of this Agricultural Impact Assessment:

- Water Resources Report prepared by EarthFX, CC Tatham, Azimuth and Worthington;
- Noise Impact Assessment prepared by HCG Engineering;
- Air Quality Study by BCX Environmental Consulting;
- Blast Impact Analysis prepared by Explotech Engineering Ltd.;
- Visual Impact Assessment prepared by MHBC Planning Ltd. ;
- Traffic Report prepared by Paradigm Transportation Solutions Ltd.;
- Planning report and ARA Summary Statement prepared by MHBC Planning Ltd.; and,
- Soil Survey and Canada Land Inventory Classification prepared by DBH Soil Services Inc. (included in Appendix A).

In addition to the plans and reports that were specifically prepared in support of the ARA application, the following materials were also reviewed:

- Site plans including Existing Conditions Plan, Operation Plan and Rehabilitation Plan;
- Site plans for the existing licenced quarry;
- Soil data resource information which should include Ontario Soil Survey reports and mapping, the provincial digital soil resource database, Canada Land Inventory Agricultural Capability mapping, Soil Suitability information and mapping (for specialty crops), and information from on-site investigations;
- Aerial photography (historic and recent) with effective user scale of 1:10,000 or smaller;
- Agricultural statistics (Statistics Canada, 2016 Census of Agriculture);
- OMAFRA's constructed and agricultural Artificial Drainage Mapping (OMAFRA Agricultural Information Atlas);
- Agricultural Systems data from OMAFRA's Agricultural System Portal; and
- Parcel mapping/fabric of the area.

A land use survey was also conducted on September 17th, 2019 with additional information gathered from Google Satellite Imagery utilized to gain a better understanding of the agricultural operations and activities in both the primary and secondary study areas. A summary of the land use survey is provided in Section 2.0 of this report. The potential for impacts will vary and mitigation is dependent on the type and sensitivity of the agricultural activities identified in the primary and secondary study areas.

1.2 Proposed Aggregate Extraction Operation

The South Extension lands are located on the south side of Sideroad 2, between Guelph Line and Cedar Spring Road. The West Extension lands are located on the east side of Cedar Springs Road, between Sideroad 2 and Colling Road. The closest point of the proposed South Extension lands are located approximately 480 metres west of the Mount Nemo settlement area (**Figure 1**), whereas the West Extension lands are located approximately 1.5 kilometres from the settlement area. The subject lands are located immediately adjacent to the existing Burlington Quarry (Licence #5499) which is owned and operated by Nelson. The subject lands (South and West extensions) will act as an extension to Licence #5499. A location map of the subject lands illustrating the existing land uses is provided as **Figure 1**.

The South Extension lands are bounded on the north by the existing licenced quarry; on the east by a woodlot and a rural residential dwelling; on the south by agricultural lands and scrublands; and on the east by a woodlot and recreational uses (Camisle Golf Course). The total area to be licensed in the South Extension is 18.3 hectares (45.2 acres), of which 13.2 hectares is considered Class 1, 3.0 hectares is Class 2 and 2.1 hectares are disturbed soils (based on detailed Soil Survey completed by DHB Soil Services). Approximately 12.7 hectares (31.4 acres) of the South Extension lands is currently in active agricultural use (discounting the disturbed lands, hedgerows and other non-arable lands). Therefore, the extraction of the South Extension area would result in the loss of approximately 16.2 hectares of 'prime agricultural lands', of which approximately 12.7 hectares are currently being cultivated.

The West Extension lands are bounded to the north by Colling Road and agricultural lands; on the east by the existing licenced quarry; on the south by Sideroad 2, rural residential dwellings and Camisle Golf

Course; and on the west by rural residential dwellings and Cedar Springs Road. The total area proposed to be licensed in the West Extension is 60 hectares (148.3 acres) and 35.7 hectares (88.2 acres) is proposed to be extracted. Although the West Extension Lands are mapped as Canada Land Inventory (CLI) Class 1 (36.8 hectares/61.2%), Class 2 (0.4 hectares/0.7%), Class 3 (20.3 hectares/33.8%) and Class 7 (2.5 hectares/4.3%) soils, these lands are currently not in agricultural production and the soil capability has been substantially disturbed as the lands are currently used for recreational purposes (Burlington Springs Golf and Country Club).

Extraction activities are proposed to be developed in phases. The proposed South extension will occur first (phase 1a, phase 1b, and phase 2). The mined aggregate is proposed to be transported by 70-tonne rock trucks across Sideroad 2 at grade to the existing processing plant. The proposed West Extension will occur after the South Extension. The West Extension will occur in phases (phase 3 – 6). The West Extension lands are contiguous with the existing quarry and the material removed from this extraction area will be transported to the existing processing plant. The operational sequence is shown in **Figure 2** of this report, with the detailed Operations Plan shown in **Figure 3**. No processing will take place on the proposed extension lands.

The South Extension lands are currently in agricultural production (soybeans, 2019), with parcels subdivided by treed hedgerows and surrounded by woodlots. The South Extension lands are described as gently rolling. Some remnants of the previous residential use, including the foundation and a drive shed, remain near the access of the property at 2316 Sideroad 2. This property does not include any agricultural infrastructure such as tile drainage, fencing, barns/agricultural structures, etc. The drive shed on the property is in poor condition. The woodlots surrounding the South Extension lands are not proposed for extraction.

The Burlington Quarry extension contains approximately 30 million tonnes of high quality aggregate resource. Nelson is applying for a maximum tonnage limit of 2 million tonnes per year; however, they plan on extracting an average of 1 million tonnes per year. The existing haul route to access the lands is via Guelph Line and No. 2 Side Road and is not proposed to change.

The proposed aggregate extraction on the extension properties will provide additional reserves and operate in conjunction with the existing quarry. Based on the available aggregate resource, the South Extension is expected to operate for 9 years, and the West Extension for 21 years.

The South Extension lands are actively farmed with a rotation of cash crops (soybeans, 2019). Data available through through OMAFRA's Agricultural System Portal indicates that there is no constructed drainage or tile drainage on the lands.

The existing agricultural production on the subject properties will continue until such time as they are required for extraction. The subject lands will not be rehabilitated back to an agricultural condition following the aggregate extraction operation, as the lands will be extracted below the water table and the depth of extraction precludes the ability to return the lands to an agricultural condition.

The proposed after use vision for the extension and existing quarry is to develop a landform suitable for a future park. As a result, the rehabilitation plan for the South extension includes a beach, lake, exposed

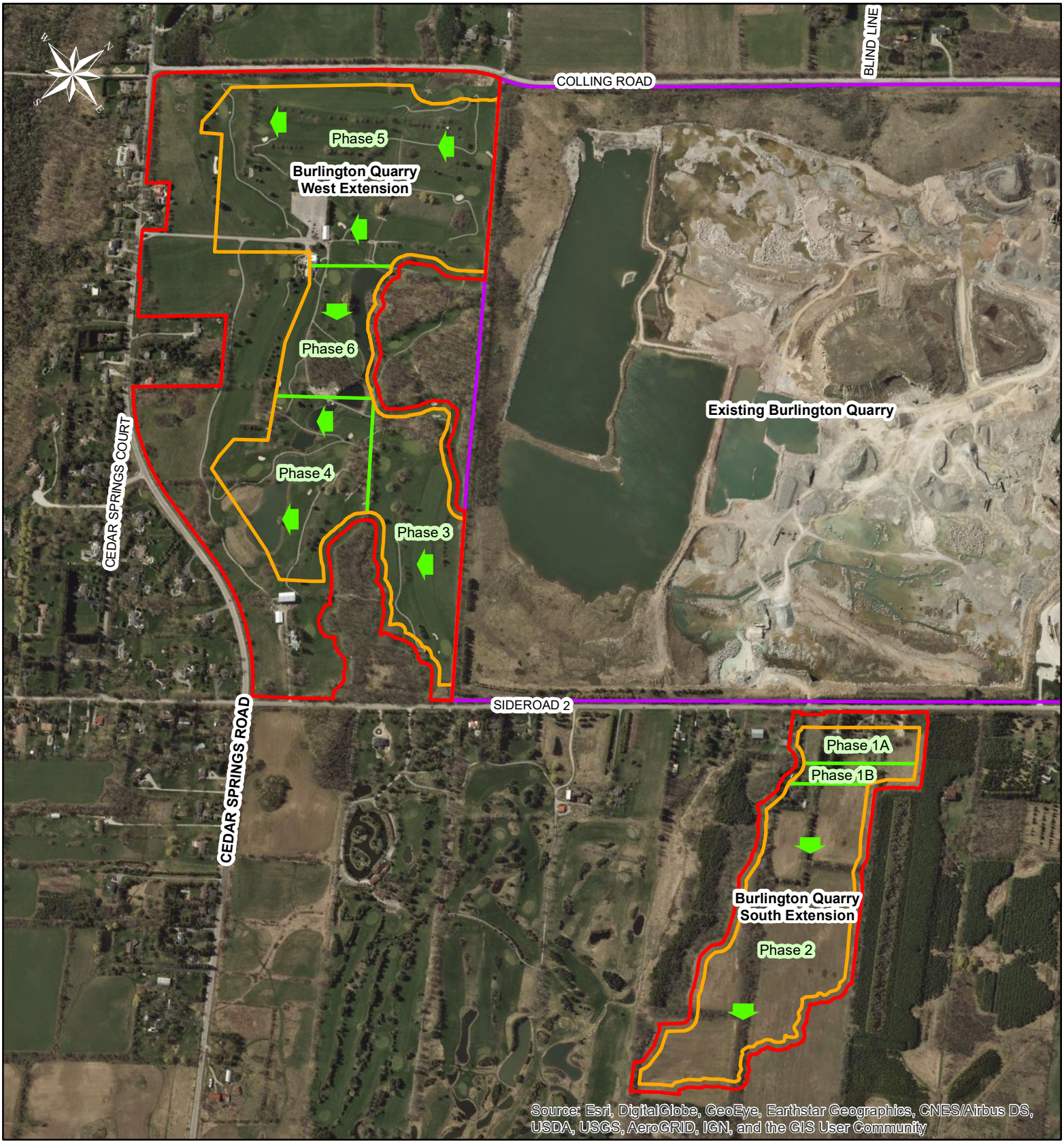

Figure # 2

Operations Sequence

Burlington Quarry Extension
Part Lots 1 & 2, Concession 2 and
Part Lot 17 & 18, Concession 2 NDS
City of Burlington
Region of Halton

Legend

- Proposed Licence Boundaries
- Proposed Limit of Extraction
- Existing Burlington Quarry
- Extraction Sequence Boundary

DATE
April 2020

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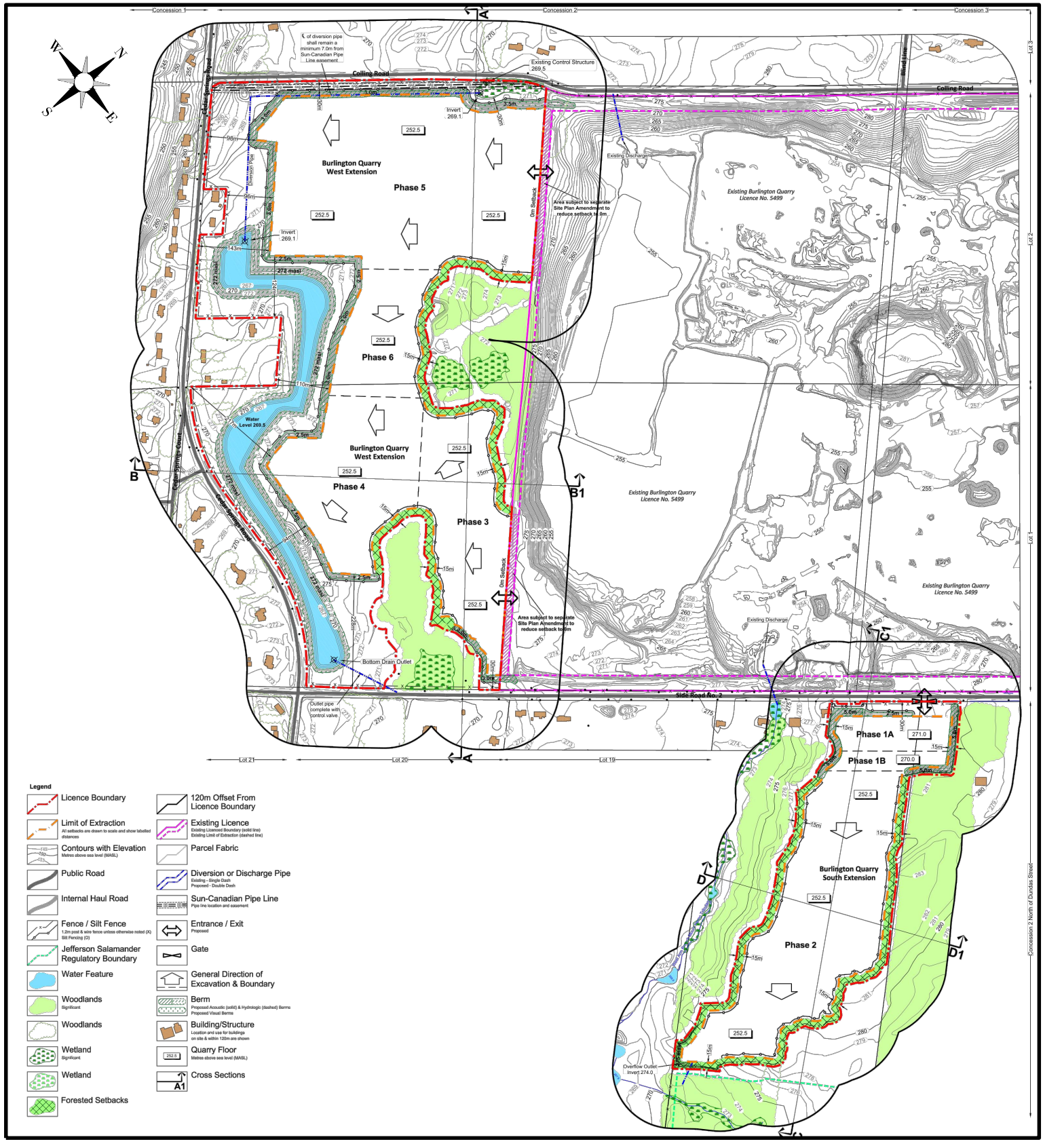

Figure # 3

Operational Plan

Burlington Quarry Extension

Part Lots 1 & 2, Concession 2 and
Part Lots 17 & 18, Concession 2 NDS
City of Burlington
Region of Halton

Date	April 2020
Sources	Nelson Aggregate's Burlington Quarry Extension Site Plan, Operational Plan, updated April 20, 2020.
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quarry faces, wetlands and forested areas. The rehabilitation plan for the West Extension includes a series of ponds, wetlands, exposed quarry faces and forested areas.

1.3 Purpose of the Study

The purpose of this Agricultural Impact Assessment is to evaluate potential impacts on agriculture from the proposed aggregate extraction operation extension and identify mitigation measures to abate these impacts to the extent feasible. Furthermore, this report is intended to provide baseline pre-extraction documentation, such as existing agricultural condition and soil details, as the land will not be rehabilitated to an agricultural condition due to the proposed below water extraction.

As part of this AIA, surrounding agricultural land uses and structures on properties within one kilometre of the subject lands have been documented to assess the potential impact from the proposed aggregate expansion on the agricultural uses/operations and determine the extent of mitigation that may be required.

Furthermore, a soil survey and Canada Land Inventory (CLI) Evaluation was completed by DBH Soil Services Inc. to document the existing soil conditions and provide a more detailed assessment of the Canada Land Inventory (CLI) classification for the soil resources on both properties. Basic information about the soils provides an interpretation of the agricultural capability of the soil to produce various types of crops as well as provide useful information to assess impacts on soil resources.

2.0 STUDY AREA

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

The Secondary Study Area includes the potential area that may be affected by indirect impacts of the proposed operations. For the purposes of this assessment, we have assigned a Secondary Study Area of one kilometre from the subject lands.

A plan identifying the adjacent properties, existing crops and existing barns and residential structures within the study area is included as **Figure 4** of this report. Both the Primary and Secondary Study Areas are shown for the South Extension and West Extension. The inventory of existing agricultural land uses, cropping practices and structures is based on observations made during a site visit completed on September 17th, 2019. A review of 2016 Census of Agriculture data was also undertaken to confirm if the Study Areas are representative of agricultural production patterns and livestock types in the broader region.

2.1 Primary Study Area

As shown in **Figure 4,** the predominant land uses within 120 m of the proposed South Extension lands is natural heritage (woodlots), agricultural (field crops), rural residential dwellings and the licenced quarry (Licence No. 5499). The predominant land uses within 120 m of the West Extension lands is the licenced quarry, recreational uses (both Burlington Spring Golf and Country Club; and Camisle Golf Course), rural residential and agricultural uses (field crops).

The crops present on the South Extension lands at the time of the site visit were soybeans. The South Extension lands are located south of No. 2 Side Road, and southeast of the Mount Nemo settlement area. The West Extension lands are located east of Cedar Springs Road. The area is primarily characterized by the existing quarry operation, recreational uses, rural residential dwellings and estate residences, with few large parcels of agricultural lands. Overall, it is noted that the immediate surrounding area is relatively fragmented by rural residential development, natural areas and recreational uses.

In 2019, surrounding uses within the Primary Study Area (120m)/abutting the **South Extension** lands included:

North – Rural residential dwellings, including one bank barn which appears to be used for storage at 2280 No. 2 Side Road; Existing licence no. 5499 and No. 2 Side Road;

South – Agricultural lands (soybeans 2019) and woodlands;

Figure # 4
Agricultural Land Uses

2433 No. 2 Side Road
Part Lot 1 & 2, Conc. 2 and Part Lot 17 & 18,
Conc. 2 in the Town of Burlington, Region of Halton

Legend

- Barn
- Equestrian
- Haul Route
- Expansion Lands
- Existing Licensed Pit
- Primary Study Area (120m)
- Secondary Study Area (1km)

Agricultural Land Use

- Corn
- Pasture
- Beans
- Fallow
- Hay
- Soy
- Wheat
- Cash Crop (not visible from road)

NOTES:
• Land use information based on Field Visit (September 17, 2019)

Date: February, 2020 | File: 9135J

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Burlington Quarry
(Licence No. 5499)

Burlington Springs
Golf & Country Club

Carisle
Golf Course

Guelph line
Golling Road
Mount Nemo Crescent
Escarpment Drive
Bluff's Way
Millar Crescent
Sideroad 2
Sideroad 1
Blind line
Atlantis Road
Forest Hill
Cedar Springs Court
Cedar Springs Road
Millborough line

Hay
Soy
Wheat
Corn
Beans
Cash Crop
Pasture
Fallow

West – Woodlands and residential dwelling located at 2244 Sideroad 2;

East – Woodlands, vacant bank barn (not visible from road, but appears to be used for storage).

