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February 22, 2016

Ref. No.: 3315446-000.700

Ms. Tracey Braun
Director
Manitoba Conservation and Water Stewardship
Environmental Approvals
2nd Floor, 123 Main Street
Winnipeg MB R3C 1A5

Dear Ms. Braun:

RE: Notice of Alteration – Environment Act Licence #2994 – Addition of Agricultural Land to Biosolid Application Program

Introduction

MMM Group Limited (MMM), a WSP Global Company, has been retained by the Rural Municipality of Springfield (RM of Springfield) to complete the removal of sludge solids from the Oakbank and Dugald Wastewater Lagoons as required by Environmental Act License #2994 (EAL #2994). Through the process of reviewing EAL #2994 and planning for the land application program it has been determined that a Notice of Alteration (NOA) for EAL #2994 is required. The NOA is to request an amendment to clauses 6 and 14C and to permit the on-site composting of the heavy vegetation growth on each of the cells. This NOA also brings attention to the addition of three agricultural fields that had not been included in the previous Environment Act Proposal submitted by Stantec Inc.:

- Environment Act Proposal Report for the Land Application of Sludge from the Oakbank and Dugald Wastewater Lagoons in the R.M. of Springfield, MB; completed on behalf of the R.M. of Springfield and Manitoba Water Services Board. Prepared by Stantec, Winnipeg, MB. December 2009. Project No. 111257009.

Background

EAL #2994 was granted to the RM of Springfield for the removal of sludge solids from two separate municipal wastewater lagoons located at NE22-11-5 EPM, east of Oakbank, and SW3-11-5 EPM, north of Dugald (Figure 1A and 1B, attached). In order to complete their decommissioning, they require dredging of the lagoon sludge remaining within their cells.

The lagoons are no longer utilized by the RM of Springfield for wastewater and sewage as a new lagoon has since been constructed southeast of Oakbank. The former Oakbank and Dugald wastewater lagoons were decanted and dispersed into local drainage systems as per the respective

EAL requirements. Cells were not aerated or biologically or chemically treated (EAP, Stantec, 2009).

Environment Act License #2910 was issued for the operation of the new RM lagoon, located at NE-11-11-5 EPM, and indicated that the former Dugald and Oakbank wastewater lagoons be decommissioned. Due to changes within management at the RM of Springfield, the decommissioning process has not yet been completed.

Scope of NOA

The scope of this NOA is to provide Manitoba Conservation and Water Stewardship (MCWS) with information regarding changes to EAL #2994 clauses 6 and 14C, and vegetation management within the cells.

The approval of this NOA request in a timely manner would be greatly appreciated as the RM of Springfield would like to tender the contract in a timely manner.

Program Components and Activities

To date, MMM has re-sampled the biosolid sludge from each of the six cells at Oakbank lagoons and the two cells at the Dugald lagoons. Sludge was collected from several locations from within the lagoon. The sub-samples were taken directly off of the excavator bucket and placed in a 20 litre pail and sludge material was then thoroughly mixed to create a composite sample for an individual cell. The composite samples for each cell were submitted for analysis to ALS Laboratory Group (ALS), an accredited laboratory by the Canadian Association for Laboratory Accreditation Inc. (CALA) and will be included in the biosolid land application prescription submission prior to land application occurring in September 2016 and 2017.

During the sampling program, the quantity of sludge was estimated by measuring the sludge depth to clay liner using the excavator bucket to collect samples. Quantities were estimated per cell by multiplying the measured sludge depths with surface area of the lagoon cells. The depths observed were noticeably less than depths reported from 2009 and therefore the volumes of sludge anticipated for the application program is reduced (Table 1).

Vegetation Overgrowth

Since the commissioning of the wastewater treatment system located in NE11-11-5EPM, both the Dugald and Oakbank lagoon cells have overgrown with wetland vegetation (Photo 1 and 2, appended). The dead vegetation material removal was initiated the week of February 15 and to be completed prior to the end of March 2016 while the ground is frozen. The vegetation will be stockpiled and allowed to dry down along the berms of each cell. The directive to contractors is that no sludge material can be scraped from the cells nor permitted to be stockpiled on the berms of the cells. Based on an estimated seven tonnes per hectare of vegetation growth (e.g. Reed Canary Grass and Cattail) there is an estimated 200 tonnes of materials to be removed over all. Table 1. outlines the estimated vegetation growth for each cell.

Table 1. Estimated Quantity of Vegetation Cover at Both Oakbank and Dugald Cells

Description	Unit	Oakbank Lagoon						Dugald Lagoon		Estimated Total Quantities
		Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	North Cell	South Cell	
Reported Area	Ha	1.7	2.2	1.9	12.9	2.4	3.6	2.1	1.8	28.6
Estimated Quantity of Vegetation Cover	tonnes	11.6	15.6	13.3	90.5	17.0	25.2	15.0	12.4	200.5
Historic Sludge Thickness (2009)	m	0.2	0.41	0.3	0.25	0.28	0.28	0.33	0.28	-
Observed Sludge Thickness (2015)	m	0.07	0.07	0.07	0.13	0.07	0.07	0.07	0.07	-
Anticipated Volume of Sludge (2015)	m ³	1,159	1,555	1,329	16,806	1,697	2,517	1,499	1,244	27807.3

The vegetation material from the Dugald and Oakbank cells will be transported and stock piled inside cell four of the Oakbank cells (Figure 1B, attached). The intent is to permit the vegetation material to compost for a short duration inside the lined cell. Composting the estimated 200 tonnes of material will allow for volume reduction to a manageable level, concentrate nutrient value and permit for easier handling and disposal of the material in a sustainable manner. The anticipated disposal, when the material is of sufficient compost quality, would be to land apply it as based on nutrient value, similar to the sludge land application program. No other municipal vegetated material would be permitted to be composed at this site.

