APPENDIX B-1

Bloomington Oak Ridges Moraine Feasibility Review

Submitted to (Owner):

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Statement of Conditions

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Table of Contents

Figures

Appendices

Executive Summary

GEI has been retained by White Owl Properties Ltd. ("**WOP**") to complete a review of the Greenbelt and Oak Ridges Moraine (**ORM**) Planning Areas in Richmond Hill, Ontario ("Subject Lands"). With an increase in housing demand within Southern Ontario, a review of existing Planning Areas was completed to understand whether additional development areas may be present within the Subject Lands while ensuring protection and enhancement of existing natural heritage features. GEI has reviewed secondary source information and completed a site reconnaissance to inform this review to identify opportunities for refinement of the existing planning areas to further optimize developable area within the Subject Lands.

The Subject Lands are located within the Greenbelt Plan and Oak Ridges Moraine Conservation Plan (**ORMCP**) Area and are designated as a mix of ORM Countryside, Natural Core Area and Natural Linkage Area. The Countryside Area designation is generally applied to rural and agricultural lands that occupy the transition between Natural Core and Natural Linkage Areas and adjacent Settlement Areas. The ORM Natural Core Areas designation is typically applied to areas with high concentrations of Key Natural Heritage Features (**KNHFs**), Key Hydrologic Features (**KHFs**) and Key Hydrologic Areas (**KHAs**). The Natural Linkage Area designation is typically applied to areas that could serve as movement corridors between Natural Core Areas.

Currently the Subject Lands consist of golf course (Bloomington Aggregate Site), agricultural and industrial uses, with natural heritage features, including woodlands and wetlands, scattered throughout. There are no watercourses on the Subject Lands; two Headwater drainage features (**HDFs**) are present, although they would not be considered intermittent or permanent streams. These HDFs may provide indirect fish habitat within the Subject Lands. Three KHA were identified within the Subject Lands; these KHAs were associated with Highly Vulnerable Aquifers (**HVAs**), Significant Groundwater Recharge Areas (**SGRAs**) / Ecologically Significant Groundwater Recharge Areas (**ESGRAs**), and Significant Surface Water Contribution Areas. Multiple wetland vegetation communities were identified within the Subject Lands, including 12 units of the Wilcox-St. George Wetland Complex. Other unevaluated wetlands that were identified on the site should be considered candidate Provincially Significant Wetlands (**PSWs**) given their proximity to the existing mapped PSW units (based on the current wetland evaluation process in Ontario). Potentially suitable habitat for Species at Risk (**SAR**) and Significant Wildlife Habitat (**SWH**) were identified throughout the Subject Lands (generally in associated with woodlands and wetlands); however, detailed field investigations will be required to confirm whether the species are present and using the habitats. Wooded communities were also identified within the Subject Lands; further evaluation is required to determine whether these woodlands would meet the threshold for significance, but multiple woodlands have been identified as candidate significant woodlands for the purposes of this assessment. The Lake St. George Provincially Significant Life Science Area of Natural and Scientific Interest (**ANSI**) is present in the southern portion of the Subject Lands.

Based on GEI's review, redesignation of the Countryside Area to Settlement Area appears feasible to facilitate construction of residential development areas while ensuring important natural heritage features are protected. No redesignation of the Natural Linkage Area is proposed at this time. The proposed refinements are located within the Countryside designated areas which are generally within active golf course, industrial and agricultural areas. . Existing KNHFs and KHFs and their associated vegetation protection zones **(VPZ**), along with several proposed enhancement areas within the proposed Settlement Area would be protected from negative impacts associated with development. Several constraints scenarios were identified as future changes to wetland evaluation processes in the province may provide alternative future development scenarios. As shown on these features, the proposed refinements will ensure the protection and enhancement of existing features while redesignating areas without KNHF, KHF and KVAs. In addition to these refinement areas, potential enhancement areas were also considered to further strengthen and create a more resilient NHS.

Additional ecological, hydrogeological and geotechnical investigations are warranted to further refine the existing constraints within the Subject Lands to determine the available developable footprint and determine design/construction approaches. Several sanitary servicing strategies have been explored and determined that servicing from the York-Durham Sewage System (**YDSS**) is feasible. Servicing the Subject Lands with watermain distribution & treatment from regional infrastructure is also feasible as is controlling post-development flows on-site with various end-of-pipe facilities.

ACRONYMS

ANSIs- Areas of Natural or Scientific Interest
ARA- *Aggregate Resources Act*
CTC – Credit Valley, Toronto and Region and Central Lake Ontario
CUM1- Mineral Cultural Meadow
CUT1- Mineral Cultural Thicket
DFO- Fisheries and Oceans Canada
EA- Environmental Assessment
EASR- Environmental Activity and Sector Registry
ELC- Ecological Land Classification
ERO- Environmental Registry Ontario
ESA- *Endangered Species Act*
ESGRAs- Ecologically Significant Groundwater Recharge Areas
FO- Forest
FOD- Deciduous Forest
FOD2- Dry –Fresh Oak – Maple – Hickory Deciduous Forest
FOD3- Dry –Fresh Poplar - White Birch Deciduous Forest
FOD5- Dry –Fresh Sugar Maple Deciduous Forest
FOM- Mixed Forest
FOM2- Dry – Fresh White Pine – Maple - Oak Mixed Forest
GEI- GEI Consultants Ltd.
HADD- "the harmful alteration, disruption or destruction of fish habitat"
HDFs- Headwater Drainage Features
HVAs- Highly Vulnerable Aquifers
IPZ- Intake Protection Zone
KHAs- Key Hydrologic Areas
KHFs- Key Hydrologic Features
KNHFs- Key Natural Heritage Features
LID- Low Impact Development
LIO- Land Information Ontario
LSRCA- Lake Simcoe Region Conservation Authority
MA- Marsh
MAM- Meadow Marsh
MAM2- Mineral Meadow Marsh
MAS- Shallow Marsh
MAS2-1- Cattail Mineral Shallow Marsh
MECP- Ministry of Environment, Conservation and Park
MENDM- Ministry of Energy, Northern Development and Mines
MNR- Ministry of Natural Resources
MNRF- Ministry of Natural Resources and Forestry

MTO- Ministry of Transportation
NEP- Niagara Escarpment Plan
NHE- Natural Heritage Evaluation
NHIC- Natural Heritage Information Centre
NHRM- Natural Heritage Reference Manual
NHS- Natural Heritage System
O. Reg. – Ontario Regulation
OAO- Open Water (Pond)
OBBA- Ontario Breeding Bird Atlas
OGS- Ontario Geological Survey
OP- Official Plan
OPSDs- Ontario Provincial Standard Drawings
ORMCP- Oak Ridges Moraine Conservation Plan
ORM-Oak Ridges Moraine
OSHA- Occupational Safety and Health Administration
OWES- Ontario Wetland Evaluation System
PCAs- Potentially Contaminating Activities
PPS- Provincial Policy Statement
PSWs- Provincially Significant Wetlands
PTTW- Permit to Take Water
SAR- Species at Risk
SARO- Species at Risk in Ontario
SGRAs- Significant Groundwater Recharge Areas
SW- Swamp
SWC- Coniferous Swamp
SWD- Deciduous Swamp
SWD4- Mineral Deciduous Swamp
SWH- Significant Wildlife Habitat
SWM- Mixed Swamp
SWM1- White Cedar Mineral Mixed Swamp
SWMP- Stormwater Management Pond
SWT- Thicket Swamp
SWT2-2- Willow Mineral Thicket Swamp
SWT2-5- Red-osier Mineral Thicket Swamp
TRCA- Toronto and Region Conservation Authority
VPZ- Vegetation Protection Zone
WHPA- Wellhead Protection Area
WOP- White Owl Properties Ltd.
YDSS - York-Durham Sewage System
YDSS- York-Durham Sewage System

1. Introduction

GEI Consultants Ltd. (**GEI**) has been retained by White Owl Properties Ltd. ("**WOP**") to complete a review of the Greenbelt Planning Areas and the Oak Ridges Moraine Conservation Plan (**ORMCP**) Areas within the property located in the Town of Richmond Hill, Ontario. Specifically, a review was completed for WOP's properties located south of Bloomington Road, east of Bayview Avenue, west of Leslie Street, and north of Lake St. George and Diamond Back Golf Club followed by Bethesda Sideroad. This block is herein referred to as the Subject Lands, as shown on **Figure 1**.

The Subject Lands are located within both the Greenbelt Planning Area (i.e., Greenbelt), and the Oak Ridges Moraine Conservation Plan Area (i.e., Oak Ridges). These two planning areas as shown on **Figure 2**.

With the increased housing demand from our population and existing communities, a review of existing areas within the Greenbelt and Oak Ridges must be undertaken to understand whether additional developable areas may be present. This review must also ensure the protection of natural heritage features within the landscape and provide opportunities for adequate servicing solutions to develop the Subject Lands. GEI has undertaken a high-level review to identify areas within the Subject Lands that are currently included within the Greenbelt and Oak Ridges plan areas where opportunities to refine and/or remove existing designations could be considered.

Figure 1: Location of Subject Lands

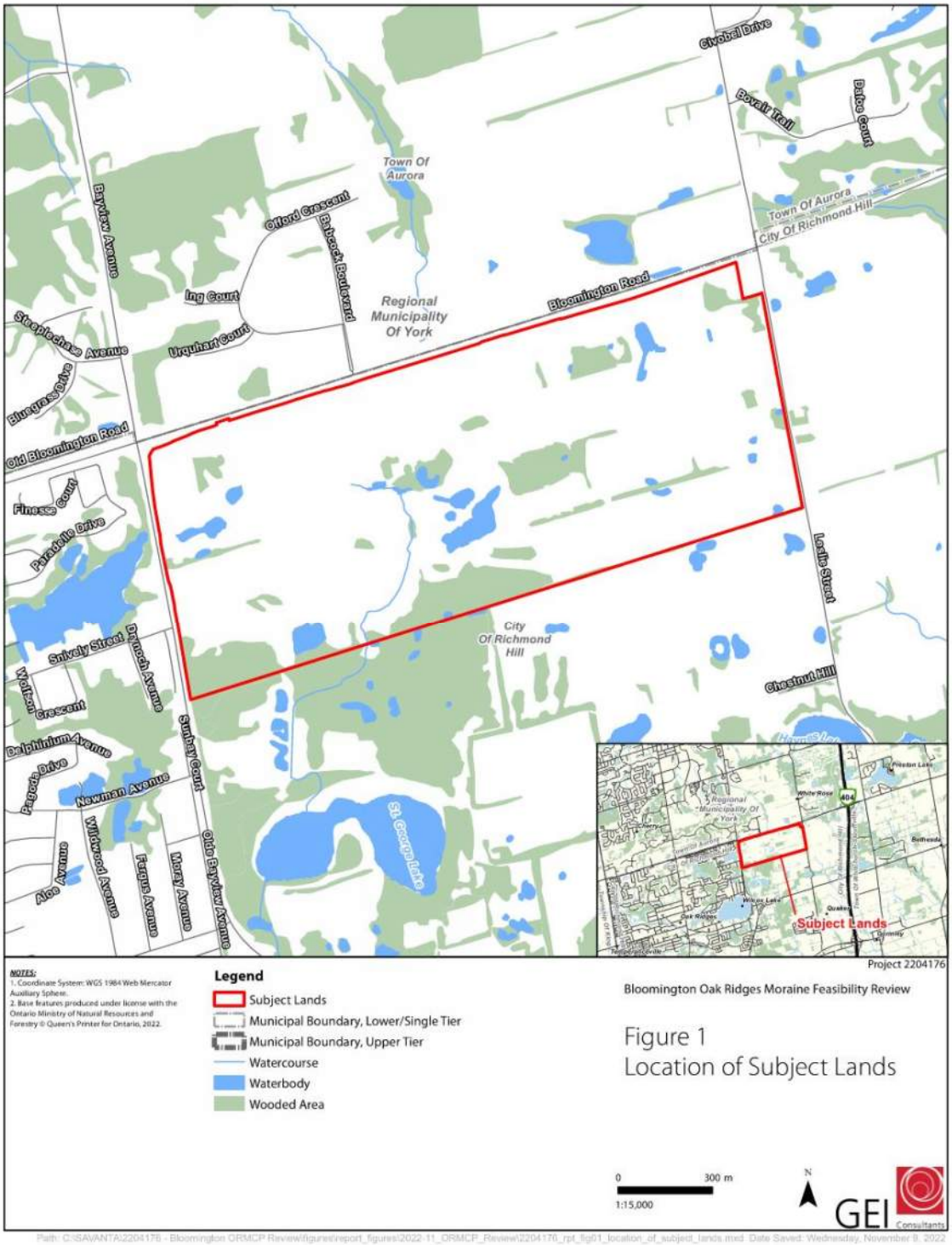
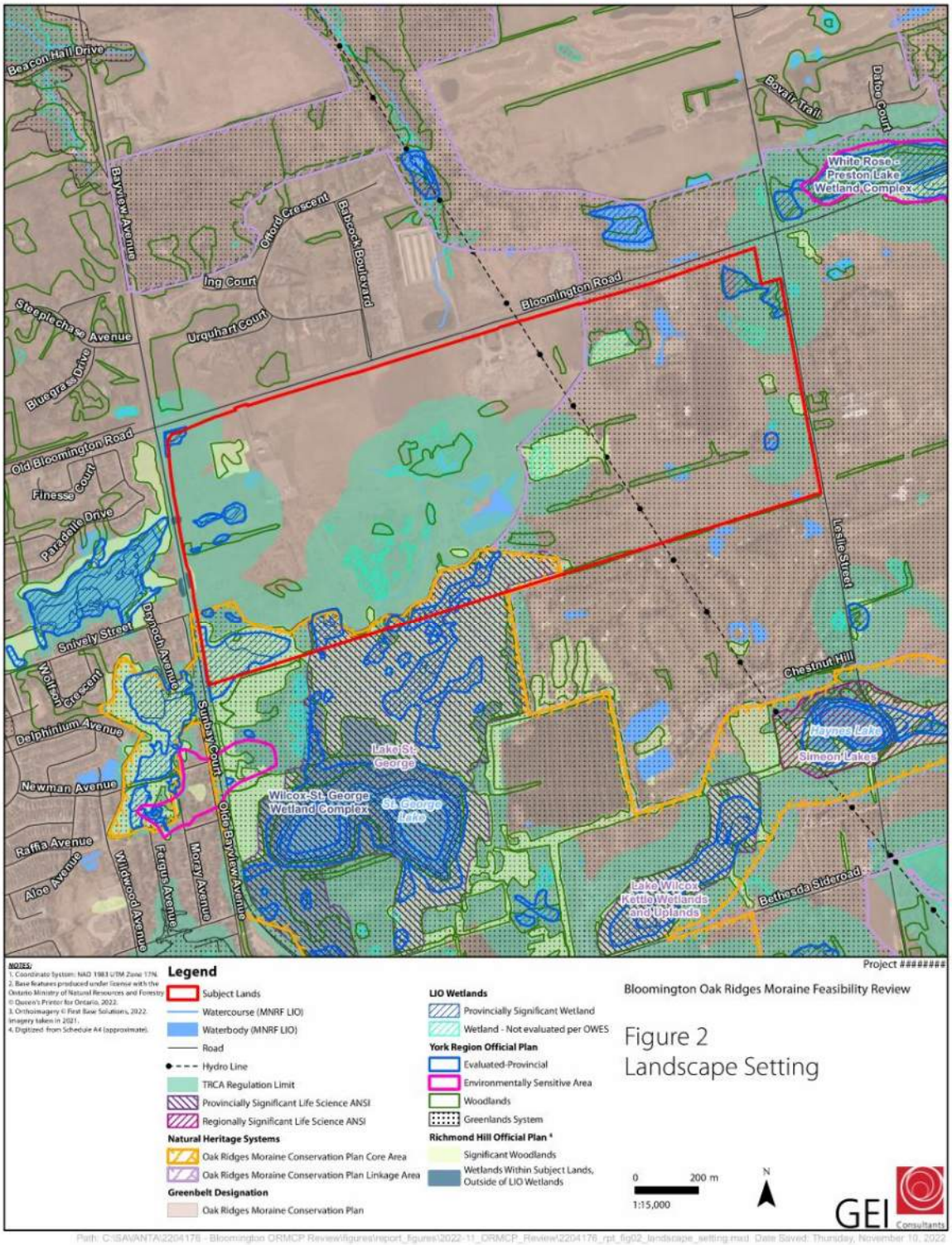