In 2019, surrounding uses within the Primary Study Area (120m)/abutting the **West Extension** lands included:

North – Estate residential surrounded by cash crop production (soybeans, 2019) and Colling Road;

South – Rural residential use with bank barn fronting on Sideroad 2 associated with the Burlington Spring Golf and Country Club (barn used for golf course storage) and small/hobby tree nursery; Small parcels of hay and tree/nursery production; No. 2 Side Road, Camisle Golf Course;

West – Rural residential dwellings at 5165-5255 Cedar Springs Road (5 in total);

East – Existing licence no. 5499.

Surrounding Land Uses:

Nelson owns and operates the Burlington Quarry, which is located on the west side of Guelph Line, between Sideroad 2 and Colling Road (Licence Nos. 5657 and 5499). The current entrance to the existing Burlington Quarry is off of Sideroad 2. The existing quarry (licenced area) is approximately 218 hectares (539 acres) in size.

The site visit confirmed that there are not many productive and contiguous agricultural operations within the Primary Study Area, as this area is already fragmented by the existing aggregate, recreational, natural and rural residential uses. The following description and photos are focused on the South Extension lands, as the West Extension lands are not in agricultural production.

Agricultural uses within the Primary Study Area of the subject lands consist of typical cash crops as well as some woodland areas. Current agricultural production on the South Extension lands includes soybeans, presumably in a corn-wheat-soy crop rotation.

There are currently no active agricultural structures within the primary study area of the South Extension lands and no visible signs of extensive agricultural improvements to the lands or structures (e.g. new fencing, tile drainage). The cash crop fields are gently sloped and subdivided by treelines/ woodlands and hedgerows. Some of the fields are considered to be smaller in size (subdivided by hedgerows and woodlands) than typical agricultural fields. In total, the lands currently in agricultural production are approximately 12.7 hectares (31.4 acres) in size, which is consistent with the average parcel size in the City of Burlington (a majority of farms (44%) are within the 10 - 69 acre farm size[1]).

The following images illustrate agricultural production of the South Extension lands.

[1] Census of Agriculture, 2016. Farms classified by total farm area: Table 32-10-0404-01

Cash crop production on subject lands, currently soybean production

Vehicle access to rear fields (soybeans)

Below is an image of the South Extension lands most southern parcel, which is larger in size than the other fields.

Southern field of South Extension lands (soybeans)

The fields are not typically shaped (e.g. rectangular), as the woodlands frame the smaller fields, creating non-contiguous parcels.

Smaller soybean field, surrounded by woodlands

The lands can be accessed via an old driveway off of 2316 Sideroad 2. The previous house was removed; however, the drive shed remains. There is also an old derelict combine harvester near the field access, which can be seen on the aerial photo below.

Aerial photo of field access via 2316 Sideroad 2

2.2 Secondary Study Area

The Secondary Study Area includes an area within a radius of one kilometre around the subject lands. In addition to the existing aggregate extraction operations within the Study Area, there are few active agricultural operations within the Secondary Study Area. A site visit was conducted on September 17th, and the following is a summary of the agricultural uses within the Secondary Study Area that existed on the day of the field observations. Comments on the physical characteristics of existing farm structures is based solely on roadside observations and not supported by any formal structural assessment.

Overall, it was observed that there are few large fields of cash crop production or large scale livestock operations within the one kilometre radius. The crops found in the secondary area include:

- Corn
- Soybeans
- Wheat
- Hay

Figure 4 illustrates the location and type of crops found in the secondary study area. Three (3) vacant bank barns are visible from No. 2 Side Road, with no evidence of livestock (appear to be utilized for storage). An active poultry operation is located at 4245 Cedar Springs Road, over 700 metres from the South extension

lands and 1 km from the West Extension lands. While two barns appear to be used for poultry production, the remaining structures appear to be used for storage.

Aerial photo of poultry operation (in red circle) and storage buildings at 4245 Cedar Spring Road

There are equestrian operations, ranging in size from hobby farms to training facilities in the surrounding area, outside of the Secondary Study Area. At the time of the site visit, horses were observed within the Secondary Study Area at 5506 Blind Line (Reindance Equestrian) and 4211 Cedar Springs Road (Golden Stirrup Equestrian).

Aerial photo of equestrian operations along Blind Line, north of existing quarry

Based on the site visit, the agricultural lands within the Primary and Secondary Study Areas are significantly fragmented by existing rural residential, natural areas and recreational uses. The parcel sizes are indicative of smaller, hobby-sized farms rather than large cash crop or livestock operations found elsewhere in southern and central Ontario. No extensive farm investment such as tile drainage, irrigation or other specialized cropping practices or equipment were observed or are documented within the Primary or Secondary Study Areas.

There is some livestock production, but existing livestock operations (including equestrian) within the Study Areas are well set back and separated from the subject lands. Due to the number of equestrian operations in the area, there appears to be some investment into fencing and other typical equestrian related infrastructure.

In addition to the farm operations referenced in **Figure 4,** there are a number of rural residential lots within the Secondary Study Area. A number of these lots were likely created through rural residential severances.

Overall, the Secondary Study Area is representative of normal livestock and cropping practices for this area.

2.3 Census of Agriculture 2016

A review of the 2016 Census of Agriculture for Halton Region and the City of Burlington was undertaken in order to provide an overview of agricultural production patterns and parcel size. This helps confirm if current farming practices within the Study Areas are characteristic of the broader agricultural area.

The total numbers of farms in Halton Region (451 farms) and the City of Burlington (66 farms) have declined since 2011. The City of Burlington experienced a greater decline (5.7%) in total number of farms when compared to the Region of Halton (3.8%).

The majority of farm uses in Halton (28.6%) and Burlington (36.4%) consist of Other Animal Production and include significant equine operations (75.2% of 'other animal' production in Halton and 70.8% in Burlington) and animal combination farming, such as hobby farms (14% in Halton and 7.5% in Burlington). The large amount of 'other animal' production farming, notably equine operations, is reflective of agricultural trends within the surrounding Region's and City's, which includes a higher concentration of equine operations.

Oilseed and grain farming (21.5% in the Region and 10.1% in the City), other crop farming (14% in the Region and 21.2% in the City) and greenhouse, nursery and floriculture production (12.6% in the Region and 15.2% in the City) also form large portions of Halton`s and Burlington`s agricultural production. Cattle ranching and farming (7.3%) and vegetable and melon farming (5.7%) contribute to a smaller portion of the Region's agricultural production while fruit and tree nut farming (9%) contribute to a smaller portion of the City`s agricultural production.

In terms of parcel size, the majority of farms in the Region and the City are within the 10-69 acres farm size (44%), followed by the 70-128 acre range (17% in Halton and 21.2% in Burlington). These farm parcel sizes are characteristic of smaller farm sizes throughout Ontario with 25.5% of farms between 10-69 acres and 21.7% between 70-129 acres.

The amount of lands in crop production has declined in the both the Region (14.7%) and the City (26.4%). Burlington has experienced a stronger decline (5,203 acres to 3,828 acres) in the amount of lands in crop production since 2011 in comparison to Halton Region (61,673 acres to 52,602 acres).

Based on the site visits, the agricultural activities within both the Primary and Secondary study area are indicative of broader agricultural trends in the City of Burlington and the Halton Region.

Overall, agricultural uses within both the Primary and Secondary Study Area are representative of normal agricultural production for this area. The loss of approximately 12.7 hectares of agricultural land, currently used for cash crop production, will have a negligible effect on the social and economic impacts of agriculture in the City of Burlington, Halton Region and province as a whole.

3.0 FIELD DATA COLLECTION

3.1 Soil and CLI Capability

The Canada Land Inventory (CLI) system uses soil attributes to create a seven class system of land use capabilities. Class 1, 2 and 3 soils are capable of sustained common field crop production. Class 4 soils are limited for sustained agriculture while Class 5 is capable for use of permanent pasture and hay. The sixth class is best utilized for wild pasture and Class 7 is for soils or landforms that are not capable for use for arable culture or permanent pasture. According to the Soil Survey and Canada Land Inventory Classification (CLI) assessment completed by DBH Soil Services Inc. (DBH), the South Extension lands are comprised of mostly Class 1 and 2 soils with a portion of Disturbed Soil Areas. The West Extension lands were not assessed as part of the soil assessment as they are not in an agricultural condition and are already considered to be disturbed (golf course).

According to the Canada Land Inventory Soils Map produced by the province, (see **Figure 5**), the South Extension lands are comprised of Class 1 soils, with a small portion of Class 2 soils. Provincial CLI mapping indicates the West Extension lands include both Class 1, 3 and 7 lands.

In order to confirm the soil type and classification, a Soil Survey and Canada Land Inventory Classification was prepared by (DBH). A copy of the Soil Survey is included as **Appendix A** of this report. The on-site soil survey was conducted on October 1, 2019 to more accurately map and classify the soil resources of the soil materials on the South Extension lands. The soil survey included a number of tasks including:

- Completion of a review of published soil information (*The Soils of Halton County (Report No. 43 of the Ontario Soil Survey* (Gillespie, J.E., R.E. Wicklund and M.H. Miller, 1971));
- Review of published Canada Land Inventory (CLI) ratings for the soils in the area surrounding the subject lands;
- Review of aerial photography and interpretation of the soil polygons, disturbed soil areas and miscellaneous landscape units (i.e. streams, boulder pavement, wayside pits);
- On-site soil survey (October 1, 2019); and
- Mapping to illustrate the location of the subject lands, the occurrence of soil polygons and appropriate CLI capability ratings.

A total of 22 soil inspection sites on the South Extension lands were examined and the information was then correlated with soil descriptions in order to produce the soils map. A soil map identifying the soil series present on the South Extension lands is shown on **Figure 6**.

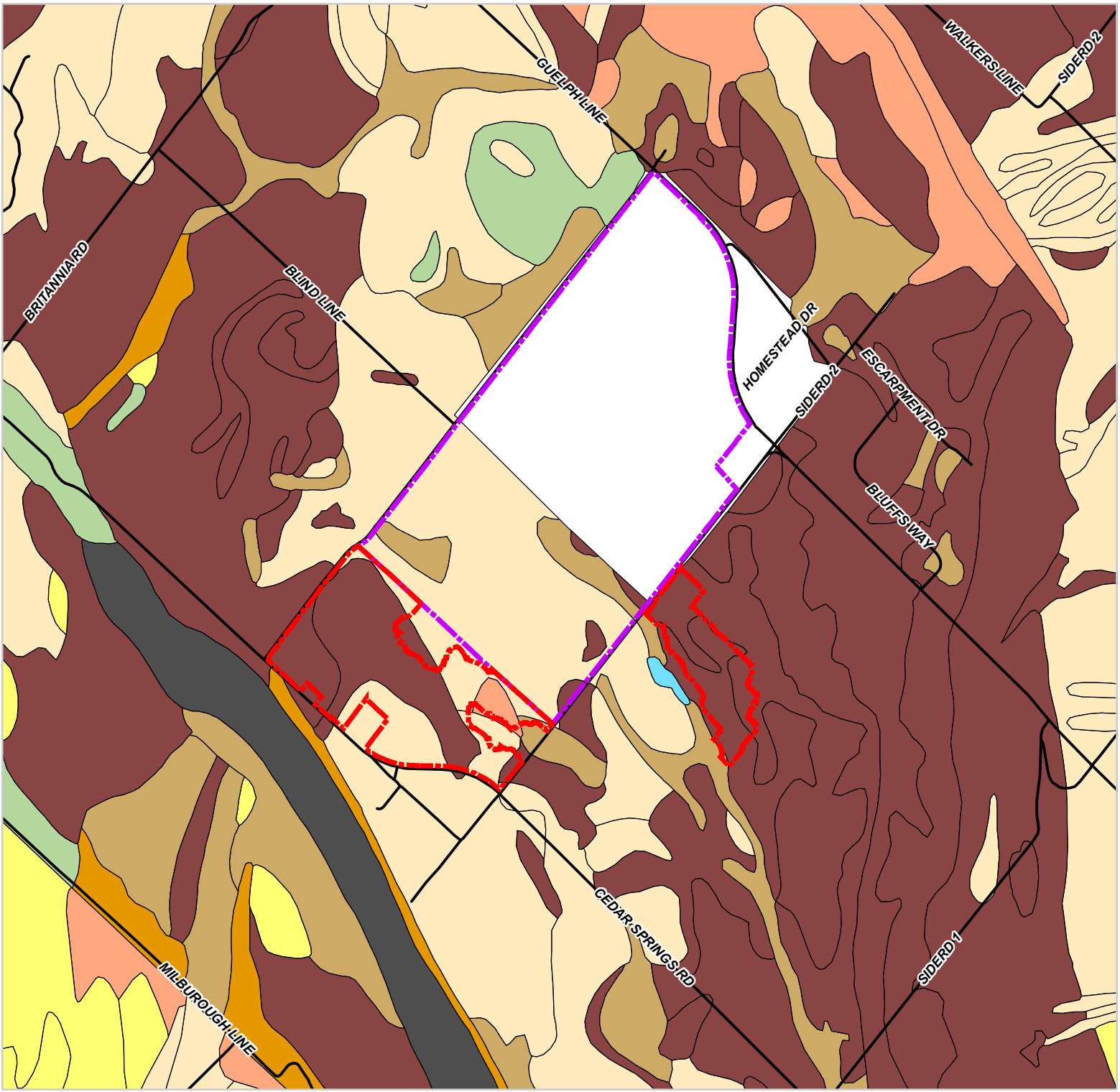

Figure # 5
Canada Land Inventory Soils

Legend

- Proposed Licence Boundaries
- Existing Burlington Quarry

Soil Class

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

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Burlington Quarry Extension
Part Lots 1 & 2, Concession 2 and
Part Lot 17 & 18, Concession 2 NDS
City of Burlington
Region of Halton

Source: Land Information Ontario (LIO) Open data

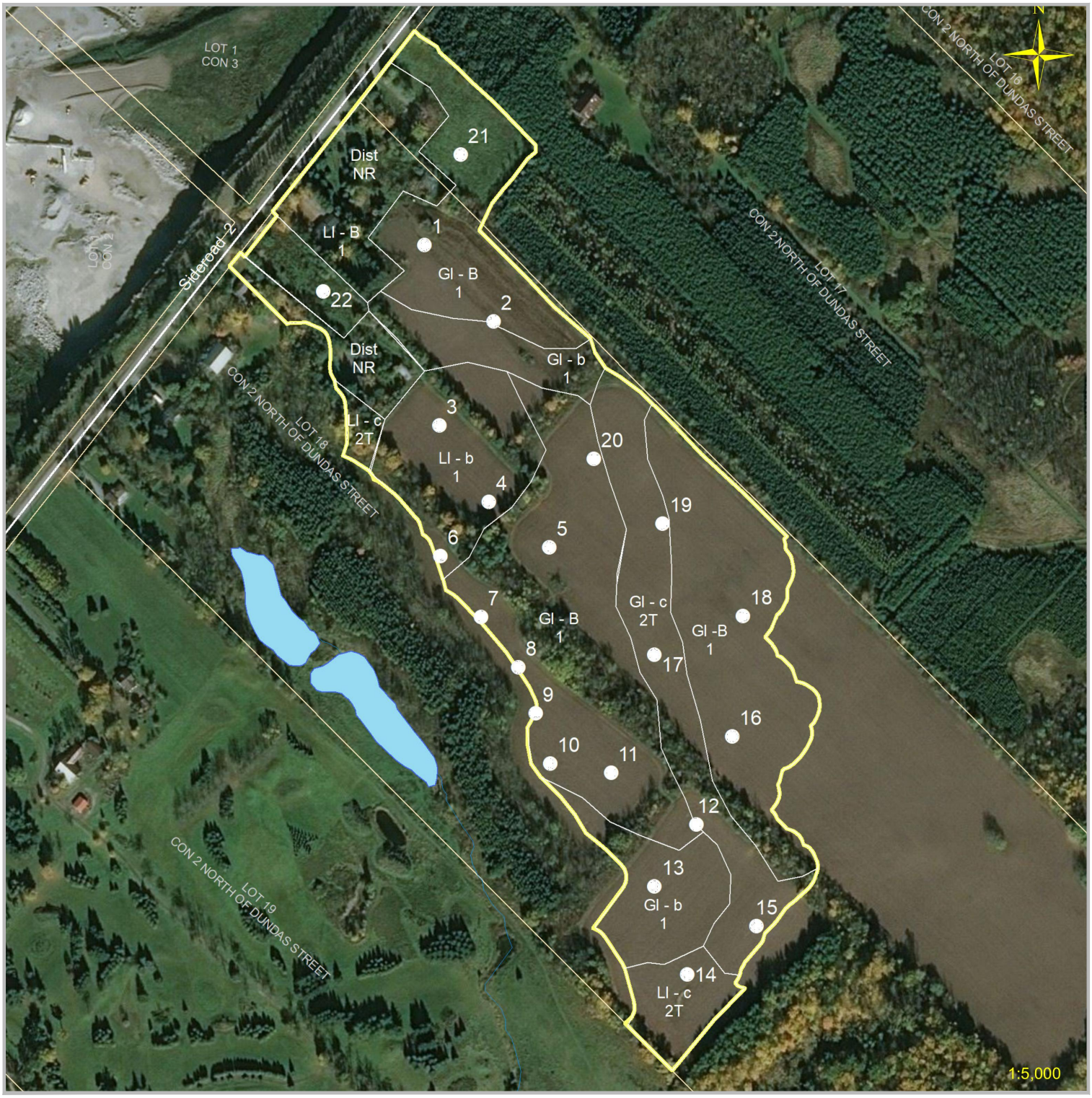

Figure 6:

DBH Soil Mapping

Legend

- Soil Inspection Site
- Roads (MNRF)
- Watercourse (MNRF)
- Lot Lines (MNRF)
- Soil Polygon Boundary
- Subject Lands Boundary
- Waterbody (MNRF)

Soil Code – Gl - c – Slope Code
CLI Class – 2T – CLI Subclass

Soil Code	CLI Subclass Limitation
Gu - Guelph LI - London	T - Topography
Dist - Disturbed Soils	NR - Not Rated

Slope Code

Aa = 0.0 - 0.5 %
Bb = 0.5 - 2.0 %
\ < 50 m slope length
\ > 50 m slope length

DATE: January, 2020

SCALE: NTS

FILE: 9135J

DRAWN: GC

north

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Burlington Quarry Extension
Part Lots 1 & 2, Concession 2 and
Part Lot 17 & 18, Concession 2 NDS
City of Burlington
Region of Halton

SOURCE
DBH Soil Services Inc., October 2019

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
200-540 BINGEMANS CENTRE DR. KITCHENER, ON, N2B 3X9
P: 519.576.3650 F: 519.576.0121 | WWW.MHBCPLAN.COM

Tables 2 and 3 summarize the relative percent area occupied by each capability class for the licensed areas of the South and West Extension lands. Note, given the existing disturbance of the soils on the West Extension lands, soil classification in Table 3 is based on existing provincial CLI mapping.