The RM of Springfield would like to request from MCWS that the vegetation material removed from each of the wastewater treatment cells be permitted to be relocated and composted within cell four of the Oakbank lagoon for a period of time to permit sustainable management of the detritus.

Surface Water Discharge

Upon, closer inspection of the Oakbank cells, it has been determined that there is a significant volume of water being held within the six cells and that a vigorous dewatering program will need to be completed. In accordance with EAL 1772 S1, Rural Municipality of Springfield; “the Licencee” Oakbank wastewater Treatment Lagoon Stage 1 Licence, the Licencee will complete water testing of all six cells to determine the best means to discharge the surface water. The dewatering program will consider two options; 1) Test each cell for water quality and discharge the water through the surface water network adjacent to the cells, or 2) Discharge water to the Oakbank force main and deliver it to the current cells located on NE11-11-5EPM pending an review of capacities and capabilities of the current wastewater treatment system under EAL 2634.

Schedule of Events

The project tasks and schedule of events for the proposed project are outlined below in Table 2.

Table 2. Project Tasks and Schedule

Task	Timeline
Biosolid and sludge quality sample collection for laboratory analysis of physical and chemical parameters.	July 2015
Consultation with Local Study Area (LSA) farm producers for land use agreement formalization.	October 2015 through to January 2016
Notice of Alteration submitted to MCWS	February 2016
Notice of Alteration approval by MCWS	March 2016
Stripping and stockpiling of vegetation material on all lagoon cells. Also, biosolids are going to be stockpiled within the Dugald cell only.	February - March 2016
Dewatering, stockpiling and drying of sludge material inside Oakbank lagoon cells.	April - September 2016
Soil sampling of cooperating farm producer land base, prescription land application rates determined and submitted to MCWS for approval.	September 2016
Land application of biosolid materials from Dugald Cells 1 and 2 and half of Cell 4 in Oakbank.	Between September through to early November 2016
Soil sampling of cooperating farm producer land base, prescription land application rates determined and submitted to MCWS for approval.	September 2017
Land application of biosolid materials from Oakbank Cells 1,2,3 part of 4, 5 and 6.	September through to Early November 2017
Land application of composted vegetation material stockpiled in an Oakbank cell.	Late October – Early November 2018

Clause 6: Fields Available for Biosolid Application

Clause 6 of EAL #2994 designates that sludge only be applied to agricultural land on SE and SW2-11-5EPM; NE, NW and SW5-11-5EPM; NE, NW and SE8-11-5EPM; NE9-11-5EPM; NE and SE 10-11-5EPM; NW and SW 11-11-5EPM; NE, NW, SE and NW 12-11-5EPM; SE and SW16-11-5EPM; NW and SW23-11-5EPM and NE and SE36-11-5EPM.

The cooperating farm producer fields confirmed for this NOA are as follows; NW and NE 10-11-5EPM; NW11-11-5EPM; NW23-11-5EPM; SW26-11-5EPM; NE and SE 36-11-5EPM and SW17-11-5EPM. New fields included at this time are summarized in Table 3 below. All fields to be included in the land application program are denoted in Figure 2 appended to this NOA. Land titles and cooperating farm producer land use agreements are also appended.

Table 3. Fields Available for Biosolid Application

Legal Land Location	Cooperating Farm Producer	Field Area (ha)	Manitoba Land Title #	Registered Owner
NW-10-11-5 E1	Greg Smith	61	1566429 1753649 1760853	Smiths' Honey and Seed Farms Ltd.
SW-17-11-5 E1	Howard Bredin	61	1177273	Ronald Emil Bredin & Myrtle Arlene Bredin
SW-26-11-5 E1	Greg Smith	40	2747586	Peter Pauls Inc.

Cooperating farm producer fields originally approved in EAL# 2994 and included in this NOA include; NE 10-11-5EPM; NW11-11-5EPM; NW23-11-5EPM; and NE and SE 36-11-5EPM.

Dominant Soil Series

The dominant soil series identified in the current agricultural fields across the land study area include eight soils series; Colby, Dencross, Glenmoor, Greenwald, Marquette, Niverville, Osborne and Red River. The addition of the three new fields does not result in the addition of any new soil series. The descriptions and suitability of said soil series can be found in the EAP submitted to MCWS in 2009. Figure 3 shows the dominant soil series within the LSA including the three new fields proposed for application. The total land area for each soil series in the LSA is summarized in Table 4 below.

Table 4. Dominant soil series area in LSA

Soil Series	Land area (ha)
Osborne	242.7
Red River	124.0

Soil Series	Land area (ha)
Dencross	53.2
Greenwald	14.6
Niverville	13.1
Glenmoor	10.5
Colby	10.0
Marquette	1.7

Canada Land Inventory (CLI) – Soil Capability for Agriculture

There were no changes to the dominant CLI soil capability for agricultural classification with the additions of the three fields, NW-10-11-5 E1, SW-17-11-5 E1 and SW-26-11-5 E1. The three dominant classes found in the current LSA are 2M, 2W and 3W (Figure 4).

Nutrient Management Zones

The Water Protection Act (C.C.sMc W65, 2005), Nutrient Management Regulation (62/2008) outlines criteria for the application of nutrients to agricultural land. The current LSA, including the addition of three fields, indicates that there are approximately 470 ha of category N1 Nutrient Management Zone (Figure 5).