Figure 2: Landscape Setting



2. Context in Natural Heritage Systems

An assessment of the quality and extent of natural heritage features found on, and adjacent to, the Subject Lands and an analysis of the potential constraints to development associated with these features was undertaken to comply with requirements of the following regulatory agencies, local municipality, and/or legislation:

- City of Richmond Hill Official Plan (**OP**; 2010);
- York Region OP (2010);
- Toronto and Region Conservation Authority (**TRCA**) Living City Policies and Ontario Regulation (**O. Reg.**) 166/06;
- Provincial Policy Statement (**PPS**; MMAH 2020);
- Greenbelt Plan (2017);
- Oak Ridges Moraine Conservation Plan (2017);
- *Endangered Species Act* (**ESA**; 2021 Consolidation of S.O. 2007, c. 6);
- *Fisheries Act* (R.S.C., 1985, c. F-14); and
- *Aggregate Resources Act* (R.S.O. 1990, c. A.8)

2.1 City of Richmond Hill Official Plan

As defined in the City of Richmond Hill OP (2010), the Greenway System includes the following natural heritage system (**NHS**) components:

a. The Greenbelt Plan's NHS;
b. The ORMCP's Natural Core Areas and Natural Linkage Areas;
c. The York Region Greenlands System;
d. Key Natural Heritage Features (**KNHFs**) and Key Hydrologic Features (**KHFs**) and their minimum vegetation protection zones; and
e. Other natural heritage and hydrologic features and functions as may be identified through the completion of Natural Heritage Evaluations (**NHE**), hydrological evaluation or other studies, such as non-significant woodlands, non-significant valleylands, headwater drainage features, and vernal pools.

KNHFs consist of:

- Habitat of endangered species and threatened species;
- Fish habitat;
- Wetlands;
- Life Science Areas of Natural or Scientific Interest (**ANSIs**);
- Environmentally significant areas;
- Significant valleylands;
- Significant woodlands;

- Significant wildlife habitat (**SWH**; including habitat of species at risk, including special concern species as identified by the Province); and
- Sand barrens, savannahs, tallgrass prairies and alvars.

The KHFs consist of:

- Permanent and intermittent streams;
- Lakes, including kettle lakes (and their littoral zones);
- Seepage areas and springs; and
- Wetlands.

The City of Richmond Hill (2010) further indicates that development and site alteration are not permitted within the NHS. Development and site alteration within 120 m of the NHS shall be accompanied by a NHEE hydrological evaluation.

Based on review of the City of Richmond Hill OP (2010) and its associated Schedules, the following Planning Area designations and Natural Heritage Features are present in or within the vicinity of the Subject Lands:

- The Subject Lands are designated as part of the Greenway System under Schedule A1 ("Urban Structure") of the City of Richmond Hill OP (2010);
- According to Schedule A2 ("Land Use") the southwestern to central portion of the Subject Lands is considered Oak Ridges Moraine (**ORM**) Natural Core Area. The northeastern and southeastern to central portion is considered an ORM Natural Linkage Area. The northwestern to central portion is considered ORM Countryside;
- An ANSI is located at the southwestern portion of the Subject Lands and extends past the property boundary down and around Lake St. George;
- There are also significant woodlands and wetlands on the Subject Lands as per Schedule A4 ("Key Natural Heritage Features and Key Hydrological Features"; and
- The Subject Lands are an area of high aquifer vulnerability as mapped in Schedule A5 ("ORM Areas of High Aquifer Vulnerability and Wellhead Protection Areas").

Natural heritage features and relevant land use designations identified in the City of Richmond Hill OP (2010) are illustrated in **Figure 2**.

2.2 York Region Official Plan

Similar to the City of Richmond Hill OP, the Region of York OP (2010) designates the Subject Lands as part of the Greenbelt and the ORMCP as per Map 1 ("Regional Structure"). Map 3 ("Environmentally Significant Areas and Areas of Natural and Scientific Interest") identify the Subject Lands to include a Life Science ANSI, Map 4 ("Key Hydrological Features") and Map 5 ("Woodlands") also identify the wetlands and woodlands discussed in the City of Richmond Hill OP.

Large portions of the Subject Lands are identified as part of the Regional Greenlands System on Map 2 ("Regional Greenlands"). The Regional Greenlands System is comprised of core areas, corridors and linkages. Core areas have high concentrations of significant natural features (including significant woodlands, wetlands, Life Science ANSIs and Environmentally Significant Areas). Corridors include existing significant valleylands and watercourses. Linkages connect core areas together and are identified as restoration areas.

The Region of York OP (2010) indicates that development and site alteration within the Regional Greenlands System are prohibited unless it is demonstrated through a NHE, hydrological evaluation, or environmental impact study that the development or site alteration will not result in a negative impact on the natural feature or its ecological functions.

Natural heritage features and relevant land use designations identified in the York Region OP (2010) are illustrated on **Figure 2**.

2.3 Toronto and Region Conservation Authority

The TRCA conducts reviews of planning processes associated with development of properties within its jurisdictional boundaries. In addition, TRCA provides planning and technical advice to planning authorities to assist them in fulfilling their responsibilities regarding natural hazards, natural heritage and other relevant policy areas pursuant to the *Planning Act* (1990).

The TRCA administers the Regulation of Development, Interference with Wetlands, Alterations to Shorelines and Watercourses, under O. Reg. 166/06. Authorizations are required from the TRCA for any development within their regulated areas which include watercourses, flooding and erosion hazards and wetlands as well as regulated allowances adjacent to these features.

Several TRCA regulated areas were identified along the north, southern and central portions of the Subject Lands (**Figure 2**). Portions of these regulated areas are associated with wetland and wooded communities, Lake St. George and Lake Haynes.

As of the time of writing of this report, this section is consistent with TRCA's current mandate. However, proposed changes to the *Conservation Authorities Act* as part of Bill 23 in late October 2022 could potentially result in changes to the features regulated by TRCA and the role TRCA would play in the development review process.

2.4 Provincial Policy Statement

The Provincial Policy Statement (; MMAH 2020) provides guidance on matters of provincial interest surrounding land-use planning and development. It "supports improved land use planning and management, which contributes to a more effective and efficient land use planning system" (p. 1). The PPS is to be read in its entirety and land-use planners and decision-makers need to consider all relevant policies and how they work together.

Eight types of significant natural heritage features are defined in the PPS, as follows:

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- SWH;
- Fish habitat;
- Habitat of endangered and threatened species; and
- ANSIs.

The PPS indicates that development and site alteration shall not be permitted in significant wetlands within EcoRegions 5E, 6E and 7E, or in significant coastal wetlands. Development and site alteration shall not be permitted in significant woodlands, significant valleylands, SWH or significant ANSIs, unless it is demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Development and site alteration shall not be permitted in the habitat of endangered and threatened species or in fish habitat, except in accordance with provincial and federal requirements.

Development and site alteration may be permitted on lands adjacent to the above features provided it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

2.5 Greenbelt Plan

The Greenbelt Plan (2017) works to permanently protect environmentally sensitive areas, due to their ecological value, within the Golden Horseshoe. It is intended to enhance the natural landscapes by working to facilitate the connection of environmentally significant areas and reducing fragmentation of the landscape. Protection is offered also to permanent agricultural areas ensuring the permanency and sustainability of natural resources.

As described within Section 2 of the Greenbelt Plan (2017), the Greenbelt Area includes lands within the Niagara Escarpment Plan (**NEP**) Area, the Oak Ridges Moraine Area, the Parkway Belt West Plan Area and lands designated as Protected Countryside and as Urban River Valley.

According to the Greenbelt Plan (2017) Appendix II (“Schematics showing settlements within Greenbelt Area”), the Subject Lands are listed as other designations in the Oak Ridges Moraine Area. A further breakdown of the land use designations in the Oak Ridges Moraine Area is discussed in **Section 2.6**.

Section 4.1.1 of the Greenbelt Plan indicates that proposals for non-agricultural uses must demonstrate the following:

1. The use is appropriate for the location in a rural area;
2. The type of water and sewer servicing proposed is appropriate for the type of use;
3. There are no negative impacts on KNHFs and/or KHFs or their functions; and
4. There are no negative impacts on the biodiversity or connectivity of the NHS.

The Greenbelt Plan (2017) contains policies to protect key hydrologic areas (**KHAs**), KHFs and KNHFs.

KHAs include the following:

- Significant groundwater recharge areas (**SGRAs**);
- Highly Vulnerable Aquifers (**HVAs**); and
- Significant surface water contribution areas.

KHFs include the following:

- Permanent and intermittent streams;
- Lakes (and their littoral zones);
- Seepage areas and springs; and
- Wetlands.

KNHFs include the following:

- Habitat of Endangered and Threatened species;
- Fish habitat;
- Wetlands;
- Life science ANSIs;
- Significant valleylands;
- Significant woodlands;
- SWH (including habitat of special concern species);
- Sand barrens, savannahs and tallgrass prairies; and
- Alvars.

2.6 Oak Ridges Moraine Conservation Plan

The ORMCP (2017) was created to provide land-use and resource management planning to protect the Moraine's ecological and hydrological features and functions. The lands identified as part of the ORMCP and the NEP are also subject to the Greenbelt Plan. The Greenbelt Plan, together with the Growth Plan for the Greater Golden Horseshoe, builds on the PPS to provide a land-use planning framework to protect the environment while supporting the provincial economy.

The following land-use designations are recognized under the ORMCP:

- Natural Core Areas – areas with high concentrations of KNHFs, KHFs, ecological functions or landform conservation areas;
- Natural Linkage Areas – areas that form part of a central corridor that support or have the potential to support movement of plants and animals between Natural Core Areas, Natural Linkage Areas, river valleys and stream corridors;
- Countryside Areas – rural lands; and
- Settlement Areas – urban development.

