MHBC
PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE

KITCHENER
WOODBRIDGE
LONDON
KINGSTON
BARRIE
BURLINGTON

AGRICULTURAL IMPACT ASSESSMENT

Strada Aggregates
Township of Melancthon, County of Dufferin

Date:
May 2017

Prepared for:
Strada Aggregates

Prepared by:
MacNaughton Hermsen Britton Clarkson Planning Ltd.
200-540 Bingemans Centre Drive
Kitchener, ON N2B 3X9

Our File Y349'G'

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 Strada Aggregates ("Strada") to complete an agricultural impact assessment for a proposed expansion to their existing aggregate extraction operations, which is comprised of two active pits located on the east side of 4th Line in the Township of Melancthon north of the Town of Shelburne in the County of Dufferin. The existing pits include Melancthon Pit #1 (License No. 129167) and Melancthon Pit #2 (License No. 625155) in the Township of Melancthon. The proposed expansion will include two separate parcels located on the north and south sides of Melancthon Pit #1. (**See Figure 1**)

Strada is filing an application with the Ministry of Natural Resources and Forestry (MNRF) for an Aggregate Resources Act (ARA) Category 3, Class "A" Pit above water license for the proposed expansion to their existing operation. Amendments to the Township of Melancthon Official Plan and Zoning By-law are also required.

In accordance with the Township Official Plan, an Agricultural Impact Assessment (AIA) is required as the expanded aggregate operation is proposed to occur on properties that are in active agricultural areas. This report is intended to satisfy the AIA requirements of the Official Plan in support of the Planning Act applications.

1.1 Data Collection and Review

The following is a list of the background materials at the upper tier and municipal levels that were reviewed as part of the preparation of this AIA:

- Dufferin County Official Plan (March 27, 2015);
- Township of Melancthon Official Plan (August 14, 2014); and
- Township of Melancthon Zoning By-law (August 1996).

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:

- Natural Environment Assessment/Environmental Impact Study (Natural Resource Solutions Inc., May 2017);
- Level 1 and 2 Hydrogeological Assessment (Whitewater Hydrogeology Ltd, May 2017)
- Noise Assessment (Aercoustics, May 2017);
- Soil Survey and Canada Land Inventory Classification (DBH Soil Services Inc., November 2016).

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

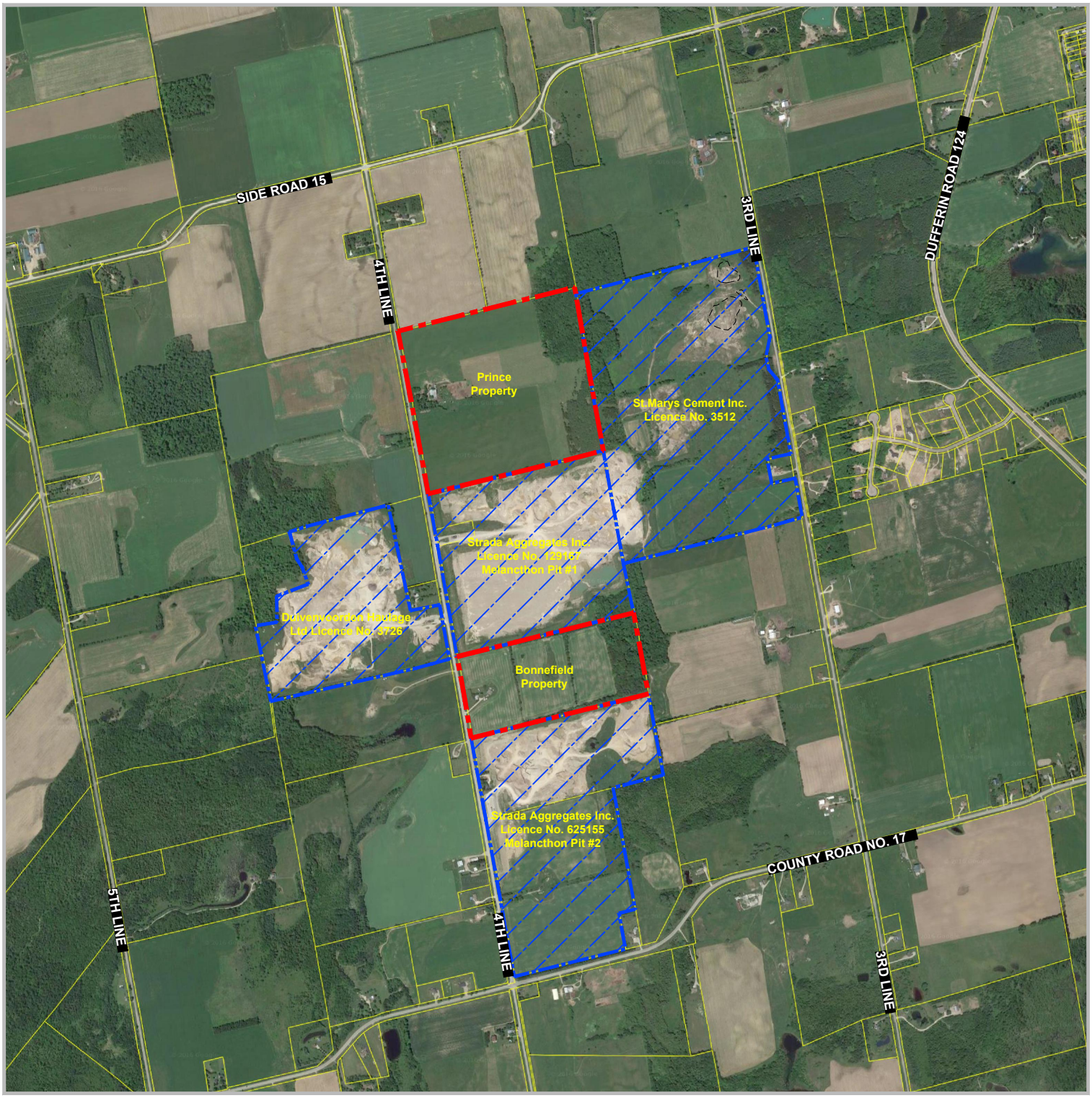


Figure 1

Location Plan

LEGEND

Subject Lands

Existing Licensed Aggregate Operations

DATE: December 2016

SCALE: 1:2,000

FILE: Y349G

DRAWN: GMC

north

K:\Y349G STRADA DUFFERIN COUNTY PROPERTIES\RPT\FIG_LOCATION_PLAN.DWG

Strada Aggregates
Part of West Half of Lots 12 and 14
Concession 3 O.S.
Township of Melancthon
County of Dufferin

Source:
Vumap 2015 Google Sattelite imagery

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

- Site plans including Existing Conditions Plan, Operation Plan and Rehabilitation Plan;
- Site plans and/or reports for Melancthon Pit #1 and St. Mary's Cement Inc. pit;
- 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 (e.g., bore hole logs from resource evaluations and hydrogeological investigations);
- Aerial photography (historic and recent) with effective user scale of 1:10,000 or smaller;
- OMAFRA's constructed and agricultural Artificial Drainage Mapping; and
- Parcel mapping/fabric of the area.

A land use survey was also conducted on October 19, 2016 and information gathered from Google Satellite Imagery (June 19, 2015) 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 Location of Proposed Aggregate Extraction Operation

The subject lands are comprised of two parcels of land located on the east side of 4th Line, approximately 1.8 kilometres north of County Road 17 and south of Side Road 15, in the Township of Melancthon. The subject lands are west of Dufferin Road 124, two kilometres west of the hamlet of Horning's Mills and six kilometres north of the Town of Shelburne. The lands are legally described as Part of West Half of Lots 12 and 14, Concession 3 O.S., Township of Melancthon ("subject lands"). A location map of the subject lands is provided as **Figure 1**.

The two parcels have a combined area of approximately 60 hectares (150 acres). The larger parcel, which is the northern parcel and legally described as Lot 14, Concession 3 ("Prince property"), is 40 hectares (100 acres) in size. The smaller parcel located to the south of Melancthon Pit #1 and legally described as Lot 12, Concession 3 ("Bonnefield property"), and is approximately 20 hectares (50 acres) in size. One larger parcel of land separates the two parcels and currently accommodates the existing Strada Aggregates operation known as Melancthon Pit #1. Melancthon Pit #2 is located immediately to the south of the Bonnefield property.

The Prince property contains a residential structure and one barn structure along the western property line, adjacent to the 4th Line. The barn structure is proposed to be removed as part of the application while the dwelling will remain. Steeper topography can be found in the wooded areas along the eastern property line. The property is actively used for agricultural purposes and the agricultural land is currently in forage/pasture production. The existing bank barn also has beef, which use the surrounding pasture land. There are no water courses on the property; however, there are two distinct woodlots along the eastern boundary of the property. The northerly woodlot is proposed to remain however, the second woodlot, located along the south-eastern edge of the property, is characterized as a plantation and is proposed to be removed as part of the expanded aggregate operations.

The Bonnefield property (formerly the Garner Property), contains one residential structure in addition to an accessory building in close proximity to 4th Line. All structures on this property are proposed to be removed as part of the application. The subject lands are actively used for agricultural purposes and are currently in soybean/cash crop production with no livestock on the subject lands. The property consists of three large fields and steep slopes to the east. Although there are no identified water courses on the site, there is a woodlot that is approximately 9 acres in size along the eastern edge of the property as well as an unevaluated wetland located along the southeastern edge of the property. The woodlot is proposed to remain as part of the proposed expansion of operations.

1.3 Description of Proposal

Strada is applying for an Aggregate (ARA) licence for a Category 3, Class "A" Pit above water. The application is for a proposed expansion to Strada's existing aggregate extraction operations known as Melancthon Pit #1 and Melancthon Pit #2.

The proposed aggregate extraction on the Prince and Bonnefield properties is proposed to operate in conjunction with the existing pits. Operations within the proposed expansion will occur above the water table, and the existing processing facilities within the existing licensed pits will continue to be utilized for processing materials from the subject properties. Melancthon Pit #1 and Melancthon Pit #2 have existing accesses off of 4th Line, and no new accesses are being proposed as part of the current ARA applications. Furthermore, the maximum tonnage that currently applies to the existing Melancthon Pit #1 and #2 will not be increased and will remain unchanged with the proposed expansion. The existing haul route south on 4th Line and east on County Road No. 17 will be utilized with no proposed changes as a result of the expanded operations. See **Figure 2** of this report, illustrating the proposed operation.

Given that the aggregate extraction operation will occur above the water table the limit of extraction on the subject lands encompasses the vast majority of both sites aside from the woodlands along the eastern perimeter. The existing agricultural operations on the subject properties will continue until such time as they are required for extraction. The properties will be progressively rehabilitated back to agriculture following the aggregate extraction operations. **Figure 3** illustrates the proposed final rehabilitation plans.

1.4 Purpose of the Study

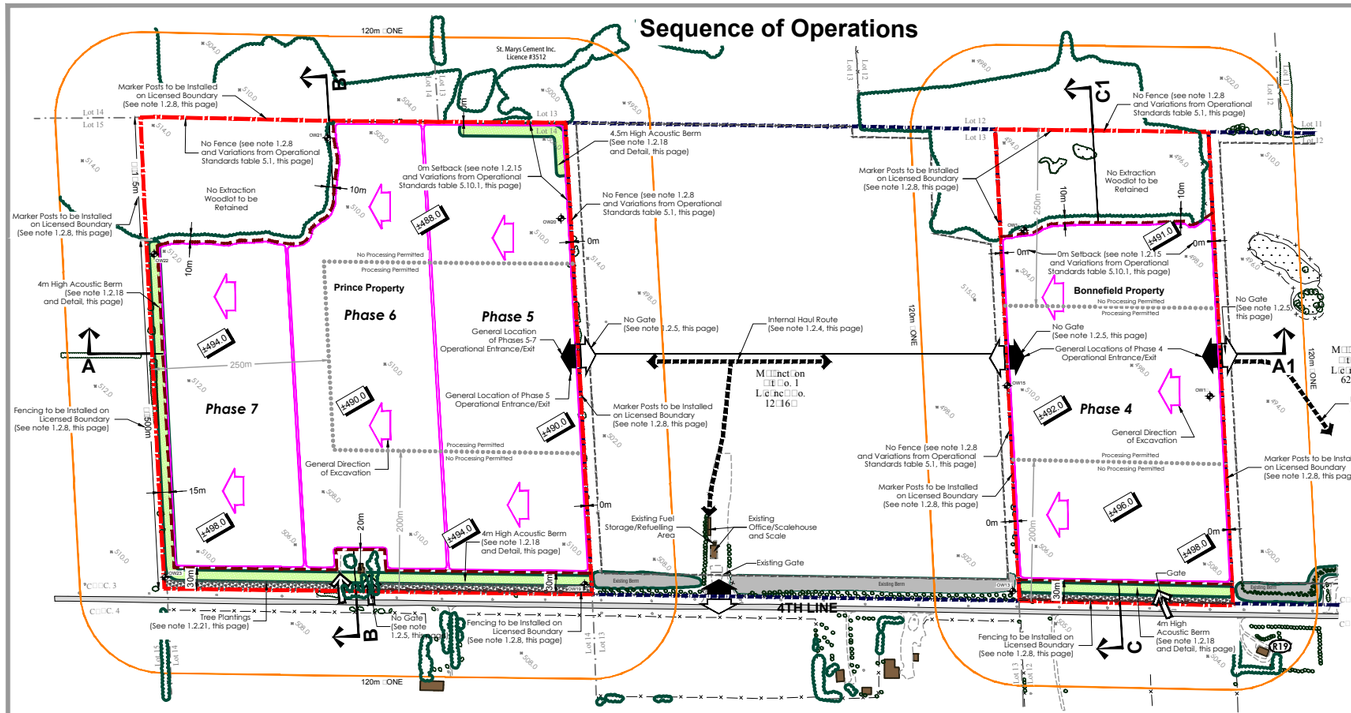
The purpose of this Agricultural Impact Assessment is to evaluate potential impacts on agriculture from the proposed aggregate extraction operation and identify mitigation measures to abate these impacts to the extent feasible. Furthermore, this report is intended to provide information to support the preparation and implementation of effective progressive rehabilitation plans for agricultural rehabilitation including the provision of baseline pre-extraction documentation.

The Agricultural Impact Assessment (AIA) is required by the Township of Melancthon as the expanded aggregate operations are proposed to occur on properties that are in agricultural areas and are actively being utilized for agricultural purposes. As part of the ARA applications, it is proposed that the lands will be returned to agricultural production once the aggregate extraction operations cease. The lands are proposed to be progressively rehabilitated to substantially the same average soil capability that existed prior to the aggregate extraction operation.

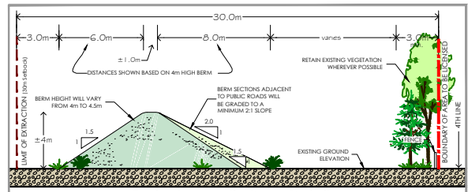
As part of this AIA, surrounding agricultural land uses and structures on properties within one kilometre of the subject lands have been documented to assess the potential impact from the proposed aggregate expansion on the agricultural uses/operations and determine the extent of mitigation that may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

Furthermore, a soil survey and Canada Land Inventory (CLI) Evaluation was completed 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 and inform the final agricultural rehabilitation.

Sequence of Operations



Typical Acoustic Berm Detail



ALL BERMS WILL BE VEGETATED AND MAINTAINED TO CONTROL EROSION
TEMPORARY EROSION CONTROL WILL IMPLEMENTED AS REQUIRED

Scale 1:200

Variations from Operational Standards

No.	Description	Standard
1	NO FENCE ALONG NORTH BOUNDARY OF AREA TO BE LICENSED, COMMON BOUNDARY WITH LICENCE #129167 AND LICENCE # 625155 OR WOODLOT AREAS. THE BOUNDARY WILL BE DEMARCATED BY MARKER POSTS.	5.1
2	NO GATE AT NORTHERN MOST ACCESS OF AREA TO BE LICENSED WHERE HOUSE IS TO BE RETAINED.	5.2
3	SCRAP MAY BE LOCATED WITHIN 30m OF THE COMMON BOUNDARY WITH THE EXISTING LICENSED PITS ADJACENT TO THIS SITE.	5.9
4	SETBACK REDUCED TO 0m ALONG BOUNDARY OF AREA TO BE LICENSED ADJACENT TO EXISTING LICENSED LANDS (LICENCE # 129167, #625155 AND #3512).	5.10.1
5	STOCKPILES MAY BE LOCATED CLOSER THAN 30m FROM THE BOUNDARY OF THE AREA TO BE LICENSED WHERE IT IS ADJACENT TO EXISTING LICENSED LANDS (LICENCE #129167, #625155 AND #3512).	5.13.1
6	WHERE BERMS ARE TO BE LOCATED ADJACENT TO COMMON BOUNDARIES WITH EXISTING LICENCES, THE SETBACK WILL BE LESS THAN 3 METRES.	5.15
7	TOPSOIL AND OVERBURDEN MAY BE STORED TEMPORARILY ON ADJACENT LICENCE #129167 AND LICENCE #625155 UNTIL REQUIRED FOR REHABILITATION PURPOSES. TOPSOIL LOCATED WITHIN THIS SITE (MELANCTHON PIT EXTENSION) MAY BE USED IN THE PROGRESSIVE REHABILITATION OF ADJACENT LICENCE # 129167 AND #625155.	5.16
8	EXCESS OVERBURDEN WITHIN THIS SITE (MELANCTHON PIT EXTENSION) MAY BE USED IN THE PROGRESSIVE REHABILITATION/BACKFILLING OF ADJACENT LICENCE #129167 AND #625155.	5.17
9	THE SIGN WILL BE LOCATED AT THE OFF SITE ACCESS TO 4TH LINE.	5.22

Phase 4 Notes:

1. Fencing along the east boundary and 10m setback from the woodlot and boundary demarcation will be established prior to site preparation as shown.
2. Extraction will commence at the southern limit of Phase 4 following the completion of Phase 3 in Pit #2. The common boundary between Pit #2 and the Phase 4 property will be removed first.
3. Phase 4 will proceed in a northerly direction towards Pit #1.
4. Initial strippings will be used to construct a 4m high berm along the west perimeter. Store any excess soil material in a stockpile(s) within the limit of extraction.
5. Truck traffic will initially enter and exit Phase 4 through the common boundary with Pit #2. Product will be shipped through the existing entrance and exit to 4th Line within Pit #2. Truck traffic may also utilize the existing entrance and exit to 4th Line within Pit #1 during later stages of Phase 4.
6. Within Phase 4 the extraction and processing equipment operating in the extension will be limited to a crusher, screening plant and associated loaders. (See note 1.2.20 and 1.2.27 'Noise' note 3).
7. Progressively rehabilitate side slopes/pit floor at the east and west limits of the property.
8. Final rehabilitation of Pit #2 with the exception of the processing area, scale, scale house and entrance/exit will be complete during extraction of Phase 4.