Data for the soil series, CLI and Nutrient Management zones was accessed through the Manitoba Land Initiative (MLI, <http://mli2.gov.mb.ca/>) on January 15, 2016. Upon review of figures, dissimilarity was observed between the NOA and EAP (2009) figures. After review of the data and an extensive quality assurance cross reference, we are confident that the data presented in this NOA is consistent with the MLI resource.

Clause 14. The Licencee shall not permit the application of sludge solids:

- c) Less than 300 metres from any occupied residence (other than the residence occupied by the owner of the land on which the sludge solids are to be applied).

This NOA requests a setback distance for an occupied residence (other than the residence occupied by the owner of the land on which the biosolids are to be applied) of 75m, property line with residence of 10m and property line without residence of 1.0 m as identified in Table 4.

Buffer Zones

In order to minimize risk to human and environmental health and safety from the land application of biosolid materials, buffer zones will be established as outlined in the Nutrient Management Regulation (62/2008) under The Water Protection Act (C.C.S.M. c. W65) and the Farm Practices Guidelines for Pig Producers in Manitoba (April 2007). Buffer zones around residential areas, residences, groundwater wells and surface water drainage systems (Figure 6) will be established as outlined in Table 5 below.

Table 5. Buffer Zones to be Established for Biosolid Application

Description	Recommended Buffer Zone Distance
Identified groundwater well	50 m
No application where there is less 1.5	n/a
Occupied Residence (other than the residence occupied by the owner of the land on which the biosolids are to be applied)	75 m ¹ (246 ft.)
Property line with residence	10 m ¹ (33 ft.)
Property line without residence	1.0 m ¹ (3.3 ft.)

Notes:

¹ *Farm Practices Guidelines for Pig Producers in Manitoba (April 2007)* if surface applied and incorporated within 48 hours

Buffer zones presented in Table 5 were adapted from the Farm Practices Guidelines for Pig Producers in Manitoba (April 2007) published by Manitoba Agriculture, Food and Rural Development (MARFD). Personal Communication (February 2015) with a Livestock Environment Specialist with MAFRD outlined that the setback distances published in the Farm Practices Guidelines for Pig Producers were established on reasonableness and effectiveness and have not been edited as there have been limited number of public complaints when these setbacks have been followed by pig manure applicators.

The Canadian Council of Ministers of the Environment (CCME) published; A Review of the Current Canadian Legislative Framework for Wastewater Biosolids, PN 1446, (2010) included in the publication is a summary of separation requirements for land application of biosolids in Canada (Table 5-G attached). Neighbouring provinces set back distances are summarized as follows:

- Alberta: With Subsurface application; 165 m from residential areas, 20 m occupied dwellings, 3 m from public building perimeter, 66 m from schools in session and 7 m out of session and 66 m from parks and playgrounds.

- Saskatchewan: 450 m from residential area, 90 m from individual residence, 200m from hospitals, 90 m from commercial land use, 200 m from schools and 90 m from parks and playgrounds.
- Manitoba: 1 Km from residential areas and 300 m from occupied residence.
- Ontario: 450 m from residential areas, 90 m from individual residences (generic).
 - Ontario further defines setback distances for on non-agricultural source materials (NASM), including biosolids, and is based on an odour classification.

To address potential odour issues associated with the beneficial use of NASM, the Ontario Regulation 267/03 approach under the Nutrient Management Act, 2002, sets out an odour classification system for NASM that are applied to agricultural land. There are three odour categories:

- OC1 has an odour detection threshold of less than 500 units per cubic metre.
- OC2 has an odour detection threshold equal to or greater than 500 units per cubic metre and less than 1500 units per cubic metre.
- OC3 has an odour detection threshold equal to or greater than 1500 units per cubic metre and less than 4500 units per cubic metre.

The Ontario Reg. 267/03 further classifies material into the three odour categories (OC1, OC2 and OC3) in Table 3. NASM Odour Category Table, an applicable summary is provided below.

- OC 1 - NASM that are less than 500 odour units:
 - Liquid anaerobically digested sewage biosolids from a municipal sewage treatment plant or its off-site storage facility.
- Residential dwelling: no application <25m.
- OC 2 – NASM that are equal to or greater than 500 odour units but less than 1500 odour units:
 - Liquid aerobically digested sewage biosolids from a municipal sewage treatment plant or its off-site storage facility.
- Residential dwelling: no application <25m, 25-90m injection or spreading & incorporation within 6 hours, >90m no restrictions.
- OC 3 – NASM that are equal to or greater than 1500 odour units but less than 4500 odour units:
 - Sewage biosolids which have been dewatered by a centrifuge operated at 2000 or higher revolutions per minute (rpm).
 - Sewage biosolids which have been dewatered and stored for 30 days or more after the dewatering process is completed.
- No application <100m, 100-450m injection or if injection not possible spreading & incorporation with 6 hours, >450m injection & incorporation within 24 hours.

The RM of Springfield considers the biosolids to be anaerobically digested sewage treatment and therefore under the Ontario Reg. an OC1 category would be applicable. This would establish the setback distances as; <25m with no application of a residential dwelling.

The examples from Ontario, Saskatchewan and Alberta demonstrate that the setback distance from residential development is 450m or less in other provincial jurisdictions and 90m or less from dwellings and Manitoba has the greatest distance for setback distances with 1Km for residential development and 300m for occupied residences. This NOA for the RM of Springfield presents a setback distance of 75m from an occupied residence with incorporation within 48 hours of application, this could be seen as reasonable setback distances based on practise in other provinces.

As rural villages and communities develop and grow, agricultural land is squeezed in with development and available land within a reasonable distance of the Oakbank and Dugald lagoons is at premium when competing with suitable lands for livestock manure application and nutrient management. Applying further constraint of greater setback distances increases the distance that needs to be traveled and increases costs. The proposed setback distances in this NOA are reasonable and within the practices established by other provincial regulators and livestock manure applicators.