The ORMCP identifies the following as KNHFs:

- Wetlands;
- Habitat of endangered and threatened species;
- Fish habitat;
- ANSIs (Life Science);
- Significant valleylands;
- Significant woodlands;
- SWH (including habitat of special concern species); and
- Sand barrens, savannahs and tallgrass prairies.

The ORMCP identifies the following as KHFs:

- Permanent and intermittent streams;
- Wetlands;
- Kettle lakes; and
- Seepage areas and springs.

Designated Natural Core Areas, Natural Linkage Areas, and Countryside Areas are present within the Subject Lands. The core areas were identified in the southwestern to central portion of the Subject Lands located around Lake St. George and the associated wetlands and wooded communities. The linkage areas are in the northeastern and southeastern to central portion of the Subject Lands near the wooded and wetland communities along Bloomington Road and Leslie Street. The countryside areas are in the northwestern to central portion of the Subject Lands near the wooded and wetland communities along Bayview Avenue and Bloomington Road.

2.7 Endangered Species Act

The provincial ESA, 2007a (Consolidation 2021) was developed to:

- Identify species at risk (**SAR**) based upon best available science;
- Protect SAR and their habitats and to promote the recovery of the SAR; and
- Promote stewardship activities that would support those protection and recovery efforts.

The ESA protects all threatened, endangered and extirpated species listed on the Species at Risk in Ontario (**SARO**) list (Government of Ontario 2007b). These species are legally protected from harm or harassment, and their associated habitats are legally protected from damage or destruction, as defined under the ESA, unless authorized through a permitting or registration process.

2.8 Fisheries Act

Fisheries and Oceans Canada (**DFO**) administers the federal *Fisheries Act*, 1985, which defines fish habitat as "water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas" (s. 2(1)). The *Fisheries Act* prohibits the death of fish by means other than fishing (s. 34.4(1)), and the harmful alteration, disruption or destruction of habitat (**HADD**; s. 35(1)), unless permitted under a Fisheries Act Authorization.

2.9 Aggregate Resource Act

The Ministry of Natural Resources and Forestry (**MNRF**) administers the *Aggregate Resources Act* (**ARA**). The purpose of the Aggregate Resources Act is to minimize the adverse environmental impacts of aggregate operations while managing the aggregate resources to meet local, regional and provincial demand. The ARA controls and regulates aggregate operations on Crown land and private land in designated areas and requires the progressive and final rehabilitation of land from which aggregate has been excavated. The ARA provides for:

- The management of the aggregate resources of Ontario;
- To control and regulate aggregate operations on Crown and private lands;
- To require the rehabilitation of land from which the aggregate has been excavated; and
- To minimize adverse impact on the environment in respect of aggregate operations.

On private land, a Class A License is permitted to a Site where more than 20,000 tonnes of aggregate is removed on an annual basis and a Class B License is permitted to a Site where 20,000 tonnes or less of aggregate is removed annually.

A 61.9 hectare (Ha) portion of the Subject Lands is noted as Authorized Aggregate Site as an Above Water Active Pit (ALPS ID 6550) identified as the Bloomington Aggregates site.

3. Ecological Characterization

3.1 Secondary Source Review

GEI has relied, in part, upon supporting secondary source information to provide insight into the overall character of the Subject Lands. These resources included:

- Land Information Ontario (**LIO**) natural features mapping (2022);
- Natural Heritage Information Centre (**NHIC**) database (2022);
- Provincial wildlife atlases (i.e., Ontario Breeding Bird Atlas, etc.);
- Citizen Science Databases (i.e., iNaturalist and eBird); and
- DFO Aquatic Species at Risk Distribution Mapping (DFO 2022).

The results of these secondary source reviews are discussed in the following sections.

3.1.1 Land Information Ontario Natural Features

The LIO geographic database (2022) identifies the following features on or within 120 m of the Subject Lands (as depicted in **Figure 2**):

Within the Subject Lands

- Woodlands;
- Provincially Significant Wetlands- Wilcox-St. George Wetland Complex;
- Unevaluated wetlands; and
- Lake St. George ANSI.

Within 120 m of Subject Lands

- Woodlands;
- Provincially Significant Wetlands- Wilcox-St. George Wetland Complex; and
- Lake St. George ANSI.

3.1.2 Natural Heritage Information Centre

The NHIC (2022) database was searched for records of provincially significant plants, vegetation communities and wildlife on and in the vicinity of the Subject Lands. The database provides occurrence data by 1 km^2 area squares, with six squares overlapping the Subject Lands: 17PJ2569, 17PJ2669, 17PJ2769, 17PJ2568, 17PJ2668 and, 17PJ2768.

In total, six species of interest were recorded in the atlas squares that overlap with the Subject Lands:

- Species listed as Threatened or Endangered on the SARO list:
    - Black Ash (*Fraxinus nigra*) – Endangered;
    - Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*) – Endangered; and
    - Bobolink (*Dolichonyx oryzivorus*) – Threatened.

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1-S3 species):
    - Wood Thrush (*Hylocichla mustelina*) – Special Concern;
    - Eastern Wood-pewee (*Contopus virens*) – Special Concern; and
    - Snapping Turtle (*Chelydra serpentina*) – Special Concern

In addition, a restricted species record is identified within the atlas squares. The NHIC restricts species records when they pertain to species that are often commercially exploited or highly sensitive to disturbance. Therefore, the identity of this species could not be confirmed for this assessment. Confirmation of the species is recommended to be completed prior to the onset of detailed SAR habitat assessment or SAR surveys.

3.1.3 Ontario Breeding Bird Atlas

The Ontario Breeding Bird Atlas (**OBBA**) contains detailed information on the population and distribution status of Ontario birds (Bird Studies Canada *et al*. 2006). The data are presented on 100 km^2 area squares with one square overlapping a portion of the Subject Lands (17PJ26). It should be noted that the Subject Lands represent only a small component of the overall bird atlas square. Therefore, it is unlikely that all species noted within this atlas square will be found within the Subject Lands. Habitat type, availability and size are all contributing factors in species presence and use.

In total, 119 species were recorded in the atlas square that overlap with the Subject Lands, with the following species of interest noted:

- Species listed as Threatened or Endangered on the SARO list:
    - Barn Swallow (*Hirundo rustica*) – Threatened;
    - Bobolink – Threatened;
    - Eastern Meadowlark (*Sturnella magna*)– Threatened;

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1-S3 species):
    - Canada Warbler (*Cardellina canadensis*) – Special Concern;
    - Eastern Wood-Pewee – Special Concern;
    - Wood Thrush – Special Concern;
    - Evening Grosbeak (*Coccothraustes vespertinus*) – Special Concern;
    - Purple Martin (*Progne subis*) – S3B (Vulnerable);
    - Black-Crowned Night Heron (*Nycticorax nycticorax*) – S3B.

3.1.4 Ontario Reptile and Amphibian Atlas

The Ontario Reptile and Amphibian Atlas contains detailed information on the population and distribution status of Ontario herpetofauna (Ontario Nature 2019). The data are presented on 100 km^2 area squares with one square overlapping a portion of the Subject Lands (17PJ26). It should be noted that the Subject Lands represent only a small component of the overall atlas square. Therefore, it is unlikely that all species noted within this atlas square are found within the Subject Lands. Habitat type, availability and size are all contributing factors in species presence and use.

In total, 21 species were recorded in the atlas square that overlaps with the Subject Lands, with three species of interest noted: Jefferson Salamander (Ambys*toma jeffersonianum*), listed as Endangered, Blanding's Turtle (*Emydoidea blandingi*), listed as Threatened and Snapping Turtle, listed as Special Concern.

3.1.5 Ontario Butterfly and Moth Atlases

The Ontario Butterfly and Moth Atlases (Toronto Entomologists' Association 2022, 2020), contain detailed information on the population and distribution status of Ontario butterflies and moths. The data are presented on 100 km^2 area squares with one square overlapping a portion of the Subject Lands (17PJ26). It should be noted that the Subject Lands represent only a small component of the overall atlas square. Therefore, it is unlikely that all species noted within this atlas square is found within the Subject Lands. Habitat type, availability and size are all contributing factors in species presence and use.

In total, 87 species were recorded in the atlas square that overlaps with the Subject Lands. Of these, two Species of Conservation Concern were noted: Monarch (*Danaus plexippus*), which is listed as Special Concern in Ontario, and Walnut Caterpillar Moth (*Datana integerrima*) ranked as S3 (Vulnerable)/S4 in Ontario.

3.1.6 Aquatic Species at Risk Distribution Mapping

Aquatic species at risk distribution mapping (DFO 2022) was reviewed to identify any known occurrences of aquatic SAR, including fish and mussels, within the subwatershed where the Subject Lands is located.

No aquatic SAR (i.e., fish or mussels) were identified on or within the general vicinity of the Subject Lands.

3.1.7 eBird Results

The eBird (2022) database is a large citizen science-based project with a goal to gather bird diversity information in the form of checklists of birds, archive it, and share it to power new data-driven approaches to science, conservation and education. As the observations can be submitted by anyone, and the records are not officially vetted, the data obtained from this tool should not be used as a clear indicator of species presence, and species may be filtered out based on habitat and target survey efforts.

This online database was examined to identify observations made within or adjacent to the Subject Lands. However, no species of interest were found on or within 120 m of the Subject Lands.

3.1.8 iNaturalist Results

The iNaturalist (2022) database is a large citizen science-based identification and data collection app. It allows any citizen to submit observations to be reviewed and identified by other naturalists and scientists to help provide accurate species observations. As the

observations can be submitted by anyone, and the records are not officially vetted, the data obtained from this tool should not be used as a clear indicator of species presence, and species may be filtered out based on habitat and targeted survey efforts.

This online database was examined to identify observations made within or adjacent to the Subject Lands. One species was found on or within 120 m of the Subject Lands: Monarch (*Danaus plexippus*)- Special Concern.

3.2 Site Reconnaissance Findings

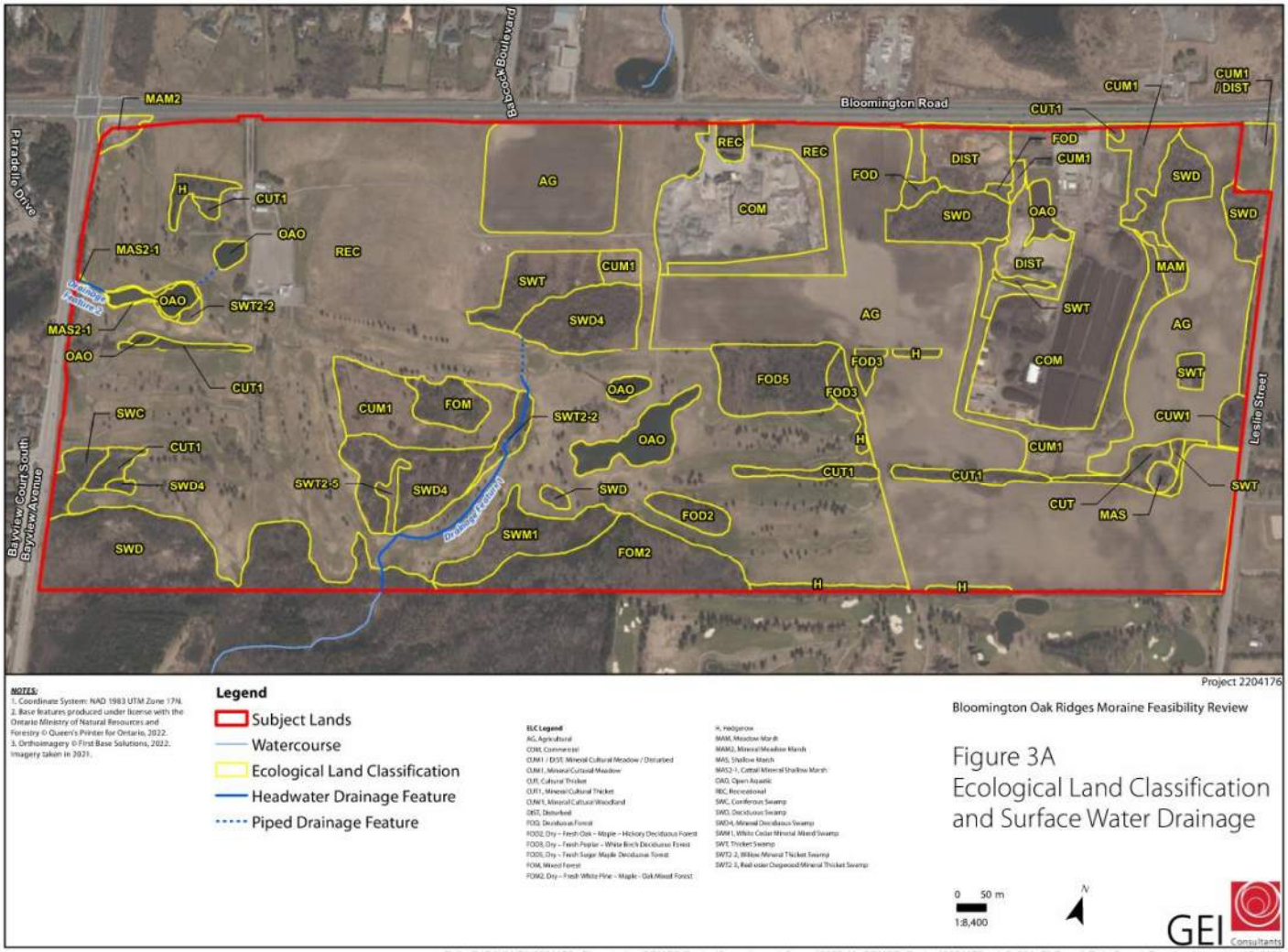
A site reconnaissance was conducted by GEI's Ecology team on November 1, 2022, to generally characterize the Subject Lands. The reconnaissance was limited to the Bloomington Downs Golf Course lands as access was not available to the remainder of the Subject Lands (i.e., within the existing asphalt operations of Miller Paving and the existing compost operations of Miller Waste). As discussed above within **Section 3.1.1**, provincially significant wetlands are present within these portions of the site. No other significant features appear present based on aerial review. A desktop review was conducted for the inaccessible portions of the property. Findings and initial interpretations are provided in the following sections.