Phase 5-7 Notes:

1. Fencing along the east and north boundary and 10m setback from the woodlot and boundary demarcation, will be established prior to site preparation as shown.
2. Extraction in Phase 5 will commence at the southern limit of the property following the completion of Pit #1. The common boundary between Pit #1 and Phase 5 will be removed first.
3. Extraction of Phase 5-7 will proceed in a northerly direction towards the northern limit of the property.
4. Initial strippings will be used to construct a 4m high berm along the entire north and west perimeters. A 4.5m high berm will also be constructed on the southeast corner of the property, extending 150m north.
5. Truck traffic will enter and exit the Prince property through the common boundary with Pit #1. Product will be shipped through the existing entrance and exit to 4th Line within Pit #1.
6. Within Phase 5-7 the extraction and processing equipment operating in the extension will be limited to: a crusher, screening plant, associated loaders, and a wash plant (See note 1.2.20 and 1.2.27 'noise' note 4).
7. Following completion of perimeter berms, subsequent topsoil and subsoil strippings will be used to progressively rehabilitate sides slopes/pit floor at the east and west limits of the property.
8. Finalize rehabilitation of Pit #1 with the exception of the processing area, scale, scale house and entrance/exit will be completed during extraction of Phases 5 and 6.

Agricultural Impact Assessment

"Agricultural Impact Assessment Strada Aggregates, Township of Melancthon County of Dufferin" (MHBC Planning, May 2017)

The side slopes should be graded to the desired slope prior to the replacement of topsoil and subsoil. The side slopes should be ripped/tilled to alleviate any compaction and to minimize potential for erosion. A permanent vegetative cover should be provided to stabilize the slopes. Subsoil and topsoil can be placed directly over the top the overburden on the side slope provided the topsoil is uniformly placed at a depth of approximately 15 cm to ensure the establishment of a perennial vegetative cover where possible and subject to material availability.

Annual reporting of all stages of the rehabilitation process should be documented and reported. Random soil testing should also be completed at the beginning of each growing season to analyze soil fertility and texture. Adjustments to cropping practices and / or soil amendments may be required based on the results of the soil testing. An annual rehabilitation practices report should be submitted in order to document agricultural rehabilitation activities and demonstrate compliance in relation to soil stripping, handling and storage; rehabilitation progress, methods and best practices; soil tests; and, post rehabilitation soil capability and farming activity.

Cultural Heritage Assessment

"Cultural Heritage Study Part of Lots 12 & 13, Concession 3, Melancthon Township" (MHBC Planning, May 2017)

In order to help ensure that the applicable cultural heritage resources are appropriately conserved, the following recommendations are made:

1. The potential for the use of the barn and outbuildings as salvage materials should be explored. This could occur as part of onsite activities or through other means.
2. A conservation plan for the house is recommended to be prepared in order to ensure that the heritage attributes of the house are retained. It is recommended that this occur at the commencement of site operations on the Prince property.
3. Site rehabilitation as shown in figure 6 is recommended in order to provide additional context and yard area surrounding the house. This will exist in a viable long-term after-use for the house.

The Prince Property.

1. The James Hamilton (BaHb-18) does not represent a significant cultural heritage resource and may be considered clear of further archaeological concern.
2. Approximately 15% of the subject property, within the limit of extraction, has not been subject to Stage 2 Archaeological Assessment. The unassessed areas comprise a cattle paddock to the east of the large barn and the pine plantation in the southeast corner of the property. Prior to any land disturbing activities within the subject property, a Stage 2 Archaeological Assessment must be conducted in accordance with the Ministry of Tourism, Culture and Sport's 2011 *Standards and Guidelines for Consultant Archaeologists.*
   a. The Stage 2 Archaeological Assessment must be carried out on all undisturbed lands remaining within the limit of extraction by means of a test pit survey. All test pits must be excavated at least five cm into sterile subsoil, with all soils being screened through six mm mesh to facilitate artifact recovery. All test pits must be at least 30 cm in diameter and hydrated sieving is encouraged. Test pits must be excavated within one metre of all built structures. The test pits must be excavated at five metre transect intervals.
   3. Approximately 15% of the subject property was not assessed, as these lands are situated outside of the limit of extraction. These lands consist of wooded areas along the east limit which retain potential for archaeological resources. Therefore, for areas formally prohibited from alteration the following documentation must be provided to the Ministry of Tourism, Culture and Sport in accordance with Section 7.8, Standard e. of the 2011 *Standards and Guidelines of Consultant Archaeologists* .
   a. A map depicting the exact limits of the area. See Figure 7 of report.
   b. Documentation describing how the limit of the area was determined during the survey and confirming that the area included enough overlap to ensure that all adjacent impacted lands were surveyed. See Section 2.0 of report.
   c. A copy of the formal condition, zoning bylaw or easement agreement confirming prohibition of alteration.
   d. A copy of a statement from the approval authority that it has implemented or is about to implement the constraint (in writing, by letter or e-mail, submitted as part of the supplementary documentation).
   e. A copy of confirmation from the proponent regarding the manner in which "no-go" instructions to construction crews will be implanted (in writing, by letter or e-mail, submitted as part of the supplementary documentation).
   4. Should the limit of extraction (as indicated on Figure 7 of the report) change for any reason, then further Stage 2 Archaeological Assessment must be conducted on the remaining 15% of the subject property prior to any land-disturbing activities in accordance with the Ministry of Tourism, Culture and Sport's 2011 *Standards and Guidelines for Consultant Archaeologists.*

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the Ontario Heritage Act.

NUMBERING SCHEME USED FOR OPERATIONAL NOTES REFERS TO AGGREGATE RESOURCES ACT PROVINCIAL STANDARDS FOR A CLASS "A" CATEGORY 3 LICENCE.

Sequence and Direction

1.2.1 The proposed extraction area is divided into four Phases over two properties. The approximate Phase limits and generalized directions of extraction are indicated on the Operational Plan. Extraction will generally proceed in a northerly direction from Phase 4 through to Phase 7.
The operator will control dust from this operation. Dust control measures will include the application of water and/or other approved dust suppressants to internal haul roads, stockpiles, processing areas and equipment, as required. Slopes and areas of the pit which are not required for pit operations, will be seeded to maintain vegetation cover.

Topsoil and Overburden Stripping and Stockpiling

1.2.2 Topsoil and organic material will be stripped and transported directly to areas that have been graded and are being prepared for final rehabilitation wherever feasible. Overburden material stripped from each phase will be used in the construction of acoustic berms (see 'Typical Acoustic Berm Detail' this page for additional details) and/or placed directly within that phase or the previous phases as general backfill for side slopes and to bring areas up to desired finished grade.
Stripping operations within each Phase will incrementally precede extraction/excavation. This will minimize the actual disturbed area and the need for temporarily stockpiling of overburden or topsoil materials. Temporary stockpiling of topsoil or overburden may occur if pit faces and/or floor areas are not immediately available for progressive rehabilitation. Long term soil stockpiling should be kept to a minimum. If material in stockpiles is required to be stored for longer than one year, the licensee/ operator will ensure adequate vegetation is established to control erosion.

Lifts

1.2.3 Excavation will generally occur in a single lift across the site wherever feasible. Where the depth of the deposit exceeds operational limits and/or Ministry of Labour requirements, excavation will occur in 2 lifts in close succession with the first lift having a minimum height of 7m. The maximum expected depth of excavation is an elevation of between +488m and 498m a.s.l. Excavation will remain a minimum of 1.5m above the established groundwater table.

Main Internal Haul Roads

1.2.4 Access to pit face and stockpile/processing areas will be by internal haul roads located as needed within the excavation area. The location of haul roads will vary depending on location of the working face.

Entrance and Exit

1.2.5 The entrance/exit to these licensed sites (Prince property and Bonnefield property) will be through the common boundary with the adjacent licensed sites. There will be no new operational entrance/exits onto 4th Line. Product will be shipped through existing entrances in the existing licences (Licence 625155 and 129167). Property/service entrances for occasional access to the setbacks/perimeter for maintenance, berm construction, monitoring etc. are also shown. The existing entrance associated with the retained farm house in Lot 14, Concession 3 will be maintained.

Ground Water Table

1.2.6 Hydrogeological information prepared by Whitewater Hydrogeology Ltd. and taken from "Combined Level 1 and 2 Hydrogeological Assessment Proposed Bonnefield and Prince Pits (? 2017) identifies that the elevation of the existing groundwater table varies from +496.5 masl in the northeast portion to ± 486.4 masl in the southeast portion of the Prince property. On the Bonnefield property, the groundwater table elevation ranges from ±500.3 masl in the northwest corner to 487.6 masl in the northeast corner of the site.

Surface Water Diversion/Discharge Points

1.2.7 No discharges to or diversions of surface water features are proposed. Post extraction drainage will be internal and percolate through the rehabilitated pit floor.

Fencing

1.2.8 Portions of the Boundary of the Area to be Licensed that will be fenced are as shown on the Sequence of Operations Drawing.
Fencing will not be required or repaired along the portions of the common boundary with adjacent licences or within the woodlots on site. In these locations the boundary will be demarcated by 1.8m high marker posts in sufficient numbers to adequately delineate the location of the Boundary of Area to be Licensed with each post visible from the next. All fencing shall be maintained. See Variations from Operational Standards Table (O.S. 5.1) this page for additional explanation.

Proposed Buildings and Structures

1.2.9 No new scale/scale house is proposed (existing scale/scale house in licence # 129167 and #625155 will be used). The onsite farm house in Lot 14 will remain. All other residential and farm buildings may be removed prior to extraction in the applicable phase. From time to time, office trailers will be brought onto the site for the use of workers during operational hours. These portable structures will be located on the pit floor as required by site operations.

Topsoil and Overburden Stockpiles

1.2.10 Temporary stockpiling of topsoil or overburden may occur if pit faces and/or floor areas are not immediately available for progressive rehabilitation. Long term soil stockpiling should be kept to a minimum. If material in stockpiles is required to be stored for longer than one year, the licensee/ operator will ensure adequate vegetation is established to control erosion.
Topsoil/overburden may be stockpiled temporarily in adjacent Melancthon Pit 1 (licence #129167) and Melancthon Pit 2 (Licence #625155) until required for progressive rehabilitation/backfilling.

Aggregate Stockpiles

1.2.11 Aggregate stockpiles will be located on the pit floor within the current phase and adjacent to portable processing equipment, no closer than 30m from the licensed boundary (see Variations from Operational Standards Table 5.13.1) this page. Aggregate materials may be brought onto site for the purposes of resale and blending. Aggregate materials and finished products may be imported and stored on site. The maximum stockpile height is 15m (50 ft).

Temporary Scrap Storage

1.2.12 Any scrap generated on site will be stored within an area no larger than 50m x 50m, within the current phase. All scrap will be removed from the site on an ongoing basis.

Fuel Storage

1.2.13 There will be no fuel storage within these extension lands.

Area to be Extracted

1.2.14 The maximum area to be extracted is ±48.4 ha. (±119.6 ac).

Setbacks

1.2.15 Setbacks will be as shown and labelled on the Sequence of Operations Diagram, this page and page 1 of 4 (see Variations from Operational Standards Table O.S. 5.10.1).

Extraction Depth

1.2.16 The maximum depth of extraction is 1.5m above the established water table and estimated by the proposed spot elevations on the Sequence of Operations Diagram, this page. The established water table elevation will be confirmed as extraction proceeds through the monitoring program (see Note 1.2.27 "Hydrogeology") and temporary test pits on the pit floor. The depth of extraction ranges from approximately 7m (southwest corner of Bonnefield property to 22m in the southeast corner of the Prince property.

Processing Areas

1.2.17 Processing of on site aggregate material will occur on the pit floor, adjacent to the active pit face within the respective phases and will include portable processing/screening plants. Material may be processed in adjacent licences, Areas where processing is permitted is shown on the Sequence of Operations drawing, this page.

Berms

1.2.18/1.2.19 Berms are to be constructed prior to extraction and/or processing on-site. Soil and overburden may be stored in storage berms. Berms are to be covered with 50mm (2") minimum topsoil, graded, seeded & maintained. Inspect and maintain vegetation on berms and slopes on a regular basis throughout the growing season. Remove and replace any areas which become damaged or diseased, as required. All proposed berms will be vegetated and maintained to control erosion. Temporary erosion control will be implemented as required (See 'Typical Acoustic Berm Detail', this page).

Equipment

1.2.20 Within Phase 4 the extraction and processing equipment operating in the extension will be limited to:

- One crusher;
- One screening plant with extraction loader; and
- One shipping loader.

Concurrent processing allowed for Licence #625155 in accordance with the existing noise conditions has been assumed, but never more than a total of two crushers, two screeners, one wash plant and five loaders can operate at the same time between Phase 4 and Licence #625155.

Within Phases 5-7, the extraction and equipment operating in the extension will be limited to:

- One crusher;
- One screening plant with extraction loader;
- One shipping loader; and the potential to relocate the wash plant from the existing licences.

Concurrent processing allowed for Licence #129167, Licence #625155 and Phase 4 has been assumed but never more than a total of two crushers, two screeners, one wash plant and 5 loaders.

Tree Screens

1.2.21 Trees will be planted along the boundary of area to be licensed/4th Line frontage of these extensions.

Hours of Operation

1.2.22 The hours of operation will be 6:00 am to 7:00 pm Monday to Friday for shipping and 7:00 am to 7:00 pm Monday to Saturday for loading, shipping, crushing and processing. The following restrictions apply to the hours of operation at the site:

- No operations on Holidays as defined in the Employment Standards Act.
- The pit will not operate Sundays except as required by a specific contract.

Tree and Stump Disposal

1.2.23 Timber resources (if any) will be salvaged for use as saw logs, fence posts and fuel wood where appropriate. Stumps and brush cleared during site preparation will be burned (subject to necessary local approvals) or mulched for use in the progressive rehabilitation of the site.

Cross Sections

1.2.24 Location of cross sections are as shown. Cross sections are provided on page 4 of 4.

Variations from Operational Standards

1.2.25 See table this page for Operational Standards (Section 5.0 of ARA Provincial Standards) that will be varied by this site plan.

Tonnage Limit

1.2.26 Annual production from the site in conjunction with the existing Strada Melancthon Pits (Licence # 129167 and Licence #615155) will not exceed 1,250,000 tonnes.

1.2.27 Technical Recommendations

Noise:

"Melancthon Pits Extension Noise Study Part of West Half of Lots 12 and 14, Concession 3 O.S. Township of Melancthon, County of Dufferin" (Aercoustics Engineering Ltd., 2017).

1. The sound emissions of all construction equipment involved in site preparation and rehabilitation activities shall comply with the sound level limits specified in MOECC publication NPC-115 "Construction Equipment".

2. It is understood that the existing Licence No. 129167 (Pit 1) and Licence 625155 (Pit 2) will continue subject to all existing mitigation requirements for that site, with the exception of:
   a. The berm along the common north boundary of Licence 129167 can be removed; and
   b. The berm along the common north boundary of Licence 625611 can be removed.

1.2.27 Technical Recommendations

Noise (cont'd):

3. Within Phase 4, except where further restrictions apply as outlined below, the extraction and processing equipment operating in the extension shall be limited to:
   a. One (1) crusher;
   b. One (1) Screening Plant with extraction loader;
   c. One (1) shipping loader
   Note: Concurrent processing allowed in Pit No. 2 in accordance with existing noise conditions, but never more than a total of two (2) crushers, two (2) screeners, one (1) wash plant and five (5) loaders between Phase 4 and Pit No. 2

4. Within Phase 5-7, except where further restrictions apply as outlined below, the extraction and processing equipment operating in the extension shall be limited to:
   a. One (1) crusher;
   b. One (1) Screening Plant with extraction loader;
   c. One (1) shipping loader; and
   d. The potential to relocate the Wash Plant from the exiting licences to this extension.
   Note: Concurrent processing allowed in Pit No. 1, Pit No. 2, Phase 4 but never more than a total of two (2) crushers, two (2) screeners, one (1) wash plant and five (5) loaders.

5. The reference sound emission levels for equipment in the extension shall not exceed:

Equipment	Reference Sound Level (dBA) [one hour LEQ @ 30 metres]
Crusher	84
Screener	80
Loader (each)	70
Wash Plant	76
Shipping Truck (each)	66

6. Hours of operation for these extensions shall be restricted to the following time periods for the following activities:

Activity	Hours of Operation
Shipping	06:00 - 19:00 (Mon-Fri)
Loading, Shipping, Crushing and Processing	07:00 - 19:00 (Mon-Sat)

7. Perimeter acoustical berms shall be constructed as indicated on the site plans. The minimum height is specified. The phasing of berm construction shall be as indicated on the site plans.
   a. For Phase 4, a berm should be constructed along the west perimeter, such that the berm is 4.0m high.
   b. For Phases 5-7, a berm should be constructed along the entire north perimeter, and along the entire west perimeter, such that the berm is 4.0m high. A berm shall also be constructed on the south-east corner of the property, extending 150m north, such that the berm is 4.5m high.

8. The phasing and direction of extraction shall be as indicated on the site plans.
   a. Within the South Extension, the processing equipment (crushing or screening) should not operate within 200m of the west perimeter, and not within 250m of the east perimeter.
   b. Within the North Extension, the processing equipment (crushing, screening or washing) should not operate within 250m of the north perimeter, and not within 200m of the east or west perimeter.

9. The depth of each lift shall where possible be a minimum of 7 metres. If this requirement cannot be met for the 2nd (or 3rd) lift, the lifts shall be extracted in close succession such that the combined face height is a minimum of 7 metres.

10. Any proposed changes to the aspects of the extraction and processing operations dealt with above as relating to noise control shall be reviewed by a qualified acoustical consultant for compliance with the relevant noise criteria.

Hydrogeology:

" (Whitewater Hydrogeology Ltd., ? 2017).

Natural Environment:

"Prince and Bonnefield Properties, 4th Line, Melancthon Township Level 1/2 Natural Environment Assessment and Environmental Impact Study " (Natural Resource Solutions Inc., May 2017).

The following is a summary of recommendations and mitigation measures that are to be incorporated into the Operational Plan for the proposed Prince and Bonnefield property pits:

- Implement 10m buffers from the retained woodland edges, which will be allowed to renaturalized and supplemented with targeted native species plantings. Machinery and materials must be maintained outside of the woodland buffers.
- Complete updated habitat assessments for the Species at Risk Barn Swallow, Bobolink and Eastern Meadowlark prior to site alteration.
- All vegetation clearing shall occur outside of the bird nesting period April 15-August 15. Identified cavity trees shall be removed outside the bat active season (April 30 - September 1) or as determined by the MNRF.
- Truck haul routes, and materials and soils stockpiling shall not be located immediately adjacent to the retained woodland features or their buffers.
- Dust impacts will be mitigated according to standard measures.
- Artificial lighting shall be shielded or directed away from adjacent natural features.
- Silt fencing shall be established along the limits of the 10m woodland buffers in accordance with an Erosion Sediment Control Plan.
- Inspect all ESC measures according to an ESC Plan and complete repairs when required.
- Operate and store all materials and equipment in a manner that prevents any deleterious substance from leaving the site.
- Vehicles and equipment must be re-fueled in the designated area away from the retained natural features and buffers.
- Develop and implement a Spill Response Plan as required under the Aggregate Resource Act.
- Develop and implement a monitoring program, pre- and during extraction operations, that includes the following components:
  - Groundwater monitoring in conjunction with ongoing monitoring at the Melanchton Pit #1 and #2 sites;
  - Surface water level monitoring and amphibian breeding monitoring within the Bonnefield property wetland, in conjunction with ongoing monitoring at Melanchton Pit #2;
  - Inspect the woodland buffers during pit operation to ensure disturbances are not occurring; and,
  - Inspect the health and survival of buffer plantings.

Archaeology:

"Stage 1 and 2 Archaeological Assessment of the Garner / Bonnefield Property, 437101 Fourth Line Part of Lot 12, Concession 3 Old Survey, Township of Melancthon, Dufferin County, Ontario" and "" Stage 1 and Stage 2 Archaeological Assessment of the Prince Property, 437213 Fourth Line, Part Lot 14, Concession 3 Old Survey, Township of Melancthon, Dufferin County, Ontario" (ASI Archaeological & Cultural Heritage Services, January 27, 2017 and February 2, 2017).