MMM would like to request that Clause 14C setback distances for occupied residence in the EAL #2994 be reconsidered based on this argument presented.

Public Consultation

A public notification by MCWS was completed for the Springfield Biosolid EAP in 2009. Public responses were received and considered prior to EAL #2994 being granted. Due to a reduction in the land required for the application program and the addition of the three fields being located outside of the 1000 m buffer from residential areas (i.e. Communities of Oakbank and Dugald) as requested by the RM of Springfield in 2009, a public consultation for this change notice is not anticipated to be required.

Conclusion

MMM was retained by the RM of Springfield to complete the removal of sludge solids from the Oakbank and Dugald Wastewater Lagoons as required by EAL #2994. Through the process of reviewing EAL #2994 and planning for the land application program it has been determined that a Notice of Alteration (NOA) for EAL #2994 is required. This NOA is based upon the previously granted EAL #2994 and the accepted Environment Act Proposal submitted by Stantec in 2009.

The land base included in this submission includes three new fields to the land application program (NW10-11-5EPM, SW17-11-5EPM and SW26-11-5EPM). Within these three additional fields there are no new additions to soil series, the CLI classifications or the Nutrient Management Zones. Further, MMM have two further requests; change to clause 14C. in EAL #2994 regarding the reduction of buffer zones for occupied residences to 75 m and to permit composting of the heavy vegetation matter within cell four of the Oakbank system.

We respectfully request approval from MCWS for this NOA request diligently to permit continued planning for the land application program in 2016. Should MCWS have any further questions or require further clarification, please contact the undersigned at 204.272.2020 or keamd@mmm.ca.

Yours truly,

MMM Group Limited

Prepared by:



Brian Moons, B.Sc., EPT
Biologist

Reviewed by:



Darren Keam, M.Sc., P.Ag.
Senior Project Manager

BM/tc

attachments



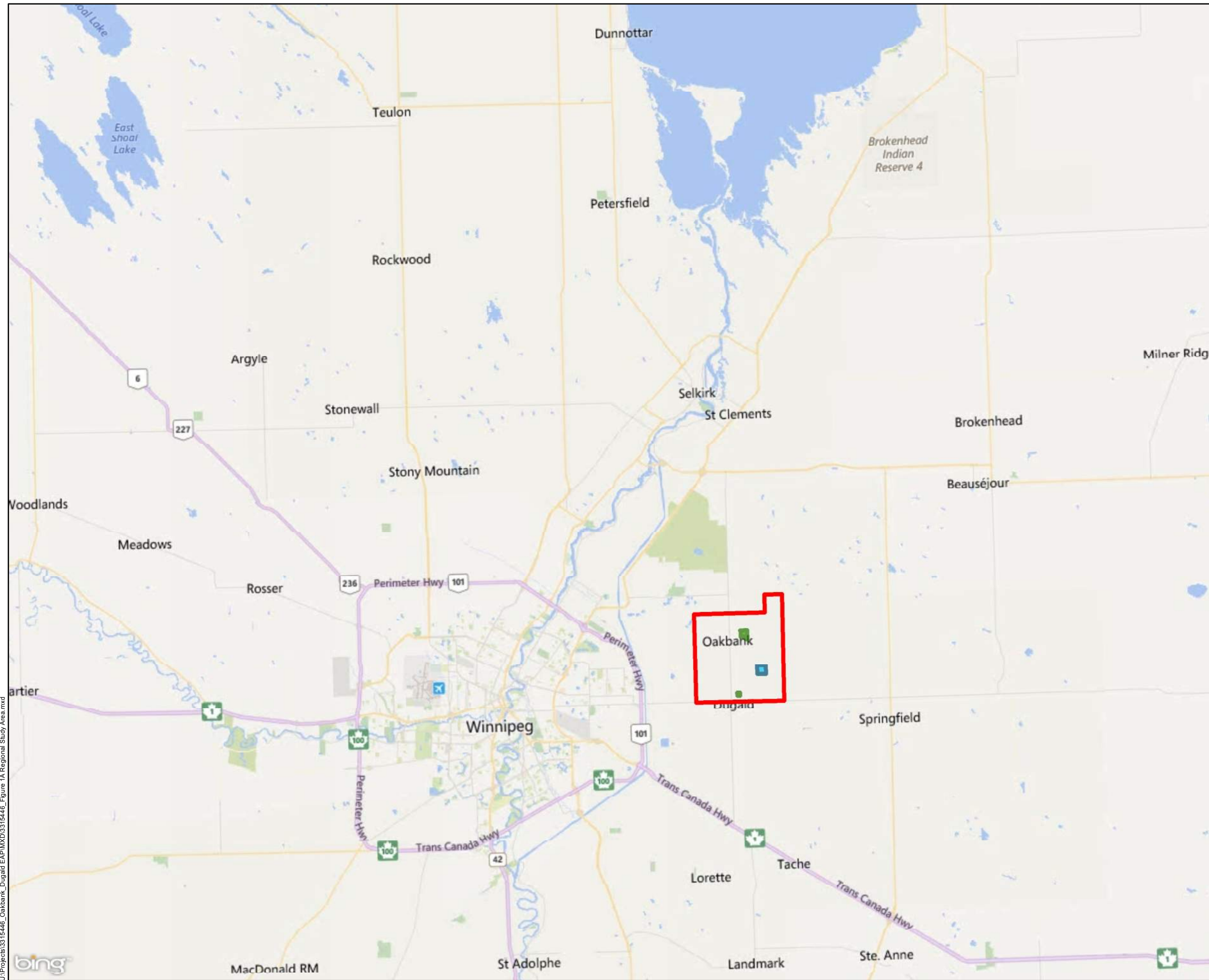
Photo 1. Excavator sampling Oakbank lagoon cells.