3.2.1 Aquatic Ecology

TRCA mapping (TRCA, 2020) identified a single regulated watercourse within the Subject Lands (**Figure 2**). A tributary of the East Humber River, this regulated feature was mapped by TRCA as originating just upstream from a woodland/wetland in the approximate mid-point of the Subject Lands and then flowing south through multiple wetlands before flowing off site into the adjacent woodland.

During the November 1, 2022, site investigation, this feature (referred to as Drainage Feature 1 for the purposes of this assessment) was observed to originate within the swamp thicket/deciduous swamp at the mid-point of the Subject Lands (**Figure 3A**). While TRCA mapping depicts this feature as originating in the golf course area northwest of the swamp, no evidence of this feature in this location was observed during the investigation. Dry during the time of the inspection, this feature is piped beneath the adjacent fairway and outlets at the northeast corner of a second swamp thicket/deciduous swamp woodland. A narrow and poorly defined channel traverses the eastern edge of the swamp thicket for approximately 90 m before directing flow into a narrow grass swale along the cart path and fairway. The grass swale passes through a series of small diameter culverts along the cart path before finally discharging into woodland at the southern end of the Subject Lands. The feature flows into Lake St. George approximately 650 m south of the Subject Lands. This feature is anticipated to convey seasonal flows but was dry during the time of inspection. While TRCA has mapped this feature as a regulated watercourse, based on the site observations (extensive piping through the golf course, lack of well-defined channel), this drainage feature would more appropriately be considered a headwater drainage feature as opposed to a regulated watercourse. This feature does not likely support a direct fish community but may provide indirect fish habitat functions to Lake St. George, approximately 550 meters south of the Subject Lands.

Figure 3A: Ecological Land Classification



Several potential headwater drainage features (**HDFs**) were identified on the Subject Lands within topographic lows of the golf course. One of these features (referred to as Drainage Feature 2 on **Figure 3A**) displayed an active connection between two ponds identified as Provincially Significant Wetlands (**PSWs**), associated with the Wilcox-St. George Wetland PSW Complex on the western side of the Subject Lands. This drainage feature was highly manipulated and partially piped but was observed to be flowing offsite beneath Bayview Avenue, connecting with another unit of the PSW to the west. Due to the presence of PSW associated with this drainage feature, it would likely receive a management recommendation of Conservation or Protection under the TRCA/CVC's *Evaluation, Classification and Management of Headwater Drainage Features Guideline* (2014). However, further seasonal field investigations are required to confirm the significance of this feature.

Based on the existing riparian vegetation, high degree of alteration and dry conditions associated with all other remaining drainage features, it is likely that these features would be assigned a Mitigation management recommendation under the TRCA/CVC's *Evaluation, Classification and Management of Headwater Drainage Features Guideline* (2014) and therefore, would not need to be maintained on the landscape.

There are several generally isolated golf course ponds, many of which displayed evidence of a high level of manipulation with pumps being observed within several of the ponds, likely for golf course irrigation purposes. All ponds appear to be anthropogenic in nature (i.e., dug) or anthropogenically influenced (i.e., irrigation ponds used to support watering activities on the golf course). These ponds have not been identified as surface water drainage features in this assessment as they appear to be isolated with no hydrological connection to either of the surface water drainage features on-site. However, given this level of manipulation of water quantities within the system, there remains some potential that several of the ponds within the Subject Lands could be hydrologically connected offsite. Additional studies will be required under appropriate seasonal conditions to confirm the hydrological and riparian conditions. These anthropogenic ponds would not be expected to be high constraint features even if they are seasonally hydrologically connected to downstream watercourses.

3.2.2 Vegetation Communities

GEI undertook preliminary delineation of vegetation communities using aerial imagery interpretation and confirmation of vegetation communities was undertaken during the site reconnaissance visit on November 1, 2022 (on accessible properties) using the southern Ontario Ecological Land Classification (**ELC**) protocol (Lee *et al.* 1998). The preliminary delineation of vegetation communities within the Subject Lands is illustrated on **Figure 3A**.

The Subject Lands consist of the Bloomington Downs Golf Course, which is primarily a mown and manicured recreational area, several industrial uses and agricultural fields. Some scattered patches of remnant natural vegetation (woodlands and wetlands), hedgerows and ponds were present, with a large woodland (extending off the Subject Lands) present within and along the southern limit of the Subject Lands. A brief description of the natural vegetation communities within the Subject Lands is provided below.

Along the southern limits of the Subject Lands, a large woodland feature was present, which consists of Deciduous Swamp (**SWD**), White Cedar Mineral Mixed Swamp (**SWM1**) and Dry – Fresh White Pine – Maple - Oak Mixed Forest (**FOM2**). Portions of the woodland extend into the Subject Lands. This woodland is part of the Lake St. George Conservation Area and is also associated with the Lake St. George ANSI and the Wilcox-St. George Wetland PSW Complex (**Figure 2**). Immediately north of the large woodland feature, small remnant patches of natural vegetation remain and have been incorporated into the Golf Course's manicured lands. These included Dry –Fresh Oak – Maple – Hickory Deciduous Forest (**FOD2**), SWD, Mineral Deciduous Swamp (**SWD4**), Mineral Cultural Thicket (**CUT1**) and Coniferous Swamp (**SWC**). Small units of the Wilcox-St. George Wetland PSW Complex are present within the SWC and SWD4 (**Figure 2**).

In the central middle portion of the Subject Lands, a complex patch of vegetation appeared to have been left to naturalize. This feature consisted of Willow Mineral Thicket Swamp (**SWT2-2**), Red-osier Mineral Thicket Swamp (**SWT2-5**), Mineral Cultural Meadow (**CUM1**), SWD4 and a Mixed Forest (**FOM**). This feature is associated with one of the unevaluated wetlands present within the Subject Lands (**Figure 2**).

In the central northern portion of the Subject Lands, a large patch of SWD4, Thicket Swamp (**SWT**) and CUM1 were present. This feature is also associated with one of the unevaluated wetlands present within the Subject Lands (**Figure 2**).

In the northeastern portion of the Subject Lands another woodland patch was present. This feature was dominated by a mature Dry –Fresh Sugar Maple Deciduous Forest (**FOD5**). A unit of unevaluated wetland is present within the western portion of the FOD5 (**Figure 2**). The woodland transitions to a younger and more disturbed Dry –Fresh Poplar - White Birch Deciduous Forest (**FOD3**) towards the eastern limit. A hydro corridor was present along the edge of the feature and is likely the cause of the noted change in forest type and quality. The hydro corridor has also fragmented a portion of the feature which is now best described as a hedgerow. This hedgerow extending eastward beyond the Subject Lands.

A number of ponds (**OAO**) are also present within the Subject Lands. In the eastern portion of the Subject Lands, a large open water pond was present. This pond generally lacked naturalized vegetation and appears to have been regularly mown up to the water's edge. A pump house was present which indicates that this feature is used to support irrigation activities for the golf course. A second smaller pond was present immediately north of the larger pond which exhibited similar characteristics. Neither of these ponds are mapped as wetland features on the LIO mapping database (MNRF 2022), nor would they be considered as such based on the field observations.

In the western portion the Subject Lands, there is one large and semi-naturalized pond; it is fringed with naturalized vegetation including bands of Cattail Mineral Shallow Marsh (**MAS2-1**) and SWT2-2; though some portions of the vegetation along the edge of the feature had been mown. The feature also exhibited dense mats of submergent aquatic vegetation. The pond is mapped as a unit of the Wilcox-St. George Wetland PSW Complex (**Figure 2**). The pond outlets to a culvert under Bayview Ave where a small patch of the MAS2-1 was noted. Unlike the main pond, the drainage feature and patch of MAS2-1 are not currently mapped units of the Wilcox-St. George Wetland PSW Complex. Immediately south of this pond, two smaller units of the Wilcox-St. George Wetland PSW Complex were present. These are represented by a small, ponded area of open water which abuts a CUT1 and a manicured portion of the

golf course. The manicured portion of the golf course which is designated as PSW appeared to have been planted with low shrubs but was dry at the time of site reconnaissance. A patch of Mineral Meadow Marsh (**MAM2**) is present within the most northwest corner of the Subject Lands and is associated with the intersection of Bayview Ave and Bloomington Road E. This feature is also a unit of the Wilcox-St. George Wetland PSW Complex (**Figure 2**). The feature was dry at the time of the site reconnaissance but is likely to be seasonally flooded based on aerial imagery.

Another pond was present just west of the Golf Course's parking area. This feature was surrounded by concrete blocks and lacks any fringing of naturalized terrestrial vegetation. This feature is not mapped as either a portion of Unevaluated wetland or Wilcox-St. George Wetland PSW Complex.

Elsewhere in the Subject Lands, the planted vegetation, mown grass, hedgerows and narrow bands of CUT1 dominated.

3.2.3 Flora

No rare species of flora were noted within the Subject Lands during the site reconnaissance. However, the following invasive species noted within the Subject Lands:

- European Buckthorn (*Rhamnus cathartica*); and
- Common Reed (*Phragmites australis*).

Common Reed appeared to be limited to the MAM2 feature located at the intersection of Bayview Ave and Bloomington Road E. While European Buckthorn was widespread, it dominated in hedgerows and CUT1's and formed a majority of the understory in some woodland features. Additional invasive species may also be present within the Subject Lands.

3.2.4 Fauna

The manicured portions of the Subject Lands would provide only limited opportunities for use by wildlife; whereas the blocks of naturalized vegetation communities, several of the ponds (particularly those that are relatively more naturalized), small remnant woodlands and the large woodland along the southern limit of the Subject Lands would provide higher quality potential wildlife habitat. Contiguous natural features that would provide a movement corridor are generally limited within the Subject Lands; wildlife moving across the landscape would be required to cross the manicured portions golf course to access the naturalized vegetation blocks and the large woodland along the southern limit of the Subject Lands. Furthermore, Bayview Avenue, Bloomington Road East and Leslie Street affect wildlife movement to the north, east and west of the Subject Lands.

Two barns and several outbuildings were recorded within the Subject Lands that could support bat SAR and Barn Swallow. Detailed investigations are required to understand whether these species are present and using these structures.

A number of ponds were observed within the Subject Lands; these features could support amphibian breeding habitat. As well, the large semi-naturalized pond that is associated with the Wilcox-St. George Wetland PSW Complex, may also support habitat for turtles, particularly for Snapping Turtle.

Other species documented during the site reconnaissance included:

- Green Frog (*Lithobates clamitans*);
- Blue Jay (*Cyanocitta cristata*);
- Mallard (*Anas platyrhynchos*);
- Wild Turkey (*Meleagris gallopavo*)
- Beaver (*Castor canadensis*); and
- White-tailed Deer (*Odocoileus virginianus*).

Further to this, there is anecdotal evidence of a Moose (*Alces alces*) within the vicinity of the Subject Lands. The Subject Lands are located within Cervid Ecological Region E1; cervids within this region mainly consist of White-tailed Deer though small numbers of Moose are present. Is generally considered unlikely that Moose would thrive within the Subject Lands, and if present, Moose are likely dependent on the large woodland to the south of the Subject Lands.

All species observed or anecdotally noted are all considered common and secure in Ontario.

3.3 Analysis of Natural Heritage Features

Eight types of natural features are identified in the PPS (MMAH 2020):

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- SWH;
- Fish habitat;
- Habitat of endangered and threatened species; and
- Significant ANSI.

The presence/absence of these natural features in the Subject Lands are discussed in the subsequent sections. These characterizations are considered preliminary and should be confirmed with detailed ecological inventories. This section is informed by the Natural Heritage Reference Manual (**NHRM**; Ministry of Natural Resources; **MNR**, 2010).