The Garner/Bonnefield Property

1. The Mazdil site (BaHb-17) represents a mid-nineteenth occupation of the property. As such, this site represents an archaeological resource where the level of cultural heritage value or interest will result in a recommendation to proceed to Stage 4 mitigation. Therefore, it is recommended that the site be subject to comprehensive Stage 3 assessment in order to more fully identify the character, extent and significance of the archaeological deposits, in accordance with the Ministry of Tourism, Culture and Sport's 2011 *Standards and Guidelines for Consultant Archaeologists.*
   a. The Stage 3 archaeological assessment will entail the creation of a recording grid on a fixed datum, the position of which has been recorded using a GPS. Then, a controlled surface collection must be conducted to precisely define the nature and extent of the site. This work will require that the area be re-ploughed and allowed to weather for a least one substantial rainfall prior to commencing this work. The location of each artifact should be mapped with the limit of extraction by means of a total transit, and a surface map produced for the site.
   b. A series of one metre by one metre units will then be excavated across the entire site area at ten metre intervals within an established grid in order to determine the nature and extent of the cultural deposits. An additional 400% of units excavated on the grid will be strategically excavated at 10 metre intervals throughout the site, around units of high artifact counts or other significant areas of the site. The test units should be excavated five cm into the sterile subsoil and all soils screened through six millimetre wire mesh to facilitate artifact recovery. The sterile subsoil should be towelled and all soil profiles examined for undisturbed cultural deposits.
   c. The results of the Stage 3 assessment will be used to evaluate the significance of the site and to develop a series of recommendations concerning any further mitigative options that may be necessary.
2. Approximately 20% of the subject property was not assessed, as these lands are situated outside of the limit of extraction. These lands consist of wooded areas along the east limit which retain potential for archaeological resources. Therefore, for areas formally prohibited from alteration the following documentation must be provided to the Ministry of Tourism, Culture and Sport in accordance with Section 2.0 of report.
   Standards and Guidelines of Consultant Archaeologists .
   a. A map depicting the exact limits of the area. See Figure 7 of report.
   b. Documentation describing how the limit of the area was determined during the survey and confirming that the area included enough overlap to ensure that all adjacent impacted lands were surveyed. See Section 2.0 of report.
   c. A copy of the formal condition, zoning bylaw or easement agreement confirming prohibition of alteration.
   d. A copy of a statement from the approval authority that it has implemented or is about to implement the constraint (in writing, by letter or e-mail, submitted as part of the supplementary documentation).
   e. A copy of confirmation from the proponent regarding the manner in which "no-go" instructions to construction crews will be implanted (in writing, by letter or e-mail, submitted as part of the supplementary documentation).
3. Should the limit of extraction (as indicated on Figure 7of the report) change for any reason, then further Stage 2 Archaeological Assessment must be conducted on the remaining 20% of the subject property prior to any land-disturbing activities in accordance with the Ministry of Tourism, Culture and Sport's 2011 *Standards and Guidelines for Consultant Archaeologists.*

Legal Description

Part of West Half of Lots 12 and 14
Concession 3 O.S.
Township of Melancthon
County of Dufferin

Figure 2

Legend

- Boundary of Area to be Licensed
- Existing Licensed Boundary — MELANCTHON PITS NOS. 1 & 2 (OWNED BY APPLICANT)
- Existing Spot Elevation — METRES ABOVE SEA LEVEL (masl)
- Existing Fence — 1.2m POST & WIRE FARM FENCE UNLESS OTHERWISE NOTED
- Building/Structure — LOCATION AND USE FOR BUILDINGS ON-SITE AND WITHIN 120m ARE SHOWN ON THIS PAGE
- Field/Residential Access
- Existing Vegetation
- Existing Berm
- Monitoring Well — WHITEWATER HYDROGEOLOGY LTD. 2017
- Cross Sections — SEE PAGE 4 OF 4 FOR EXISTING AND REHABILITATED CROSS SECTIONS
- Limit of Extraction — ALL SETBACKS ARE DRAWN TO SCALE AND SHOW LABELLED DISTANCES
- Existing Extraction Limit — MELANCTHON PITS NOS. 1 & 2 (OWNED BY APPLICANT)
- Proposed Acoustic Berm — SEE NOTE 1.2.18/1.2.19 AND "TYPICAL ACOUSTIC BERM" DETAIL THIS PAGE
- Proposed Fence — 1.2m HIGH POST & WIRE FENCE UNLESS OTHERWISE NOTED
- Operational Entrance — MAINTAINED BY A GATE WHICH WILL BE LOCATED WHEN PIT IS NOT IN OPERATION
- General Direction of Excavation — REFER TO NOTES (THIS PAGE) FOR ADDITIONAL DETAILS
- Internal Haul Road — LOCATION APPROXIMATE AND LOCATION MAY VARY
- Proposed Spot Elevation Above Water (masl) — MAXIMUM DEPTH OF EXTRACTION
- Noise Receptor — SEE NOTE 1.2.27 "NOISE" FOR ADDITIONAL DETAILS
- Tree Plantings

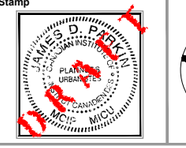
Site Plan Amendments

No.	Date	Description	By

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

MNR Approval Stamp

Stamp



Applicant

STRADA AGGREGATES
30 Floral Parkway, Concord ON, L4K 4R1
Phone: 905 669 5400 Fax: 905 669 2296

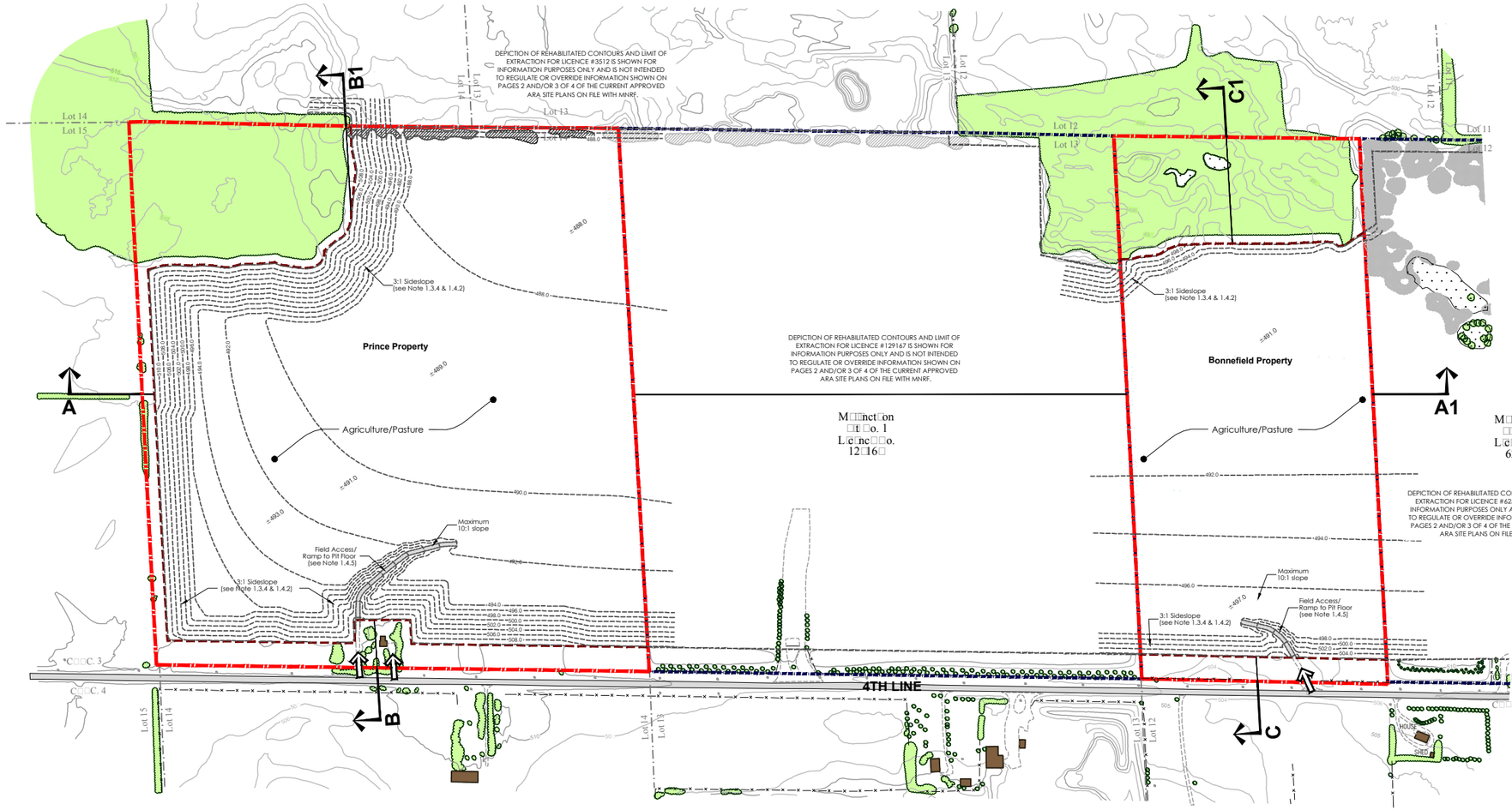
Project

Melancthon Pit Extension

Part of West Half of Lots 12 and 14 Concession 3 O.S.
Township of Melancthon, County of Dufferin

MNR Licence Reference No.	Pre-approval review: For client review - May 12/2017
Plan Scale **1:4000 (Arch D)** SCALE 50 0 100 200 METRES	Plot Scale 1:4 [1mm = 4 units] MODEL
	Drawn By D.S.
	Checked By J.P.
	File No. **Y349G**
File Name	**OPERATIONAL PLAN**
Drawing No.	**2 OF 4**

K:\y349G Strada Dufferin County properties\A\Operplan 2of4.DWG



NUMBERING SCHEME USED FOR OPERATIONAL NOTES REFERS TO AGGREGATE RESOURCES ACT PROVINCIAL STANDARDS FOR A CLASS "A" CATEGORY 3 LICENCE.

Sequence and Direction
1.3.1 Rehabilitation will be progressive and proceed as limits of excavation (area and depth) are reached. 3:1 rehabilitation slopes will be constructed with a mix of stripped overburden and the underlying till to enable recovery of as much aggregate as realistically possible. The sequence of rehabilitation will follow the Operational phasing sequence shown and described on page 2.

Topsoil and Overburden
1.3.2 Topsoil and overburden will be stripped, stored and replaced separately. Topsoil and subsoil shall be replaced in the appropriate sequence on all pit slopes and the pit floor to a minimum depth of 0.5m, graded and cultivated in preparation for seeding. All excavation faces shall be sloped and graded to no steeper than 3:1. This may be accomplished by backfilling with clean fill material obtained from within the area to be excavated where the deposit is of unsuitable quality. Where there is a deficiency of fill for slope rehabilitation, clean fill may be imported (see note 1.3.6/1.4.1 page 3). Soil compaction within areas returning to agricultural/pasture use shall be alleviated by ripping to a minimum depth of 0.5m, or by cultivating and/or discing (see "Pit Floor Agricultural Rehabilitation Sequence" this page).

Proposed Vegetation
1.3.3 & 1.4.3 The majority of the extraction area (± 48.4 ha.) will be returned to agricultural/pasture use in accordance with the "Pit Floor Agricultural Rehabilitation Sequence". Rehabilitated slopes and non agricultural areas of the pit floor shall be seeded with a grass/legume seed mixture comprising white clover, timothy and perennial ryegrass. All vegetation planted on areas undergoing rehabilitation shall be replanted, if required, to ensure successful establishment and prevent erosion. Fertilizer (5-20-20) or equal will then be applied on the areas to be seeded. Create a post rehabilitation management plan program in accordance with the "Pit Floor Agricultural Rehabilitation Sequence" to accommodate a five year plan for the restoration of the soils. Use best management agricultural practices as are appropriate for the area, climate and conditions.

Slope Creation & Rehabilitated Landform
1.3.4 & 1.4.2 The final pit landform will generally be in accordance with the drawing as shown on this page. All excavation faces shall be sloped and graded to no steeper than 3:1. This will be accomplished by backfilling with topsoil, overburden and clean fill material obtained from within the area to be excavated where the deposit is of unsuitable quality. Where there is a deficiency of fill for slope rehabilitation, clean inert fill may be imported.
The side slopes should be graded to the desired slope prior to the replacement of topsoil and subsoil. The side slopes should be ripped/tilled to alleviate any compaction and to minimize potential for erosion. A permanent vegetative cover should be provided to stabilize the slopes. Subsoil and topsoil can be placed directly over the top the overburden on the side slope provided the topsoil is uniformly placed at a depth of approximately 10 to 15 cm to ensure the establishment of a perennial vegetative cover where possible and subject to material availability.

Progressive Rehabilitation
1.3.5 Progressive rehabilitation shall follow the Sequence of Operations diagram/notes and Phase notes on page 2 of 4.

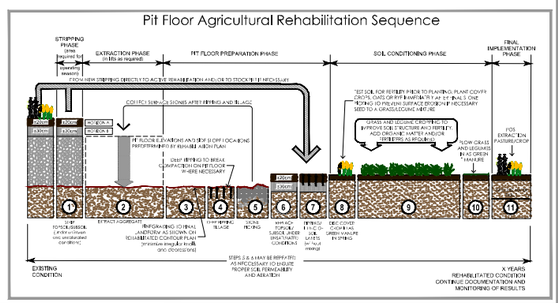
Importation of Fill
1.3.6 & 1.4.1 Clean inert fill (e.g. topsoil, overburden) may be imported to facilitate pit rehabilitation. Only sufficient material to create a 3:1 (horizontal: vertical) grade may be imported. At the request of MNR, the licensee will conduct random sampling of the imported material to ensure that it meets the Ministry of the Environment's (MOE) criteria under Table 1 of MOE's "Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act". Sampling results will be provided to MNR upon request.

Buildings & Structures
1.4.4 No buildings or structures associated with aggregate operations will remain on site. The farm house located within the setback along 4th Line in Lot 14 Concession 3 will be retained.

Internal Haul Roads
1.4.5 No internal haul roads will remain onsite. Agricultural field accesses will generally be from the existing entrances off 4th Line by ramp and laneway as shown.

Surface Water Drainage & Discharge
1.4.6 Final surface drainage will follow the rehabilitated contours as shown and generally be directed to the north and east and infiltrate the rehabilitated pit floor through vertical seepage.

Pit Floor Agricultural Rehabilitation Sequence



Legal Description

Part of West Half of Lots 12 and 14
Concession 3 O.S.
Township of Melancthon
County of Dufferin

Figure 3

Legend

- □oundary of Area to be Licensed
- Existing Licensed □oundary — MELANCTHON PITS NOS. 1 & 2 (OWNED BY APPLICANT)
- Ele□ation, Contour — METRES ABOVE SEA LEVEL
- Existing Fence — 1.2m POST & WIRE FARM FENCE UNLESS OTHERWISE NOTED
- Field□Residential Access
- Existing Vegetation
- Cross Sections — SEE PAGE 4 OF 4 FOR EXISTING AND REHABILITATED CROSS SECTIONS
- Limit of Extraction — ALL SETBACKS ARE DRAWN TO SCALE AND SHOW LABELLED DISTANCES
- Existing Extraction Limit — MELANCTHON PITS NOS. 1 & 2 (OWNED BY APPLICANT)
- Proposed Contour — METRES ABOVE SEA LEVEL (m A.S.L.)
- Proposed Ele□ation — MAXIMUM DEPTH OF EXTRACTION PROPOSED PIT FLOOR (m A.S.L.)
- Proposed Vegetation

Site Plan Amendments

No.	Date	Description	□y

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

MNR Approval Stamp

Stamp

JAMES D. PARKIN — PLANNER, URBAN DESIGNER, LANDSCAPE DESIGNER — MCIP — RPP

north

Applicant

STRADA AGGREGATES
30 Floral Par□way, Concord ON, L4K 4R1
Phone: 905□669□5400 Fax: 905□669□2296

Project

Melancthon Pit Extension

Part of West Half of Lots 12 and 14 Concession 3 O.S.
Township of Melancthon, County of Dufferin

MNR Licence Reference No.

Pre-approval review:
For client review - May 12/2017

Plan Scale **1:3000 (Arch D)**

SCALE
50 0 50 100
METRES

Plot Scale 1:3 [1mm = 3 units] MODEL

Drawn By D.S.

Checked By J.P.

File No. **Y349G**

File Name

REHABILITATION PLAN

Drawing No.

3 OF 4

K:\y349G Strada Dufferin County properties\A\Rehaplan 3of4.DWG

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'. Although the area that each area occupies can vary, 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 approximately 120 metres from the subject lands.

The secondary study area includes the potential area that may be affected by indirect impacts of the proposed operations and can range considerably based on the size of the aggregate operation. For example, a small to medium sized gravel pit may only have a secondary study area that includes nearby rural properties while a large, limestone quarry will have a larger affected area which on average could encompass an area of approximately one kilometre. For the purposes of this assessment, we have assigned a more conservative secondary study area of one kilometre from the subject lands. A plan identifying the adjacent properties, existing crops and all existing barns and residential structures within the study areas are included as **Figure 4** of this report. The inventory of existing agricultural land uses, cropping practices and structures is based on observations made during a site visit completed in the fall of 2016.

2.1 Primary Study Area

Given the location of the subject lands relative to the existing aggregate operations, the predominant land use within the primary study area consists of active licenced pits. To the south of the Prince property is Melancthon Pit #1, which is owned and operated by Strada. To the west of Melancthon Pit #1 and southwest of the Prince property is an existing aggregate operation by Duivenvoorden Haulage Ltd. (License No. 3726). To the east of the Prince property is an existing aggregate pit which is operated by St. Marys Cement Inc. (License No. 3512). Agricultural uses within the primary study area of the Prince property, predominantly consists of typical cash crops that are cultivated in a soybean/winter wheat/corn rotation. With the exception of the existing bank barn (Barn No. 3 on **Figure 4**) and grain silos on the Prince property, there are no other agricultural structures within the primary study area of the Prince property. The barn on the Prince property appears to house a modest beef, cattle operation and the lands surrounding the existing farmhouse/barn are in pasture/forage production. There are no visible signs of extensive agricultural improvements to the lands or structures (i.e. new fencing, tile drainage, barn improvements). The existing barn and structures appear to be in relatively good repair/condition (note, no physical or structural assessment of the barn has been completed).

Figure 4

Agricultural Land Uses

Strada Aggregates
Part of West Half of Lots 12 and 14
Concession 3 O.S.
Township of Melancthon
County of Dufferin

LEGEND

- Subject Lands
- Primary Study Area (120m)
- Secondary Study Area (1km)
- Existing Licensed Aggregate Operations
- # Residential Structure
- # Barn Structure

CROPS*

C	Corn	Po	Potato
F	Forage	S	Soybean
P	Pasture	W	Winter Wheat
F/P	Forage/ Pasture		

Source:
*Crop information based on observations made during October 19, 2016 site visit, as well as information gathered from Google Satellite Imagery (June 19, 2015)

DATE: May 2017

FILE: Y349G

SCALE: ±1:12,500

DRAWN: GMC

north

K:\Y349G STRADA DUFFERIN COUNTY PROPERTIES\RPT\AIA CROPS MAY 2017.DWG

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

Prince Property

Prince Property

Similar to the Prince property, the Bonnefield property is predominantly surrounded by aggregate operations within the primary study area. Located immediately north and south of the Bonnefield property are Melancthon Pit #1 and Melancthon Pit #2, respectively. Agricultural land uses within the primary study area of the Bonnefield property generally consists of cash crops (winter wheat, soybean) and hay. There are no livestock operations, barns or other agricultural structures within the Bonnefield primary study area. The Bonnefield property is currently occupied by an existing house and older drive shed/garage. The lands surrounding the existing structures are currently in soybean production.