Table 2: Canada Land Inventory – Burlington Quarry South Extension

Canada Land Inventory Class (CLI)	Area (ha/acres)	Percent Occurrence (%)
Class 1	13.2/32.6	71.9
Class 2	3.0/7.4	16.2
Class 3	-	-
Class 4	-	-
Class 5	-	-
Class 6	-	-
Class 7	-	-
Disturbed Soil Areas	2.1/5.2	11.9
Totals	18.3/45.2	100.0

Table 3: Canada Land Inventory – Burlington Quarry West Extension

Canada Land Inventory Class (CLI)	Area (ha/acres)	Percent Occurrence (%)
Class 1	36.8/90.9	61.2
Class 2	0.4/1.0	0.7
Class 3	20.3/50.2	33.8
Class 4	-	-
Class 5	-	-
Class 6	-	-
Class 7	2.5/6.2	4.3
Disturbed Soil Areas		
Totals	60/148.3	100.0

According to the Soil Survey and Canada Land Inventory (CLI) Evaluation by DBH, the South Extension lands are comprised mainly of Canada Land Inventory (CLI) Class 1 soils (71.9%) with a portion of Class 2 soils (16.2%). The presence of Class 1 and 2 soils means that the South Extension lands are considered prime agricultural lands. Similarly, the West Extension lands are 'mapped' as prime agricultural lands, however, these lands are currently not in agricultural production and the soils have been substantially altered, and as a result, the CLI classification system has no agricultural capability rating for these lands.

The Hoffman Productivity Index (HPI) is a tool that is used to relate the productivity of lands to the CLI soil capability. The value is derived from the sum of the percent occurrence of each CLI Soil Capability Class on the parcel. Based on the findings from the Soil Survey prepared by DBH Soil Services Inc., the calculated Soil Productivity Rating for the South Extension lands is 0.83 or a CLI Class 2 equivalent.

The DBH analysis confirms that a large portion of the South Extension lands is comprised of Class 1 and Class 2 soils. The presence of Class 1 and 2 soils means that the South Extension lands are considered prime agricultural lands. The Soil Productivity Rating of 0.83 demonstrates the land's average productivity is a Class 2 equivalent.

3.2 Microclimate for Specialty Crop Production

Climate data was obtained from the OMAFRA document titled "Agronomy Guide for Field Crops – Publication 811 (June 2009)" and the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Factsheet – Crop Heat Units for Corn and Other Warm Season Crops in Ontario, 1993. The subject lands are located within the 3100-3300 average accumulated Crop Heat Units (CH-MI) available for corn production in Ontario. The Crop Heat Units (CHU) index was originally developed for field corn and has been in use in Ontario for 30 years. The CHU ratings are based on the total accumulated crop heat units for the frost free growing season in each area of the province. CHU averages range between 2500 near North Bay to over 3500 near Windsor. The higher the CHU value, the longer the growing season and greater are the opportunities for growing value crops.

According to DBH, the properties are located within the 3100-3300 average accumulated Crop Heat Units (CH-MI) and as such, the agricultural lands are not subject to special climatic conditions. Given the typical climatic conditions, there are limited opportunities for growing speciality crops, and therefore, the properties have not been identified as a specialty crop area in the Region of Halton and City of Burlington Official Plans and do not meet the criteria as identified by the Province.

4.0 PLANNING POLICY FRAMEWORK

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

4.1 Provincial Policy Statement

The 2020 Provincial Policy Statement (PPS) replaces the 2014 PPS and was issued under Section 3 of the Planning Act and comes into effect on May 1, 2020. Although at the time of writing this report the 2020 PPS was not effect, the 2020 PPS has been reviewed for the purposes of this report.

The PPS establishes the policy foundation for regulating the development and use of land in the province and provides policy direction on matters of provincial interest related to land use planning and development. It provides a vision for land use planning in Ontario that encourages an efficient use of land, resources and public investment in infrastructure. The PPS strongly encourages development that will provide long term prosperity, environmental health and social wellbeing. The 2020 PPS applies to planning decisions made on or after the effective date and applies to the consideration of the proposed Official Plan and Zoning By-law Amendment applications.

The PPS defines "Prime agricultural areas" as:

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

Further, the PPS defines Prime agricultural land as:

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

In accordance with Section 2.3.2 of the PPS, Halton Region designates the subject lands as Agricultural. As previously noted, based on the soil survey completed by DBH Soil Services Inc., the majority of the South Extension lands consists of Classes 1 and 2 soils, and therefore is considered to be "prime agricultural lands." Although the West Extension lands are not in agricultural production, the CLI mapping indicates the soils are considered primarily to be Class 1 and 3. Furthermore, based on the CLI mapping of the surrounding area, the surrounding lands also consists of predominantly Classes 1 and 2 soils and thus the

area is considered a "prime agricultural area" as defined by the PPS. The lands are also mapped as prime agricultural area under the Agricultural Land Base for the Greater Golden Horseshoe (See **Figure 7** – GGH Agricultural System Mapping). The lands are also designated as Prime Agricultural Area in the Region of Halton's Official Plan (Schedule 1E – Agricultural System and Settlement Areas: see **Figure 8).**

The PPS defines specialty crop areas as:

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

The lands and surrounding areas have not been identified or designated as a specialty crop area by the province or the municipality and neither do the lands exhibit characteristics of a specialty crop production as defined by the PPS. Accordingly, the subject lands are not within a specialty crop area.

In prime agricultural areas, the PPS permits agriculture uses, agriculture-related uses and on-farm diversified uses. In accordance with the Provincial Policy all types, sizes and intensities of agricultural uses and normal farming practices are promoted and protected in prime agricultural areas.

Limited non-agricultural uses such as the extraction of mineral aggregate resources are permitted in prime agricultural areas in accordance with Policy 2.3.6 and 2.5.4 of the PPS.

Policy 2.3.6.1(a) provides that extraction of mineral aggregate resources is permitted in prime agricultural areas. Furthermore, policy 2.3.6.2 provides that "impacts from any new or expanding non-agricultural uses on surrounding agricultural operations and lands are to be mitigated to the extent feasible". Anticipated impacts on the surrounding agricultural activities are discussed and addressed in Section 5 of this report.

Policy 2.5 of the PPS deals specifically with mineral aggregate resources and Policy 2.5.1 provides that mineral aggregate resources shall be protected for long term use. Therefore, although the PPS recognizes the importance of prime agricultural lands, it also recognizes the importance to sustain mineral resources for long term use.

Policy 2.5.2.2 of the PPS requires that "*extraction shall be undertaken in a manner which minimizes social, economic and environmental impacts*." The impacts of the operations on the surrounding agricultural land uses are discussed later in this report.

With respect to extraction in Prime Agricultural land, section 2.5.4.1 notes that extraction of mineral aggregate resources is permitted as an interim use provided that rehabilitation of the site will be carried out so that substantially the same areas and same average soil quality for agriculture are restored. This section of the PPS also states that complete rehabilitation to an agricultural condition is not required if:

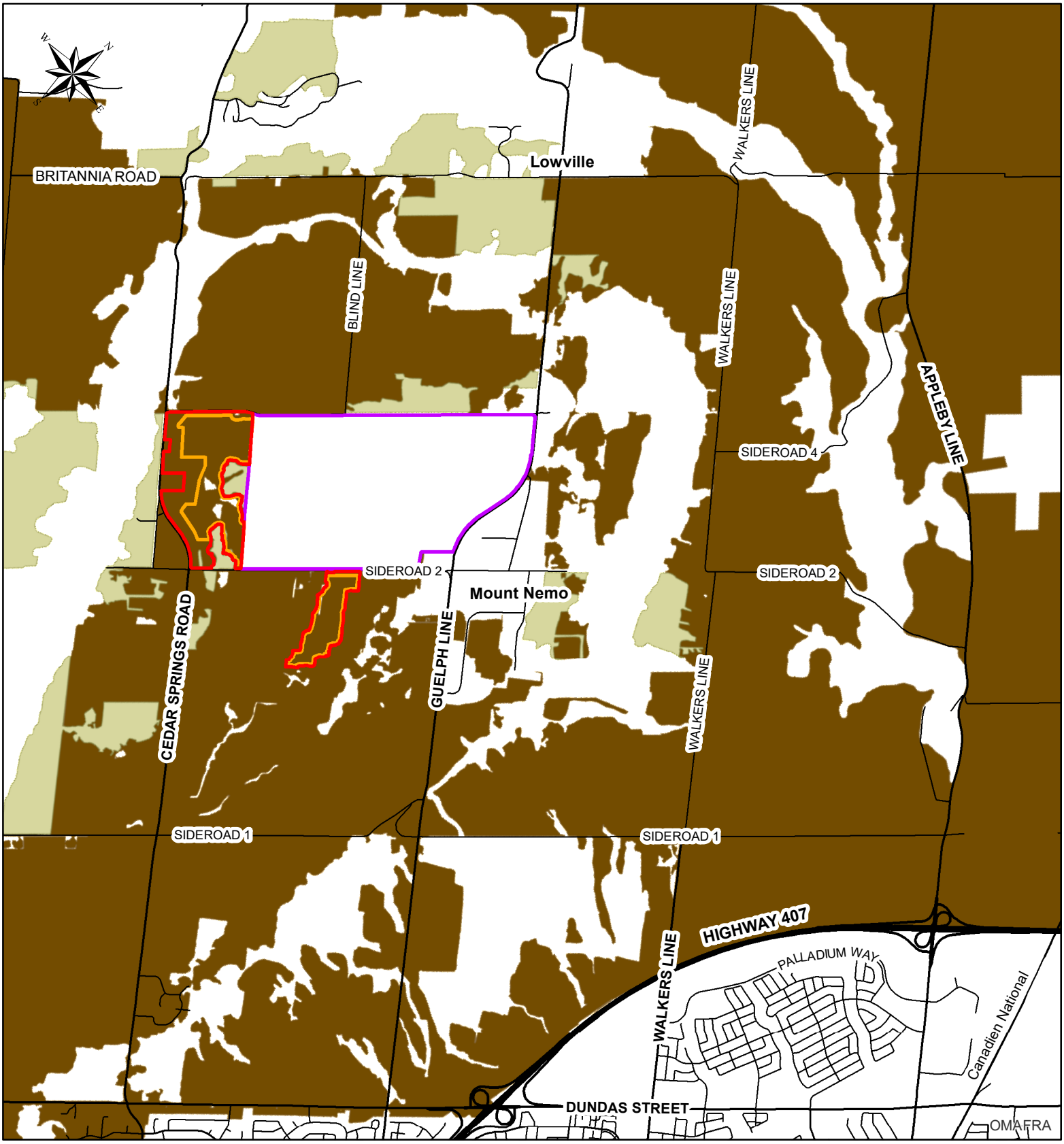

Figure # 7

Provincial Agricultural System

Burlington Quarry Extension
Part Lots 1 & 2, Concession 2 and
Part Lot 17 & 18, Concession 2 NDS
City of Burlington
Region of Halton

Legend

- Proposed Licence Boundaries
- Proposed Limit of Extraction
- Existing Burlington Quarry
- Prime Agricultural
- Candidate Area

DATE
April 2020

SOURCES
Land Information Ontario
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Meters (1:40,000)

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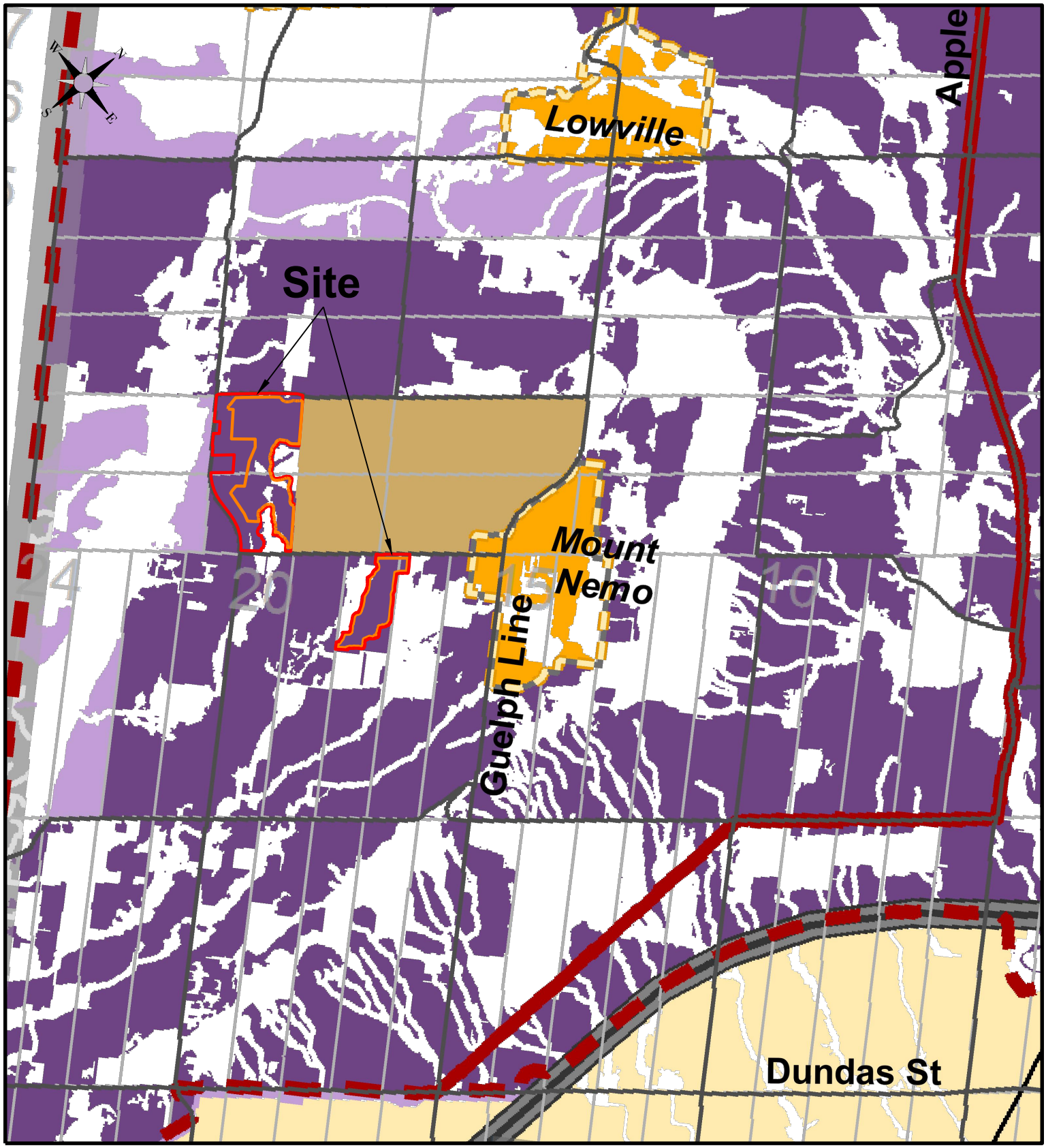

Figure # 8

Agricultural System & Settlement Areas

Region of Halton Official Plan

Burlington Quarry Extension

Part Lots 1 & 2, Concession 2 and
Part Lots 17 & 18, Concession 2 NDS
City of Burlington
Region of Halton

Legend

- Proposed Licence Boundaries
- Proposed Limit of Extraction
- Niagara Escarpment Plan
- Greenbelt Plan
- Prime Agricultural Areas
- Agricultural System Outside Prime Agricultural Areas
- Mineral Resource Extraction Area
- Urban Area
- Hamlet

Date: April 2020

Sources: Halton Region Official Plan - Map 1E - Agricultural System and Settlement Areas, dated June 19, 2018

Scale: 0 500 1000 Meters (1:40,000)

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a) *outside of a specialty crop area, there is a substantial quantity of mineral aggregate resources below the water table warranting extraction, or the depth of planned extraction in a quarry makes restoration of pre-extraction agricultural capability unfeasible;*

b) *in a specialty crop area, there is a substantial quantity of high quality mineral aggregate resources below the water table warranting extraction, and the depth of planned extraction makes restoration of pre-extraction agricultural capability unfeasible;*

c) *other alternatives have been considered by the applicant and found unsuitable. The consideration of other alternatives shall include resources in areas of Canada Land Inventory Class 4 through 7 lands, resources on lands identified as designated growth areas, and resources on prime agricultural lands where rehabilitation is feasible. Where no other alternatives are found, prime agricultural lands shall be protected in this order of priority: specialty crop areas, Canada Land Inventory Class 1, 2 and 3 lands; and*

d) *agricultural rehabilitation in remaining areas is maximized.*

The new licence is proposed to include below water table extraction and therefore rehabilitation to an agricultural use post-extraction is not feasible. Rehabilitation for the South Extension includes a beach, lake, wetlands and forested area. The West Extension rehabilitation includes a series of ponds, wetlands and forested areas.

The vast majority of available lands within the City of Burlington and Halton Region are considered to be prime agricultural lands within a prime agricultural area and there are limited areas within the Region of Halton and City of Burlington for aggregate extraction that would avoid prime agricultural lands. The property is located outside of a specialty crop area and does not include soils that would support speciality crop production[2].

As Nelson is currently operating a below water table quarry operation directly adjacent to the proposed extension areas, the South and West Extensions are the most logical choice for a new Licence and will help minimize potential impacts to agriculture as the proposed extensions are an expansion of an existing use and will not introduce 'new' impacts in the area on existing agricultural operations through the use of the existing haul route and activities. Nelson has chosen to expand operations into an adjacent property rather than another property located farther away. This allows for both Licences to be operated collectively utilizing the same processing equipment, entrance/exit, and existing haul route. The new licensed areas will be operated as an expansion to the existing quarry, which prevents further fragmentation of agricultural land and facilitates the comprehensive rehabilitation of the lands.