3.3.1 Significant Wetlands

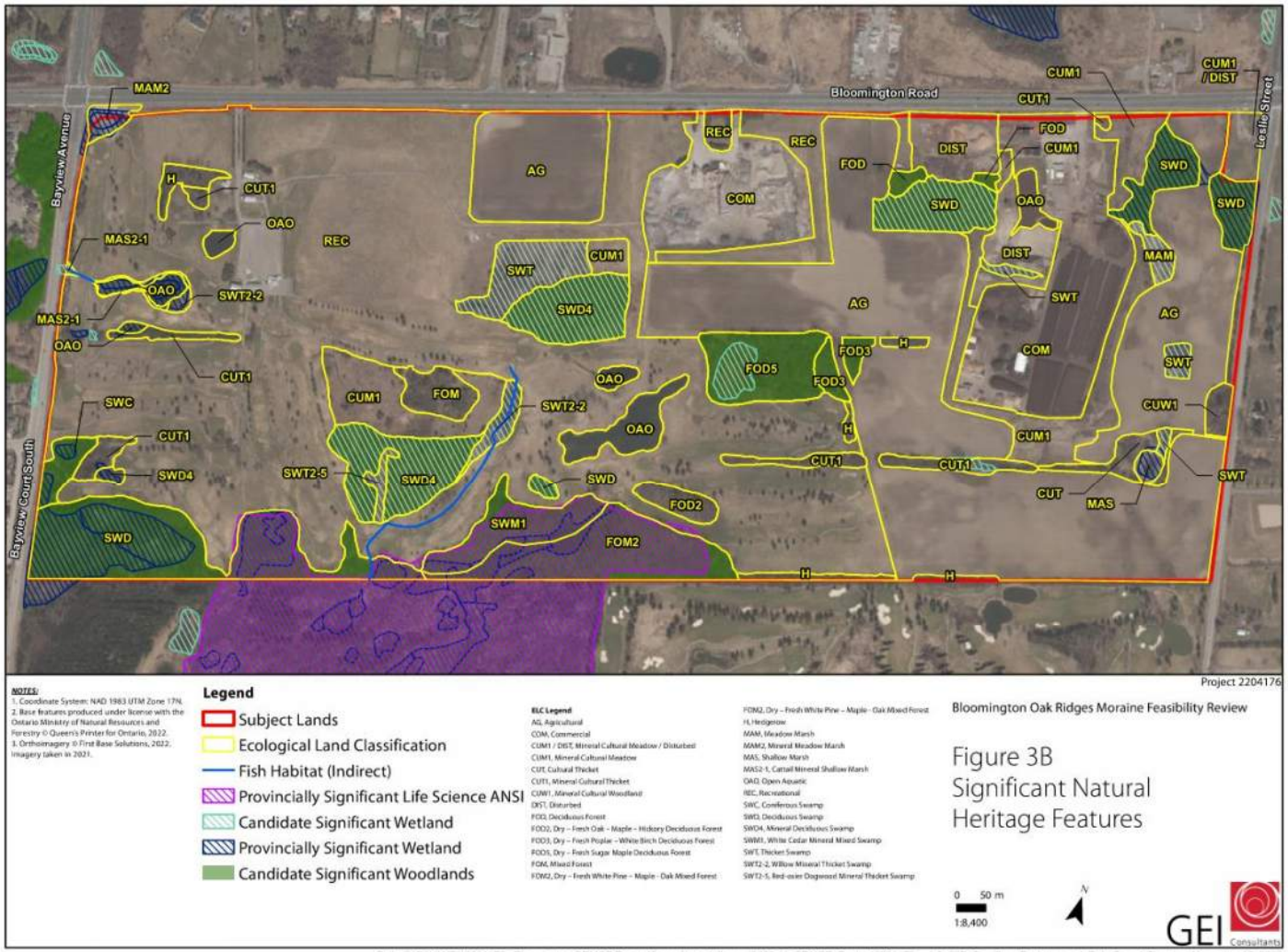
Within Ontario, significant wetlands are identified by the MNRF or by their designates. Other evaluated or unevaluated wetlands may be identified for conservation by the municipality or the conservation authority. MNRF LIO mapping identified 12 PSW units, associated with the

Wilcox-St. George Wetland PSW Complex and 10 units of unevaluated wetland within the Subject Lands (as shown on **Figure 2**). Wetlands were then identified, and boundaries were refined (as warranted), within the Subject Lands during GEI's field investigation (all wetland ELC units are identified on **Figure 3A**). In some areas, GEI's wetland boundaries extended beyond the previously mapped boundaries, while in other areas, wetlands were smaller than previously mapped in LIO. Several wetlands not previously identified by MNRF were identified during GEI's review.

Based on the current Ontario Wetland Evaluation System (**OWES**; MNR 2013), previously unevaluated or unidentified wetlands can be classified as provincially significant either by complexing them with a nearby PSW (i.e., within 750 m, subject to some limitations) provided they meet the criteria for complexing, or by evaluating the wetland on its own to determine if it meets the test of significance (where complexing is not possible). Given that a confirmed PSW is present within the Subject Lands, it is possible that the unevaluated wetlands could be considered part of the overall PSW complex, based on the complexing rules in the current OWES manual (MNR 2013). As a result, these unidentified wetlands may be evaluated as part of the existing PSW complex (as they are within 750 m of an existing PSW). As a precautionary approach, these wetlands are considered herein as candidate PSWs (**Figure 3B**).

However, the current OWES process may change as a result of recent postings on the Environmental Registry Ontario (**ERO**) to update how wetlands are evaluated. Under this posting, the new process would eliminate complexing of potential PSWs and will remove MNRF as a reviewer of OWES. Further, re-evaluation of existing wetland units within a PSW complex could be completed to see if the individual units meet significance criteria on their own (outside of the larger complex). Therefore, if the OWES process is changed as per the ERO posting, it is possible that the PSW designation could potentially be removed from some or all of the wetlands on the Subject Lands and the candidate PSWs may not meet the threshold to be PSWs in the absence of complexing, if they were to be evaluated under the proposed OWES changes.

Figure 3B: Significant Features



3.3.2 Significant Coastal Wetlands

Similar to significant wetlands, the MNRF or their designates identify significant coastal wetlands present on the landscape. Coastal wetlands are defined in the NHRM (MNR 2010) as:

a) *"any wetland that is located on one of the Great Lakes or their connecting channels (Lake St. Clair, St. Mary's, St. Clair, Detroit, Niagara and St. Lawrence Rivers); or*

b) *Any other wetland that is on a tributary to any of the above-specified water bodies and lies, either wholly or in part, downstream of a line located two km upstream of the 1:100-year floodplain (plus wave run-up) of the large water body to which the tributary is connected."*

No coastal wetlands are identified in the Subject Lands and would not be expected given the distance of the Subject Lands from the waterbodies noted above.

3.3.3 Significant Woodlands

Significant woodlands are identified by the planning authority in consideration of criteria established by the MNRF. Under the NHRM (2010) woodlands are defined as:

...treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products. Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional and provincial levels...

However, both the York Region and City of Richmond Hill OP define Woodlands as:

… An area of land at least 0.2 hectare in area with at least:

a) *1000 trees of any size, per hectare;*
b) *750 trees measuring over 5 centimetres diameter at breast height, per hectare;*
c) *500 trees measuring over 12 centimetres diameter at breast height, per hectare; or,*
d) *250 trees measuring over 20 centimetres diameter at breast height, per hectare…*

The Town of Richmond Hill OP further indicates that:

…When determining the full limit of a woodland, continuous agricultural hedgerows and woodland fingers or narrow woodland patches will be considered part of a woodland if they have a minimum average width of at least 40 metres and narrower sections have a length to width ratio of 3 to 1 or less. Undeveloped clearings within woodland patches are generally included within a woodland if the total area of each clearing is no greater than 0.2 hectares…

Some significant woodlands have been identified and mapped by the City of Richmond Hill though schedule A4 of the OP; these features are illustrated on **Figure 2**. However, the OP further indicates that any woodland meeting any one of below requirements will be considered Significant

a. Contains globally or provincially rare plants, animals or communities as designated by the Natural Heritage Information Centre;

b. Contains species designated by the Committee on the Status of Endangered Wildlife in Canada or by the Committee on the Status of Species at Risk in Ontario as threatened, endangered, or of special concern;

c. Is within 30 metres of a KHF;

d. Is over 2 hectares and:

    i. Is within 100 metres of another KNHF; or

    ii. Occurs within the Greenway System.

e. Is 4 hectares or larger in size.

f. Notwithstanding (a) to (e), on lands within the Greenbelt Plan Area, the woodland will be evaluated for significance based on the requirements of the Greenbelt Plan and associated technical papers.

GEI completed a high-level assessment of the woodlands on the Subject Lands to determine if they would have the potential to be significant woodlands. This assessment was primarily based on size, proximity to other woodlands and proximity to KHFs. Based on this assessment, several of the features identified in the City of Richmond Hill OP do not appear to meet these criteria and therefore, are not being identified as candidate significant woodlands in this assessment. In some instances, the identified woodland areas do not meet minimum size or width criteria (and are assumed to not host species at risk), while in one area, no woodland was present in the location mapped in the OP. However, several other woodlands not identified in the City of Richmond Hill OP mapping appear to meet the criteria for consideration and therefore, have been identified as candidate significant woodlands (recognizing that additional ecological studies will be required to confirm if they meet significant woodland criteria). All candidate significant woodlands identified on the Subject Lands are illustrated in **Figure 3B**.

3.3.4 Significant Valleylands

Significant valleylands are defined and designated by the planning authority (per section 8.1.3 of the NHRM; MNR 2010). General guidelines for determining significance of these features are presented in the NHRM (MNR 2010). Recommended criteria for designating significant valleylands includes prominence as distinctive landform, degree of naturalness, and importance of its ecological functions, restoration potential and historical and cultural values.

It is recognized that the NHRM doesn't specify the number of criteria that are required to be met for a feature to be significant and recommends that local planning authorities undertake a study that would determine which criteria should be applied for a valleyland to be considered significant.

The City of Richmond Hill OP defines significant valleyland as "*a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year. These areas are ecologically important in terms of features, functions, representation or amount, and contribute to the quality and diversity of an identifiable geographic area or natural heritage system*"

Although the drainage feature flowing through the Subject Lands is located within a topographical depression (not a defined valleyland), it is unlikely to be considered a significant valleyland based on the high degree of disturbance due to surrounding land use, relatively small size and characterization as an HDF (as opposed to a regulated watercourse). Based on this characterization, the feature is not likely ecologically important in the general landscape context. Therefore, the feature is not identified as a significant valleyland for the purposes of this assessment.

3.3.5 Significant Wildlife Habitat

SWH is one of the more complex natural heritage features to identify and evaluate. There are several provincial documents that discuss identifying and evaluating SWH including the NHRM (MNR 2010), the Significant Wildlife Habitat Technical Guide (MNR 2000) and the SWH Eco-Region Criterion Schedule (MNRF 2015). The Subject Lands are located in Eco-Region 6E and were therefore assessed using the 6E Criterion Schedule (MNRF 2015).

There are four general types of SWH:

- Seasonal concentration areas;
- Rare or specialized habitats;
- Habitat for species of conservation concern; and
- Animal movement corridors.

General descriptions of these types of SWH are provided in the following sections.

<u>Seasonal Concentration Areas</u>

Seasonal concentration areas are those sites where large numbers of a species gather together at one time of the year, or where several species congregate. Seasonal concentration areas include deer yards, wintering sites for snakes, bats, raptors and turtles, waterfowl staging and molting areas, bird nesting colonies, shorebird staging areas and migratory stopover areas for passerines or butterflies. Only the best examples of these concentration areas are usually designated as SWH.

Rare or Specialized Habitats

Rare and specialized habitat are two separate components. Rare habitats are those with vegetation communities that are considered rare in the province. SRANKS are rarity rankings applied to species at the 'state', or in Canada at the provincial level, and are part of a system developed under the auspices of the Nature Conservancy (Arlington, VA). Generally, community types with SRANKS of S1 to S3 (extremely rare to rare-uncommon in Ontario), as defined by the NHIC (2022), could qualify. It is to be assumed that these habitats are at risk and that they are also likely to support additional wildlife species that are considered significant.

Specialized habitats are microhabitats that are critical to some wildlife species. The NHRM (MNR 2010) defines specialized habitats as those that provide for species with highly specific habitat requirements, areas with exceptionally high species diversity or community diversity, and areas that provide habitat that greatly enhances species' survival.

Habitat for Species of Conservation Concern

Species of conservation concern include those that are provincially rare (S1 to S3), provincially historic records) and Special Concern species. Several specialized wildlife habitats are also included in this SWH category, including Terrestrial Crayfish habitat, and significant breeding bird habitats for marsh, open country and early successional bird species.

Habitats of species of conservation concern do not include habitats of endangered or threatened species as identified by the ESA (2021 Consolidation). Endangered and threatened species are discussed in **Section 3.3.7**.

Animal Movement Corridors

Animal movement corridors are areas that are traditionally used by wildlife to move from one habitat to another. This is usually in response to different seasonal habitat requirements, including areas used by amphibians between breeding and summer/over-wintering habitats, called amphibian movement corridors.