Bonnefield Property

Bonnefield Property

2.2 Secondary Study Area

The Secondary Study Area includes an area with a radius of one kilometre around the subject lands. In addition to the four existing aggregate extraction operations within the Study Area, there are a number of active agricultural operations within the Secondary Study Area. A site visit was conducted on October 19, 2016 and the following is a summary of the agricultural uses and structures within the Secondary Study Area that existed on the day of the field observations (note: the farm numbers below correspond with the

'barn' numbers identified on **Figure 4** of this report). Comments on the physical characteristics of existing farm structures is based solely on roadside observations and not supported by any formal structural assessment.

Farm No. 1 – 43700 4th Line

This farm is located opposite the Melancthon Pit #2 and is occupied by a residential dwelling, a drive shed, a quonset shed and an older bank barn. All structures appear to be in relatively good condition but the existing bank barn is in need of some minor repairs (missing boards were observed on the side of the barn). There is no evidence of livestock or other facilities (e.g. fencing or manure storage) that would suggest the barn is used or occupied by livestock. Agricultural land surrounding the farmstead is in winter wheat production.

43700 4th Line

Farm No. 2 – 4th Line

This property is opposite the Prince property and the only structure on the property consists of an older unutilized drive shed. No livestock or farm machinery were present on the property. There are no other structures on the property with the exception of the former remains of a residential dwelling. The agricultural lands surrounding the former farmstead is in soybean production.

4th Line

Farm No. 4 – 477274 3rd Line

This farm is immediately located northeast of the Prince property and abuts the northern limit of the St. Marys Cement licenced pit. In addition to the existing farmhouse, the property is occupied by a number of structures including two quonsets/coverall sheds, two drive sheds and a large bank barn. Beef cattle were observed around the bank barn and the adjacent pastures. Agricultural lands surrounding the farmstead were in pasture or cropped in hay and potatoes.

477274 3rd Line

Farm No. 5 – 477285 3rd Line

This farm is located northeast of the Prince property and the existing St. Marys Cement licenced aggregate operation. The property is located on the east side of 3rd Line and is located opposite Farm No. 4. The property is occupied by a single detached dwelling and a number of agricultural structures including two drive sheds, a bank barn and a single storey barn with an associated livestock yard. Beef cattle and lambs were observed on the property. The agricultural lands surrounding the farmstead included pasture land and lands cropped in potato, hay and winter wheat.

477285 3rd Line

477285 3rd Line

Farm No. 6 – 477084 3rd Line

This farm is located immediately east of the Bonnefield property. The property is occupied by a single detached dwelling, a large bank barn, a coverall/quonset shed and two drive sheds. Dairy cattle were observed on the property and the surrounding agricultural lands were in corn, hay and soybean production as well as pasture.

477084 3rd Line

477084 3rd Line

Farm No. 7 – 477081 3rd Line

This farm is located on the east side of 3rd Line and opposite Farm No. 6. The property is occupied by a single detached dwelling and two drive sheds used for the storage of agricultural equipment and field crops (e.g. potatoes). No livestock were observed on the property nor were there any

477081 3rd Line

facilities/structures on the property to accommodate livestock. The agricultural lands surrounding the farmstead were either in pasture, winter wheat or hay production.

Farm No. 8 – 477081 3rd Line

This property is located southwest of the Bonnefield property and abuts the eastern limit of the existing Melancthon Pit #2 licenced boundary. This property is occupied by a single detached dwelling and a number of agricultural structures including a large bank barn and three drive sheds. All structures appear to be in good repair with the exception of an older drive shed. The surrounding pastures were fenced and beef and dairy cattle were observed in the surrounding pastures. Agricultural lands surrounding the farmstead were either in pasture, hay or soybean production.

477081 3rd Line

Farm No. 9 – 585246 County Road 17

This property is located on the south side of County Road 17 southwest of Melancthon Pit #2 and the Bonnefield property. Remnants of former barn/structures are apparent on the property and a single drive shed remains on the property. There is no evidence of any livestock or any facilities/structures to accommodate livestock on the property. In addition to the drive shed, there is an existing single detached dwelling present on the property. The drive shed is in poor condition and is in need of repair. The agricultural lands surrounding the farmstead is predominantly in corn and pasture production.

Farm No. 10 – 585188 County Road 17

This property is located immediately south of County Road 17 and opposite Melancthon Pit #2. The property is located on the southeast corner of County Road 17 and 4th Line and is occupied by an equestrian farm consisting of a single detached dwelling, a bank barn and a coverall/arena. The farm is identified as the "Four Gaits Farm". All paddocks are fenced and include run-in shelters and hay feeders. The agricultural lands surrounding the farmstead are generally comprised of pasture and hay fields (note: at the time of the site visit the property was for sale).

585188 County Road 17

Farm No. 11 – 435574 4th Line

This property is located southwest of Melancthon Pit #2 and is located on the southwest corner of County Road 17 and 4th Line. The property is occupied by a single detached dwelling and a bank barn. The barn appears to be generally in good

435574 4th Line

repair and existing fencing on the surrounding pastures appear to be well maintained. Goats were observed in the pastures surrounding the farmstead. The agricultural lands surrounding the farmstead are predominantly in soybean pasture and hay production.

In addition to the above referenced farm operations, there are a number of rural residential lots within the Secondary Study Area. A number of these lots were likely created as surplus farm dwellings. There is also a large concentration of rural residential lots including an estate residential subdivision (part of the Horning's Mills settlement area) located on the east side of the 3rd Line. All other agricultural lands and crops within the Secondary Study Area is generally comprised of cash crops (soybeans, corn and winter wheat), hay/pasture as well as potato crops. No extensive farm investment such as tile drainage, irrigation, fencing or other specialized cropping practices or equipment were observed or are documented within the Primary or Secondary Study Areas.

In summary, the agricultural lands within the Primary and Secondary Study Areas reflect typical agricultural livestock and cropping practices that are predominant throughout southern and central Ontario. No significant investments were observed in cropping practices or equipment within the study area. All existing livestock operations within the study area are well set back and separated from the subject lands. The agricultural lands within the study area are generally extensively fragmented by existing aggregate operations, woodlots/natural heritage features and existing rural residential lots.

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 Canada Land Inventory Soils Map produced by the province, (see **Figure 5**), the Prince property is comprised of Class 1 and Class 2 soils and the Bonnefield property is made up of Class 2 soils. The existing aggregate operations were also Class 1 and Class 2 soils as is most of the land within the primary and secondary study areas. Both of the soil types are considered prime agricultural soils (see Section 4.1 of this report for further discussion on this matter).

In order to confirm the soil type and classification and to help inform the rehabilitation plans, a Soil Survey and Canada Land Inventory Classification was prepared by DBH Soil Services Inc. (DBH). A copy of the Soil Survey is included as **Appendix A** of this report. The on-site soil survey was conducted on October 17, 2016 to more accurately map and classify the soil resources of the soil materials on the subject lands. The soil survey included a number of tasks including:

- Completion of a review of published soil information (Soil Survey of Dufferin County, Report No. 38 of the Ontario Soil Survey (Hoffman, D.W., B.C. Matthews and R.E. Wicklund, 1964));
- 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; and
- Mapping to illustrate the location of the subject lands, the occurrence of soil polygons and appropriate CLI capability ratings.

A total of 48 soil inspection sites on the subject 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 subject lands is shown on **Figure 6**.

The onsite soil survey revealed two soil series and one miscellaneous landscape unit. The soil series were identified as Honeywood Fine Sandy Loam and Caledon Fine Sandy Loam. The miscellaneous landscape unit was identified as "Disturbed Soils", which are associated with the farm building complexes on both parcels.

Figure 5

Canada Land Inventory Soils Map

Strada Aggregates
Part of West Half of Lots 12 and 14
Concession 3 O.S.
Township of Melancthon
County of Dufferin

LEGEND

- Subject Lands
- Primary Study Area (120m)
- Secondary Study Area (1km)

SOILS - CLI

- Class 1
- Class 2
- Class 7
- Organic Soil
- Water

Source:
Ministry of Agriculture, Food and Rural Affairs- Agricultural Information Atlas

DATE: December 2016

SCALE: NTS

FILE: Y349G

DRAWN: GMC

north

K:\Y349G STRADA DUFFERIN COUNTY PROPERTIES\RPT\FIG_CLI_SOILS.DWG

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

Figure 6

Detailed Soil Survey

DBH Soil Services

Strada Aggregates
Part of West Half of Lots 12 and 14
Concession 3 O.S.
Township of Melancthon
County of Dufferin

Soil Code

Dist = Disturbed
Cgf = Caledon Fine Sandy Loam
Hof = Honeywood Fine Sandy Loam

Slope Class

Aa = 0.0 - 0.5%
Bb = 0.5 - 2.0%
Cc = 2.0 - 5.0%
Dd = 5.0 - 9.0%
Ee = 9.0 - 15.0%
Ff = 15.0 - 30.0%
Slope length < 50 m
Slope length > 50 m

Soil Code — Slope Code
Cgf - e
4T
CLI Class — CLI Subclass

CLI Subclass Limitation

D = Undesireable Structure
E = Erosion
F = Low Fertility
I = Inundation
M = Low Moisture
P = Stoniness
R = Shallow to Bedrock
S = Adverse Conditions (F, M, T or P)
T = Topography
W = Excess Water

Source:
Soil Survey and Canada Land Inventory Classification for Part of West half of Lots 12 and 14 Concession 3 O.S. Township of Melancthon County of Dufferin. DBH Soil services November 24, 2016.

DATE: December 2016

SCALE: NTS

FILE: Y349G

DRAWN: GMC

north

K:\Y349G STRADA DUFFERIN COUNTY PROPERTIES\RPT\FIG_DBH_SOIL.DWG

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

Based on the work completed by DBH, each polygon identified on-site was classified according to the Canada Land Inventory rating system and then correlated to the CLI classifications as presented in Soil Survey of Dufferin County, Report No. 38 of the Ontario Soil Survey (Hoffman, D.W., B.C. Matthews and R.E. Wicklund, 1964) report, CLI map No. 41A/I and 3I d/4, the digital soil data provided by OMAFRA and the OMAFRA document "Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for the Application of the Canada Land Inventory in Ontario".

The following tables summarize the relative percent area occupied by each capability class for the subject lands.

Table 1 – Canada Land Inventory – Lot 14 – Prince property

Canada Land Inventory Class (CLI)	Area (ha/acres)	Percent Occurrence (%)
Class 1	N/A	N/A
Class 2	25.4/62.8	62.9
Class 3	8.9/22.0	22.0
Class 4	3.2/7.9	7.9
Class 5	0.9/2.3	2.3
Class 6	N/A	N/A
Class 7	N/A	N/A
Disturbed Soil Areas	2.0/4.9	4.9
Totals	40.4/99.8	100.0

Table 2 – Canada Land Inventory – Lot 12 – Bonnefield property

Canada Land Inventory Class (CLI)	Area (ha/acres)	Percent Occurrence (%)
Class 1	N/A	N/A
Class 2	2.7/6.7	13.2
Class 3	15.9/39.3	77.5
Class 4	0.8/1.9	3.8
Class 5	0.4/1.1	2.2
Class 6	N/A	N/A
Class 7	N/A	N/A
Disturbed Soil Areas	0.7/1.7	3.3
Totals	20.5/50.7	100.0

According to the Soil Survey and Canada Land Inventory (CLI) Evaluation the Prince property is comprised mainly of Canada Land Inventory (CLI) Class 2 soils and the Bonnefield property consists mainly of Canada Land Inventory (CLI) Class 3 soils.

With regards to drainage on the properties, an evaluation was done by DBH through a correlation of observations noted during windshield surveys, aerial photographic interpretation and a review of the

OMAFRA's Artificial Drainage System Mapping. Based on the information available, it does not appear that drainage systems are registered to either of the subject lands. Furthermore, the soil survey also revealed that neither property is set up for the use of irrigation equipment.

Although the DBH analysis confirms that there are no Class 1 soils on the subject lands, the presence of the Class 2 and Class 3 soils mean that the subject lands are considered prime agricultural lands.

3.2 Soil Suitability and Microclimate for Specialty Crop Production

As part of the Soil Survey and Canada Land Inventory Classification by DBH, topographic information was reviewed and correlated to the Site Plan, the 1:10,000 scale Ontario Base Mapping, detailed soil survey assessment (utilizing a hand held clinometer), aerial photo interpretation and windshield surveys.

The Physiography of Southern Ontario Physiographic Unit Map identifies the subject lands as being located within the Dundalk Till Plain Physiographic Region. This Region is described as gently undulating till plain. The plain is characterized by swamps or bogs and poorly drained depressional areas. A significant portion of the plain is comprised of surficial soil deposits consisting of silt of fine sands, which is typically less than 60 centimetres (2 feet) in depth.

The Prince and Bonnefield Properties are located along the eastern boundary of this physiographic region and have slopes that range from gentle to steep sloping.

Climate data was obtained from the OMAFRA document titled "Agronomy Guide for Field Crops – Publication 811 (June 2009)". The subject lands are located within the 2700-2900 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 less than 2700 east of Parry Sound 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 2700-2900 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 Township of Melancthon Official Plan 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 review of the land use policy framework related to the subject lands.

Both the Prince and the Bonnefield properties are outside the Greenbelt Plan, Oak Ridges Moraine Conservation Plan and the Niagara Escarpment Plan, and therefore, these provincial documents were not reviewed as part of this assessment.

4.1 Provincial Policy Statement

The 2014 Provincial Policy Statement (PPS) was issued under Section 3 of the Planning Act and came into effect on April 30, 2014. 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 2014 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."*

As previously noted, based on the Canada Land Inventory mapping and the soil survey completed by DBH Soil Services Inc., the majority of the subject lands consists of Classes 2 and 3 soils, and therefore, both properties are considered to be "prime agricultural lands". Furthermore, based on the CLI mapping of the

surrounding area, the surrounding lands consists of predominantly Classes 1 and 2 soils and thus the area is considered a "prime agricultural area".

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 of the PPS.

Policy 2.3.6.1(a) provides that extraction of mineral aggregate resources is permitted in prime agricultural areas in accordance with policies 2.4 and 2.5 of the PPS. 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. Based on the area to be extracted, most of the existing woodlots will be retained.

The PPS recognizes that extraction is an interim land use, and as such, progressive and final rehabilitation is required to accommodate future land uses, especially in prime agricultural areas. Policy 2.5.3.1 of the PPS states that final rehabilitation shall consider surrounding land uses. In addition, within prime agricultural

areas, Policy 2.5.4.1 of the PPS states that extraction of mineral aggregate resources is permitted as an interim use provided that the site will be rehabilitated back to an "agricultural condition".

With respect to prime agricultural lands outside of specialty crop areas, the PPS defines "agricultural condition" as:

> *"A condition of which substantially the same areas and same average soil capability for agricultural are restored."*

The application proposes that once the aggregate extraction operations cease, the property will be rehabilitated and returned to agriculture. Approximately 47.2 hectares (116.6 acres) of land on the subject property is currently in agricultural production (this includes the small plantation on the Prince property). Note, the balance of the land on the subject property is comprised of the farm cluster (e.g. residential dwelling and barns) and retained woodlots. The proposed rehabilitation plan intends to return approximately 38.4 hectares (94.8 acres) of land back to agriculture. As a result, approximately 8.8 hectares (21.7 acres) or 19% of existing agricultural land will be lost with the final rehabilitated land form. This loss is generally attributed to side slopes required in order to create the final agricultural landscape.

The rehabilitation plan prescribes a process / methodology to rehabilitate and restore the agriculture land to establish, on average, the same pre-existing soil capability in the rehabilitated pits. The proposed rehabilitation plans also intends to build on, and complement, the rehabilitation plans for the adjacent aggregate operations such that it satisfies the intent of PPS Policy 2.5.3.2, which encourages comprehensive rehabilitation where there is a concentration of mineral aggregate operations.

The comprehensive rehabilitation plan will facilitate more land to be returned to agriculture given the elimination of setbacks / side slopes between the licensed pits. It is estimated that, approximately 9.9 hectares (24.4 acres) of additional land can be returned to agriculture as a result of this comprehensive rehabilitation plan.

Given the foregoing, it is our opinion that the proposed pit expansion and associated rehabilitation plans are consistent with the PPS.

4.2 Dufferin County Official Plan

The Dufferin County Official Plan received Provincial approval in March 2015 except for a few sections in the document that remain under appeal at the Ontario Municipal Board (OMB). Schedule B (see **Figure 7**) of the Official Plan designates the subject lands as "Countryside Area" and Schedule C (see **Figure 8**) designates the subject property as "Agricultural Area".

The Agricultural Area designation applies to prime agricultural lands which are intended to be designated in local municipal official plans in accordance with Provincial guidelines. The Dufferin County Official Plan requires that lands within this designation are protected for agricultural uses unless appropriate justification is provided for alternative uses. Furthermore, non-agricultural uses may only be permitted in agricultural areas for the extraction of mineral aggregate resources in accordance with the policies of the Official Plan.