Notwithstanding the above policy considerations, it is worth noting that the expansion lands are located within an "Identified Mineral Resources Areas", as identified on Schedule 1F of the Region of Halton Official Plan. Further, it would be difficult to locate any new aggregate operation within the City of Burlington or Region of Halton that would avoid prime agricultural areas. In terms of impacts on surrounding agricultural

[2]DBH Soil Survey and Canada Land Inventory Classification for Part Lots 17 & 18, Concession 2 North of Dundas Street, City of Burlington, Halton Region. October 15, 2019

properties, an expansion of an existing quarry is preferable as it minimizes impacts on the surrounding agricultural system.

As outlined in Section 5 of this Report, the proposed quarry is not anticipated to have any negative impact on surrounding agricultural operations.

Given the foregoing, it is our opinion that aggregate extraction and the proposed rehabilitation plan for the subject lands is consistent with the PPS.

4.2 The Niagara Escarpment Plan

The Niagara Escarpment includes a variety of topographic features and land uses extending 725 kilometres from Queenston on the Niagara River to the islands off Tobermory on the Bruce Peninsula. The Niagara Escarpment Plan (NEP) serves as a framework of objectives and policies to protect this landform and the resources it supports.

The following outlines the relevant agricultural policies of the NEP that have been considered in this report. The subject lands are designated 'Escarpment Rural Area' in the NEP, as illustrated in **Figure 9**.

The Escarpment Rural Areas provide a buffer to the more ecologically sensitive areas of the Escarpment. Key objectives of the Escarpment Rural Area are provided in Section 1.5.1 of the NEP, and read:

1. *To maintain the scenic resources of lands in the vicinity of the Escarpment and the open landscape character of the Escarpment.*
2. *To conserve cultural heritage resources, including features of interest to First Nation and Métis communities.*
3. *To encourage forest management and recreation.*
4. *To provide for compatible rural land uses.*
5. *To encourage agriculture and protect agricultural lands and prime agricultural areas.*
6. *To provide a buffer for ecologically sensitive areas of the Escarpment.*
7. *To provide for the consideration of new Mineral Resource Extraction Areas which can be accommodated by an amendment to this Plan.*

Section 2.8 of the NEP illustrates a key objective of the NEP "*is to encourage agricultural uses in agricultural areas, especially in prime agricultural areas, to permit uses that are compatible with farming and to encourage accessory uses that directly support continued agricultural uses*." The agricultural objectives are as follows:

1. *Prime agricultural areas shall be protected for long-term agricultural use.*
2. *Development, including the creation of lots and livestock facilities, shall comply with the minimum distance separation formulae.*
3. *Topsoil augmentation on pasture or cropland may be permitted if it is in accordance with Part 2.13 (Scenic Resources and Landform Conservation) and if it is supported by a report from a certified agrologist or an agricultural engineer establishing that the development serves to enhance the agricultural capability of the site. A fill management plan may be required at the discretion of the*

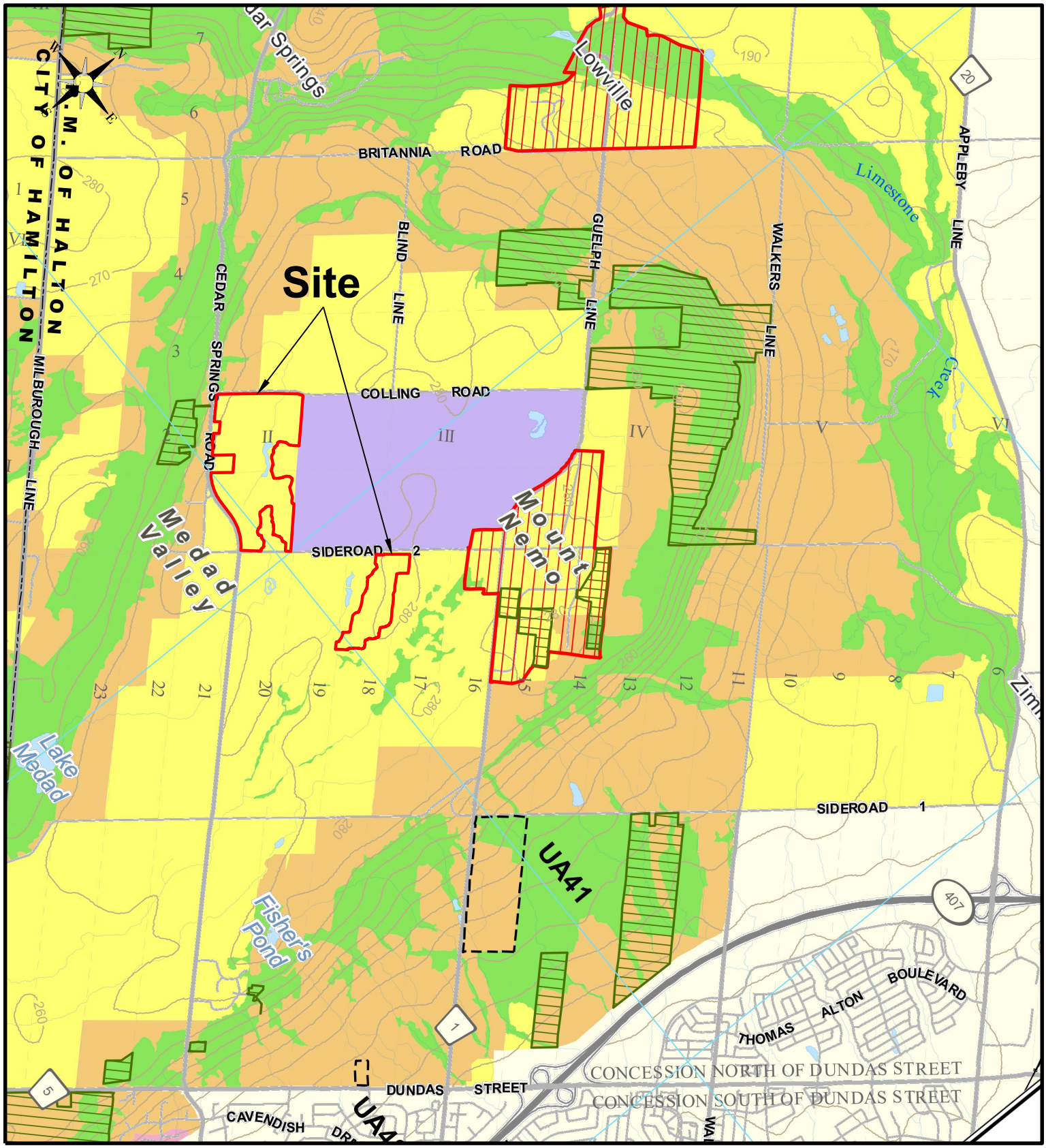

Figure # 9

Land Use Designations

Niagara Escarpment Plan
Region of Halton

Burlington Quarry Extension

Part Lots 1 & 2, Concession 2 and
Part Lots 17 & 18, Concession 2 NDS
City of Burlington
Region of Halton

Legend

- Proposed Licence Boundaries
- Niagara Escarpment Parks and Open Space System
- Amendments to the Niagara Escarpment Plan
- Escarpment Natural Area
- Escarpment Protection Area
- Escarpment Rural Area
- Mineral Resource Extraction Area
- Minor Urban Centre

Date: April 2020

Sources: Niagara Escarpment Plan - Map 3 - Regional Municipality of Halton - Plan Designations, dated June 1, 2017

Scale: 0 500 1000 Meters (1:40,000)

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implementing authority, depending upon the quantity of fill and the ecological and landscape sensitivity of the site. Placement of fill that does not meet the definition of topsoil will not be permitted on pasture or cropland.

4. *New development adjacent to prime agricultural areas may only be permitted where the new development incorporates suitable methods to avoid, minimize and mitigate land use conflicts.*

The following uses may be permitted in the Escarpment Rural Area (Section 1.5.3)[3]:

1. *Agricultural uses*
2. *Agriculture-related and on-farm diversified uses*
3. *Existing uses*
4. *Single dwellings*
5. *Secondary dwelling units*
6. *Mobile or portable dwelling unit(s) accessory to agriculture*
7. *Recreational uses, outside of prime agricultural areas*
8. *Forest, wildlife and fisheries management*
9. *Licensed archaeological fieldwork*
10. *Infrastructure*
11. *Accessory uses (e.g. a garage, swimming pools, tennis courts, ponds or signs)*
12. *Institutional uses, outside of prime agricultural areas*
13. *Uses permitted in the Parks and Open Space System Master/Management Plans that are not in conflict with the Niagara Escarpment Plan*
14. *Home occupations and home industries*
15. *Watershed management and flood and erosion control projects carried out or supervised by a public body*
16. *The Bruce Trail corridor, including the pedestrian footpath and, where necessary, trail-related constructions (e.g., bridges, boardwalks), overnight rest areas and Bruce Trail access points*
17. *New licensed mineral aggregate operations producing up to 20,000 tonnes annually*
18. *Wayside pits and quarries*
19. *Recycling depots for paper, glass and cans, etc. serving the local community*
20. *Bed and breakfast*
21. *Nature preserves owned and managed by an approved conservation organization*
22. *Agricultural Purposes Only lot (APO lot)…*

Section 1.5.3 of the NEP provides that wayside pits and quarries are permitted in the Escarpment Rural Area. Section 2.9 of the NEP provides the Mineral Aggregate Resources policies. Section 2.9.3(f) requires that an Agricultural Impact Assessment (AIA) be undertaken in prime agricultural areas to determine how to avoid, minimize and mitigate impacts on agricultural lands and operations. This AIA report has been prepared in accordance with this policy.

The following policies from Section 2.9.11 are relevant to this Agricultural Impact Assessment:

[3] Note permitted uses 23 to 33 have not been included in this report as they are site specific provisions and not applicable to the subject lands.

Rehabilitation shall incorporate the following:

g) *In prime agricultural areas, other than specialty crop areas, Mineral Resource Extraction Areas shall be rehabilitated to a condition in which substantially the same areas and same average soil capability for agriculture are restored;*

h) in specialty crop areas, Mineral Resource Extraction Areas shall be returned or rehabilitated to a condition in which substantially the same areas and same average soil capability for agriculture are restored, the same range and productivity of specialty crops common in the area can be achieved, and, where applicable, the microclimate on which the site and surrounding area may be depended for specialty crop production are maintained or restored;

i) in prime agricultural areas, where rehabilitation to the conditions set out in (g) and (h) above is not possible or feasible due to the depth of planned extraction or due to the presence of a substantial deposit of high quality mineral aggregate resources below the water table warranting extraction, agricultural rehabilitation in the remaining areas will be maximized as a first priority;

The NEP's definition of prime agricultural area is consistent with the same definition in the PPS. The subject lands are considered to be prime agricultural land as they are comprised of predominantly Classes 1, 2 and 3 soils, but do not include specialty crop areas.

In response to (i) above, the proposed extraction of the subject lands will occur below the water table. In accordance with section 2.5.4.2 of the PPS, the Rehabilitation Plan for the Burlington Quarry expansion proposes to return a majority of the lands to an open-water area with naturalized side-slopes. The proposed ARA site plans prescribe extraction phases that ensure that the amount of disturbed area is minimized.

Given the foregoing, it is our opinion that proposed rehabilitation plans for the proposed quarry expansion conform to the policies of the Niagara Escarpment Plan.

4.3 Halton Region Official Plan

The Halton Region Official Plan was first adopted by Regional Council in March 1994, with a Decision on the final Official Plan issued by the Ministry of Municipal Affairs in November 1995. Between 2006 and 2009, the Region undertook a planning exercise ("Sustainable Halton"), which resulted in the adoption of Regional Official Plan Amendment 38 by Regional Council on December 16, 2009. The amendment was approved by the Minister of Municipal Affairs and Housing in November 2011 and subsequently appealed to and adjudicated by the Ontario Municipal Board from 2012 through 2017, with certain site-specific appeals outstanding. The 2018 consolidation of the Official Plan has been prepared on the basis of the approvals of the Sustainable Halton amendments which occurred between 2014 and 2017.

The Halton Region Official Plan intends to provide a long term vision for Halton's physical form and community character. The Regional Official Plan identifies the subject lands as "Agricultural Area" on Schedule 1 (see **Figure 10**). An amendment is required to the Region's Official Plan to permit aggregate extraction on the subject lands.

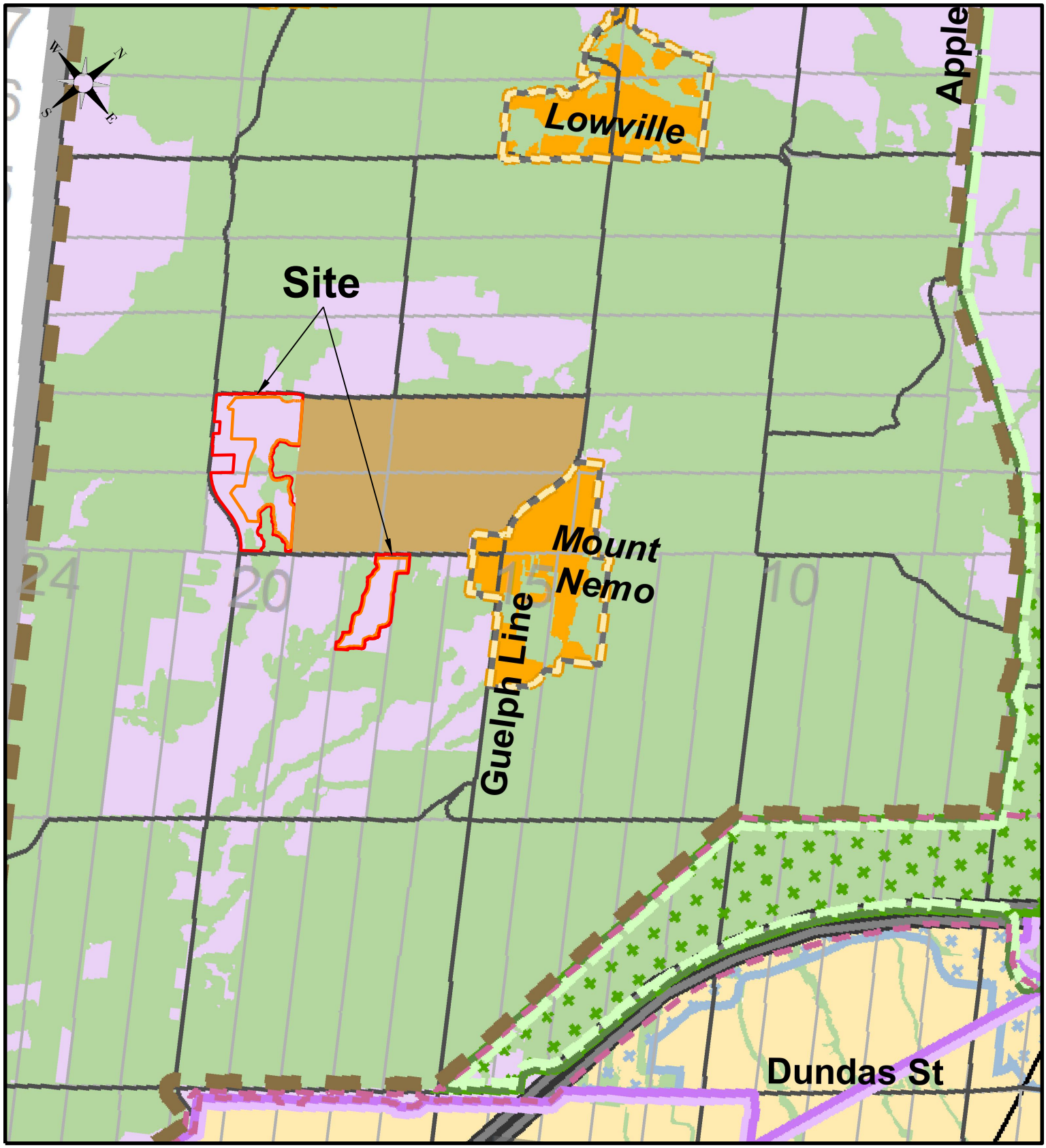

Figure # 10
Regional Structure
Region of Halton Official Plan

Burlington Quarry Extension
Part Lots 1 & 2, Concession 2 and
Part Lots 17 & 18, Concession 2 NDS
City of Burlington
Region of Halton

Legend

- Proposed Licence Boundaries
- Proposed Limit of Extraction
- Niagara Escarpment Plan
- Built Boundary
- Employment Area
- Greenbelt Natural Heritage System
- Regional Natural Heritage System
- Agricultural Area
- Mineral Resource Extraction Area
- Urban Area
- Hamlet

Date: April 2020

Sources: Halton Region Official Plan - Map 1 - Regional Structure, dated June 19, 2018

Scale: 0 500 1000 Meters (1:40,000)

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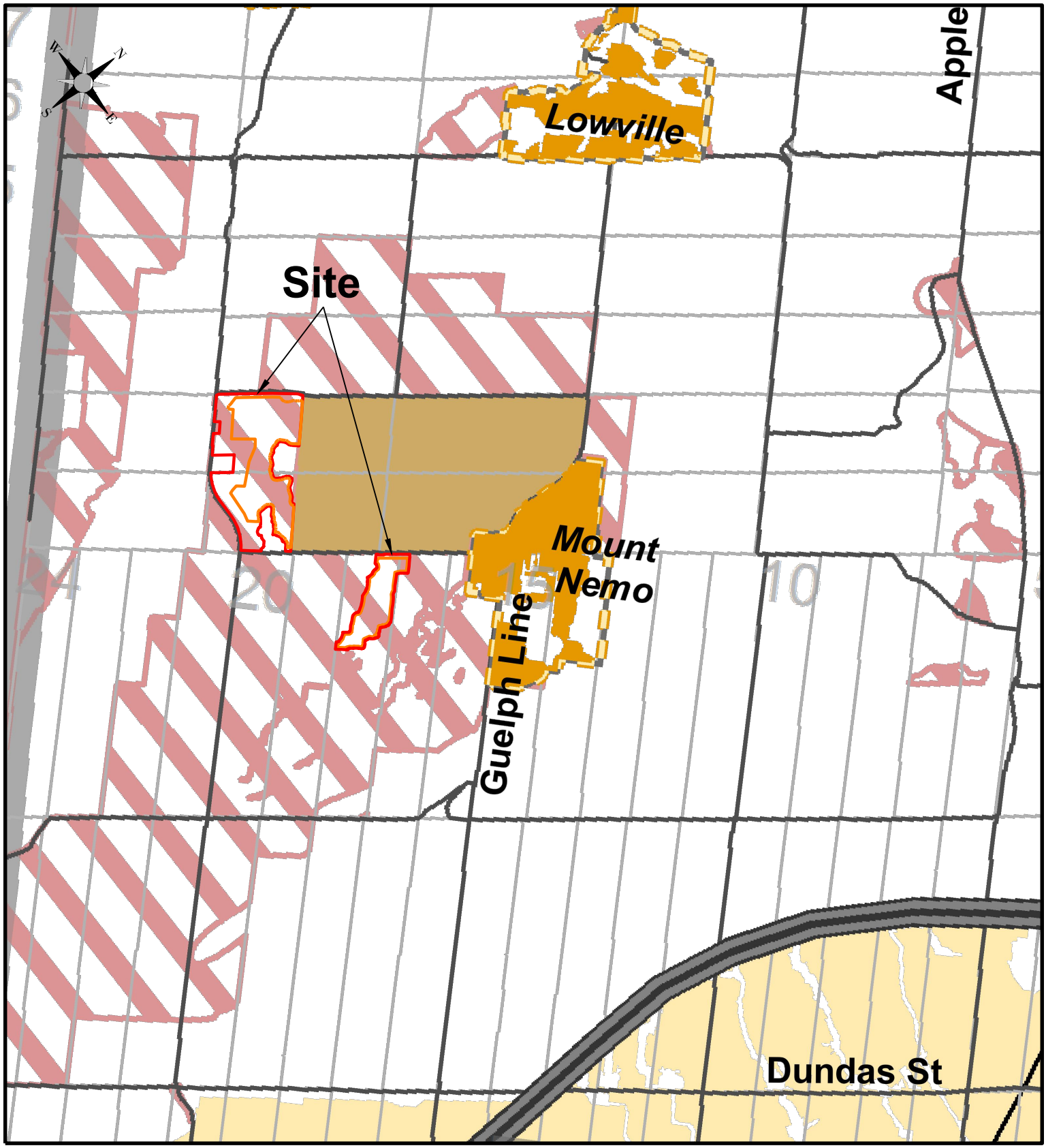