Table 1 (**Appendix A**) discusses the potential for SWH within the Subject Lands based on the preliminary ELC and site reconnaissance observations. Detailed ecological investigations are required to confirm whether SWH is present within the Subject Lands.

The following candidate SWH types were identified within the Subject Lands:

- Raptor Wintering Areas (the large woodland feature along the southern edge of the Subject Lands);
- Bat Maternity Colonies (**FOD**; deciduous forest, FOM, SWD, **SWM**; mixed swamp);
- Turtle Wintering Areas (the semi-naturalized OAO associated with the PSW);
- Reptile Hibernacula (Foundations of an old barn and grain silo within the Subject Lands);
- Colonial Bird Nesting Sites (tree/shrubs; SWD and SWM);
- Bald Eagle and Osprey Habitats (**FO**; forest and **SW**; swamp);

- Woodland Raptor Nesting Habitat (FO and SW);
- Seeps and Springs (Forested ecosites);
- Woodland Amphibian Breeding Habitat (FO and SW);
- Wetland Amphibian Breeding Habitat (SW and **MA**; marsh);
- Amphibian Movement Corridors;
- Woodland Area-Sensitive Bird Breeding Habitat (FO and SW);
- Terrestrial Crayfish (**MAM**; meadow marsh, **MAS**; shallow marsh, SWT, SWD, SWM);
- Habitats for Special Concern and Rare Wildlife:
    - Black-Crowned Night Heron;
    - Canada Warbler;
    - Eastern Wood-Pewee;
    - Wood Thrush;
    - Monarch;
    - Walnut Caterpillar Moth; and
    - Snapping Turtle.

All candidate SWH types are generally associated with the wetland and forested communities found within the Subject Lands (and as such are not explicitly mapped in **Figure 3B**), except for candidate Monarch SWH and the potential reptile hibernacula (which is associated with an anthropogenic structure). Seasonal ecological surveys would be required to confirm the presence/absence of all SWH types on and adjacent to the Subject Lands. Therefore, there is potential that SWH could be identified in areas on the Subject Lands not currently mapped as Key Natural Heritage Features (I.e., candidate significant woodlands and candidate significant wetlands) and this could impact future development potential.

While unlikely, Monarch SWH may be present within the CUM vegetation communities in the Subject Lands. Large abundances of Common Milkweed (*Asclepias syriaca*), the host plant for Monarch, and evidence of Monarch breeding would be required to be considered SWH for this species. For the purposes of this assessment, the CUM vegetation communities have not been identified as SWH, although additional studies will be required to confirm that criteria are not met.

3.3.6 Fish Habitat

Fish habitat, as defined in the federal *Fisheries Act* (1984), c. F-14, means “spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes.” Fish, as defined in S.2 of the *Fisheries Act*, c. F-14, includes “parts of fish, shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals.”

Drainage Feature 1 is piped across an extended distance and does not have a well-defined channel; this feature does not likely support a direct fish community. However, it may provide indirect fish habitat functions to Lake St. George, approximately 550 meters south of the Subject Lands. Therefore, this feature is mapped as indirect fish habitat on **Figure 3B**.

Similarly, Drainage Feature 2, which includes an online pond, may support seasonal fish habitat and/or indirect fish habitat (**Figure 3B**).

Any other HDFs on the Subject Lands that are dry and/or containing standing water during early spring assessment would not provide fish habitat. To determine the hydrology, functionality and extent of HDFs within the Subject Lands, additional investigations would be required to assess their management recommendations using the TRCA and CVC's 2014 *Headwater Drainage Feature Assessment Guideline*, in conjunction with fish community sampling.

Other isolated ponds on the Subject Lands could potentially contain fish, however, DFO does not consider isolated ponds that are not hydrologically connected to other waterbodies containing fish to be fish habitat. Therefore, the isolated golf course ponds or industrial ponds on the Subject Lands are not considered to be fish habitat, even though they could potentially contain fish.

3.3.7 Habitat for Endangered and Threatened Species

Table 2 (**Appendix A**) discusses the potential for endangered and threatened SAR and SAR habitat within the Subject Lands. This is based on the species identified through the secondary source review (**Section 3.1**).

The following SAR and SAR habitat may be present within the Subject Lands based on preliminary ELC and site reconnaissance findings:

- Black Ash;
- Barn Swallow;
- Jefferson Salamander;
- Bat SAR (Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), Tri-coloured Bat (*Perimyotis subflavus*) and Northern Myotis (*Myotis septentrionalis*)); and
- a restricted species record.

These species would generally be expected to be associated with woodlands and wetlands, most of which have been identified as KNHFs for the purposes of this assessment.

Consultation with the NHIC would be required to confirm the restricted species record. As well, detailed ecological investigations are required to confirm the presence of SAR and SAR habitat. Consultation with the Ministry of Environment, Conservation and Parks (**MECP**) would be required to identify any permitting associated with potential impacts to SAR or SAR habitat.

3.4 Significant Areas of Natural and Scientific Interest

The Lake St. George ANSI is located along the southern edge of the Subject Lands (**Figure 2**).

4. Desktop Review for Geotechnical & Hydrogeological Conditions

GEI has conducted a desktop background review of the publicly available sources of subsurface information, surficial geology and bedrock mapping, and local experience about nearby soil and groundwater conditions to discuss geotechnical and hydrogeological engineering constraints / considerations for the Subject Lands.

Existing subsurface investigations, geotechnical reports, or hydrogeological reports were not provided by the client for the site. An overview of the subsurface conditions expected to be encountered on site were established using a range of publicly available information and previous subsurface investigations completed by GEI nearby, summarized below. The actual subsurface conditions on site may differ once detailed borehole investigations are carried out.

4.1 Physiology and Geology Mapping

Surficial geology mapping from the Ontario Geological Survey (OGS; 2022) was reviewed and is provided on **Figure 4A**. The OGS mapping indicates that most of the Subject Lands are dominated by glaciofluvial deposits, typically consisting of sands and gravels. Ice-contact stratified deposits typically consisting of sands are shown at the northwestern corner of the Subject Lands with a small area of clay to silt-textured glacial till located along the western boundary. Local areas of organics are noted at the south and southwestern boundary generally in the location of the PSWs noted on **Figure 3B**. Surficial geology details are shown on **Figure 4A**.

The Subject Lands are within the Physiographic Region denoted as the Oak Ridges Moraine (Chapman and Putnam 1984) and the landform consists of Kame Moraines as shown on **Figure 4B**.

At depth, the Subject Lands are underlain by bedrock of the Blue Mountain Formation which consists primarily of shale with limestone interbeds as shown in **Figure 4C**. Bedrock topography mapping from the Ministry of Northern Development and Mines (Open File Map 196;1992 Holden et al.) indicates bedrock is deeper than 200 metres below grade.

Geotechnical boreholes available on a database from the Ministry of Energy, Northern Development and Mines (**MENDM**) were reviewed but no boreholes were found within or near the Subject Lands. Publicly available Ministry of Transportation (**MTO**) borehole logs were reviewed at the intersection of Highway 404 and Bloomington Road, approximately 1.15 km east of the Subject Lands. The boreholes typically encountered earth fill underlain by deposits of compact to very dense sands and silts, and stiff to hard deposits of clayey silt or clayey silt glacial till. The boreholes extended to depths of 16 metres below grade. MTO borehole logs were also reviewed at Highway 404 and Bethesda Side Road, about 1.2 km southeast of the Subject Lands. The boreholes extended to about 16 metres below grade and encountered dense to very dense sandy silt to silty fine sand.