Figure 7

Dufferin County Official Plan
Schedule B:
Community Structure and Land Use

Strada Aggregates
Part of West Half of Lots 12 and 14
Concession 3 O.S.
Township of Melancthon
County of Dufferin

LEGEND

- Subject Lands
- Urban Settlement Area
- Community Settlement Area
- Countryside Area
- Provincial Plan Area
- Provincially Significant Wetlands
- Provincial Highway

Source:
County of Dufferin Official Plan, (Schedule B, September, 2014)

DATE: December 2016

SCALE: 1:60,000

FILE: Y349G

DRAWN: GMC

north

K:\Y349G STRADA DUFFERIN COUNTY PROPERTIES\RPT\FIG_DUFFOP_SCHEDB.DWG

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

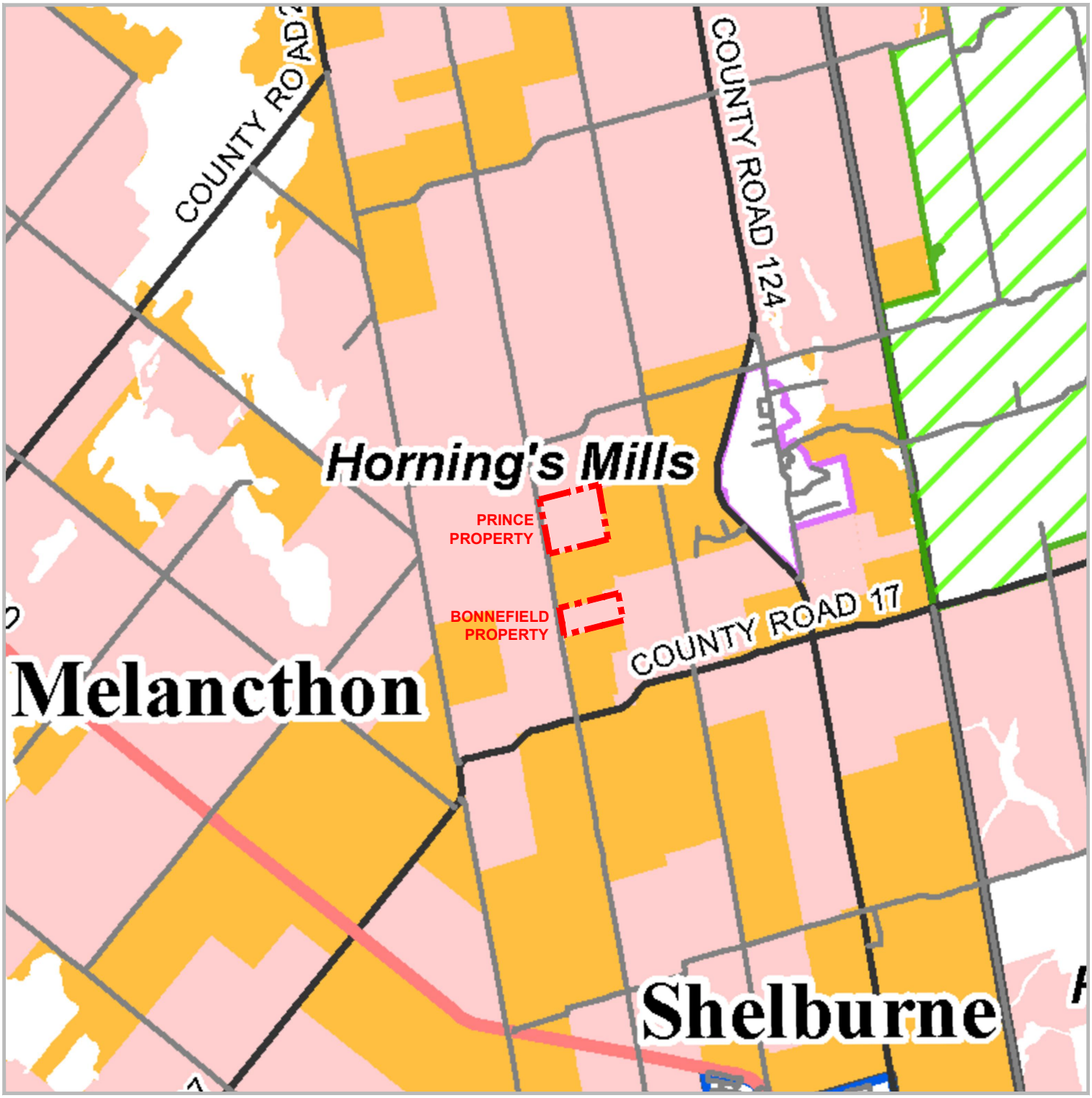


Figure 8

Dufferin County Official Plan
Schedule C:
Agricultural Area and Rural Lands

Strada Aggregates
Part of West Half of Lots 12 and 14
Concession 3 O.S.
Township of Melancthon
County of Dufferin

LEGEND

- Subject Lands
- Urban Settlement Area
- Community Settlement Area
- Agricultural Area
- Rural Lands
- Provincial Plan Area
- Provincial Highway

Source:
County of Dufferin Official Plan, (Schedule C, September, 2014)

DATE: December 2016
SCALE: 1:60,000
FILE: Y349G
DRAWN: GMC

north

K:\Y349G STRADA DUFFERIN COUNTY PROPERTIES\RPT\FIG_DUFFOP_SCHEDC.DWG

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

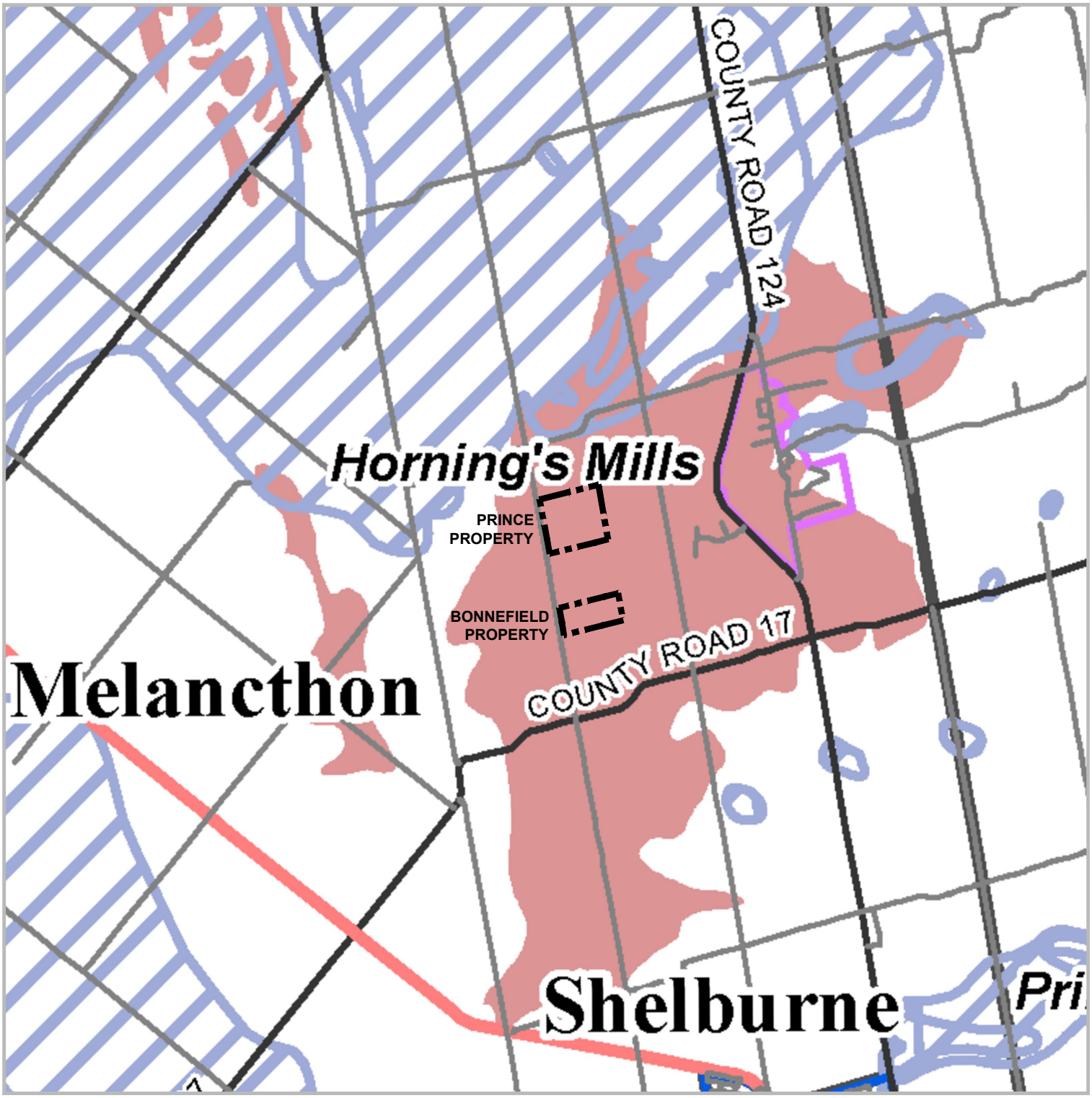


Figure 9

Dufferin County Official Plan
Schedule D:
Mineral Aggregate Resource Areas

LEGEND

- Subject Lands
- Urban Settlement Area
- Community Settlement Area
- Sand and Gravel Resource Area
- Bedrock Resource Area

DATE: December 2016

SCALE: 1:60,000

FILE: Y349G

DRAWN: GMC

north

K:\Y349G STRADA DUFFERIN COUNTY PROPERTIES\RPT\FIG_DUFFOP_SCHEDD.DWG

Strada Aggregates
Part of West Half of Lots 12 and 14
Concession 3 O.S.
Township of Melancthon
County of Dufferin

Source:
County of Dufferin Official Plan, (Schedule D, September, 2014)

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

Deposits of mineral aggregate resources are identified on Schedule D of the Dufferin County Official Plan (see **Figure 9**). Schedule D designates the properties as "Sand and Gravel Resource Area".

Policy 4.2.3.1 of the Dufferin County Official Plan provides that non-agricultural uses are permitted in agricultural areas for the extraction of mineral aggregate resources provided the operations are undertaken in accordance with the policies of the Plan. A site-specific local municipal official plan amendment will be required to permit a non-agricultural use within the agricultural area; however, an amendment to the Dufferin County Official Plan is not required. The extraction of minerals, petroleum resources and mineral aggregate resources in prime agricultural areas, is permitted in accordance with the policies of the Dufferin County Official Plan.

Policy 4.4.2.1 provides criteria on impacts that new or expanding mineral aggregate resource operations must address. The following are relevant to agricultural uses:

> *vii.* *noise, dust and vibration, in accordance with Provincial Standards; and*
>
> *ix.* *demonstration that the final rehabilitation plan is consistent with the policies of this Plan and the local municipal official plan*;

Section 4.4.2.2 of the Dufferin County Official Plan also includes policies with respect to rehabilitation. The policies in this section state that the extraction of mineral aggregate resources is permitted as an interim use on prime agricultural land provided the site will be rehabilitated back to an agricultural condition. Criteria are provided for when complete rehabilitation is not required however, as the proposed operations do not meet the criteria as set out in the Official Plan, complete agricultural rehabilitation is being proposed as part of the application. The proposed aggregate extraction operations are an interim use and once the use ceases, the properties will be returned back to a condition where agricultural activities can occur.

The lands are considered prime agricultural lands and are not identified as being a specialty crop area. The subject lands were selected in order to provide a logical expansion to the existing aggregate operations in the area. The proposed aggregate extraction operations are an interim use and the lands will be rehabilitated back to an agricultural condition. Therefore, the extraction of the aggregate resources on the subject lands conforms with the policies of the Dufferin County Official Plan.

4.3 Township of Melancthon Official Plan

The Township of Melancthon Official Plan was adopted by Township of Melancthon Council in August 2014 and approved (with modifications) by the Ministry of Municipal Affairs and Housing on March 9, 2015. Schedule A-5 'Land Use and Roads Plan' of the Township's Official Plan (**Figure 10**) designates the subject lands as "Agricultural" and "Environmental Conservation".

The principal objective of the Agricultural designation is to protect key prime agricultural areas for the long term use for agricultural purposes and includes lands having primarily Classes 1, 2 and 3 Soil Capability for Agriculture ratings under the Canada Land Inventory. The following uses are permitted in the Agricultural designation: "*Agricultural uses, agriculture-related uses, and on-farm diversified uses are permitted in the Agricultural designation. Agricultural uses include all agricultural operations that are determined to employ*

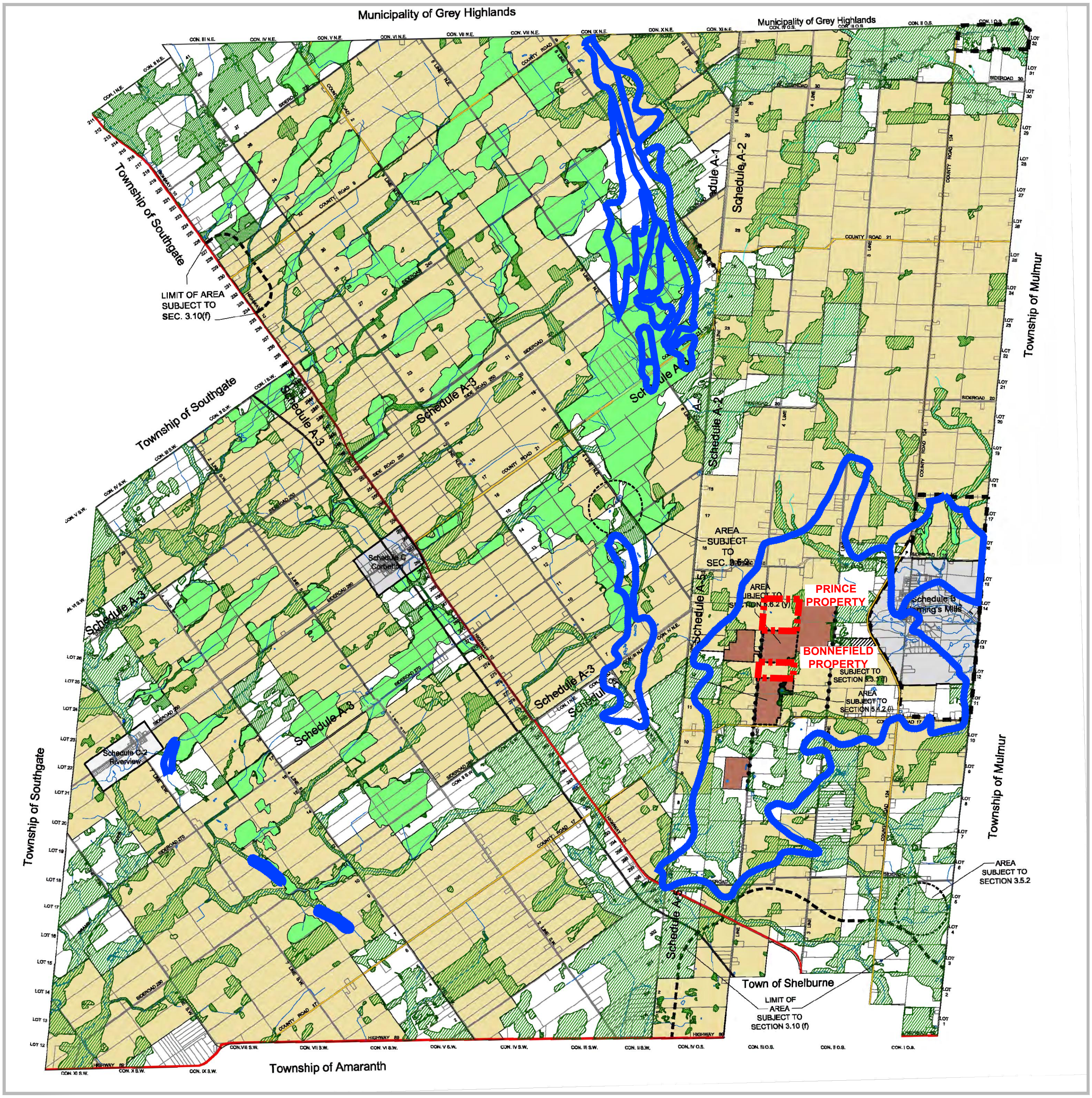


Figure 10

Township of Melancthon Official Plan

Land Use & Roads Plan with Primary Sand & Gravel Resource Area Overlay

LEGEND

- Subject Lands
- Agricultural
- Extractive Industrial
- Environmental Conservation
- Environmental Protection
- Rural
- Existing Mineral Aggregate Haul Route
- Primary Sand & Gravel Area

DATE: May 2017

SCALE: NTS

FILE: Y349G

DRAWN: GMC

north

K:\Y349G STRADA DUFFERIN COUNTY PROPERTIES\RPT\FIG_AGGREGATE_LANDUSE_OVERLAY.DWG

Strada Aggregates

Part of West Half of Lots 12 and 14
Concession 3 O.S.
Township of Melancthon
County of Dufferin

Source:
Township of Melancthon Official Plan, (Schedules A1-A5, August, 2014)

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

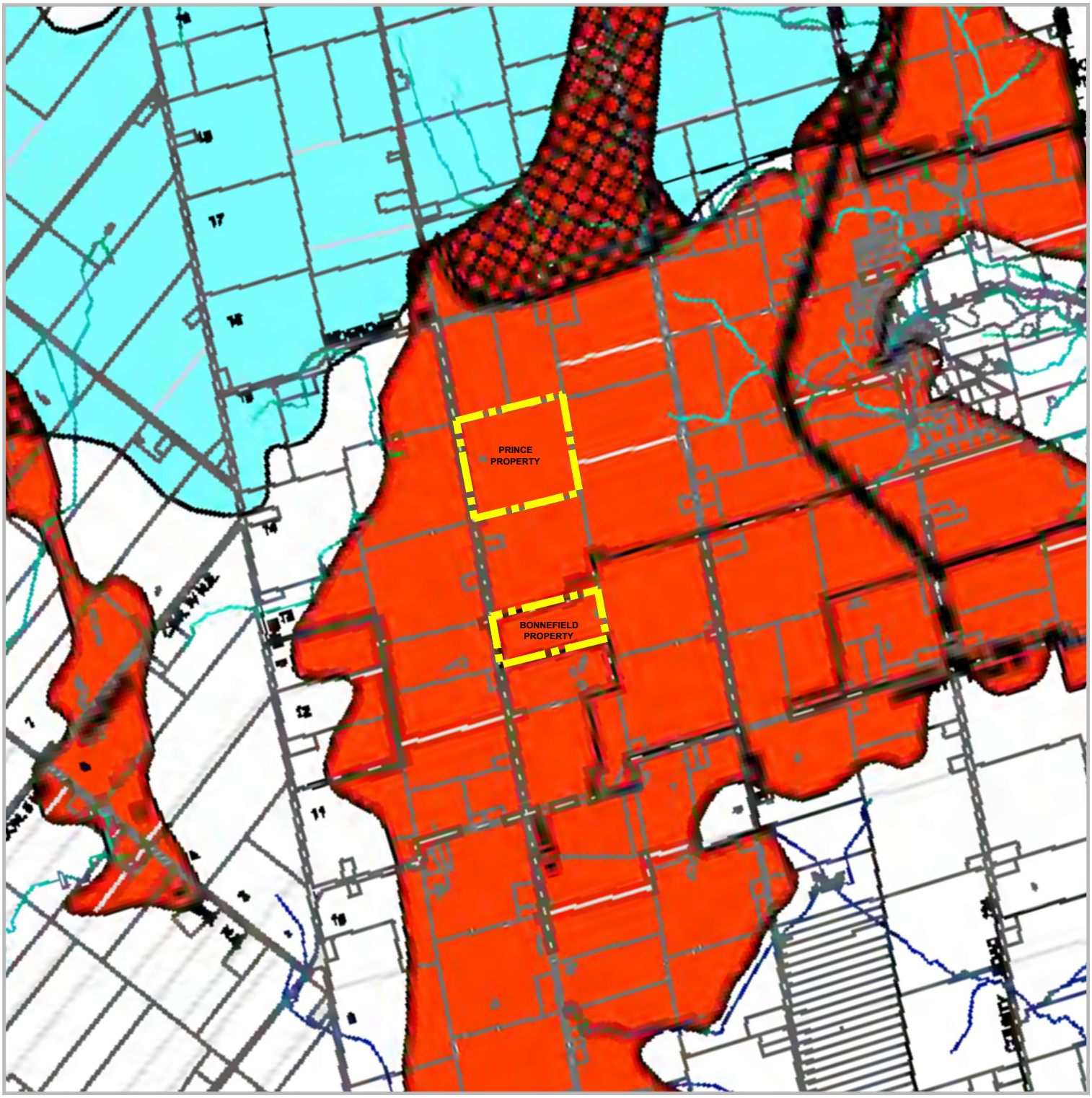


Figure 11

Township of Melancthon Official Plan
Schedule H:
Primary Aggregate Resource Areas

LEGEND

Subject Lands

Sand & Gravel Resource Area - Primary

DATE: December 2016

SCALE: NTS

FILE: Y349G

DRAWN: GMC

north

K:\Y349G STRADA DUFFERIN COUNTY PROPERTIES\RPT\FIG_MELANOP_SCHEDH.DWG

Strada Aggregates
Part of West Half of Lots 12 and 14
Concession 3 O.S.
Township of Melancthon
County of Dufferin

Source:
Township of Melancthon Official Plan, (Schedule H, August, 2014)

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

normal farm practices as defined herein using the terminology of the Farming and Food Production Protection Act." In addition, farm related tourism and on-farm business uses are permitted as on-farm diversified uses and a single detached dwelling is also permitted as a component of an agricultural use. In addition to the "Agricultural" designation, a portion of the subject lands is also designated "Environmental Conservation" coinciding with the existing woodlots on the properties, which are predominantly being retained.