Figure # 11
Identified Mineral Resource Area
Region of Halton Official Plan

Burlington Quarry Extension
Part Lots 1 & 2, Concession 2 and
Part Lots 17 & 18, Concession 2 NDS
City of Burlington
Region of Halton

Legend

- Proposed Licence Boundaries
- Proposed Limit of Extraction
- Mineral Resource Extraction Area
- Identified Mineral Resource Area
- Urban Area
- Hamlet

Date: April 2020

Sources: Halton Region Official Plan - Map 1F - Identified Mineral Resource Area, dated June 19, 2018

Scale: 0 500 1000 Meters (1:40,000)

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The Halton Region Official Plan recognizes the mineral aggregate resource industry as an important component to the Region's economic development and employment opportunities. The Official Plan includes objectives to recognize existing mineral aggregate operations and to protect known mineral aggregate deposits and areas of high potential mineral aggregate resources. The subject lands are located within the Identified Mineral Resource Area on Map 1F (see **Figure 11**), adjacent to the existing Mineral Resource Extraction Area (Licence no. 5499). The purpose of the Identified Mineral Resource Area is to assist with the implementation of sections 112(1) and 112(2), policies designed to protect high potential mineral aggregate resources areas from incompatible land uses.

Extraction of mineral aggregate resources is permitted within Prime Agricultural Areas in accordance with Section 110(6.1):

> *Require the rehabilitation of mineral aggregate operations on prime agricultural lands, within Prime Agricultural Areas to be carried out so that substantially the same areas and same average soil quality of agriculture are restored.*
>
> *On prime agricultural lands, complete agricultural rehabilitation is not required if:*
>
> *a) There is a substantial quantity of mineral aggregate resources below the water table warranting extraction, or the depth of planned extraction in a quarry makes restoration of pre-extraction agricultural capability unfeasible;*
>
> *b) Other alternative locations have been considered by the applicant and found unsuitable. The consideration of other alternatives shall include resources in areas of Canada Land Inventory Class 4 to 7 soils, resources on lands identified as designated growth areas, and resources on prime agricultural lands where rehabilitation is feasible. Where no other alternatives are found, prime agricultural lands shall be protected in this order of priority: specialty crop areas, and Canada Land Inventory Class 1, 2 and 3 lands; and*
>
> *c) Agricultural rehabilitation in remaining areas is maximized.*

Both the South and West Extension lands include lands designated as Prime Agricultural Lands on Map 1E (see **Figure 8**). Although the expansion to remove a total of 73.7 hectares of land that is identified and mapped as prime agricultural lands (see Tables 2 & 3), the total amount of land to be removed from actual agricultural production is much smaller and is equivalent to approximately 12.7 hectares. This recognizes that the majority of the proposed extension is comprised of disturbed lands (e.g. former homestead, golf course) that have already been removed from an agricultural land use as well as the existing natural features and hedgerows on the lands. Further justification for the proposed removal of prime agricultural lands is included below, in **Table 4**.

As mentioned above, the proposed extraction of the subject lands will occur below the water table. In accordance with section 2.5.4.2 of the PPS, the Rehabilitation Plan for the Burlington Quarry expansion proposes to return a majority of the lands to an open-water area with naturalized side-slopes. The proposed ARA site plans prescribe extraction phases that ensure that the amount of disturbed area is minimized.

In terms of alternative locations, the South and West Extensions are the most logical choice for a new Licence and will help minimize potential impacts to agriculture as the proposed extensions are an expansion of an existing use and will not introduce 'new' impacts to agricultural operations through the use of the existing haul route and activities. As Nelson is currently operating a below the water table quarry operation directly adjacent to the proposed extension areas, Nelson has chosen to expand operations into an adjacent property rather than another property located farther away. The new licences will be operated as an expansion to the exiting quarry which prevents further fragmentation of the agricultural landscape and facilitates the comprehensive rehabilitation of the lands. This allows for both Licences to be operated collectively utilizing the same processing equipment, entrance/exit, and existing haul route.

It is noted again that the vast majority of available lands within the City of Burlington and Halton Region are considered to be prime agricultural lands within a prime agricultural area and there are limited areas within the Region of Halton and City of Burlington for aggregate extraction that would avoid prime agricultural lands.

Section 139.9 provides for the Regional Official Plan policies associated with Prime Agricultural Areas, as shown on Map 1E. The Region's Prime Agricultural Areas include lands in the Agricultural Area and Regional Natural Heritage System designations. Together, these lands support and advance the goal to maintain a permanently secure, economically viable agricultural industry and to preserve the open space character and landscape of Halton's non-urbanized area. Outside of the Greenbelt Area, the removal of land from Prime Agricultural Areas is permitted only when the policies of 139.9.2.3 (a) through (g) have been satisfied. The following table summarizes the Region's evaluation criteria:

Table 4: Halton ROP Removal of Prime Agricultural Lands (Policy 139.9.2.3)

Halton Region OP Policy 139.9.2.3	Response
a) Necessity of such uses within the planning horizon for additional land to be designated to accommodate the proposed uses;	The extension areas contain approximately 30 million tonnes of high quality aggregate resources in proximity to the Greater Toronto Area.
b) amount of land area needed for such uses;	In total, 78.3 hectares is proposed to be licenced with 50.2 hectares of land proposed to be extracted. Of this, 50.2 hectares only 12.7 hectares (or 25%) is currently in agricultural production.
c) reasons for the choice of location;	Both the South and West Extension lands are logical expansions to the existing quarry operation (Licence No. 5499) and will help minimize potential impacts to agriculture as the proposed extensions are an expansion of an existing use and will not introduce 'new' impacts to agricultural operations through the use of the existing haul route and activities. The new licences will be operated as an expansion to the exiting quarry which prevents further fragmentation of the agricultural landscape and facilitates

	the comprehensive rehabilitation of the lands.
d) justification that there are no reasonable alternate locations of lower capability agricultural lands	The majority of available lands within the City of Burlington and Halton Region are considered to be prime agricultural lands within a prime agricultural area and there are limited areas within the Region of Halton and City of Burlington for aggregate extraction that would avoid prime agricultural lands. The proposal is also an expansion to an existing use and all reasonable alternatives surrounding the existing quarry are within a prime agricultural area. The West Extension lands are not used for agricultural production (current use: Burlington Springs Golf Club).
e) no negative impact to adjacent agricultural operations and the natural environment;	There are no livestock operations located immediately adjacent to either the South or West Extension lands. The haul route is not changing. As such, no negative impacts on adjacent agricultural operations are anticipated. Table 5 in Section 5 of this report provides a summary of the net impacts and associated mitigation.
f) there are no reasonable alternatives that avoid Prime Agricultural Areas as shown on Map 1E; and,	The majority of available lands within the City of Burlington and Halton Region are considered to be prime agricultural lands within a prime agricultural area and there are limited areas within the Region of Halton and City of Burlington for aggregate extraction that would avoid prime agricultural lands. The proposal is also an expansion to an existing use and all reasonable alternatives surrounding the existing quarry are within a prime agricultural area.
g) The land does not comprise of specialty crop area.	The subject lands do not comprise of specialty crop areas. The West Extension lands are not used for agriculture, and are currently a recreational use.

Based on the forgoing, the proposed extraction and rehabilitation conforms to the policies of Halton Region's Official Plan.

4.4 City of Burlington Official Plan

The City's Official Plan was adopted by City Council in July 1994, and subsequently approved, with modification, by Halton Region in March, 1997. The October 2017 office consolidation incorporates all modifications, approvals and amendments to the plan. There are a number of deferrals and referrals that are still outstanding as of the Consolidation date, which are shown in Table A of the City Official Plan.

The extension lands (both South and West) are designated as Escarpment Rural Area on Schedule C of the City of Burlington Official Plan (Comprehensive Land Use Plan – Rural Planning Area, **Figure 12**). As discussed above, these lands are included within and subject to the Niagara Escarpment Plan. Section 2.3 (Part IV – Land Use Policies – Rural Planning Area) of the City Official Plan describes the objectives and policies for the Escarpment Rural Area designation. The key objectives for this designation are:

i. *To maintain the scenic values of lands in the vicinity of the Escarpment;*

ii. *To maintain the open landscape character by encouraging the conservation of the traditional cultural landscape and cultural heritage features;*

iii. *To encourage agriculture and forestry and to provide for compatible rural land uses;*

iv. *To provide a buffer for the more ecologically sensitive areas of the Escarpment; and,*

v. *To provide for the designation of new Mineral Resource Extraction Areas which can be accommodated by an amendment to the Niagara Escarpment Plan.*

In addition to the permitted uses described above in Section 4.2 of this report (Niagara Escarpment Plan), the following additional uses are permitted through the City's Official Plan:

i. *Mobile or portable dwellings accessory to an agricultural operation subject to the development criteria of the Niagara Escarpment Plan;*

ii. *Wayside pits and quarries for the purposes of public road construction;*

iii. *Linear transportation and utility facilities;*

iv. *A second single dwelling on an existing lot of record where there is an existing dwelling designated and an easement agreement registered under the Ontario Heritage Act for a dwelling of local cultural heritage value or interest or where the dwelling is considered to be of provincial or national heritage value or interest, and in the opinion of City Council the allowance of the second single dwelling is the only viable way to preserve the local, provincial or national heritage value or interest of the existing single dwelling on the lot, and where there is no conflict with all other provisions of this Plan;*

v. *Retail uses with a gross floor area not exceeding 500 sq. m., if located on a commercial farm and secondary to the farming operation and provided the majority of the commodities for sale, measured by monetary value, are produced or manufactured on the farm.*

This confirms that a diverse range of uses are permitted in the Escarpment Rural Area designation of the Niagara Escarpment Plan and City Official Plan.

While agriculture is recognized as the primary activity and land use in the Rural Planning Area, the City's Official Plan recognizes and protects existing and identified Mineral Resource Extraction areas. While the Planning Justification Report for this application provides a more detailed review of the Mineral Aggregate Resource policies of the Official Plan, it is noted that the proposed expansions meet the objectives of the

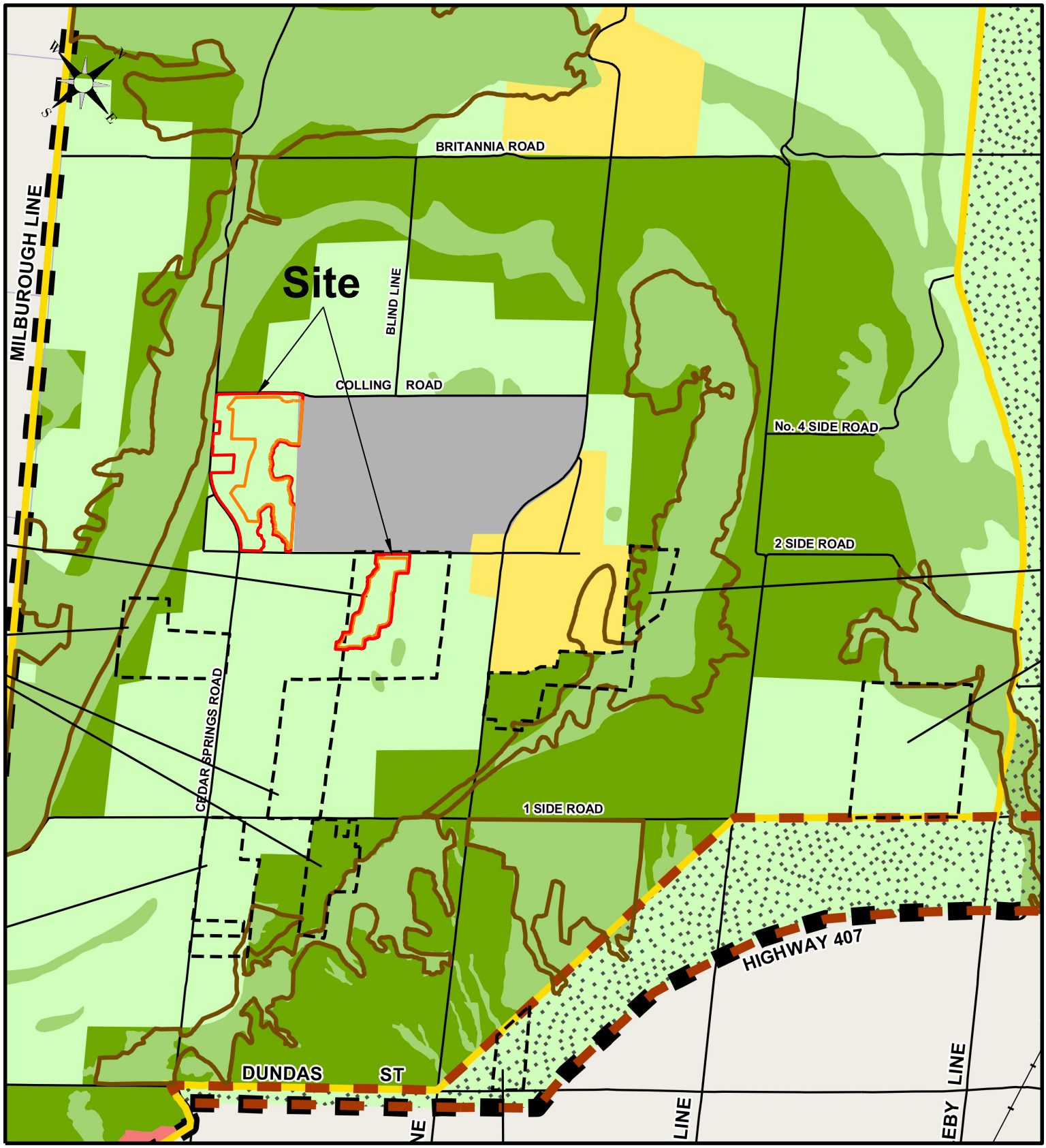

Figure # 12

Comprehensive Land Use Plan - Rural Planning Area

City of Burlington Official Plan

Burlington Quarry Extension

Part Lots 1 & 2, Concession 2 and
Part Lots 17 & 18, Concession 2 NDS
City of Burlington
Region of Halton

Legend

- Proposed Licence Boundaries
- Proposed Limit of Extraction
- Niagara Escarpment Plan Area / Parkway Belt Plan Area
- Environmentally Sensitive Area
- Greenlands (EPA)
- Escarpment Protection Area
- Escarpment Rural Area
- Escarpment Urban Area
- Agricultural Rural Area
- Mineral Resource Extraction Area
- Rural Settlement Area

Date: April 2020

Sources: City of Burlington Official Plan - Schedule C - Comprehensive Land Use Plan - Rural Planning Area, dated October 2017

Scale: 0 500 1000 Meters (1:40,000)

N:\Brian\9135D- Nelson - Project Sideways\Drawings\Figures\Planning Report Figures\CAD\9135D - Planning Report Figures - April 2020.dwg

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE

Official Plan as it would "*provide for the potential expansion of existing licensed aggregate operations or establishment of new operations in areas identified as High Potential Mineral Aggregate Resource Areas by the Province through amendments to this Plan.*[4]" The lands are identified as a Mineral Resource Area by the Region of Halton Official Plan, Schedule 1F (see **Figure 11**).

From an agricultural perspective, the proposed expansions will not result in incompatible land uses with surrounding agricultural uses. The expansions are logical in that they are adjacent to an existing quarry, and will not result in changes to the haul route. Further, no processing will be located on the South or West Extension areas.

While the lands are designated as Escarpment Rural Area (rather than Agricultural Rural Area), this report is prepared in accordance with Section 13.3(e) of the City's Official Plan:

> *e) The City and Region of Halton shall require the proponent of a non-farm development to carry out an Agricultural Impact Assessment based on the guidelines adopted by Regional Council.*

An assessment of the agricultural impacts of the proposed expansion is discussed in Section 5.0 of this report. As previously noted, the vast majority of available lands within the City of Burlington and Halton Region are considered to be prime agricultural lands within a prime agricultural area and there are limited areas within the Region of Halton and City of Burlington for aggregate extraction that would avoid prime agricultural lands.

In summary, the proposed extensions conform to the City of Burlington Official Plan.

[4] Section 2.12.1(e) from Part II, Functional Policies.

5.0 ASSESSMENT OF IMPACT

As previously noted, mineral aggregate extraction is considered a permitted use in prime agricultural areas in accordance with Provincial, Regional and local policy. Provincial and local policies require that impacts on surrounding agricultural operations and lands be mitigated. Although resource uses such as mineral aggregate extraction have traditionally been considered part of the agricultural / rural landscape fabric, impacts from these land uses should be considered and mitigated to the extent feasible. Impacts associated with the reduction / loss of agricultural land and / or infrastructure, agricultural land fragmentation, dust, noise, road traffic and water resources as a result of the proposed mineral aggregate expansion on the subject lands have been assessed and are reviewed in the following sections.