Photo 2. Thick cattail and canary grass growing in lagoons.



Date Taken: July 27, 2015	Client: RM of Springfield
Taken by: CBaldwin	Location: Oakbank, MB
Project No.: 3315446	



OAKBANK-DUGALD EAP

Legend

- Regional Study Area
- Former Wastewater Lagoon
- New Wastewater Treatment Site

Coordinate System: NAD 83, UTM Zone 14 N
 Data Source: MLI, MMM, Bing
 Date Created: January 18, 2015
 Revision Date: January 18, 2016

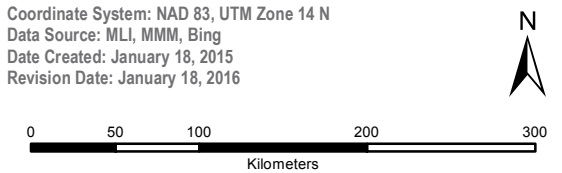
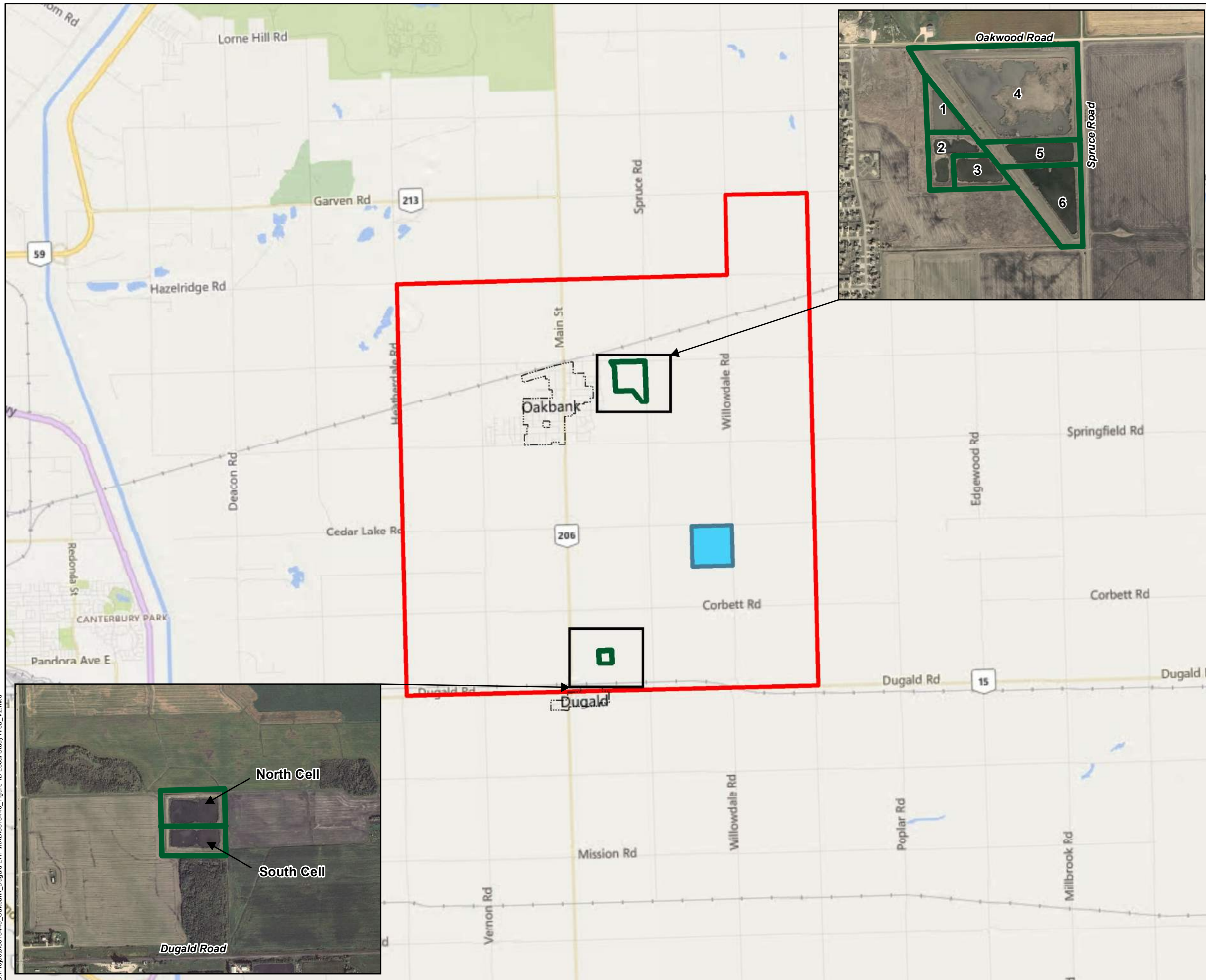


FIGURE 1A

Regional Study Area



OAKBANK-DUGALD EAP

Legend

- Regional Study Area
- Approximate Urban Area
- Former Wastewater Lagoon
- New Wastewater Treatment Site

Coordinate System: NAD 83, UTM Zone 14 N
 Data Source: MLI, MMM, Bing, NRCan
 Date Created: January 18, 2015
 Revision Date: February 11, 2016