Schedule H-Primary Aggregate Resource Areas designates the subject lands as "Sand and Gravel Aggregate Resource-Primary" (**Figure 11**). The areas identified as such on Schedule H are based on the 2014 edition of Aggregate Resources Inventory Paper of Dufferin County as published by the Ministry of Northern Development, Mines and Forestry. The purpose of Schedule H is to identify areas of potentially significant deposits of mineral aggregate resources in the Township of Melancthon and to assist in protecting as much of those resources as is justifiable in planning policy terms. Much of the Primary Sand and Gravel Resource in the Township is overlain by prime agricultural land and designated "Agricultural" in the Official Plan. The extent of the Primary Sand and Gravel Resource Area is superimposed on the Township's Official Plan Land Use Schedule **on Figure 10**.

Section 3.17.2 of the Township of Melancthon's Official Plan applies to new or expanded mineral aggregate operations. It states that new or any expansion of an existing mineral aggregate operation will be permitted only through an amendment to the Official Plan. Furthermore, Policy 3.17.2(e) states that new or expanded mineral aggregate operations are permitted in conformity with the Extractive Industrial policies in Section 5.6 of the Official Plan.

Policy 5.6.2(g) of the Township's Official Plan states that applications to permit new or expanded mineral aggregate operations will be evaluated on a case by case basis to determine the best haul route. The 4th Line is designated as a "Mineral Aggregate Haul Route" south of the Prince property. The 4th Line will continue to operate as the haul route and no additional haul routes are proposed as part of the proposed expansions. Tonnage limits are not changing as a result of the expansion and therefore the traffic volumes to/from the existing and proposed aggregate operations will not change. As a result, no additional impacts on agricultural traffic is anticipated on the established haul routes.

Policy 5.6.2(k) provides that mineral aggregate operations are permitted provided documentation has been provided demonstrating to Council's satisfaction that there is conformity with certain criteria and policies. The criteria and how they have been met is summarized in the table below.

Table 3: Criteria to Permit Mineral Aggregate Operations in the "Agricultural" Designation

Policy	How the Policy is Addressed
i. The use shall be interim in nature.	The operation is temporary and upon the operation ceasing, the lands will be rehabilitated to an agricultural use.
ii. The site will progressively rehabilitated to an agricultural condition.	The extraction on both subject lands will take place above the water table and as such, the site is proposed to be rehabilitated to an agricultural use. The rehabilitation plans require that the lands be

Policy	How the Policy is Addressed
	progressively rehabilitated back to the same average soil capability and prescribes a process for agricultural rehabilitation. Approximately 81% of the subject lands will be returned back to agriculture. As a result of the proposed comprehensive rehabilitation plan that includes the existing licensed pits with the subject lands an additional 9.9 hectares (24.4 acres) of land will be rehabilitated back to agriculture.
iii. Complete rehabilitation to an agricultural condition is not required if:…	N/A
iv. Impacts 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 5.6.2(n) also includes evaluation criteria applicable to new or expanded aggregate operations. With regards to possible impacts on agricultural activities, the applicable criteria are noted below:

> *"ix That dust and any other air emissions will be mitigated on-site to the extent feasible, through land use planning such as the implementation of required setbacks through the Zoning By-law, being acceptable to the municipality;*
>
> *xi That the rehabilitation will be progressive, will minimize the extent of the disturbed area in accordance with the policies of subsection (r) of this section, and will comply with other applicable policies of this Plan such as those in subsection (j) of this section; and*
>
> *xii That the proposal minimize impacts on surrounding land uses and views by means such as screening, phasing and the direction of extraction."*

The ARA licence plans and prescribed conditions of the ARA address the criteria of policy 5.6.2(n). Dust is required to be mitigated on site and specific mitigation measures are noted on the ARA site plans. The pits will be screened with perimeter berms and the rehabilitation plans require progressive rehabilitation to reduce the extent of disturbed area.

In terms of rehabilitation of the site, Policy 5.6.2(w) provides that any site consisting of prime agricultural land prior to the commencement of a mineral aggregate operation and originally within the Agricultural designation shall be restored to an agricultural use in compliance with the policy of subsection 5.6.2(k)iii. Section 6 of this report details best practices in order to ensure a successful agricultural rehabilitation program for the subject lands. The proposed rehabilitation plans prepared in support of the applications implements the best practices and satisfies the Township's rehabilitation policies. The details on the site plans prescribe a method/approach to rehabilitating the lands back to the same or average soil capability

that exists today. The proposed rehabilitation plan for the subject lands complements the rehabilitation plans for the existing pits, which are also proposed to be rehabilitated back to agriculture.

In summary, the proposed expansion of the existing mineral aggregate operations on the subject lands conforms with the policies of the Township of Melancthon Official Plan.

5.0 ASSESSMENT OF IMPACT

As previously noted, limited non-agricultural uses such as mineral aggregate extraction is considered a permitted use in prime agricultural areas in accordance with provincial policy. Provincial and local policies require that impacts on surrounding agricultural operations and lands be mitigated to the "extent feasible". Although resource uses such as mineral aggregate extraction have traditionally been considered part of the agricultural / rural landscape fabric, impact 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, water resources and other agricultural operations 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

The Prince property has an area of 40 hectares (100 acres) and the Bonnefield property has an area of 20 hectares (50 acres). Of this total area, approximately 33.7 hectares (83.3 acres) on the Prince property and 13.5 hectares (33 acres) on the Bonnefield property are currently farmed (note, the plantation portion of the woodlot on the Prince property is included in the total 'farmed' land). The balance of the lands are either treed or form part of the farmstead. As previously noted, the subject properties are in forage / pasture and soybean production. There are no existing agricultural structures on the Bonnefield property, whereas a single bank barn and two grain silos along with a single detached dwelling exists on the Prince property.

The operation on the Prince property currently consists of a beef cattle operation and investment / improvements into the property appear to be generally modest. 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.

According to the ARA rehabilitation plans, a total of approximately 38.4 hectares (94.8 acres) of the subject lands will be returned to agriculture. As a result, approximately 8.8 hectares (21.7 acres) of existing farmland will be lost with the final rehabilitated land form. This loss is generally attributed to side slopes required in order to create the final agricultural landscape.

The proposed comprehensive rehabilitation of the subject lands as well as the adjacent existing mineral aggregate operation will result in the elimination of potential side slopes between the existing and proposed licensed operations. As a result of this comprehensive rehabilitation, approximately 9.9 hectares (24.4 acres) of land that would have normally been used for side slopes will now be returned to agriculture and agricultural after uses.

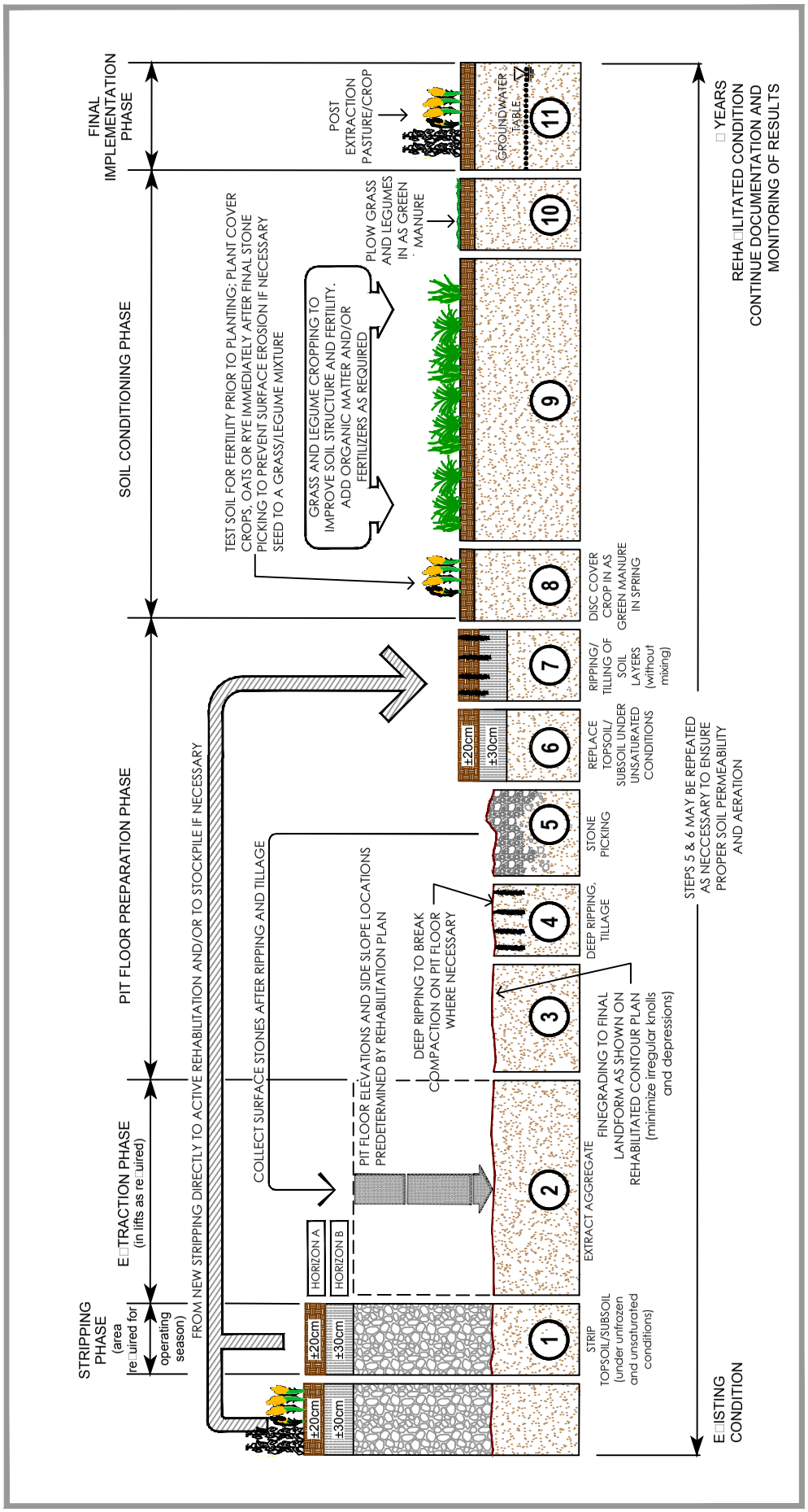


Figure 12

Recommended Pit Floor

Agricultural Rehabilitation Sequence

Although the extraction of the subject land results in a 19% reduction of the existing farmland on the subject lands, the addition of the side slopes through the comprehensive rehabilitation plan will offset the total agricultural land that may be impacted. As a result, the permanent loss of farmland from the proposed expansion will be nominal.

5.2 Fragmentation of Agricultural Lands

Agriculture benefits from being adjacent to the other agricultural operations and if lands are fragmented, there is potential to negatively impact farming practices on the isolated farm parcels. The proposed expansion on the subject property will not result in creating isolated agricultural lands as they "round out" and "fill in" the existing aggregate operations, which are currently concentrated in this one location of the Township.

The land uses within the surrounding area, and more particularly within the secondary study area, are highly fragmented by existing aggregate operations, existing rural residential lots and natural heritage features. It is important to note that when all the aggregate operations are returned to an agricultural after use, the lands will be less fragmented and comprise of a consistent agricultural landscape. As a result, the proposed aggregate expansions and final rehabilitated land form will have a negligible impact on agricultural land fragmentation in the area.

5.3 Dust Impact

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

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

The 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 3 pit:

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

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

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

The system under the EPA to prevent adverse effects from contaminants discharged is through the requirement of an Environmental Compliance Approval (ECA) by the Ministry of Environment and Climate Change (MOECC).

Therefore, dust is required to be mitigated on site through the prescribed conditions of the ARA and any applicable ECA`s that may be required for any permanent equipment on site. As a result of implementing these measures, it is not anticipated that dust will have an impact on surrounding local 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.

The proposed aggregate operations on the subject lands are above the water table. No water taking or below water extraction is proposed as a result of the applications. A hydrogeological assessment has been prepared by Whitewater Hydrogeology Ltd. and has concluded that there will be no influence on the water table elevations as a result of the extraction on the subject lands. As a result, there will be no influence on the domestic water wells as a result of the proposed expansions. By extension, it is also not anticipated that there will be any impact on groundwater resources required for surrounding agricultural / livestock operations.

Given the conclusions of the Hydrogeological Assessment and the types of crops and livestock operations within the study area, it is not anticipated that the surrounding agricultural operation will be impacted from a groundwater or surface water resource perspective. No water taking or any significant changes to the local drainage patterns/features are proposed as a result of the proposed operation.

5.5 Traffic

The existing tonnage limit that applies to the existing licenses will be extended to the proposed expansion areas and therefore tonnage limits and truck traffic to /from the licensed areas is not proposed to change. The existing and established haul route will also remain unchanged. The majority of the shipments will be to the south to GTA markets with access to the market areas obtained by travelling south on the 4th Line and east on County Road 17 and south on County Road 124. The majority of the haul route is on County roads, which are designed and meant to carry high volumes of traffic. Agricultural traffic on these County

roads is not anticipated to be high as this type of traffic would generally avoid high volume routes and be directed towards local / Township roads.

The established haul route on the 4th Line is approximately 1.5 kilometres long to the intersection of County Road 17. This relatively short section of the haul route has a limited number of existing agricultural properties fronting the road. As a result, it is not anticipated that the truck traffic on the haul route will significantly conflict with agricultural traffic on the 4th Line. This opinion recognizes that the haul route is a well-established route and neighbouring property owners have been accustomed to the truck traffic patterns from the existing aggregate operations. Furthermore, given the limited operating hours of the aggregate operations (7:00 am to 7:00 pm Monday to Friday and 7:00 am to 12:00 pm on Saturday) it is anticipated that any potential impacts / conflicts with agricultural traffic / machinery would be nominal and only concentrated during planting and harvest periods (early spring / late fall).

5.6 Visual Impact

Acoustical and visual berms will be constructed around the perimeter of the proposed pits. Berms will be constructed as phasing and extraction progresses. Berms will also be vegetated and maintained to control erosion and provide a visual screen from surrounding land uses. The ARA site plans identify the location of the berms and their height and detail their implementation. Aggregate stockpiles will be located on the pit floor as well as portable processing equipment and front end loaders / shipping trucks. As a result, much of the physical activity within the pits will be screened from surrounding agricultural uses.

No new entrances on the 4th Line are being created. Therefore, other than the perimeter berms, the visual appearance along the 4th Line will remain relatively unchanged.

5.7 Noise Impacts

Noise is an additional potential impact from aggregate operations. A Noise Impact Study has been prepared by Aercoustics and has confirmed that noise from the proposed extraction operations on the subject lands will comply with the guidelines established by the MOECC. The Noise Study recommends a number of noise control measures required to be incorporated into the aggregate operation and concluded that with the implementation of the recommended noise control measures that the proposed expansions to the existing aggregate operations will comply with the Ministry's guidelines. As a result, it is not anticipated that surrounding agricultural uses would be impacted by noise.

6.0 PROPOSED REHABILITATION PLAN

The subject property is proposed to be rehabilitated back to agriculture. The existing surrounding licensed operations are also proposed to be rehabilitated back to agriculture. As previously noted, approximately 81% of the subject lands will be rehabilitated back to an agricultural after use. As a result of the proposed comprehensive rehabilitation plan (which includes the adjacent licensed pits) an additional 9.9 hectares (24.4 acres) of land will be rehabilitated back to agriculture. This additional land more than "offsets" the loss of agricultural land on the subject lands.

Based on the proposed ARA rehabilitation plan for the subject lands (see **Figure 3** of this report) and conclude the rehabilitation makes adequate provision for the proper rehabilitation to an agricultural after use. It is recommended that the progressive rehabilitation adopt the following best practices in order to ensure the successful agricultural rehabilitation of the properties. **Figure 12** of this report illustrates the recommended agricultural rehabilitation sequence, which reflects the following best practices.

6.1 Stripping and Handling of Soil Resources

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

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

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

Depths of soil being removed during stripping should be monitored. Based on the Soil Survey completed by DBH, the average existing topsoil depths are approximately 20cm thick with subsoil depths averaging approximately 25 – 30cm in depth.

6.2 Create Appropriate Post-Extraction Land Form

The maximum permitted side slopes in accordance with the ARA provincial standards is 3:1 (33%). The side slopes should be graded to the desired slope prior to the replacement of topsoil and subsoil. The side slopes should be ripped/tilled to alleviate any compaction and to minimize potential for erosion. A permanent vegetative cover should be provided to stabilize the slopes. Subsoil and topsoil can be placed directly over the top the overburden on the side slope provided the topsoil is uniformly placed at a depth of approximately 10 to 15 cm to ensure the establishment of a perennial vegetative cover where possible and subject to material availability. Subject to availability of the material, side slopes of 10:1 or greater should be created where possible to allow for agricultural use of the side slopes. Replacement of soil resources should be minimized on non-agricultural side slopes.

Slope contours on the pit floor should be as uniform as possible and large regularly shaped fields should be created. Any grading should ensure there are no irregular undulations or depression areas on the rehabilitated pit floor. Slopes to be created should be in the range of 2% to 5% to provide for adequate surface drainage toward an outlet or infiltration or on-site surface water features.

6.3 Soil Compaction

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

6.4 Soil Replacement / Conditioning Soil

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

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

6.5 Monitoring

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

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

7.0 SUMMARY

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

- Provincial and local planning policies recognizes that mineral aggregate extraction operations are an interim land use. Mineral aggregate extraction is a permitted use within prime agricultural areas in accordance with provincial policy.
- The subject properties are not within a specialty crop area.
- Although the subject properties are within a prime agricultural area, the properties will be rehabilitated back to agriculture with the same average soil capability that currently exists.
- There are limited areas within the Primary Aggregate Resource Area in the Township that would avoid prime agricultural soils. Non-prime agricultural lands within the Primary Aggregate Resource Area are either constrained by environmental conservation protection features, removed from other aggregate operations and / or not located on established haul routes.
- The proposed expansion of the existing pit on the subject properties is within an area of established and concentrated mineral aggregate operations.
- No new haul routes are being created and existing truck traffic to/from the existing aggregate operations is not changing as a result of the proposed expansions.
- Extraction is proposed to be above the watertable and no water taking is proposed. As a result, no impacts are anticipated on the availability of groundwater resources for the continued operation of surrounding agricultural uses.
- Impacts from dust, noise and visibility will be mitigated through implementation of prescribed conditions and technical requirements / recommendations and berming.
- The net loss of available agricultural land from the subject lands is marginal and largely attributed to side slopes created in the final landform. This marginal loss of agricultural land is offset by the additional land made available to rehabilitate back to agriculture as a result of the comprehensive rehabilitation plan that includes the existing adjacent licensed pits.
- Implementation of the recommended rehabilitation plan including the recommended best practices in the report will ensure a successful agricultural rehabilitation process.

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

Sandy Little, BES, MCIP, RPP

SOIL SURVEY AND CANADA LAND INVENTORY CLASSIFICATION FOR PART OF WEST HALF OF LOTS 12 AND 14 CONCESSION 3 O.S. TOWNSHIP OF MELANCTHON COUNTY OF DUFFERIN

Prepared for:

Strada Aggregates
30 Floral Parkway
Concord, ON
L4K 4R1

DBH Soil Services Inc.