5.1 Reduction / Loss of Agricultural Land and Infrastructure

As previously noted, 12.7 hectares (31.4 acres) of the subject lands (South Extension Lands) proposed for extraction are currently in agricultural production (cash crops). There is no removal of agricultural structures proposed, and therefore no loss of agricultural infrastructure is associated with the proposed expansion. The type and nature of the agricultural uses on the subject lands are fairly typical of this area and cropping practices throughout southern /central Ontario, as confirmed through a review of 2016 Census of Agriculture data.

Again, it is noted that the West Extension Lands is not used for agricultural production and the soils have been considerably disturbed. As a result, there is no loss of productive agricultural land or infrastructure associated with the West Extension Lands. The resulting loss of 12.7 hectares of productive agricultural lands for typical cash crop production is considered to be a negligible loss of land particularly in the context of the existing agricultural resource in the Region and City.

5.2 Fragmentation of Agricultural Lands

Approximately 12.7 hectares (31.4 acres) of the subject lands (South Extension Lands) are currently farmed (soybeans in 2019). There does not appear to be significant improvements to the lands, such as fencing, buildings or structures. A review of the Ontario Ministry of Agriculture, Food and Rural Affairs AgMaps confirms there is no tile drainage on the site. The type and nature of the agricultural uses on the subject lands are fairly typical of this area and cropping practices throughout southern /central Ontario.

The new licence is proposed to operate below the water and will serve as an expansion to the existing Burlington Quarry. Due to the below the water table extraction, in accordance with section 2.5.4.1 of the PPS, no lands are proposed to be returned to an agricultural land use once extraction is completed.

Extraction of the property will result in the permanent conversion of approximately 12.7 hectares of active agricultural land to an alternative land-use. Note, the Western Extension lands are not currently used for agricultural production and have been used for recreational purposes (golf course). Furthermore, portions of the South Extension lands have been disturbed and/or consist of naturalized areas/hedgerows. Considering the extensive amount of prime agricultural land available in the Region of Halton, this 12.7

hectares of cultivated land represents a small loss in agricultural land that is permitted by Provincial and municipal planning policy.

The proposed rehabilitation of the licence area to an, open-water feature with naturalized side-lopes will create a final land use that is compatible with the surrounding agricultural uses and will provide alternative recreational and landscape benefits such as flood attenuation, habitat for wildlife, and surface water reserves that could be used for irrigation.

5.3 Air Quality

BCX Environmental Consulting prepared an Air Quality Study for the application. The Air Quality Study conservatively assessed five maximum emission operating scenarios (including a baseline operating scenario) to represent the six phases over the lifespan of the proposed project. A series of emission inventories and air dispersion modelling exercises were completed to assess the potential for air quality impacts in the vicinity of the proposed site from all significant on-site sources (including both stationary and mobile sources) over all phases of the proposed extensions.

Contaminants of potential concern (CoPCs) were evaluated according to Ministry of Environment, Conservation and Parks guidelines, including:

- Total suspended particulate (PM)
- Fine particulate
- Respirable crystalline silica
- Combustion gases
- Benzene and Benzo(a)pyrene

With respect to potential health impacts, the study determined that no significant health impacts are expected. Further, the study determined that no significant nuisance impacts (e.g. dust) are expected.

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

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

The ARA sets provincial standards for dust control in pits and quarries. All new licenses must adhere to the following prescribed conditions as set out in the ARA provincial standards for a Category 2 – Quarry Below Water operation:

- Dust will be mitigated on site;

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

Dust is required to be mitigated on site through the prescribed conditions of the ARA.

Recommended mitigation measures to mitigate the impacts of the proposed aggregate operation include:

- Nelson will update and implement their Best Management Practice Plan (BMPP) to control nuisance dust; and,
- Construct noise berms specified in the Noise Impact Assessment.

It is important to note that there are no livestock operations in close proximity to the extension areas. As a result of implementing these measures, it is not anticipated that dust or other emissions will have an impact on surrounding agricultural uses.

5.4 Hydrogeology

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

A hydrogeological assessment has been completed and concludes that surrounding wells will be protected. As part of the new license, a Residential/Agricultural Well Complaint Procedure has been established and will be implemented by the quarry operator. This Procedure provides a protocol for addressing complaints from surrounding landowners who may experience water supply or other well issues that may be associated by the proposed quarry operation.

As a result, it is not anticipated the proposed expansion will have a negative impacts on surrounding agricultural uses from a hydrogeological perspective. This opinion recognizes not only the conclusions of the hydrogeological study and the implementation of the Well Complaint Procedure but also the fact that there are few intensive livestock operations within the secondary study area that would be significantly affected by a temporary disruption in water and there is no evidence of irrigation systems or crops that are dependent upon extensive irrigation in the area.

5.5 Traffic

A Traffic Report was prepared by Paradigm Transportation Solutions Ltd. The proposed licence application would allow for the extraction of up to 2.0 million tonnes annually, however, Nelson plans on producing 1.0 million tonnes per year.

There are no changes proposed to the existing haul route, which will continue to access the quarry along No. 2 Sideroad, from Guelph Line. No new impacts to the road network are anticipated. No. 2 Sideroad is a

paved two-lane collector road connecting Guelph Line and Cedar Springs Road. Guelph Line (Halton Regional Road 1) is a north-south major arterial roadway that is designed and meant to carry high volumes of traffic. Agricultural traffic on these Regional roads is not anticipated to be high as this type of traffic would generally avoid high volume routes and be directed towards local roads. While some capacity deficiencies at study area intersections were identified through the Traffic Report, these deficiencies will occur with or without the proposed quarry extension.

The quarry's truck entrance on No. 2 Sideroad is approximately 350 metres west of the intersection at Guelph Line. A second driveway is located approximately 450 metres west of Guelph Line on the north side of No. 2 Sideroad, which provides access for light vehicles to the existing office building. It is noted that there are no access/driveways to agricultural operations or fields along No. 2 Sideroad between the existing quarry access and Guelph Line. As a result, it is not anticipated that the truck traffic on the haul route will conflict with agricultural traffic on No. 2 Sideroad. While there is one field accesses along Guelph Line (between No. 2 Sideroad and 1 Sideroad), Guelph Line is designed with wide shoulders that agricultural traffic can use to move between fields, if needed. This opinion further recognizes that neighbouring property owners have been accustomed to the truck traffic patterns from the existing quarry operation in the area. Furthermore, given the limited operating hours of the aggregate operations it is anticipated that any potential impacts / conflicts with agricultural traffic / machinery would be nominal and only concentrated during planting and harvest periods (early spring / late fall).

The mined aggregate from the South Extension lands is proposed to be transported by 70-tonne rock trucks across No. 2 Sideroad at grade to the existing processing plans. The proposed crossing maintains suitable sight distance in each direction for both east/west approaches. This will also ensure that agricultural traffic utilizing Sideroad No. 2 will have high visibility of truck traffic.

In conclusion, the proposed quarry extension will have nominal impacts on agricultural traffic in the area.

5.6 Blasting Impacts

A Blasting Impact Analysis was completed by Explotech Engineering Ltd. to assess vibration levels based on the Ministry of the Environment, Conservation and Parks Model Municipal Noise Control By-law with regard to guidelines for blasting in Mines and Quarries. The report assessed the area surrounding the proposed licence areas with regard to potential damage from blasting operations and compliance with Provincial guidelines. The report concludes that the planned mineral extraction extensions can be carried out safely and within Provincial guidelines. Recommendations are included to encourage blasting activities are carried out in a safe and productive manner with management and mitigation measures should there be any damages on surrounding properties.

From an agricultural perspective, the proposed blasting activities are not anticipated to have any negative impacts. There are no livestock operations located adjacent to the South or West Extension areas. The recommendations in the report, which include compliance with the Province's guidelines and monitoring of vibrations, are considered to be sufficient. While impacts to water quality and production capacity of groundwater supply wells is a common concern for residents near blasting operations, the report emphasizes that blasting operations do not result in any permanent impact on wells outside of the immediate blast zone. Therefore, impacts of surrounding agricultural operations are not anticipated.

5.7 Noise Impacts

Noise is an additional potential impact from aggregate operations. A Noise Impact Study has been prepared by HGC Engineering to consider sound emission levels for the proposed expansion. The Noise Impact Study confirms that sound levels from the proposed quarry, predicted under worst-case operating scenarios and with the recommended noise control measures recommended will comply with the MECP guideline limits.

The Noise Impact Assessment also recommends noise control measures to be implemented by the applicant. For the extension lands, the recommendation includes the construction of perimeter berms. From an agricultural perspective, the recommendations of the Noise Impact Study will ensure surrounding agricultural uses are not negatively impacted.

5.8 Summary of Net Impacts

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

Table 5: Summary of Net Impacts

Objective	Mitigation Measure	Description
Minimize the loss of agricultural land	Select areas with less agricultural land and lower priority agricultural lands	The proposed operation is an expansion to an existing, licenced quarry (Licence no. 5499). An expansion is preferable to a new aggregate operation as impacts on surrounding agricultural uses are already managed and mitigated by the existing operation (e.g. established haul route, dust and noise management etc.). The lands are primarily comprised of prime agricultural lands, however, only 12.7 hectares is currently used for agricultural production. A large proportion of the designated aggregate resources identified in the Region of Halton OP are coincident with designated prime agricultural

Objective	Mitigation Measure	Description
		areas. It is difficult to locate any new aggregate operations within the City/Region that would avoid prime agricultural areas.
	Rehabilitate the land	Since below water extraction is proposed, agricultural rehabilitation is not an option. The lands will be rehabilitated to a landform suitable for recreational after-use to a lake with a shoreline, wetlands, islands and vegetated side slopes.
	Phase Development	Development will be phased. Agricultural production will continue on the South Extension lands as long as possible.
Minimize the fragmentation of agricultural land	Maintain farm parcels	Since below water extraction is proposed, agricultural rehabilitation is not an option. The farm parcels shall not be maintained.
Minimize impacts on farmland and agricultural operations	Minimum Distance Separation	MDS I and II setbacks are not required for mineral aggregate resources.
	Select compatible land uses; put lower impact development adjacent to farmland and operations	The proposed expansion would be buffered from adjacent agricultural land uses through the provision of setbacks, berms and existing vegetation.
	Design to support agriculture (e.g. help farms to continue to operate; help prevent and reduce trespassing and vandalism)	Conflicts between the proposed expansion and the surrounding agricultural land uses will be minimized through the implementation of physical and visual barriers (vegetative berms); similar to what is

Objective	Mitigation Measure	Description
		currently in use at the existing quarry. The haul route is not proposed to change from the existing route that accesses No. 2 Side Road from Guelph Line. Agricultural traffic along No. 2 Side Road will not be impacted by truck traffic from the proposed operation. Nelson is applying for a maximum tonnage limit of 2 million tonnes per year; however they plan on extracting an average of 1 million tonnes per year. Processing facilities will continue to be located within the existing quarry, which is located away from agricultural lands and reduces impacts related to noise and dust.
Minimize and mitigate changes in water quality or quantity	Implement a groundwater monitoring program	Nelson Aggregate Ltd. will continue to monitor groundwater through their existing groundwater monitoring program. Nelson will implement a Residential/Agricultural Well Complaint Procedure, which will provide a process for addressing any well interference issues that may arise.
Mitigating impacts during construction or operations (e.g. mitigate dust, noise)	Adjust operational procedures to accommodate agriculture in the area	With the existing aggregate use of the licensed quarry, surrounding agricultural uses are accustomed to the operational procedures

Objective	Mitigation Measure	Description
		associated with mineral resource extraction. The proposed expansion will operate 7am-7pm Monday to Friday and shipping hours from the existing quarry will be maintained. Noise and dust will be mitigated from the subject lands in accordance with provincial standards. There are no specialty crops or large livestock operations in the area which would be affected by the operation.
	Vegetative berms	A setback of 30 metres will be provided around the majority of both the South and West Extension lands to create buffering between the proposed expansions and surrounding agricultural land uses. Vegetative berms will also be implemented which will provide a visual buffer.
	Maintain, restore or construct farm infrastructure	The subject lands do not include any farm infrastructure. The existing barn within the West Extension Lands is used by the golf course for storage and is not used for agriculture.
Mitigate ongoing impacts from new development	Implement measures that can be in place post development to support compatibility with agriculture	All planting associated with the berms, lake, wetland and forest will be non-invasive species and will not impact agricultural rehabilitation or production when the lands are

Objective	Mitigation Measure	Description
		rehabilitated.
Education to achieve greater compatibility between agricultural and non-agricultural uses	Education and awareness	Nelson will include an open door policy to discuss ongoing operations and rehabilitation with the surrounding landowners.

6.0 PROPOSED REHABILITATION PLAN

In accordance with section 2.5.4.1 of the PPS, the proposed aggregate operation will include below water extraction of a substantial quantity of aggregate resources, therefore complete rehabilitation to an agricultural conditions is not required.

The proposed licence will be rehabilitated to a landform that is suitable for a future park, which will include a beach, lake, exposed quarry faces, wetlands and forested areas. Portions of the open-water area are proposed to be ecologically enhanced through the creation of littoral zones, riparian plantings, fish habitat creation, and naturalization of shorelines and side-slopes. This final rehabilitated land-use is compatible with the surrounding agricultural uses and operations and will create landscape diversity. The open-water feature can provide benefits to the agricultural uses in the area through flood attenuation and the storage of fresh water for potential irrigation purposes. The proposed rehabilitation plan is included in **Figure 13**.

Figure # 13

Rehabilitation Plan

Burlington Quarry Extension
Part Lots 1 & 2, Concession 2 and
Part Lots 17 & 18, Concession 2 NDS
City of Burlington
Region of Halton

Date: April 2020

Sources: Nelson Aggregate's Burlington Quarry Extension Site Plan, Rehabilitation Plan, updated April 20, 2020.

Scale: 0 150 300 Meters (1:10,000+/-)

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7.0 RECOMMENDATIONS

Based on our analysis, the following recommendations are made to reduce the impacts of the proposed new licence on the surrounding agricultural uses and operations in the primary and secondary study area:

1. All of the recommendations of the technical reports should be implemented to minimize and prevent impacts to adjacent and surrounding agricultural uses and operations.

8.0 SUMMARY

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

- Mineral aggregate extraction is a permitted use on prime agricultural land and within prime agricultural areas in accordance with the PPS, Growth Plan, Halton Region Official Plan and City of Burlington Official Plan.
- The subject property is not within a specialty crop area and does not contain soils that would support specialty crops.
- In accordance with Policy 2.5.4.1 of the PPS there is a substantial quantity of mineral aggregate resources available below the water table; therefore, complete rehabilitation to an agricultural condition is not required.
- Both the extension lands are logical expansions to the existing quarry and will help minimize potential impacts to agriculture as the proposed extensions are an expansion of an existing use and will not introduce 'new' impacts to agricultural operations.
- All reasonable alternatives surrounding the existing quarry are within a prime agricultural area. There are limited areas within the Region of Halton and City of Burlington for aggregate extraction that would avoid prime agricultural lands.
- No new haul routes are being created and existing truck traffic to/from the existing aggregate operation is not expected to change.
- Impacts from dust and noise/blasting will be mitigated through implementation of prescribed conditions and the technical report recommendations included on the Site Plan.
- There are no impacts anticipated to the surrounding and adjacent agricultural uses or operations as a result of the proposed Licence.
- The proposal results in minimal loss of active/productive agricultural land.
- This final rehabilitated land-use is compatible with the surrounding agricultural uses and operations and will create landscape diversity.

Respectfully submitted by,

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

APPENDIX A | Soil Survey and Canada Land Inventory Classification

DOCUMENT TRANSMITTAL

Document:	**SOIL SURVEY AND CANADA LAND INVENTORY (CLI) EVALUATION – BURLINGTON QUARRY – NELSON AGGREGATE CO.**		
Prepared for:	Mr. Pierre Chauvin MHBC Planning, Urban Design & Landscape Architecture 540 Bingemans Centre Drive Suite 200 Kitchener, ON N2B 3X9	Date Our Ref. No. Your Ref. No.	March 4, 2020 2019 - 087
Attention:	Mr. Pierre Chauvin	DRAFT	FINAL ☑

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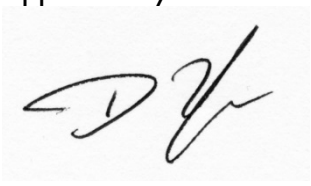
Approved by:



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

SOIL SURVEY AND CANADA LAND INVENTORY CLASSIFICATION (CLI) FOR PART LOTS 17 & 18 CONCESSION 2 NORTH OF DUNDAS STREET CITY OF BURLINGTON HALTON REGION

Prepared for:

Nelson Aggregate Co.
2433 No. 2 Sideroad
Burlington, ON
L7P 0G8

DBH Soil Services Inc.

March 4, 2020

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1.0 BACKGROUND

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

Part Lots 17 & 18
Concession 2 North of Dundas Street
City of Burlington
Halton Region

This area is considered as the proposed southern extension of the existing Burlington Quarry and comprised 5 individual parcels. The parcel identification numbers (as identified in the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) online Agricultural Information Atlas) are:

24020303081200000000
24020303081190000000
24020303081180000000
24020303081170100000
24020303081170000000

The portions of these five parcels that are part of the proposed southern extension of the existing Burlington Quarry will henceforth be referred to as the Subject Lands.