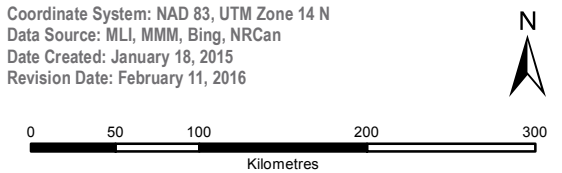


FIGURE 1B

Local Study Area

U:\Projects\3315446_Oakbank_Dugald EAP\MXD\3315446_Figure 1B Local Study Area_V2.mxd



OAKBANK-DUGALD EAP

- Legend**
- Regional Study Area
 - Local Study Area
 - Former Wastewater Lagoon
 - New Wastewater Treatment Site
 - Quarter Section Division
 - ~ Watercourse

Coordinate System: NAD 83, UTM Zone 14 N
 Data Source: Bing, MLI, MMM, MBCons, NRCan
 Date Created: January 18, 2015
 Revision Date: February 08, 2016

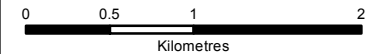
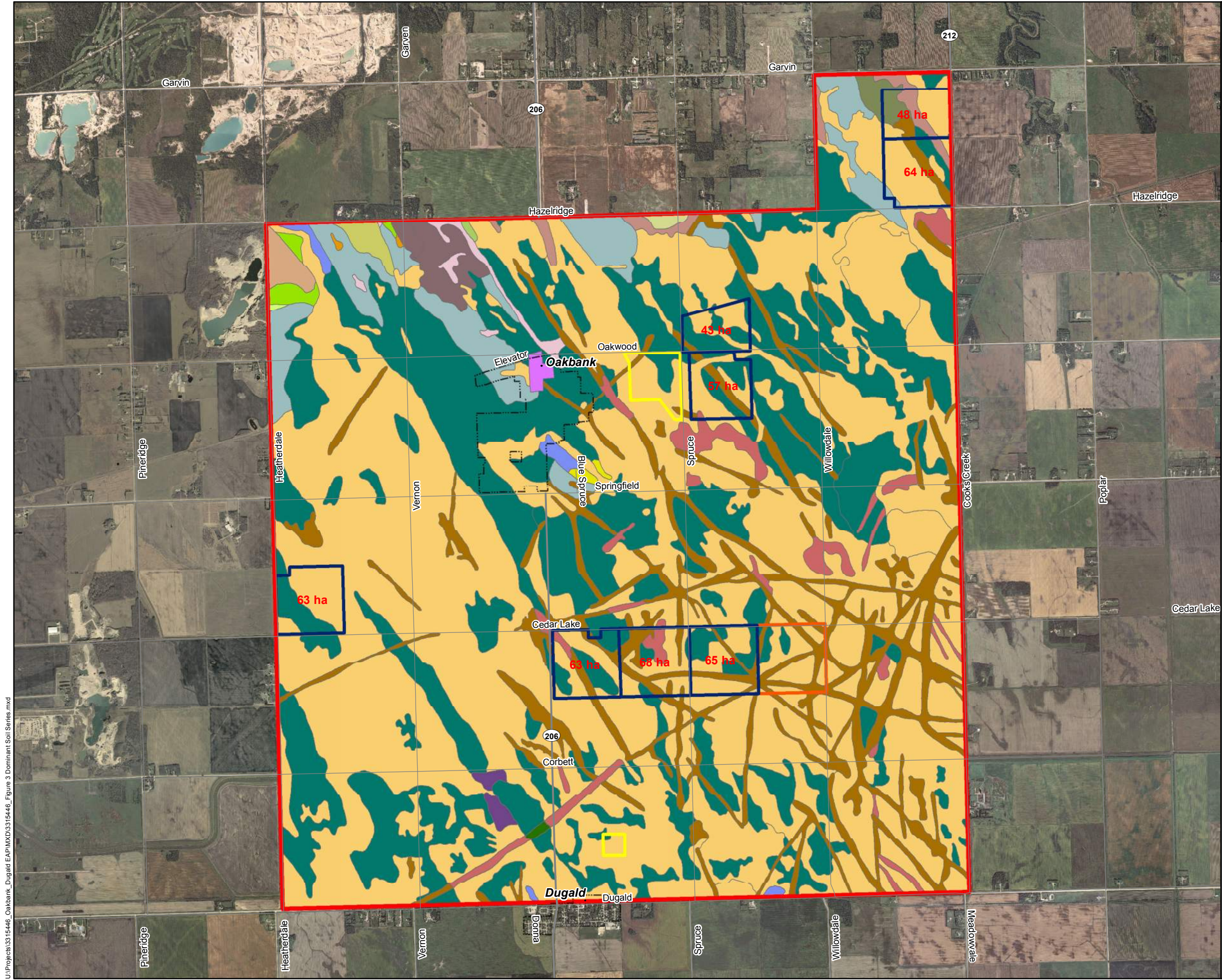


FIGURE 2

Fields for New Application Program



U:\Projects\3315446_Oakbank_Dugald EAP\MXD\3315446_Figure 2 New Application Program Fields.mxd



OAKBANK-DUGALD EAP

Legend

- Regional Study Area
- Local Study Area
- Former Wastewater Lagoon
- New Wastewater Treatment Site
- Approximate Urban Area

Dominant Soil Series

 Aneda	 Kline, drained
 Colby	 Leary
 Delmar	 Libau
 Dencross	 Marquette
 Glenella	 Myrtle
 Glenmoor, drained	 Niverville
 Greenwald	 Osborne, drained
 Gunton	 Osborne, peaty, drained
 Hoddinott	 Red River
 Isafold	 Scanterbury
 Kline	 Urban land

Coordinate System: NAD 83, UTM Zone 14 N
 Data Source: MLI, MMM, NRCan, Bing
 Date Created: January 18, 2015
 Revision Date: February 08, 2016