Figure 4A: Surficial Geology

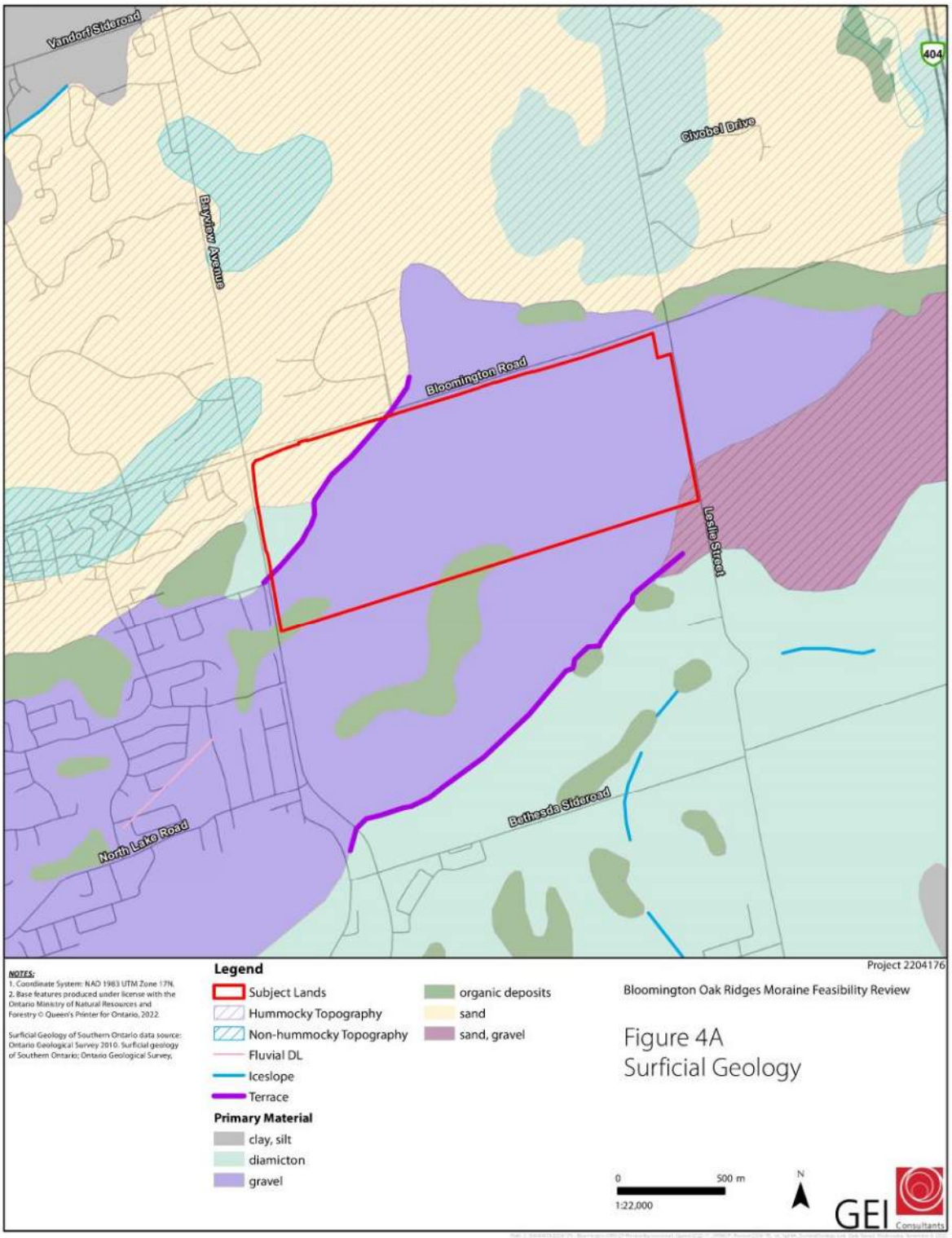


Figure 4B: Physiography

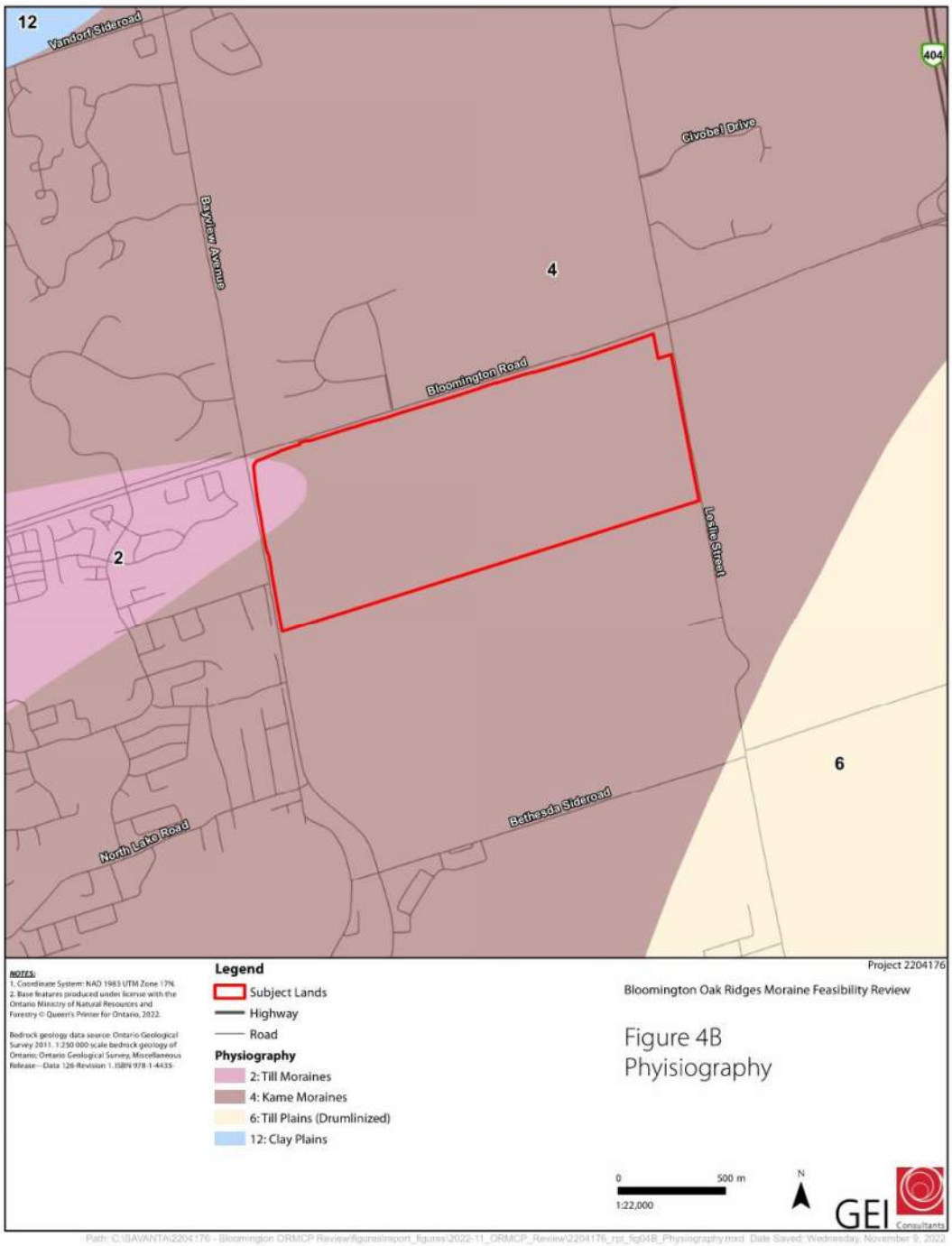
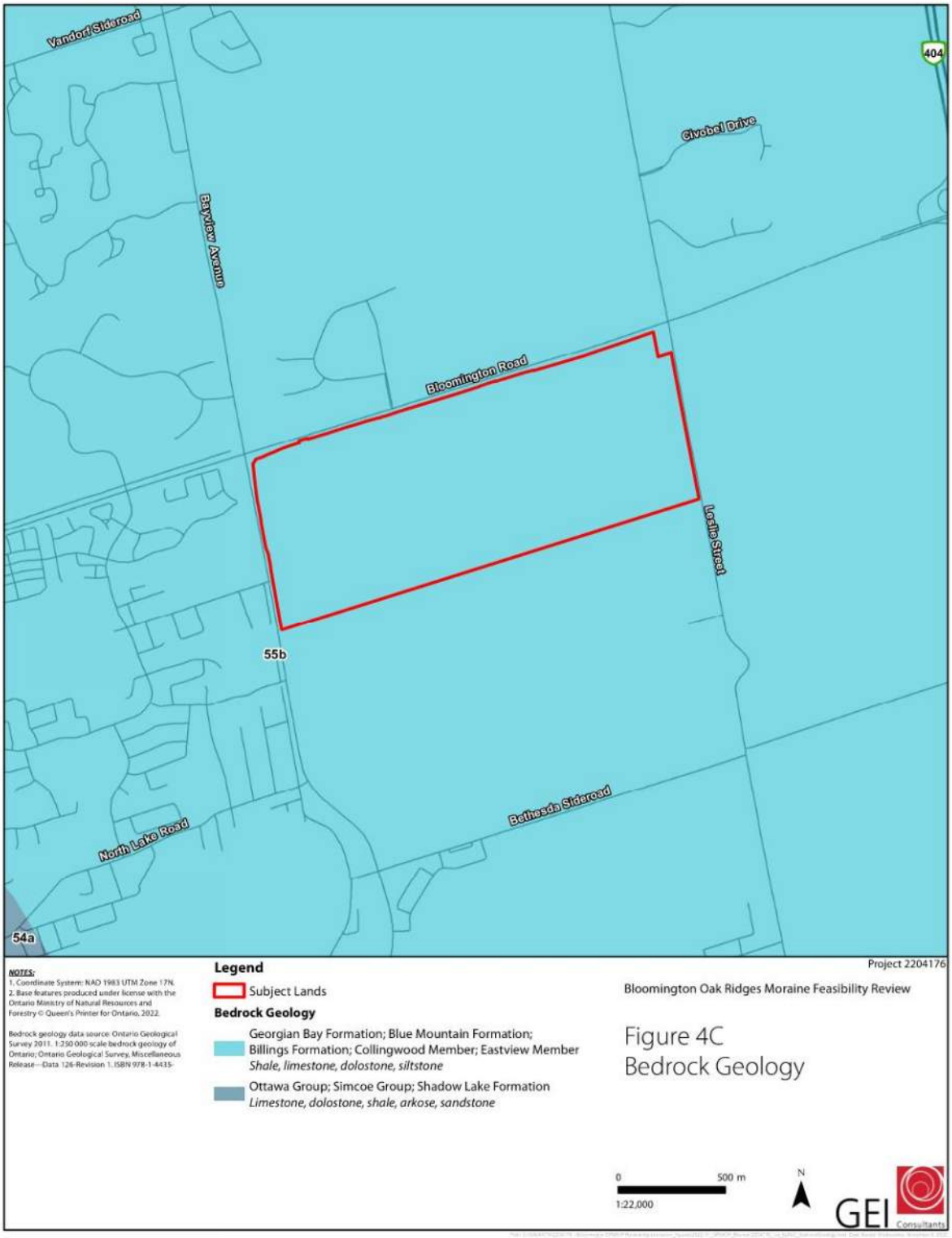


Figure 4C: Bedrock Geology



4.2 Topography and Surficial Drainage

MNRF mapping with 5 metre contour intervals shows that the Subject Lands are relatively flat with elevations typically near 305 metres. The mapping indicates that the eastern part of the Subject Lands may slope up to Elev. 310 metres

The online Source Protection Information Atlas from the MECP and watershed mapping from Toronto and Region Conservation Authority (TRCA) (2022) indicate that the Subject Lands drain into three different watersheds. Most of the Subject Lands are within the Humber River Watershed (TRCA jurisdiction) that generally drains southwest and the eventually south into Lake Ontario. Approximately the eastern 550 metres are within the Rouge River Watershed (also TRCA jurisdiction), which generally drains south / southeast into Lake Ontario. Both MECP and TRCA maps indicate that a small section in the northern middle part of the site is part of the East Holland River Watershed, in the jurisdiction of Lake Simcoe Region Conservation Authority (**LSRCA**). It is noted that LSRCA mapping (2021) shows that East Holland River Watershed does not cross south over Bloomington Road at the Subject Lands. It is expected that Bloomington Road creates a drainage divide unless culverts extend beneath the roadway from the Subject Lands.

Based on the topography and watershed mapping, it is expected that most of the Subject Lands drain to the west / southwest, and the easternmost area drains to the southeast.

Based on the topography and the Site Reconnaissance conducted by GEI representatives, it appears that the headwater drainage features are unconfined and do not contain apparent valleyland.

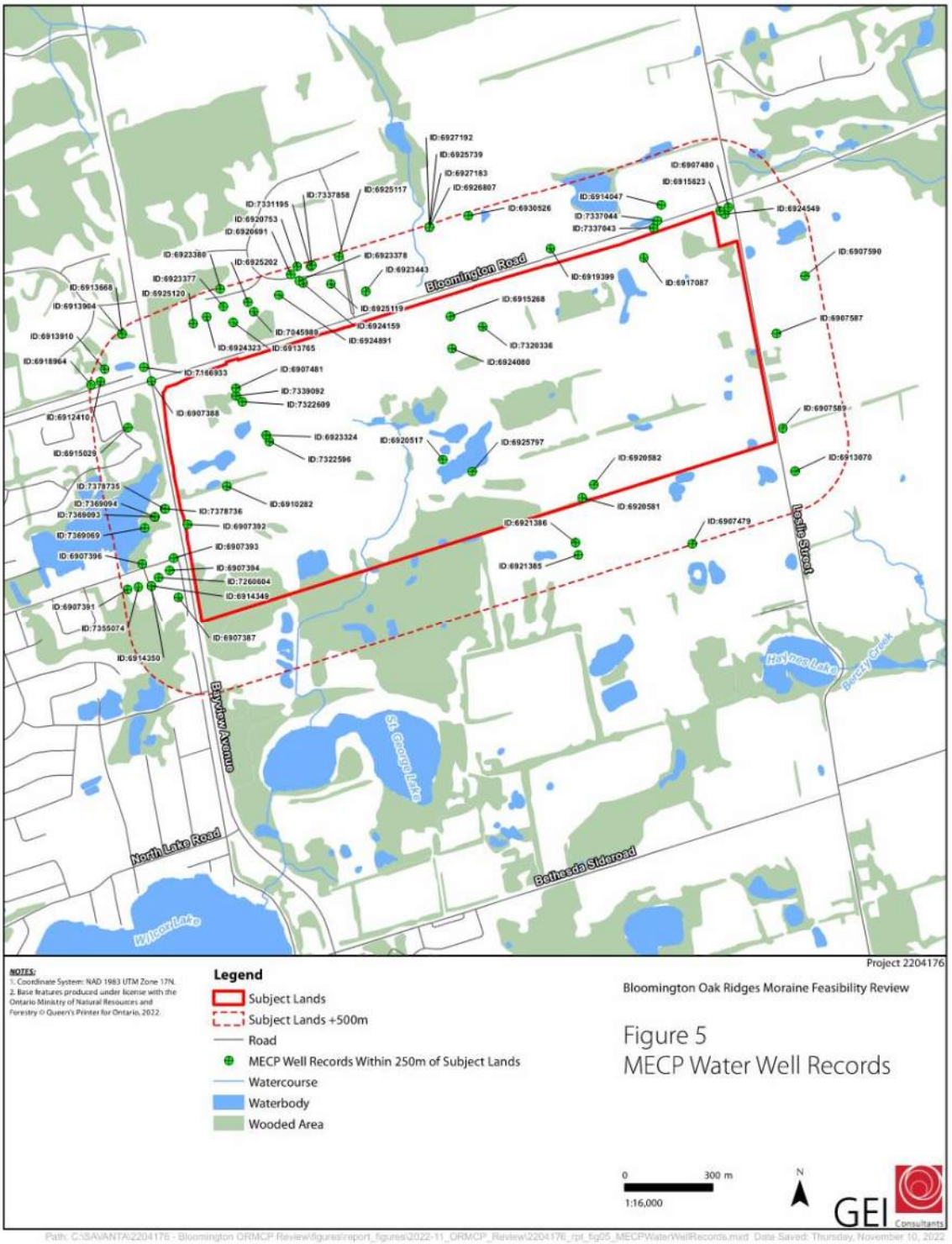
4.3 MECP Water Well Records and PTTW Mapping

MECP water well records (2021) were reviewed for the Subject Lands and surrounding area. Seventy-three (73) well records were identified within the Subject Lands and within a 500 m Subject Lands. The wells were installed for the following uses:

- Forty-two of the records indicate domestic use;
- One (1) of the records indicate commercial use;
- One (1) of the records indicate industrial use;
- Four (4) of the records indicate irrigation use;
- Five (5) of the records indicate livestock use;
- Four (4) of the records indicate monitoring/test hole use;
- Three (3) of the records indicate “not in use”;
- Two (2) of the records indicate public use; and
- Eleven of the records did not specify the use and are considered to be of unknown use.

The identified well records are appended in a summary table and their locations shown on **Figure 5**. The stratigraphic descriptions within the MECP well records are typically inaccurate due to the methodology in which they are determined (observations of cuttings and no consistency between descriptions of soil between different well drillers). Though this is the case, an overall sense of the stratigraphy can still be determined.

Figure 5: MECP Water Well Records



The well records typically show layers of brown to grey clay that typically extends to a maximum depth of between 15 to 25 metres below grade. Some well records note that the clay contains stones and gravel, and some well records indicate that surficial deposits of sands and gravels exist at grade above the clay. The clay layers are typically underlain with cohesionless deposits of sand at depth. Stabilized water levels were measured to range between 5 metres to over 50 metres below ground surface. These water levels may not fully represent groundwater levels near the ground surface, as some wells may be screened within different stratigraphic units (deeper aquifers). The well records show that most domestic wells are screened within deeper sand and gravel aquifers at 20 metres below grade or deeper.

The northwestern corner of the Subject Lands that were denoted as ice-contact stratified deposits contained well records that mostly encountered sand that extended to depths up to 40 metres below grade. The sands contained interbedded layers of clay.

The online MECP Permit to Take Water (**PTTW**) database shows there are three active PTTWs within the Subject Lands. All three are located within the Bloomington Downs Golf Course and are for the purpose of golf course irrigation. The PTTWs have a cumulative maximum rate of 2,126,000 L/day. The permits were issued on June 13, 2018 and expire on April 30, 2028.