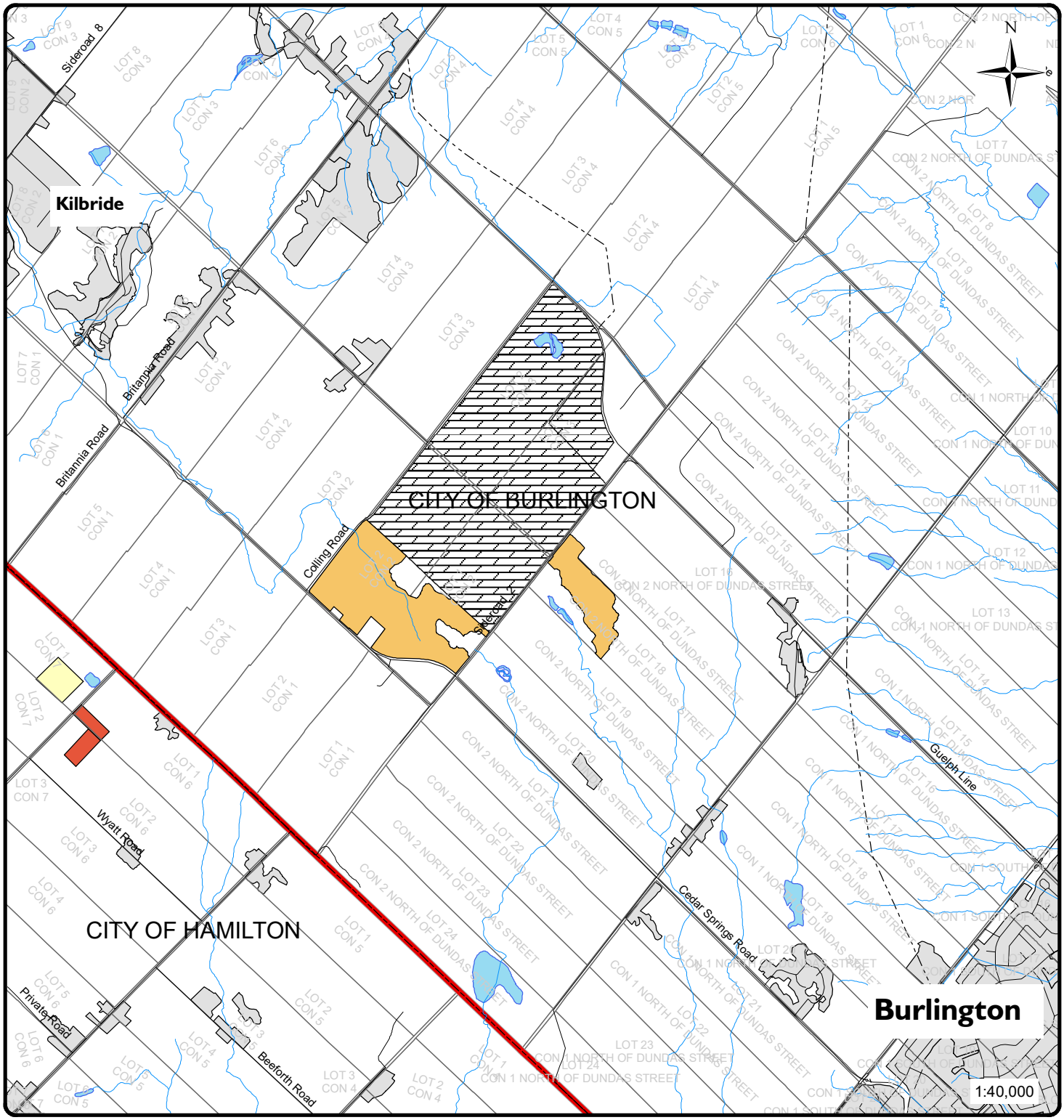
The Subject Lands comprise approximately 18.3 ha (45.2 acres) of which the majority of the lands are used for the production of common field crop (soybean in the 2019 growing season). The lands are generally gently rolling. The properties are all bordered by treed fencerows. The agricultural fields are also divided by treed fencerows. Numerous stones and boulders were noted in the fence rows.

The Subject Lands are roughly bounded: on the north by: Sideroad 2, and the existing Burlington Quarry; on the east and south by woodlots and agricultural lands; and on the west by woodlots and a golf course.

In the local area context, the Subject Lands are located approximately 3.0 km north of Dundas Street and the urban area of the City of Burlington, and approximately 4.3 km south of the hamlet of Kilbride.

This report was completed to document the existing soil conditions and to provide a more detailed assessment of the Canada Land Inventory (CLI) classification of the soil resources onsite. A proposed quarry extension necessitated this study.

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



Legend

- Roads (MNRF)
- Watercourse (MNRF)

Utility Line

- Hydro Line
- Unknown Transmission Line
- Authorized Aggregate Areas (MNRF)
- Built Up Areas (MNRF)
- Lot Lines (MNRF)
- Municipal Boundary
- Subject Lands
- Waterbody (MNRF)

Tile Drainage System Type

- Random
- Systematic

Figure 1

Location

DBH Soil Services Inc.

February 27, 2020

2.0 METHODOLOGY

2.1 DATA SOURCES

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

- 1:10000 scale Ministry of Natural Resources (MNR) Aerial Photography, 1978,
- 1:10000 scale Ontario Base Map (1983) Ministry of Natural Resources:
    - 10 17 5500 48150
    - 10 17 5450 48150
- 1:50000 scale NTS Map No 40 P/9. 1984. Ministry of Energy Mines and Resources, Canada,
- 1:50000 scale NTS Map No 40 P/9. Canada Land Inventory (CLI) Capability Mapping,
- Agricultural Information Atlas (online resource, Ontario Ministry of Natural Resources),
- *Agronomy Guide for Field Crops (Publication 811). (2009).* Ontario Ministry of Agriculture, Food and Rural Affairs,
- *Birdseye Satellite Imagery - Garmin,*
- *Classifying Prime and Marginal Agricultural Soils and Landscapes:* Guidelines for Application of the Canada Land Inventory in Ontario. OMAFRA. Online, 2016,
- *Draft Agricultural Impact Assessment (AIA) Guidance Document (March 2018),*
- *Google Earth Pro Imagery,*
- *Greenbelt Plan* (2017),
- *Growth Plan for the Greater Golden Horseshoe (2019),*
  Guide to Agricultural Land Use, Ontario Ministry of Agriculture, Food and Rural Affairs, March 1995,
  Guidelines for Detailed Soil Surveys for Agricultural Land Use Planning (OMAFRA, 2018 online) (*http://www.omafra.gov.on.ca/english/landuse/facts/soil_survey.htm),*
- *Guidelines on Permitted Uses in Ontario's Prime Agricultural Areas (Publication 851)*, Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), 2016,
- *Niagara Escarpment Plan (2017)*,
- Online Soils data for the Province of Ontario (Land Information Ontario (LIO)), 2018,
- *Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Factsheet – Crop Heat Units for Corn and Other Warm Season Crops in Ontario, 1993*,
- Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) AgMaps online mapping, (http://www.gisapplication.lrc.gov.on.ca/AIA/Index.html?viewer=AIA.AIA&locale=en-US)
- Ontario Ministry of Agriculture and Food - Land Use Systems Mapping,
- Ontario Ministry of Agriculture and Food - Artificial Drainage Mapping,
- *Provincial Policy Statement, 2014,*
- *Soils of Halton County, Report No. 43 of the Ontario Soil Survey (*Gillespie, J.E., R.E. Wicklund and M.H. Miller, 1971),
- *The Physiography of Southern Ontario 3rd Edition, Ontario Geological Survey Special Volume 2, Ministry of Natural Resources, 1984,*
- *Windshield and field surveys by DBH Soil Services staff, October 1, 2019.*

2.2 FIELD DATA COLLECTION

2.2.1 SOIL INVESTIGATION

Basic soils (and Canada Land Inventory classification (CLI)) information was provided in the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) soils and mapping report *The Soils of Halton County. (Report No. 43 of the Ontario Soil Survey*. Gillespie, J.E., R.E. Wicklund and M.H. Miller, 1971) with mapping at a scale of 1:63360. Digital mapping was provided by the Ontario Ministry of Agricultural, Food and Rural Affairs (OMAFRA) through the Land Information Ontario (LIO) warehouse website. The digital mapping was provided at a scale of 1:50000. Mapping at this scale is of a general nature when referring to site-specific planning; therefore detailed soils or soil verification assessments are often required for farm scale or lot size planning initiatives and applications for amendments to Official Plans and /or Zoning By-Laws.

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

A detailed onsite soil survey and surrounding land reconnaissance survey were conducted on October 1, 2019.

2.2.2 PHYSIOGRAPHY

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

2.2.3 TOPOGRAPHY AND CLIMATE

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

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

2.2.4 AGRICULTURAL LAND USE

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

Agricultural land use data was collected through observations made during the detailed soil survey completed on October 1, 2019. Data collected included the identification of land use (both agricultural and non-agricultural), documentation of the type and location of agricultural facilities (if any), non-farm residential units (if any) and non-farm buildings (business, commercial and institutional usage). The data presented in this report reflects the present day agricultural land use (if any).

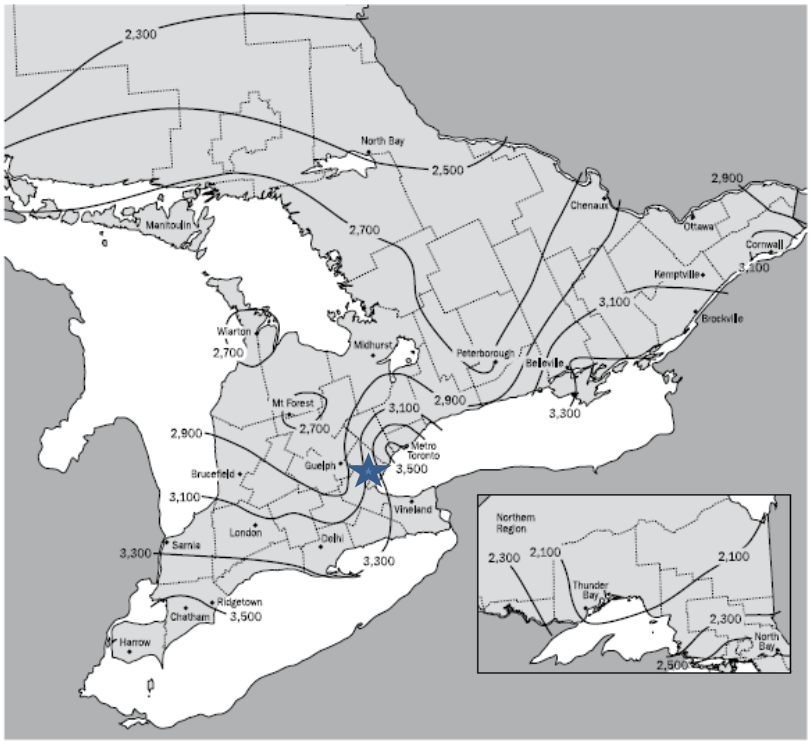
3.0 FINDINGS

3.1 PHYSIOGRAPHY AND CLIMATE

The *Physiography of Southern Ontario* (3rd Edition) Physiographic Unit Map indicates that the Subject Lands are located in the Niagara Escarpment Physiographic unit. A more detailed map of the Physiography of the South Central Portion of Southern Ontario (Map 2226) illustrates that the Subject Lands are located to the west of the Niagara Escarpment in an area of till moraines. Till moraines are the glacially formed accumulation of unconsolidated clay, sand, and stone/boulder materials. In this area the till moraines often occur as thin layers (< 10 m) over bedrock.

The Subject Lands are located within the 3100 - 3300 average accumulated Crop Heat Units area in Ontario. The Crop Heat Units (CHU) index was originally developed for field corn and has been in use in Ontario for 30 years. The CHU ratings are based on the total accumulated crop heat units for the frost free growing season in each area of the province. CHU averages range between 2500 near North Bay to over 3500 near Windsor. The higher the CHU value, the longer the growing season and greater are the opportunities for growing value crops.

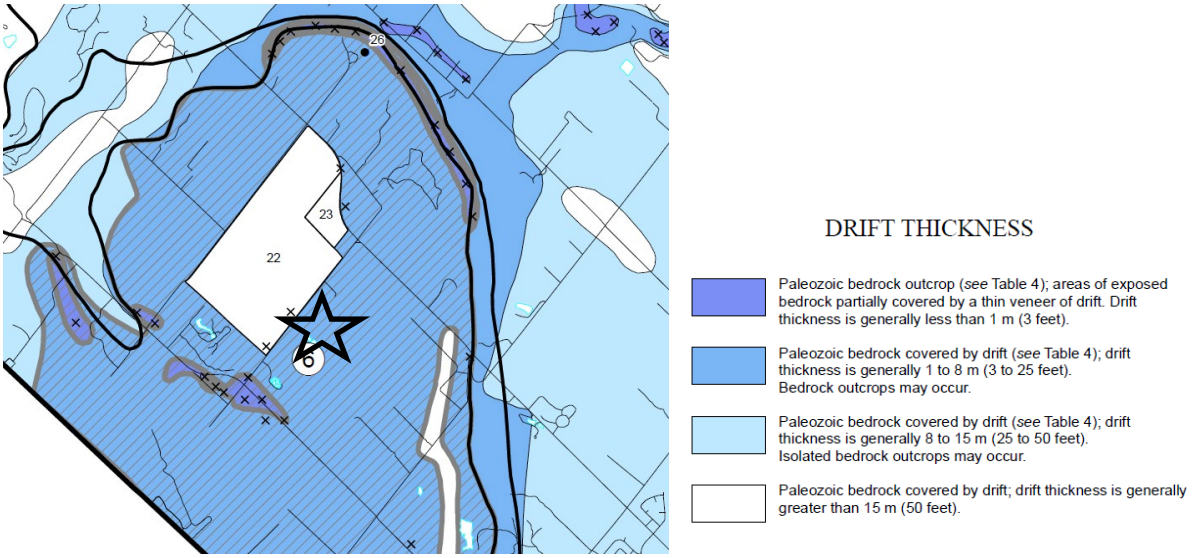
Crop Heat Units for corn (based on 1971-2000 observed daily minimum and maximum temperature (OMAFRA, 2009)) map is illustrated below. The approximate location of the Subject Lands is marked with a star.



Source: Agronomy Guide for Field Crops OMAFRA – Publication 811

3.2 AGGREGATE RESOURCES INVENTORY

A review of the Aggregate Resources Inventory of the Regional Municipality of Halton, Southern Ontario (Ontario Geological Survey Aggregate Resources Inventory Paper 184, 2009) reveals that the Subject Lands are located in area where the drift thickness ranges from 1 to 8 m, and bedrock outcrops may appear. The approximate location of the Subject Lands is illustrated with a black star.



From Aggregate Resources Inventory Paper 184 – ARIM 184-2 Bedrock Resources

3.3 DETAILED SOIL SURVEY

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

- Completion of a review of published soil information (*The Soils of Halton County. Report No. 43 of the Ontario Soil Survey*. Gillespie, J.E., R.E. Wicklund and M.H. Miller, 1971),
- Conduct a review of published Canada Land Inventory (CLI) ratings for the soils of this area,
- Conduct an aerial photographic review and interpretation of the soil polygons, disturbed soil areas and miscellaneous landscape units (ie: streams, boulder pavement, wayside pits),
- Conduct an on-site soil survey,
- Completion of mapping to illustrate the location of the property, the occurrence of soil polygons and appropriate CLI capability ratings,
- Completion of a report outlining the methodologies employed, findings (including a discussion of relevant features identified) and a conclusion as to the relevance of the CLI classifications for the soil polygons on the property.

The detailed soil survey of the Subject Lands and reconnaissance of the surrounding area was conducted on October 1, 2019. Aerial photographic interpretation was used to delineate soil polygon boundaries by comparing areas, on stereoscopic photographs, for similar tone and texture. Delineated soil polygons were evaluated for the purpose of verifying soil series and polygon boundaries. The evaluation was completed through an examination of the existing soil conditions to a minimum depth of 100 cm or to refusal. A hand held Dutch Soil Auger and/or Dutch Stone Auger was used to extract the soil material to a minimum depth of one metre (or to refusal).

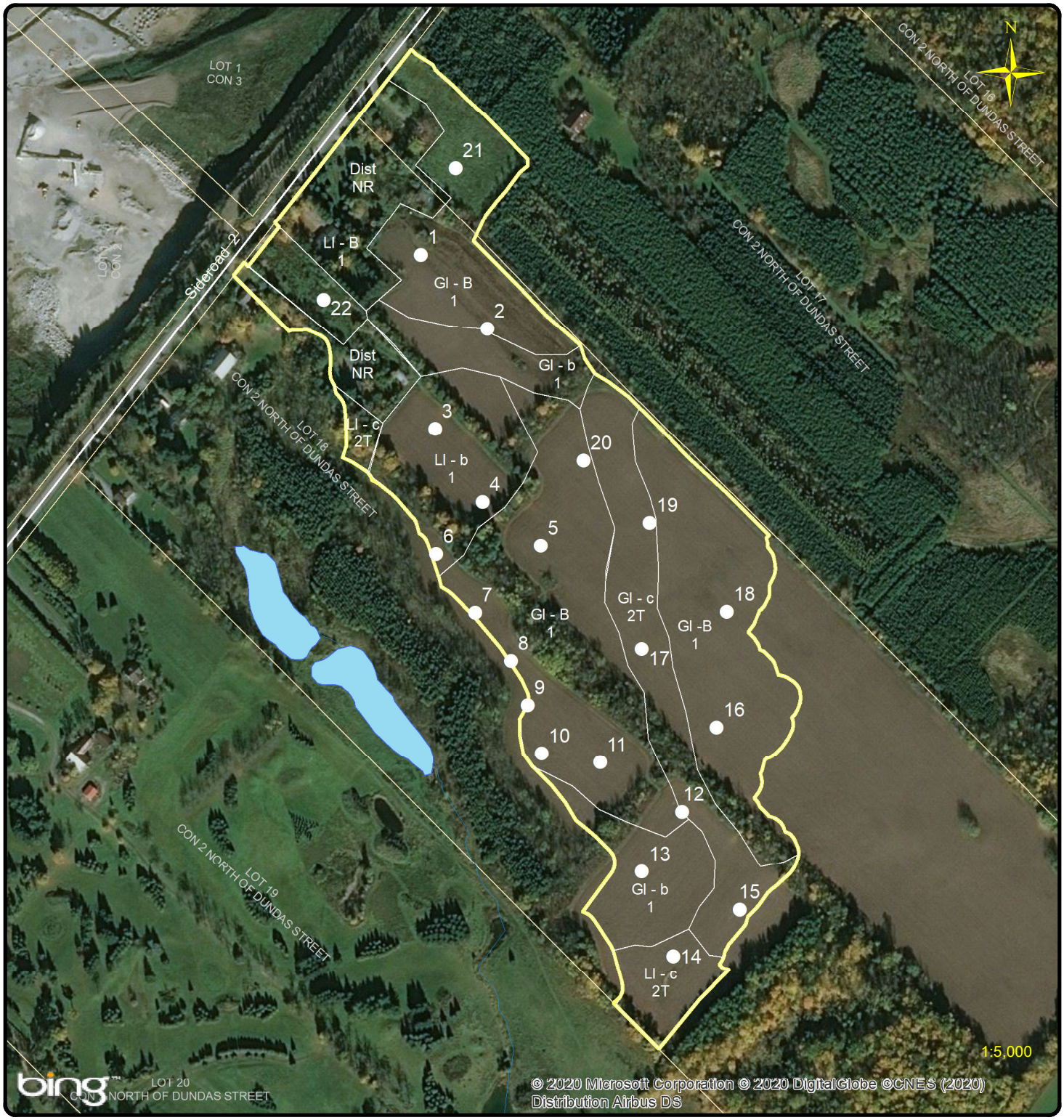
Each soil profile was examined to assess inherent soil characteristics. Soil attributes were correlated with the *Canadian System of Soil Classification* (CSSC) (Agriculture Canada, 1998) and the *Field Manual for Describing Soils in Ontario* (Ontario Centre for Soil Resource Evaluation, 1993). A hand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

Depth to free water within one metre of the soil surface was also recorded at inspection sites located on lower slope positions (where applicable). Names for the soil series and the Canada Land Inventory (CLI) ratings were assigned to each soil polygon by correlating the soil series with soils information presented in *The Soils of Halton County (Report No. 43 of the Ontario Soil Survey*. Gillespie, J.E., R.E. Wicklund and M.H. Miller, 1971) and with the CLI information presented on the 1:50000 scale manuscript mapping.