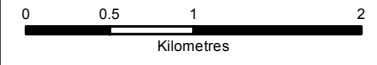
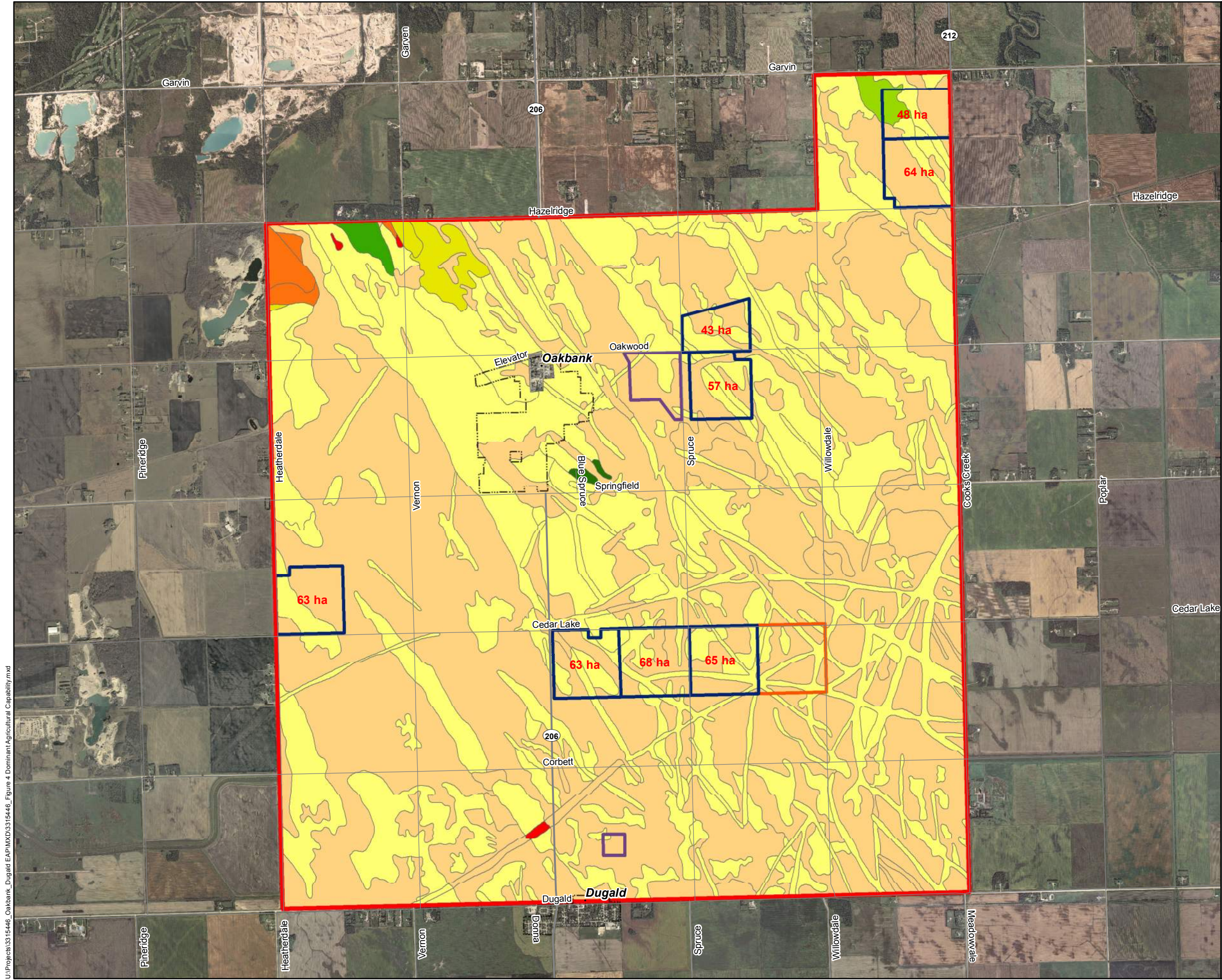


FIGURE 3
Dominant Soil Series
within Local Study Area

U:\Projects\3315446_Oakbank_Dugald EAP\MXD\3315446_Figure 3 Dominant Soil Series.mxd

U:\Projects\3315446_Oakbank_Dugald EAP\MXD\3315446_Figure 4 Dominant Agricultural Capability.mxd



OAKBANK-DUGALD EAP

Legend

- Regional Study Area
- Local Study Area
- Former Wastewater Lagoon
- New Wastewater Treatment Site
- Approximate Urban Area

Dominant Agricultural Capability Classification

- 1
- 3D
- 2D
- 3W
- 2M
- 5M
- 2W
- 5W

Agricultural Capability Classes	
Class	Description
1	Class 1 soils have no significant limitations for crops.
2	Class 2 soils have moderate limitations that restrict the range of crops that can be grown or require moderate conservation practices.
3	Class 3 soils have moderately severe limitations that restrict the range of crops that can be grown or require special conservation practices.
4	Class 4 soils have severe limitations that restrict the crops that can be grown or require special conservation practices, or both.
5	Class 5 soils have severe limitations that restrict their capability to producing perennial forage crops, and improvement practices are feasible.
6	Class 6 soils are capable of only supporting perennial forage crops, and improvement practices are not feasible.
7	Class 7 soils have no capability for arable culture or permanent pasture.