November 24, 2016

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1.0 BACKGROUND

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

Part of West Half of Lots 12 and 14
Concession 3 O.S.
Township of Melancthon
County of Dufferin

This area comprises two parcels (identified above), with a total area of approximately 60.0 ha (150.0 acres). The parcel located on Lot 14 encompasses approximately 40 ha (100.0 acres), while the parcel located on Lot 12 covers approximately 20 ha (50 acres). Together these two parcels are referred to as the Subject Lands.

The Subject Lands are roughly bounded: on the west by 4th Line (a paved and upgraded road (to the south) used for the existing aggregate pits located west of, south of and between these two parcels), aggregate pits and agricultural lands; on the north by agricultural lands and woodlots; on the east by aggregate operations, agricultural lands and woodlots; and on the south by aggregate operations.

In the local area context, the Subject Lands are located approximately 2.0 km west of the hamlet of Horning's Mills and approximately 6.0 km north of the Town of Shelburne.

This report was completed to document the existing soil conditions and to provide a more detailed assessment of the Canada Land Inventory (CLI) classification for the soil resources onsite.

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

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

Legend

- Roads
- Built Up Areas (MNR Data)
- Lot Lines
- Subject Lands

Figure 1

Location

DBH Soil Services Inc

November 2016

2017/02/Figure 1 - Location

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 5550 48850
    - 10 17 5600 48900
    - 10 17 5550 48900
    - 10 17 5600 48850,
- 1:50000 scale NTS Map No 41A/1 and 31 D/4. 1984. Ministry of Energy Mines and Resources, Canada,
- 1:50000 scale NTS Map No 41A/1 and 31 D/4. Canada Land Inventory (CLI) Capability Mapping,
- *Agronomy Guide for Field Crops (Publication 811). (2009).* Ontario Ministry of Agriculture, Food and Rural Affairs,
- *Classifying Prime and Marginal Agricultural Soils and Landscapes:* Guidelines for Application of the Canada Land Inventory in Ontario. OMAFRA. Online, 2016,
- *County of Dufferin Soils data,* Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), digital data 2016,
- *Dufferin County Official Plan, (March 27, 2014),*
- *Greenbelt Protection Plan* (The Greenbelt Act 2005),
  Guide to Agricultural Land Use, Ontario Ministry of Agriculture, Food and Rural Affairs, March 1995,
- Guidelines on Permitted Uses in Ontario's Prime Agricultural Areas (Publication 851). Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), 2016,
- *Niagara Escarpment Plan* (June 1, 2005),
- Ontario Ministry of Agriculture and Food - Land Use Systems Mapping,
- Ontario Ministry of Agriculture and Food - Artificial Drainage Mapping,
- *Provincial Policy Statement, 2014,*
- *Soil Survey and Canada Land Inventory Classification for Part Lot 13, Concession 3 OS, Township of Melancthon, Dufferin County (DBH Soil Services Inc), 2001,*
- *Soil Survey of Dufferin County; Report No. 38 of the Ontario Soil Survey. (Hoffman, D.W., B.C. Matthews, and R.E. Wicklund, 1964),*
- *Surficial Soil Study, Part Lots 11 & 12, Concession 3, Township of Melancthon, Dufferin County (May 2008),*
- *The Physiography of Southern Ontario 3rd Edition, Ontario Geological Survey Special Volume 2, Ministry of Natural Resources, 1984,*
- *The Township of Melancthon Official Plan (August 2014),*
- *Windshield and field surveys by DBH Soil Services staff, October 17, 2016.*

2.2 FIELD DATA COLLECTION

2.2.1 SOIL INVESTIGATION

Basic soils information was provided in the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) soils reporting and mapping (*Soil Survey of Dufferin County,* Report No. 38 of the Ontario Soil Survey (Hoffman, D.W., B.C. Matthews, and R.E. Wicklund, 1964)) with mapping at a scale of 1:63360 (or one inch to one mile). Mapping at this scale is of a general nature when referring to site-specific planning; therefore detailed soils assessments are often required for farm scale or lot size planning initiatives and applications for amendments to Official Plans.

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 17, 2016.

2.2.2 TOPOGRAPHY AND CLIMATE

Topographic information was reviewed and correlated to the Site Plan (provided by MHBC/Stada Aggregates), the 1:10000 scale Ontario Base 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)'.

2.2.3 AGRICULTURAL LAND USE

Initial Agricultural Land Use data was provided by the Ontario Ministry of Agriculture, Food and Rural Affairs. This information is presented at the Township level and identified a land usage for individual properties. 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 in October 17, 2016. Data collected included the identification of land use (both agricultural and non-agricultural), documentation of the type and location of agricultural facilities (if any), non-farm residential units (if any) and non-farm buildings (business, commercial and institutional usage). The data presented in this report reflects the present day agricultural land use (if any).

3.0 POLICY REVIEW

The long term protection of quality agricultural lands is a priority of the Province of Ontario and has been addressed in the Provincial Policy Statement (2014). Municipal Governments have similar regard for the protection and preservation of agricultural lands, and address their specific concerns within their respective Official Plans. With this in mind, the Provincial Policy Statement (2014), *Dufferin County Official Plan, (March 27, 2014) and The Township of Melancthon Official Plan (August 2014)* were reviewed for policies directly related to soil resources and Canada Land Inventory (CLI). The relevant policies are indicated as follows.

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

3.1 PROVINCIAL AGRICULTURAL POLICY

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

Agricultural Policies are addressed in Section 2.3 – Agriculture. Section 2.3.6 – Non-Agricultural Uses in Prime Agricultural Areas provides policy specific to this study. Section 2.3.6.1 states: "Planning authorities may only permit non-agricultural uses in *prime agricultural areas* for:

> a) extraction of *minerals*, *petroleum resources* and *mineral aggregate resources*, in accordance with policies 2.4 and 2.5;

Mineral Aggregate Policies are addressed within Section 2.4 and 2.5 of the Provincial Policy Statement. Section 2.4.2.1 identifies the Protection of Long-term Resource Supply and states: "*Mineral mining operations* and *petroleum resource operations* shall be identified and protected from *development* and activities that would preclude or hinder their expansion or continued use or which would be incompatible for reasons of public health, public safety or environmental impact."

Further, Section 2.4.3.1 states:

> "2.4.3.1 Rehabilitation to accommodate subsequent land uses shall be required after extraction and other related activities have ceased. Progressive rehabilitation should be undertaken wherever feasible", and Section 2.4.4.1 states:
> "2.4.4.1 Extraction of *minerals* and *petroleum resources* is permitted in *prime agricultural areas* provided that the site will be rehabilitated."

Sections 2.5.2 – Protection of Long-Term Resource Supply and Section 2.5.3 – Rehabilitation provide policy for Mineral Aggregate Resources and Rehabilitation.

"2.5.2 Protection of Long-Term Resource Supply

2.5.2.1 As much of the *mineral aggregate resources* as is realistically possible shall be made available as close to markets as possible. Demonstration of need for *mineral aggregate resources*, including any type of supply/demand analysis, shall not be required, notwithstanding the availability, designation or licensing for extraction of *mineral aggregate resources* locally or elsewhere.

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

Section 2.5.3 Rehabilitation provides the following policies:

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

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

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

3.2 OFFICIAL PLAN POLICY

Official Plan policies are prepared under the Planning Act, as amended, of the Province of Ontario. Official Plans generally provide policy comment for land use planning while taking into consideration the economic, social and environmental impacts of land use and development concerns. For the purpose of this report the Dufferin County Official Plan (March 27, 2015) and the Township of Melancthon Official Plan (August 2014) were reviewed for issues related to agricultural soils.

The County municipal government is a two tier system. The County sets broad level policies while the local (township) municipalities provide more detailed policies for planning and development.

3.3 DUFFERIN COUNTY OFFICIAL PLAN

Dufferin County is in the process of completing their first Official Plan. For the purposes of this study, the Dufferin County Official Plan (March 27, 2015) was reviewed. Schedule C – Agricultural Area and Rural Lands mapping illustrates that the Subject Lands are located in an area designated as Agricultural Area. Schedule D – Mineral Aggregate Resource Areas

illustrates that the Subject Lands are located in an area designated as Sand and Gravel Resource Area.

Section 4.2 provides policies for Agricultural Area, Section 4.3 provides Land Use policies, while Section 4.4 provides policies on the Management of Mineral Aggregate, Minerals and Petroleum Resources. Section 4.4.2.1 provides policy on New or Expanding Mineral Resource Operations, while Section 4.4.2.2 provides policy on Rehabilitation.

Section 4.2.3 states:

"a) The County and local municipalities will designate prime agricultural areas in their official plans, through procedures established by the Province. Prime agricultural areas are designated on Schedule C of this Plan. Any changes to the designation of prime agricultural areas will require an amendment to this Plan, and an amendment to the local municipal official plan."

Section 4.4.2.1 states:

"a) New mineral aggregate resource operations or any expansion to an existing mineral aggregate resource operation that extends beyond the lands identified in the local municipal official plan will require an amendment to the local municipal official plan, and will conform to the policies of this Plan and the local municipal official plan. An amendment to this Plan will not be required for new or expanding mineral resource operations.

b) Development and activities in known deposits of mineral aggregate resources and on adjacent lands, with the exception of agricultural uses, which would preclude or hinder the establishment of new mineral aggregate resource operations or access to the resources will only be permitted if: i. resource use would not be feasible; or ii. the proposed land uses or development serves a greater long-term public interest; and iii. issues of public health, public safety and environmental impact are addressed. For the purposes of this policy, 'adjacent to' will generally include lands within 1,000 metres of an existing pit, quarry, and aggregate reserve.

c) Mineral aggregate resource operations shall be protected from development and activities that would preclude or hinder their expansion or continued use or which would be incompatible for reasons of public health, public safety or environmental impact.

d) In considering new mineral aggregate resource operations or any expansion to an existing mineral aggregate resource operation, the County and local municipality will be satisfied that prior to approval of a local municipal official plan amendment that impacts are minimized with respect to the following:

i. surrounding land uses and siting of extraction operations, including demonstrating compatibility with the rural character and landscape, including visual impacts;

ii. surrounding sensitive uses through adequate buffering, screening, and other mitigation measures;

iii. transportation infrastructure, particularly as it relates to County Roads and Provincial Highways;

iv. surface water and groundwater quality and quantity, provincially significant natural features, natural heritage features and areas, and the environment;

v. social and community considerations; vi. cultural heritage and archaeological resources;

vii. noise, dust and vibration, in accordance with Provincial Standards;

viii. the removal and placement of fill, topsoil or overburden;

ix. demonstration that the final rehabilitation plan is consistent with the policies of this Plan and the local municipal official plan;

x. other matters identified by the Province, County, or local municipality, or identified in the local municipal official plan; and

xi. requirements under the Aggregate Resources Act.,"

Section 4.4.2.2 – Rehabilitation states that:

"a) Progressive and final rehabilitation will be required to accommodate subsequent land uses, to promote land use compatibility, to recognize the interim nature of extraction, and to minimize impacts, to the extent possible. Final rehabilitation will take into consideration the pre-extraction land use designation and conditions, and compatibility with the character of the surrounding land uses and approved land use designations, in consideration of the County Plan and local municipal official plan, as well as the opportunity to accommodate parks and open space uses.

b) Comprehensive and coordinated rehabilitation planning is encouraged where there is a concentration of mineral aggregate operations.

c) In prime agricultural areas, on prime agricultural land the extraction of mineral aggregate resources is permitted as an interim use provided the site will be rehabilitated back to an agricultural condition. Complete rehabilitation back to an agricultural condition is not required if:

i. 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;

ii. other mineral aggregate resource extraction alternatives have been considered by the proponent and found unsuitable. The consideration of other mineral aggregate resource extraction alternatives will include mineral aggregate resources in areas of Canada Land Inventory Class 4 through 7 lands, resources on lands identified as settlement areas, and,

resources on prime agricultural lands where rehabilitation is feasible. Where no other alternatives are found, prime agricultural lands will be protected in this order of priority: Canada Land Inventory Class 1, 2 and 3 lands; and

iii. agricultural rehabilitation in remaining areas is maximized."

3.3.1 Township of Melancthon Official Plan (August 2014)

The Township of Melancthon Official Plan (August 2014) provides for Agricultural Policies in Section 5.2 and Extractive Industrial in Section 5.6.

Section 5.2.2 states:

"(b) *Agricultural uses* shall be given priority over all other uses with the exception of:
ii new or expanded *mineral aggregate operations,* on the basis of a site specific interim use related amendment to this Plan, and *wayside pits and quarries* where either of these types of uses can be justified in terms of their compliance with the applicable policies of sections 3.17, 3.18, and 5.6 including the policies of subsections 5.6.2(k) and (m) in the Extractive Industrial section of this Plan, and all other polices of this Plan"

Section 5.6.2 – Planning and Development Policies states:

"(k) Where a new or expanded *mineral aggregate operation* is proposed for a site either within the Agricultural designation or on agriculturally used land within the Rural designation, such use may be permitted only if documentation has been provided demonstrating to Council's satisfaction that there is conformity with the following criteria and policies, in addition to all other applicable policies of this Plan.

i The use shall be interim in nature.
ii Alternatives involving sites having lower quality or nonagricultural soils have been evaluated by the applicant and have been found to be unsuitable.
iii On a site designated Agricultural, the *mineral aggregate operation* shall be limited to a size and to a depth, both below the existing grade and above the water table, that makes it feasible through rehabilitation to restore a minimum of 90 percent of the area to be extracted, as shown on site plans approved by the Ministry of Natural Resources, back to the same soil quality for agriculture as existed prior to the *mineral aggregate operation*.
iv On a site having agriculturally used land in the Rural designation, the rehabilitation policy in item iii above shall apply unless its implementation is unfeasible, in which case there shall be conformity with the other rehabilitation related policies of this Plan.

(l) As with all materials provided in support of a proposed *mineral aggregate operation*, the documentation provided with regard to the matters referenced in subsection (k) above will be peer reviewed by the Township.

(m) Where no other alternatives are found in accordance with subsection (k) above, prime agricultural lands shall be protected in this order of priority: Specialty Crop Areas, if any, Canada Land Inventory Class 1 soils, Class 2 soils and Class 3 soils."

Section 5.6.2 – Planning and Development Policies (General Policies for the Extractive Industrial Designation) provides policy for rehabilitation in Section (v) – Use of Site After Rehabilitation. This policy states:

"(v) As *mineral aggregate operations* are to be permitted only as interim uses, upon completion of mineral aggregate extraction and full implementation of the associated rehabilitation plans to pre-extraction conditions or enhanced preextraction conditions, the site of an extractive industrial operation may be used for any of the other uses permitted in subsection 5.6.1, including agriculture, forestry and low intensity outdoor recreation.

(w) Notwithstanding the provisions of subsection (v) immediately above, any site consisting of prime agricultural land prior to the commencement of a *mineral aggregate operation* and originally within the Agricultural designation or agriculturally used land originally within the Rural designation shall be restored to agricultural use in compliance with the policy of subsection 5.6.2(k)iii. The use of rehabilitated extractive industrial lands for any purpose other than those permitted by subsection (v) and this subsection will require amendments to this Plan and the zoning by-law.

(x) Post-rehabilitation uses shall comply with all applicable policies of this Plan, particularly those intended to achieve compatibility between new and existing uses."

4.0 FINDINGS

4.1 SUBJECT LANDS

The Subject Lands were defined as:

Part of West Half of Lots 12 and 14
Concession 3 O.S.
Township of Melancthon
County of Dufferin

This area comprises two parcels (identified above), with a total area of approximately 60.9 ha (150.5 acres). The parcel located on Lot 14 encompasses approximately 40.8 ha (99.8 acres), while the parcel located on Lot 12 covers approximately 20.5 ha (50.7 acres). Together these two parcels are referred to as the Subject Lands.

The Subject Lands are roughly bounded: on the west by 4th Line (a paved and upgraded road (to the south) used for the existing aggregate pits located west of, south of and between these two parcels), aggregate pits and agricultural lands; on the north by agricultural lands and woodlots; on the east by aggregate operations, agricultural lands and woodlots; and on the south by aggregate operations.

In the local area context, the Subject Lands are located approximately 2.0 km west of the hamlet of Horning's Mills and approximately 6.0 km north of the Town of Shelburne.

The northern portion of the Subject Lands (40.8 ha (99.8 acres)) comprise croplands, pasture, woodlots and a farm residential unit (including out buildings (barn, machine shed)). The southern portion of the Subject Lands (20.5 ha (50.7 acres)) comprise croplands, woodlots and a farm residential unit (including out buildings).

No ponds, standing water or stream courses were observed on either portion of the Subject Lands.

Cattle were pastured on a central pasture area on the northern portion of the Subject Lands.

4.2 PHYSIOGRAPHY AND CLIMATE

The *Physiography of Southern Ontario* Physiographic Unit Map indicates that the Subject Lands are located within the Dundalk Till Plain Physiographic Region. This Region is described as gently undulating till plain. The plain is characterized by swamps or bogs and poorly drained depressional areas. Much of the plain area is comprised of surficial soil deposits consisting of silt of fine sands. This material is usually less than 60 cm (2 feet) in depth.

The Subject Lands are located along the eastern boundary of this physiographic region and have slopes that range from gently sloping to steeply sloping.

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

4.3 DETAILED SOIL SURVEY

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

- Completion of a review of published soil information (*Soil Survey of Dufferin County, Report No. 38 of the Ontario Soil Survey (Hoffman, D.W., B.C. Matthews, and R.E. Wicklund, 1964*)),
- 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 17, 2016. 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.

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 *Soil Survey of Dufferin County, Report No. 38 of the Ontario Soil Survey (Hoffman, D.W., B.C. Matthews, and R.E. Wicklund, 1964)* and with the CLI information presented on the 1:50000 scale manuscript mapping.

The detailed soil survey of the Subject Lands revealed that the majority of the southern parcel had been harvested and plowed this fall. Numerous stone piles were noted along fence rows, field rows, along the forested edge and in piles in the fields (particularly in the eastern most field). The parcel comprises three large fields, with the middle and eastern fields covering areas of steeply sloping topography.

Photograph illustrates the central portion of the property looking north (Panoramic view)

The northern parcel comprised large pasture/forage areas bordering a central pasture area extending from the farm building complex to the wooded areas at the east. Steeper topography was noted in an area surrounding and adjadent to the farm building complex. The wooded areas at the eastern extent of the property are divided into two sections. The northern section comprised simple slopes (greater than 50 m slope length), while the southern section comprised more complex topography (slope lengths less than 50 m). Numerous stone piles were noted along fence rows and in the eastern portions of the property.

Photograph illustrates the northern property looking north east at the woodlot edge. Note boulders.

A total of 48 soil inspection sites were examined over the Subject Lands (two parcels). The soil inspection information was correlated with soil descriptions in *Soil Survey of Dufferin County,* Report No. 38 of the Ontario Soil Survey (Hoffman, D.W., B.C. Matthews, and R.E. Wicklund, 1964), 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 *Soil Survey of Dufferin County, Report No. 38 of the Ontario Soil Survey (Hoffman, D.W., B.C. Matthews, and R.E. Wicklund, 1964)*.