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

- The majority of the Subject Lands were used for the production of common field crop (soybean) in the 2019 growing season
- The lands are gently sloping, with predominantly long simple sloped areas
- Stone piles were noted along the edge of the fields (in treed fence rows) in various locations around the Subject Lands. Stone piles included stone up to boulder size.
- Stones were rounded (river stone).

A total of 22 soil inspection sites were examined on the Subject Lands. The soil inspection information was correlated with soil descriptions in *The Soils of Halton County (Report No. 43 of the Ontario Soil Survey*. Gillespie, J.E., R.E. Wicklund and M.H. Miller, 1971) and the OMAFRA digital soils data (Land Information Ontario, 2019), prior to the production of the soils map in Figure 2. Soil names used in the identification of the soil series on Figure 2 were taken from *The Soils of Halton County (Report No. 43 of the Ontario Soil Survey*. Gillespie, J.E., R.E. Wicklund and M.H. Miller, 1971).



Legend

- Soil Inspection Site
- Roads (MNRF)
- Watercourse (MNRF)
- Lot Lines (MNRF)
- Soil Polygon Boundary
- Subject Lands Boundary
- Waterbody (MNRF)

Soil Code — Gl - c — Slope Code
CLI Class — 2T — CLI Subclass

Soil Code

Gu - Guelph
LI - London

Dist - Disturbed Soils

CLI Subclass Limitation

T - Topography

NR - Not Rated

Slope Code

Aa = 0.0 - 0.5 %
Bb = 0.5 - 2.0 %
\ < 50 m slope length
\ > 50 m slope length

Figure 2

Soils and
Canada Land Inventory (CLI)

DBH Soil Services Inc.

March 4 2020

The following photograph illustrates the condition of this year's crop (as of October 1, 2019) and an indication of the amount and size of surface stone on the Subject Lands.

Photograph illustrates examples surface stone and this year's crop

Photograph illustrates the size of boulders located in treed fence rows within the Subject Lands.

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

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

The onsite soil survey identified two soil series. The two series were identified as: Guelph; and London. An additional miscellaneous nonsoil group was identified. The miscellaneous nonsoil group comprised areas that have been disturbed, such as residential units, farmstead areas and laneways.

The Guelph soils are the well-drained member of the Guelph soil catena. Guelph soils developed on loam till parent materials derived from the limestone bedrock underlying the soils in this area. These soils can be slightly to moderately stony. The A horizon (surface material) is generally loamy in texture over sandy loam/loam B horizons which may contain limestone fragments ranging from pebbles to boulders in size. Surface stones are generally few in number and do not interfere with cultivation operations. Guelph soils occur on level and gently rolling slopes.

The London soils are the imperfectly drained member of the Guelph soil catena. The London soils developed on loam till parent materials. These soils occur on level and gently sloping areas. The London soils occur in similar landscapes as the soils of the Guelph soil series.

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

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

3.3.1 ARTIFICIAL DRAINAGE

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

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

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

OMAFRA Artificial Drainage System Maps (online resource mapping) were reviewed to determine if an agricultural tile drainage system had been registered to the Subject Lands. The OMAFRA maps revealed that agricultural drainage systems were not registered to any portions of the Subject Lands.

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

3.3.2 IRRIGATION

Observations noted during the surficial soil survey indicated that the Subject Lands are not irrigated and that the property is not set up for the use of irrigation equipment. Visual evidence supporting the use of irrigation equipment would include the presence of the irrigation equipment (piping, water guns, sprayers, tubing, etc), the presence of a body of water capable of sustaining the irrigation operation and lands that are appropriate for the use of such equipment.

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

3.3.3 LANDFORMING

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

3.3.4 SOIL CAPABILITY FOR AGRICULTURE

Basic information about the soils of Ontario is made more useful by providing an interpretation of the agricultural capability of the soil for various crops. The Canada Land Inventory (CLI) system combines attributes of the soil to place the soils into a seven-class system of land use capabilities. The CLI soil capability classification system groups mineral soils according to their potentialities and limitations for agricultural use. The first three classes are considered capable of sustained production of common field crops, the fourth is marginal for sustained agriculture, the fifth is capable for use of permanent pasture and hay, the sixth for wild pasture and the seventh class is for soils or landforms incapable for use for arable culture or permanent pasture. Organic or Muck soils are not classified under this system. Disturbed Soil Areas are not rated under this system.

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

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

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

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

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

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

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

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

Each polygon identified on-site was classified according to the Canada Land Inventory rating system then correlated to the CLI classifications as presented *The Soils of Halton County (Report No. 43 of the Ontario Soil Survey*. Gillespie, J.E., R.E. Wicklund and M.H. Miller, 1971), CLI map No. 40 P/9, the digital soil data provided by OMAFRA, and the OMAFRA document "Classifying

Prime and Marginal Agricultural Soils and Landscapes: Guidelines for the Application of the Canada Land Inventory in Ontario".

Guelph soils on simple (slope length more than 50 m) and complex (slope length less than 50 m) 'B' and 'b' (0.5 – 2.0 percent) were rated CLI class 1 and on and complex 'C' slopes were rated as CLI class 2T

London soils on simple (slope length more than 50 m) and complex (slope length less than 50 m) 'B' and 'b' (0.5 – 2.0 percent) were rated CLI class 1 and on and complex 'C' slopes were rated as CLI class 2T.

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 T - Topography: This subclass denotes limitations due to slope steepness and length. Such limitations may hinder machinery use, decrease the uniformity of crop growth and maturity, and increase water erosion potential.*

Disturbed soil areas are considered as Not Rated within the Canada Land Inventory classification system.

Table 1 summarizes the relative percent area occupied by each capability class for the proposed southern quarry extension licensed boundary.

Table 1 Canada Land Inventory – Proposed Southern Quarry Extension Licensed Boundary

Canada Land Inventory Class (CLI)	Area (ha/acres)	Percent Occurrence
Class 1	13.2/32.6	71.9
Class 2	3.0/7.4	16.2
Class 3	-	-
Class 4	-	-
Class 5	-	-
Class 6	-	-
Class 7	-	-
Disturbed Soil Areas	2.1/5.2	11.9
Totals	18.3/45.2	100.0

The Subject Lands comprise approximately 88.2 percent Canada Land Inventory (CLI) class 1 – 3 soils.

3.3.5 HOFFMAN PRODUCTIVITY INDEX (SOIL PRODUCTIVITY RATING)

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

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

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

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

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

Table 2 Soil Productivity Index Ranges

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

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

Soil Productivity Index =

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

Once a Soil Productivity Index value is calculated for the parcel or polygon, the value can be related back to a CLI Equivalent. The following table (Table 3) illustrates the range of values which can be directly correlated to the equivalent CLI class.

Table 3 Soil Productivity Index Range and Equivalent CLI

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

With respect to the Subject Lands, an HPI calculation was completed. The HPI value and subsequent CLI class are provided in Table 4.

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

	Soil Productivity Rating	Corresponding CLI Class
Subject Lands	0.848	2

The calculated Soil Productivity Rating for the Subject Lands was 0.848 or a CLI class 2 equivalent.

4.0 SUMMARY AND CONCLUSIONS

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

Part Lots 17 & 18
Concession 2 North of Dundas Street
City of Burlington
Halton Region

This area is considered as the proposed southern extension of the existing Burlington Quarry and comprised 5 individual parcels. The parcel identification numbers (as identified in the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) online Agricultural Information Atlas) are:

24020303081200000000
24020303081190000000
24020303081180000000
24020303081170100000
24020303081170000000

The portions of these five parcels that are part of the proposed southern extension of the existing Burlington Quarry will henceforth be referred to as the Subject Lands.

The Subject Lands comprise approximately 18.3 ha (45.2 acres) of which the majority of the lands are used for the production of common field crop (soybean in the 2019 growing season). The lands are generally gently rolling. The properties are all bordered by treed fencerows. The agricultural fields are also divided by treed fencerows. Numerous stones and boulders were noted in the fence rows.

The Subject Lands are roughly bounded: on the north by: Sideroad 2, and the existing Burlington Quarry; on the east and south by woodlots and agricultural lands; and on the west by woodlots and a golf course.

In the local area context, the Subject Lands are located approximately 3.0 km north of Dundas Street and the urban area of the City of Burlington, and approximately 4.3 km south of the hamlet of Kilbride.

This report was completed to document the existing soil conditions and to provide a more detailed assessment of the Canada Land Inventory (CLI) classification of the soil resources onsite. A proposed quarry extension application necessitated this study.

The results of the Soil Survey assessment include the following:

- The majority of the Subject Lands are used for the production of common field crops. (soybean) in the 2019 growing season).

- Portions of the Subject Lands comprised woods, brush areas and treed fence rows.

- Significant stone piles were noted in the treed fence rows.

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

- Approximately 88.2 percent of the Subject Lands is Canada Land Inventory (CLI) class 1 – 3 soils.

- The Soil Productivity Rating for the Subject Lands is 0.848 giving a CLI equivalent rating of class 2.

5.0 REFERENCES

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

- 1:10000 scale Ministry of Natural Resources (MNR) Aerial Photography, 1978,
- 1:10000 scale Ontario Base Map (1983) Ministry of Natural Resources:
    - 10 17 5500 48150
    - 10 17 5450 48150
- 1:50000 scale NTS Map No 40 P/9. 1984. Ministry of Energy Mines and Resources, Canada,
- 1:50000 scale NTS Map No 40 P/9. Canada Land Inventory (CLI) Capability Mapping,
- Agricultural Information Atlas (online resource, Ontario Ministry of Natural Resources),
- *Agronomy Guide for Field Crops (Publication 811). (2009).* Ontario Ministry of Agriculture, Food and Rural Affairs,
- *Birdseye Satellite Imagery - Garmin,*
- *Classifying Prime and Marginal Agricultural Soils and Landscapes:* Guidelines for Application of the Canada Land Inventory in Ontario. OMAFRA. Online, 2016,
- *Draft Agricultural Impact Assessment (AIA) Guidance Document (March 2018),*
- *Google Earth Pro Imagery,*
- *Greenbelt Plan* (2017),
- *Growth Plan for the Greater Golden Horseshoe (2019),*
  Guide to Agricultural Land Use, Ontario Ministry of Agriculture, Food and Rural Affairs, March 1995,
  Guidelines for Detailed Soil Surveys for Agricultural Land Use Planning (OMAFRA, 2018 online) (*http://www.omafra.gov.on.ca/english/landuse/facts/soil_survey.htm*),
- *Guidelines on Permitted Uses in Ontario's Prime Agricultural Areas (Publication 851),* Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), 2016,
- *Niagara Escarpment Plan (2017),*
- Online Soils data for the Province of Ontario (Land Information Ontario (LIO), 2018,
- *Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Factsheet – Crop Heat Units for Corn and Other Warm Season Crops in Ontario, 1993*,
- Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) AgMaps online mapping, (http://www.gisapplication.lrc.gov.on.ca/AIA/Index.html?viewer=AIA.AIA&locale=en-US)
- Ontario Ministry of Agriculture and Food - Land Use Systems Mapping,
- Ontario Ministry of Agriculture and Food - Artificial Drainage Mapping,
- *Provincial Policy Statement, 2014,*
- *Soils of Halton County, Report No. 43 of the Ontario Soil Survey (*Gillespie, J.E., R.E. Wicklund and M.H. Miller, 1971),
- *The Physiography of Southern Ontario 3rd Edition, Ontario Geological Survey Special Volume 2, Ministry of Natural Resources, 1984,*
- *Windshield and field surveys by DBH Soil Services staff, October 1, 2019.*

APPENDIX A

Soil Inspection Site Characteristics

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
1	Ap Bt Ck	0 – 21 21 – 60 60 +	Loam Loam Loam	Well	Guelph
2	Ap Bt*	0 – 23 23 – 29	Loam Loam	Well	Guelph
3	Ap Bt Ck	0 – 24 24 – 69 69 – 80*	Loam Loam Loam	Imperfect	London
4	Ap Bt Ck	0 – 22 22 – 64 64 – 90*	Loam Loam Loam	Imperfect	London
5	Ap Bt Ck	0 – 23 23 – 65 65 +	Loam Loam Loam	Well	Guelph
6	Ap Bt Ck	0 – 22 22 – 58 58 - 74*	Loam Loam Loam	Imperfect	London
7	Ap Bt Ck	0 – 21 21 – 62 62 – 80*	Loam Loam Loam	Well	Guelph
8	Ap Bt Ck	0 – 26 26 – 66 66 – 95*	Loam Loam Loam	Well	Guelph
9	Ap Bt Ck	0 – 25 25 – 65 65 +	Loam Loam Loam	Well	Guelph
10	Ap Bt Ck	0 – 21 21 – 66 66 - 100	Loam Loam Loam	Well	Guelph
11	Ap Bt Ck	0 – 25 25 – 62 62 - 91*	Loam Loam Loam	Well	Guelph
12	Ap Bt Ck	0 – 24 24 – 71 71*	Loam Loam Loam	Well	Guelph
13	Ap Bt Ck	0 – 23 23 – 59 59 – 82*	Loam Loam Loam	Well	Guelph
14	Ap Bt Ck	0 – 24 24 – 57 57 – 93*	Loam Loam Loam	Well	Guelph
15	Ap Bt	0 – 20 20 – 35*	Loam Loam	Imperfect	London
16	Ap Bt Ck	0 – 25 25 – 61 61 - 95*	Loam Loam Loam	Well	Guelph
17	Ap Bt Ck	0 – 25 25 – 68 68 - 100	Loam Loam Loam	Well	Guelph
18	Ap Ae Bt Ck	0 – 24 24 – 32 32 – 56 56 - 100	Loam Loam Loam Loam	Well	Guelph

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
19	Ap Bt Ck	0 – 24 24 – 67 67 – 95*	Loam Loam Loam	Well	Guelph
20	Ap Bt Ck	0 – 22 22 – 60 60 - 100	Loam Loam Loam	Well	Guelph
21	Ap Bt Ck	0 – 23 23 – 54 54 – 75*	Loam Loam Loam	Well	Guelph
22	Ap Bt Ck	0 – 25 25 – 55 55 – 84*	Loam Loam Loam	Imperfect	London

Notes:
- A horizons are the surface materials often with the greatest percent of organic material
- B horizons are generally beneath the A horizon and show slight soil formation (ie: increases in clay and organic content)
- C horizons are generally beneath the B horizon and show little to no soil profile/horizon formation

* = refusal (excessive stoniness)

APPENDIX B

Photographs

Photograph illustrating the soybean crop and surface stone size and content.

Photograph illustrating ridge and slope areas at the southern portion of the Subject Lands.

APPENDIX C

Curriculum Vitea

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217 Highgate Court
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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.

1988 to 1992

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

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SELECT PROJECT EXPERIENCE

Environmental Assessment Studies

- Agricultural Component of the Greater Toronto Area West (GTAW) Highway Corridor Assessment, 2019 – ongoing.
- 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.
- Peer Review Agricultural Component of the Union Gas Dawn Corridor Expansion, 2006.
- Agricultural Component of the Trafalgar Road study, Halton Region, 2005.
- Agricultural Component of the Highway 404 Extension North, 2004.
- Agricultural Component of the Highway 404 – 400 Bradford Bypass, 2004.
- Agricultural Component of the Highway 407 East Extension, 2002 – 2010.

Agricultural Impact Studies

- Smithville, West Lincoln Master Community Plan, Agricultural Impact Assessment, AECOM, 2019 – On-going.
- Kirby Road Agricultural Impact Assessment, HDR, Vaughan, 2019 – On-going.
- Elfrida Lands, City of Hamilton, Agricultural Impact Assessment Update, WSP, 2019 – On-going.
- 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.

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Soil Surveys/Soil Evaluations

- 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.
- Soil Survey and Canada Land Inventory Evaluation, Official Plan Amendment, Township of Essa, County of Simcoe, 2014.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), Stonescape, Buckhorn, 2013.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), Hatch Engineering, 2013.
- Soil Survey and Canada Land Inventory Evaluation, Solar Feed-In Tariff (FIT Program Study), Stantec, 2013.
    - Thunder Bay – 3 Sites.
- Soil Survey and Canada Land Inventory Evaluation, Waterford Sand And Gravel Quarry, 2013.
- City of Kitchener, City Wide Urban Soils Evaluations, 2012 – 2013.
- City of Kitchener, Urban Soils Evaluations in Natural Areas and City Boulevards, 2010 – 2011.

Land Evaluation and Area Review Studies (LEAR)

- 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.
- Evaluation of Soil Resources - Land Evaluation and Area Review, City of Sudbury, 2003 - 2004.

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Expert Witness

- 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 – Gas Pipeline Construction Monitoring – Mainline Construction (20 ") – Kingsville – 2019 - ongoing.
- 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.
- City of Kitchener, Soil Sampling and Laboratory Analysis, Urban Silviculture, 2009 – 2012.
- Soils Resource Group Inc. – City of London Water Supply Aqueduct soil monitoring program, 2011.

Publications

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

APPENDIX B | Curriculum Vitae

MHBC
PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE

CURRICULUM**VITAE**

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

EDUCATION

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

1993
Bachelor of Science in Agriculture
University of Guelph

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

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

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

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

PROFESSIONAL ASSOCIATIONS

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

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CURRICULUM**VITAE**

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

PROFESSIONAL HISTORY

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

SELECTED PROJECT EXPERIENCE

Parks & Recreation

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

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

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

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

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

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

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CURRICULUM**VITAE**

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

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

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

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

Source Water Protection

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

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

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

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

Official Plan/Zoning By-laws

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

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

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

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

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CURRICULUM**VITAE**

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

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

Agricultural/Rural Planning

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

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

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

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

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

Special Studies & Other

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

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

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

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

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CURRICULUM**VITAE**

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

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

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

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

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

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

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

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

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

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

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ARCHITECTURE

CURRICULUM**VITAE**

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

AWARDS / PUBLICATIONS / PRESENTATIONS

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

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