Coordinate System: NAD 83, UTM Zone 14 N
 Data Source: MLI, MMM, NRCan, Bing
 Date Created: January 18, 2015
 Revision Date: February 08, 2016

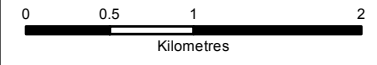
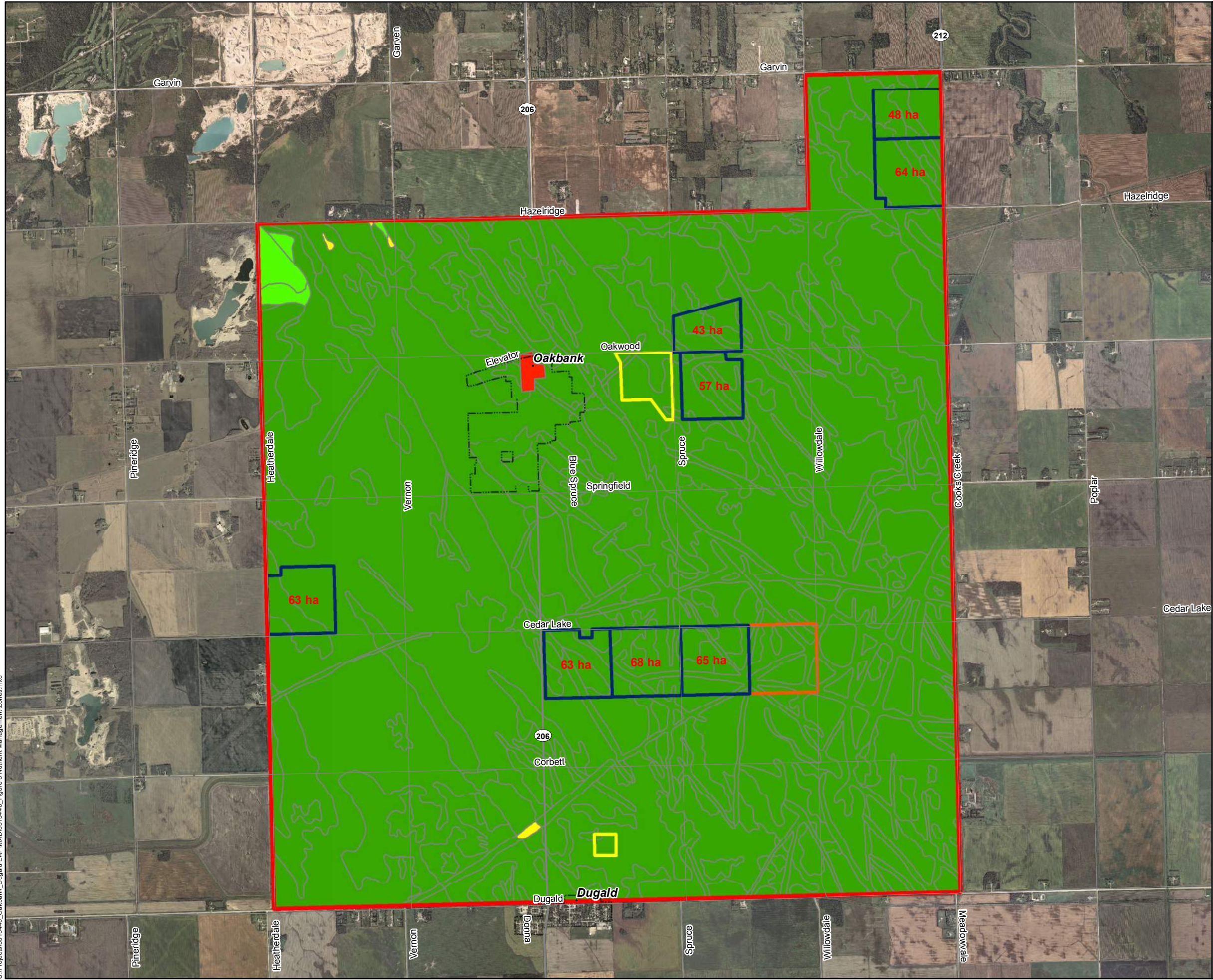


FIGURE 4
Dominant Agricultural Capability
within Local Study Area

U:\Projects\3315446_Oakbank_Dugald EAP\MXD\3315446_Figure 5 Nutrient Management Zones.mxd



OAKBANK-DUGALD EAP

Legend

- Regional Study Area
- Local Study Area
- Former Wastewater Lagoon
- New Wastewater Treatment Site
- Approximate Urban Area

Nutrient Management Zone

- N1
- N2
- N3
- N4
- N5

Note:
Nutrient Management Zone displayed are representative for the most limiting Agricultural Capability rating for the soil series.

Coordinate System: NAD 83, UTM Zone 14 N
Data Source: MLI, MMM, NRCan, Bing
Date Created: January 18, 2015
Revision Date: February 08, 2016

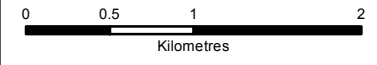


FIGURE 5
Nutrient Management Zones
within Local Study Area



OAKBANK-DUGALD EAP

- Legend**
- Regional Study Area
 - Local Study Area
 - Former Wastewater Lagoon
 - New Wastewater Treatment Site
 - Quarter Section Division

- Stream Order**
- 1 5
 - 2 6
 - 3 8
 - 4
- Cedar Lake

Coordinate System: NAD 83, UTM Zone 14 N
 Data Source: MLI, MMM, MBCons, NRCan, Bing
 Date Created: January 18, 2015
 Revision Date: February 08, 2016

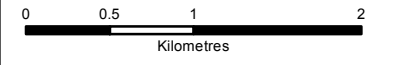


FIGURE 6

Designated Drains and Stream Order



U:\Projects\3315446_Oakbank_Dugald EAP\MXD\3315446_Figure 6 Designated Drains and Stream Order.mxd