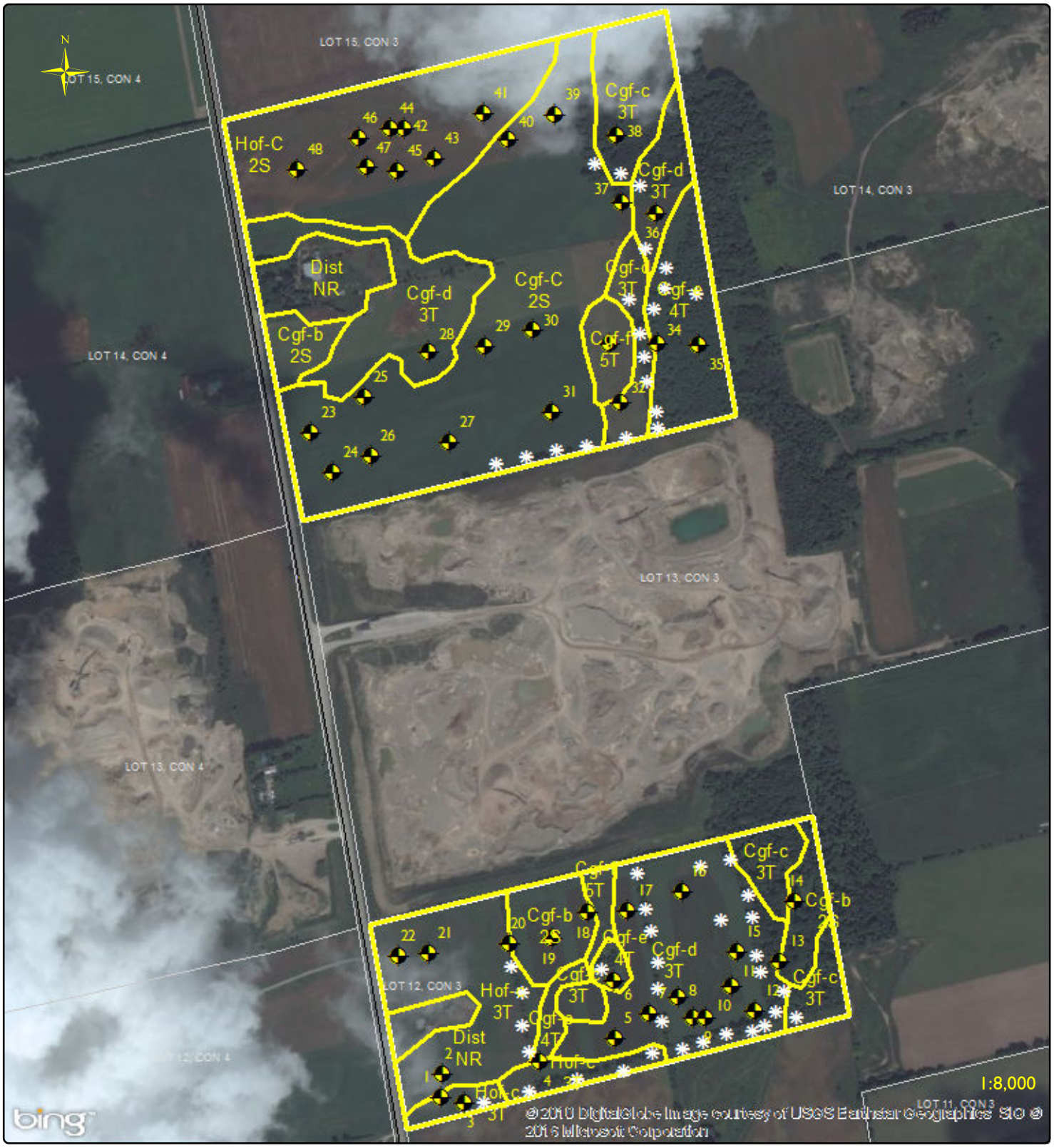
The onsite soil survey identified two soil series and one miscellaneous landscape unit. The soil series were identified as Honeywood Fine Sandy Loam and Caledon Fine Sandy Loam. The miscellaneous landscape unit was identified as Disturbed Soils. The Disturbed soils are associated with the farm building complexes on both parcels.

The Honeywood Fine Sandy Loam soils are the well-drained member of the Honeywood soil catena. Honeywood soils developed from wind deposited fine sandy loam materials that are underlain by calcareous loam till materials. Generally the fine sandy materials over the till are stone free. However, in areas of steeper topography, the soils may be eroded resulting in stony materials at the soil surface.

Caledon soils occur on gently undulating topography. The soil surface is usually stone free. External drainage is moderate and internal drainage is medium.

The Caledon Fine Sandy Loam soils are the well-drained member of the Caledon soil catena. Caledon soils developed on gravelly materials. Caledon soils occur on gently sloping topography. External drainage is moderate and internal drainage is rapid.

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



Legend

- Stone Pile
- Soil Inspection Site Location
- Roads
- Detailed Soil Survey Polygon
- Lot Lines
- Subject Lands

Soil Code

Dist = Disturbed
Cgf = Caledon Fine Sandy Loam
Hof = Honeywood Fine Sandy Loam

Slope Class

Aa = 0.0 - 0.5%
Bb = 0.5 - 2.0%
Cc = 2.0 - 5.0%
Dd = 5.0 - 9.0%
Ee = 9.0 - 15.0%
Ff = 15.0 - 30.0%
Slope length < 50 m
Slope length > 50 m

Soil Code / Slope Code
Cgf - e
4T
CLI Class / CLI Subclass

CLI Subclass Limitation

D = Undesireable Structure
E = Erosion
F = Low Fertility
I = Inundation
M = Low Moisture
P = Stoniness
R = Shallow to Bedrock
S = Adverse Conditions (F, M, T or P)
T = Topography
W = Excess Water

Figure 2

Soils and
Canada Land Inventory (CLI)

DBH Soil Services Inc

November 2016

2017/02/Figure 2 - Soils/CLI

4.3.1 SOIL CAPABILITY FOR AGRICULTURE

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

Each polygon identified on-site was classified according to the Canada Land Inventory rating system then correlated to the CLI classifications as presented *Soil Survey of Dufferin County, Report No. 38 of the Ontario Soil Survey (Hoffman, D.W., B.C. Matthews, and R.E. Wicklund, 1964)* report, CLI map No 41A/1 and 31 D/4, 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".

Caledon Fine Sandy Loam soils on complex slopes (slope length less than 50 m) on 'b' slopes (0.5 – 2.0 percent) and on simple 'C' slopes (slope length greater than 50 m)(2.0 – 5.0 percent slope) are rated as class 2S. Caledon Fine Sandy Loam soils on complex 'c' and complex 'd' slopes are rated as class 3T. Caledon Fine Sandy Loam soils on complex 'e' slopes are rated as Class 4T, and on complex 'f' slopes are rated as 5T.

Honeywood Fine Sandy Loam soils on simple 'C' slopes are rated as class 2S. Honeywood Fine Sandy Loam soils on complex 'c' slopes are rated as Class 3T.

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 whole of the Subject Lands.

Table 1 Canada Land Inventory - Subject Lands (Both Parcels)

Canada Land Inventory Class (CLI)	Area (ha/acres)	Percent Occurrence
Class 1	-	-
Class 2	28.1/69.5	46.2
Class 3	24.8/61.2	40.7
Class 4	4.0/9.8	6.5
Class 5	1.4/3.4	2.3
Class 6	-	-
Class 7	-	-
Disturbed Soil Areas	2.6/6.5	4.3
Totals	60.9/150.5	100.0

The Subject Lands (both parcels) comprise approximately 86.9 percent Canada Land Inventory (CLI) class 1 – 3 soils.

Table 2 summarizes the relative percent area occupied by each capability class for the southern parcel of the Subject Lands.

Table 2 Canada Land Inventory - Subject Lands (Southern Parcel)

Canada Land Inventory Class (CLI)	Area (ha/acres)	Percent Occurrence
Class 1	-	-
Class 2	2.7/6.7	13.2
Class 3	15.9/39.3	77.5
Class 4	0.8/1.9	3.8
Class 5	0.4/1.1	2.2
Class 6	-	-
Class 7	-	-
Disturbed Soil Areas	0.7/1.7	3.3
Totals	20.5/50.7	100.0

The Southern Parcel comprises approximately 90.7 percent Canada Land Inventory (CLI) class 1 – 3 soils.

Table 3 summarizes the relative percent area occupied by each capability class for the northern parcel of the Subject Lands.

Table 3 Canada Land Inventory - Subject Lands (Northern Parcel)

Canada Land Inventory Class (CLI)	Area (ha/acres)	Percent Occurrence
Class 1	-	-
Class 2	25.4/62.8	62.9
Class 3	8.9/22.0	22.0
Class 4	32./7.9	7.9
Class 5	0.9/2.3	2.3
Class 6	-	-
Class 7	-	-
Disturbed Soil Areas	2.0/4.9	4.9
Totals	40.4/99.8	100.0

The Northern Parcel comprises approximately 84.9 percent Canada Land Inventory (CLI) class 1 – 3 soils.

The Provincial Policy Statement (PPS) considers Class 1 – 3 soils as Prime agricultural lands. Approximately 0.0 percent of the Subject Lands are rated as Class 1 – 3 soil materials within the Canada Land Inventory System.

4.3.2 ARTIFICIAL DRAINAGE

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

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

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

OMAFRA Artificial Drainage System Maps were reviewed to determine if an agricultural tile drainage system had been registered to the Subject Lands. The OMAFRA maps revealed that agricultural drainage systems were not registered to Subject Lands.

4.3.3 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 during the course of the on-site survey.

5.0 SUMMARY AND CONCLUSIONS

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

Part of West Half of Lots 12 and 14
Concession 3 O.S.
Township of Melancthon
County of Dufferin

This area comprises two parcels (identified above), with a total area of approximately 60.9 ha (150.5 acres). The parcel located on Lot 14 encompasses approximately 40.8 ha (99.8 acres), while the parcel located on Lot 12 covers approximately 20.5 ha (50.7 acres). Together these two parcels are referred to as the Subject Lands.

The Subject Lands are roughly bounded: on the west by 4th Line (a paved and upgraded road (to the south) used for the existing aggregate pits located west of, south of and between these two parcels), aggregate pits and agricultural lands; on the north by agricultural lands and woodlots; on the east by aggregate operations, agricultural lands and woodlots; and on the south by aggregate operations.

In the local area context, the Subject Lands are located approximately 2.0 km west of the hamlet of Horning's Mills and approximately 6.0 km north of the Town of Shelburne.

The results of the Soil Survey assessment include the following:

- The Subject Lands comprise two individual parcels: Part of West Half Lots 12 and 14, Concession 3 O.S., Township of Melancthon, County of Dufferin..

- Both parcels are used for agricultural operations. The northern parcel comprises forage/pasture lands, woodlots and a farm building complex. The south parcel comprises cropland, woodlots and a farm building complex.

- The eastern extents of both parcels are wooded.

- No open water, ponds or streams were observed on either parcel

- Significant stone piles were noted along the fence rows, field edges and in piles in the fields on the central-eastern extent of both parcels.

- Steeper slopes were noted in the eastern extent of both parcels.

- The presence of livestock, or areas for pasturing or for housing livestock were observed on the northern parcel of the Subject Lands.

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

- No artificial tile drainage was noted on the Subject Lands and no agricultural tile drainage systems were registered to the property. Therefore, no additional investment in agriculture is associated with these lands.

- The Northern Parcel comprises approximately 84.9 percent Canada Land Inventory (CLI) class 1 – 3 soils.

- The Southern Parcel comprises approximately 90.7 percent Canada Land Inventory (CLI) class 1 – 3 soils.

- The Subject Lands (both parcels) comprise approximately 86.9 percent Canada Land Inventory (CLI) class 1 – 3 soils.

6.0 REFERENCES

- 1:10000 scale Ministry of Natural Resources (MNR) Aerial Photography, 1978,
- 1:10000 scale Ontario Base Map (1983) Ministry of Natural Resources:
    - 10 17 5550 48850
    - 10 17 5600 48900
    - 10 17 5550 48900
    - 10 17 5600 48850,
- 1:50000 scale NTS Map No 41A/1 and 31 D/4. 1984. Ministry of Energy Mines and Resources, Canada,
- 1:50000 scale NTS Map No 41A/1 and 31 D/4. Canada Land Inventory (CLI) Capability Mapping,
- *Agronomy Guide for Field Crops (Publication 811). (2009).* Ontario Ministry of Agriculture, Food and Rural Affairs,
- *Classifying Prime and Marginal Agricultural Soils and Landscapes:* Guidelines for Application of the Canada Land Inventory in Ontario. OMAFRA. Online, 2016,
- *County of Dufferin Soils data,* Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), digital data 2016,
- *Dufferin County Official Plan, (March 27, 2014),*
- *Greenbelt Protection Plan* (The Greenbelt Act 2005),
  Guide to Agricultural Land Use, Ontario Ministry of Agriculture, Food and Rural Affairs, March 1995,
- Guidelines on Permitted Uses in Ontario's Prime Agricultural Areas (Publication 851). Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), 2016,
- *Niagara Escarpment Plan* (June 1, 2005),
- Ontario Ministry of Agriculture and Food - Land Use Systems Mapping,
- Ontario Ministry of Agriculture and Food - Artificial Drainage Mapping,
- *Provincial Policy Statement, 2014,*
- *Soil Survey and Canada Land Inventory Classification for Part Lot 13, Concession 3 OS, Township of Melancthon, Dufferin County (DBH Soil Services Inc), 2001,*
- *Soil Survey of Dufferin County; Report No. 38 of the Ontario Soil Survey. (Hoffman, D.W., B.C. Matthews, and R.E. Wicklund, 1964),*
- *Surficial Soil Study, Part Lots 11 & 12, Concession 3, Township of Melancthon, Dufferin County (May 2008),*
- *The Physiography of Southern Ontario 3rd Edition, Ontario Geological Survey Special Volume 2, Ministry of Natural Resources, 1984,*
- *The Township of Melancthon Official Plan (August 2014),*
- *Windshield and field surveys by DBH Soil Services staff, October 17, 2016.*

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 – 36 36 +	fSL fSL L	Well	Honeywood
2	Ap Bt Ck	0 – 22 22 – 38 38 +	fSL fSL L	Well	Honeywood
3	Ap Bt Bm	0 – 25 25 – 50 50 +	fSL fSL fSL	Well	Honeywood
4	Ap Bt Bm	0 – 25 25 – 50 50 +	fSL fSL fSL	Well	Caledon
5	Ap Bt Ck	0 – 22 22 – 38 38 +	fSL fSL L	Well	Caledon
6	Ap Bt Ck	0 – 21 21 – 36 36 +	fSL fSL L	Well	Caledon
7	Ap Bt Ck	0 – 22 22 – 39 39 +	fSL fSL L	Well	Caledon
8	Ap Ah Bt Bm	0 – 25 25 – 30 30 – 80 80 - 100	fSL fSL fSL fSL	Well	Caledon
9	Ap Btk Ck	0 – 22 22 – 38 38 +	fSL fSL L	Well	Caledon
10	Ap Bt Bmk	0 – 25 25 – 50 50 +	fSL fSL fSL	Well	Caledon
11	Apk Bmk Ck	0 – 15 15 – 45 45 +	fSL fSL L	Well	Caledon
12	Apk Bmk Ck	0 – 10 10 – 40 40 +	fSL fSL L	Well	Caledon
13	Apk Bmk Ck	0 – 15 15 – 45 45 +	fSL fSL L	Well	Caledon
14	Ap Bt Bmk	0 – 25 25 – 50 50 +	fSL fSL fSL	Well	Caledon
15	Ap Btk Ck	0 – 22 22 – 38 38 +	fSL fSL L	Well	Caledon
16	Ap Btk Ck	0 – 22 22 – 39 39 +	fSL fSL L	Well	Caledon
17	Apk Bmk Ck	0 – 10 10 – 40 40 +	fSL fSL L	Well	Caledon
18	Apk Bmk Ck	0 – 15 15 – 45 45 +	fSL fSL L	Well	Caledon

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
19	Ap Ah Bt Bm	0 – 25 25 – 30 30 – 80 80 - 100	fSL fSL fSL fSL	Well	Caledon
20	Ap Ah Bt Bm	0 – 25 25 – 30 30 – 80 80 - 100	fSL fSL fSL fSL	Well	Caledon
21	Ap Bt Ck	0 – 21 21 – 36 36 +	fSL fSL L	Well	Honeywood
22	Ap Bt Ck	0 – 24 24 – 42 42 +	fSL fSL L	Well	Honeywood
23	Ap Bt Ck	0 – 25 25 – 45 45 +	fSL fSL L	Well	Caledon
24	Ap Bt Ck	0 – 26 26 – 55 55 +	fSL fSL L	Well	Caledon
25	Ap Btk Bmk Ck	0 – 22 22 – 39 39 – 55 55 – 80+	fSL fSL fSL L	Well	Caledon
26	Ap Ah Bt Bm	0 – 25 25 – 35 35 – 74 74 - 100	fSL fSL fSL fSL	Well	Caledon
27	Ap Btk Ck	0 – 22 22 – 45 45 +	fSL fSL L	Well	Caledon
28	Ap Ah Bt Bm	0 – 25 25 – 30 30 – 70 70 - 100	fSL fSL fSL fSL	Well	Caledon
29	Ap Bt Ck	0 – 25 25 – 45 45 +	fSL fSL L	Well	Caledon
30	Ap Btk Ck	0 – 26 26 – 39 39 +	fSL fSL L	Well	Caledon
31	Ap Bt Ck	0 – 26 26 – 55 55 +	fSL fSL L	Well	Caledon
32	Ap Ah Bt Bm	0 – 25 25 – 29 29 – 65 65 - 100	fSL fSL fSL fSL	Well	Caledon
33	Ap Ah Bt Bm	0 – 25 25 – 30 30 – 80 80 - 100	fSL fSL fSL fSL	Well	Caledon
34	Ap Bt Ck	0 – 25 25 – 45 45 +	fSL fSL L	Well	Caledon

Soil Inspection Site Number	Horizon	Depth of Horizon (cm)	Soil Texture	Drainage Class	Soil Series
35	Ap Bt Ck	0 – 29 29 – 48 48 +	fSL fSL L	Well	Caledon
36	Ap Btk Ck	0 – 28 28 – 57 57 +	fSL fSL L	Well	Caledon
37	Ap Bt Ck	0 – 26 26 – 65 65 +	fSL fSL L	Well	Caledon
38	Ap Bt Ck	0 – 22 22 – 53 53 +	fSL fSL L	Well	Caledon
39	Ap Btk Ck	0 – 22 22 – 39 39 +	fSL fSL L	Well	Caledon
40	Ap Bt Ck	0 – 26 26 – 55 55 +	fSL fSL L	Well	Caledon
41	Ap Bt Ck	0 – 24 24 – 47 47 +	fSL fSL L	Well	Honeywood
42	Ap Bt Ck	0 – 23 23 – 50 50 +	fSL fSL L	Well	Honeywood
43	Ap Bt Ck	0 – 25 25 – 54 54 +	fSL fSL L	Well	Honeywood
44	Ap Bt Ck	0 – 24 24 – 42 42 +	fSL fSL L	Well	Honeywood
45	Ap Bt Ck	0 – 21 21 – 53 53 +	fSL fSL L	Well	Honeywood
46	Ap Bt Ck	0 – 24 24 – 65 65 +	fSL fSL L	Well	Honeywood
47	Ap Bt Ck	0 – 25 25 – 62 62 +	fSL fSL L	Well	Honeywood
48	Ap Bt Ck	0 – 24 24 – 42 42 +	fSL fSL L	Well	Honeywood

Notes:
L = Loam, SL = Sandy Loam, fSL = fine Sandy Loam
- 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 formation

APPENDIX B

Photographs

Photograph illustrating slopes and surface stone content (South Parcel)

Photograph illustrating slopes and surface stone content (South Parcel)