4.4 MECP Source Protection Mapping

The online Source Protection Information Atlas (2022) from the MECP was reviewed. The Subject Lands are not located within a Wellhead Protection Area (WHPA) A to E but are identified within a Well Head Protection Area Q2 Zone as shown on **Figure 6A**. A WHPA-Q1 Zone refers to an area where activities that take water without returning it to the same source may be a threat and a WHPA-Q2 Zone refers to an area where activities that reduce recharge may be a threat. The Subject Lands fall within a HVA as shown on **Figure 6B**. The Subject Lands fall within a SGRA Area as shown on **Figure 6C**. The Subject Lands are not located within in an Intake Protection Zone (**IPZ**).

Figure 4 in Appendix A of the document, *"Technical Memorandum, Methodology for Delineation of Ecologically Significant Groundwater Recharge Areas,"* (TRCA 2019) shows a high-level map indicating that ESGRAs are likely present on the Subject Lands.

Online mapping from MECP shows that there is a mapped watercourse flowing south through the center of the Subject Lands. The watercourse and adjacent lands are shown to be Regulated Areas, as discussed above within **Section 2.3**. As discussed in **Section 3.2.1**, the watercourse may be a headwater drainage feature and was dry during a site inspection.

Figure 6A: Wellhead Protection Areas

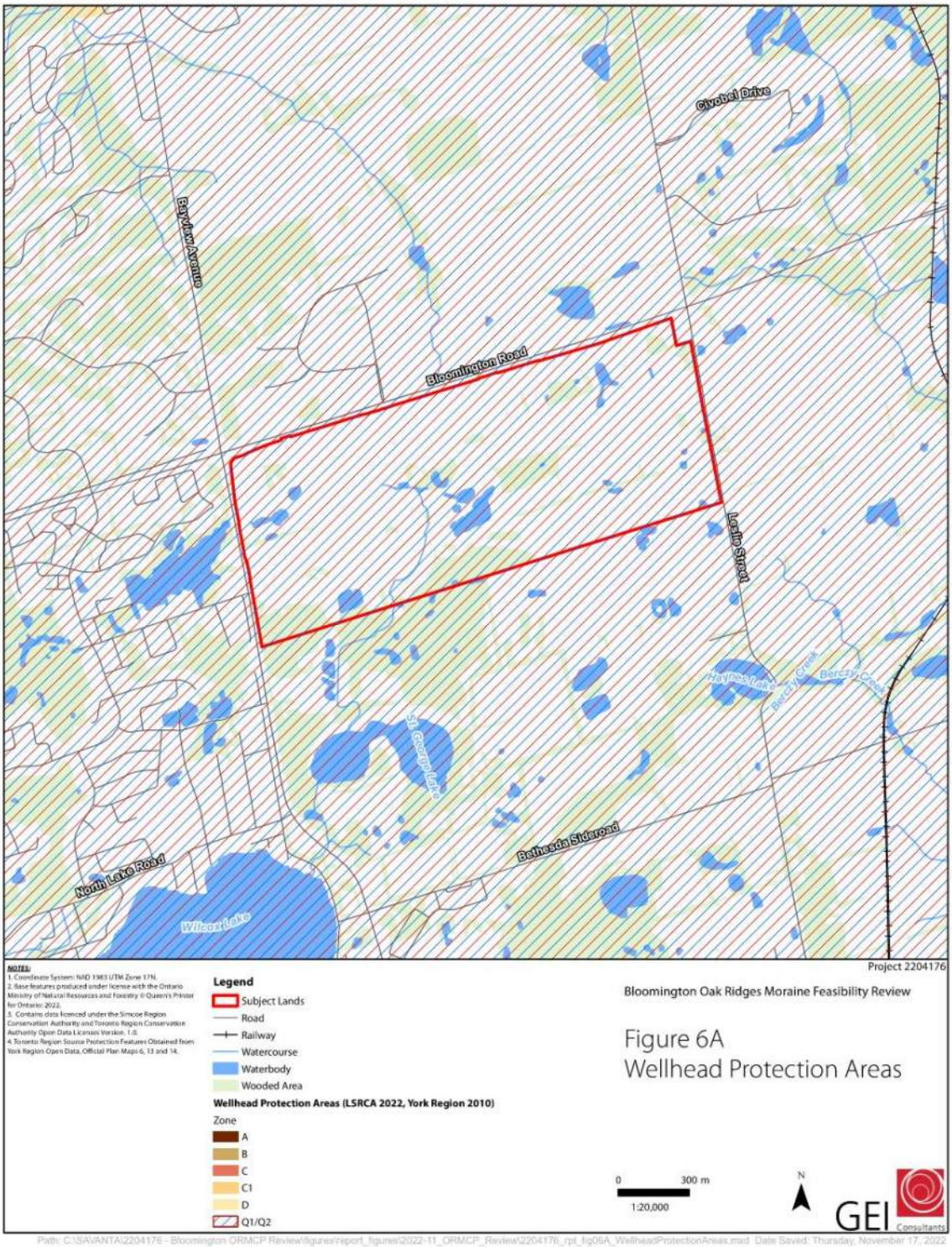


Figure 6B: Highly Vulnerable Aquifers

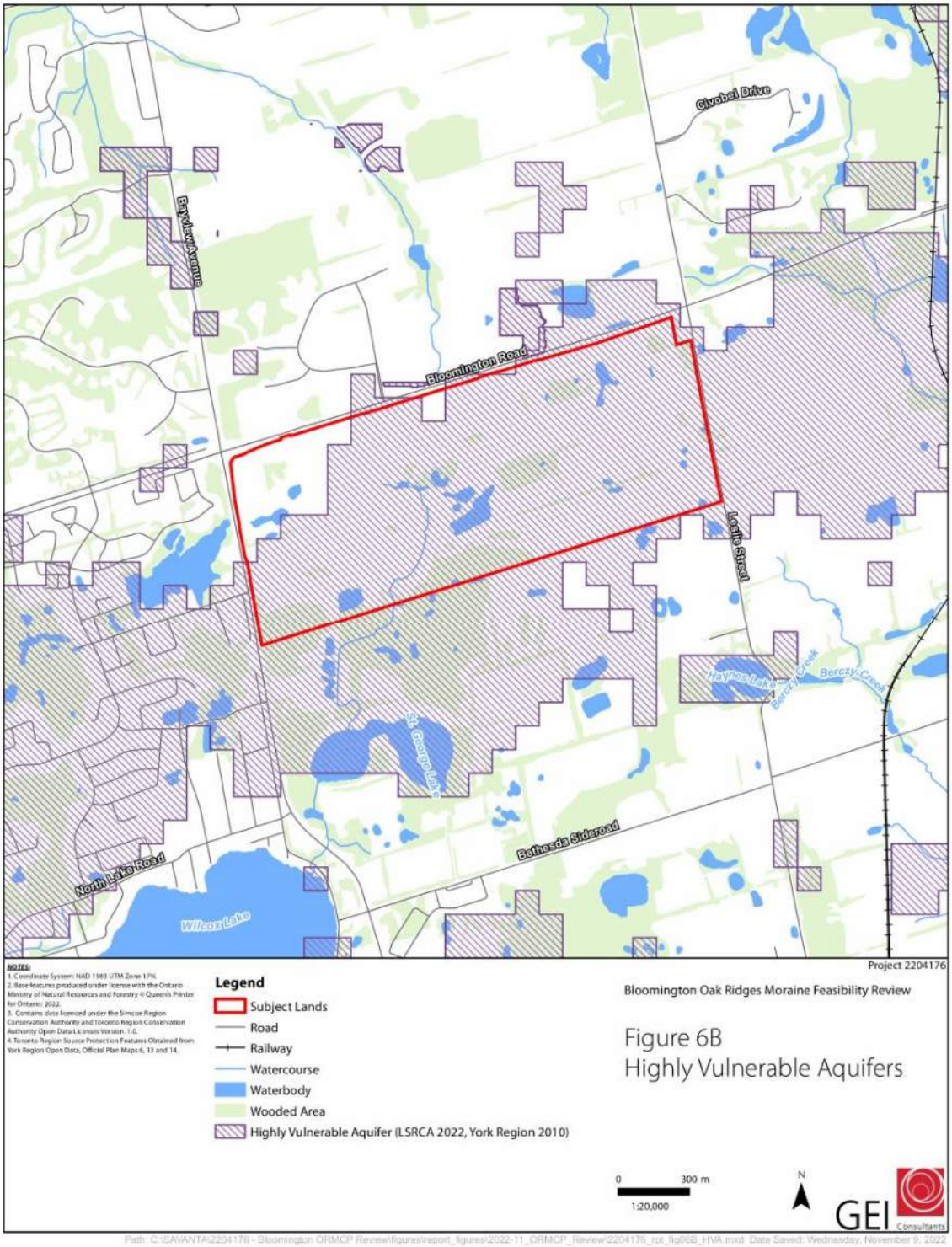
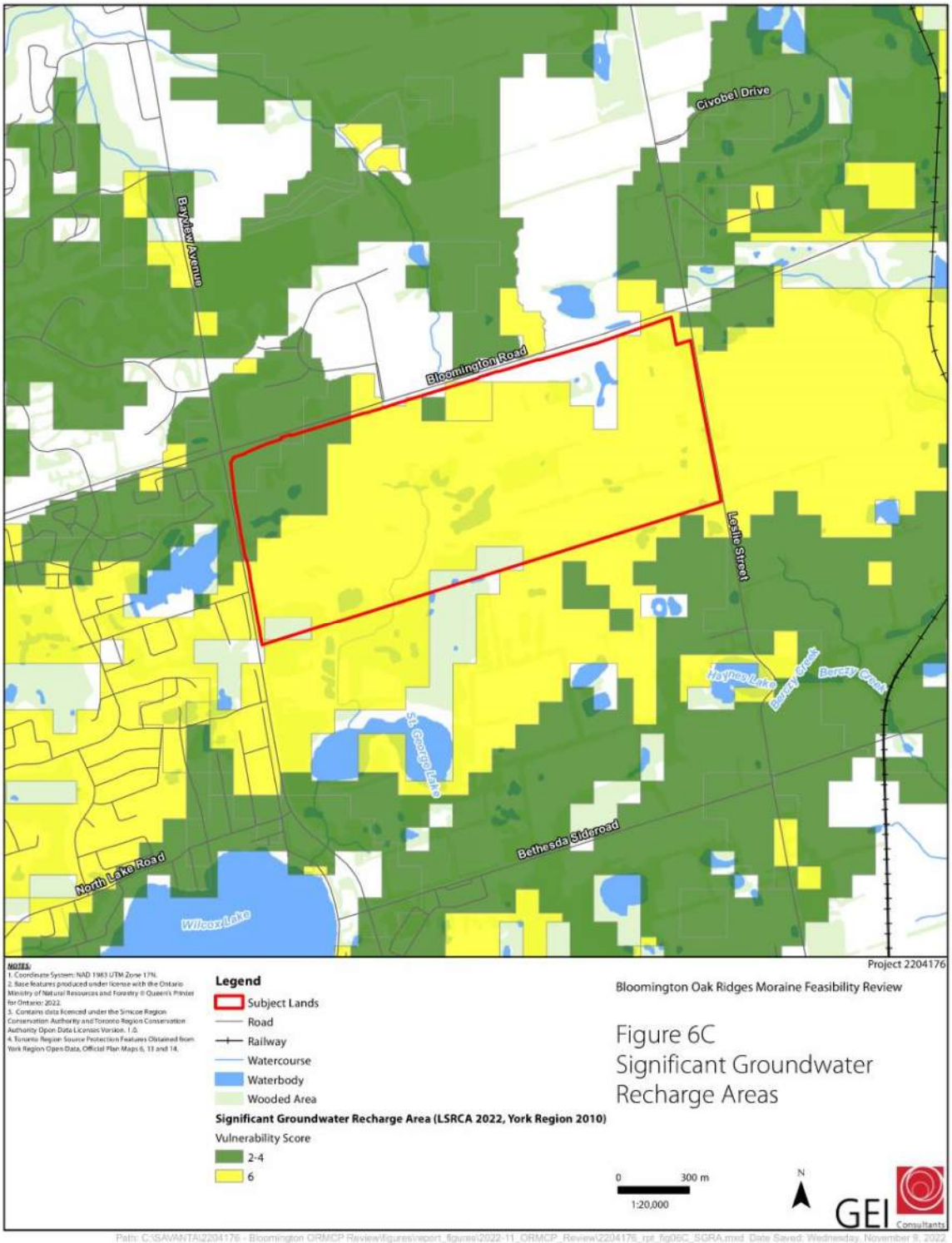


Figure 6C: Significant Groundwater Recharge Areas



4.5 Historic Aerial Photographs

Various aerial images of the Subject Lands from 1985 to 2022 were reviewed online from Google Earth. An aerial photograph dated 1954 was obtained from the University of Toronto Library. The Subject Lands has predominantly been used as a golf course, Miller Compost facility, Miller Paving, and farmlands with some intermittent farmstead developments (barns, farmhouses, etc.) near the roadways. No obvious signs of infilling were identified, but some earthworks were observed, and no obvious signs of erosion along the watercourses were visible. Further discussion is provided in **Section 10** and the aerial images are appended.

5. Hydrogeological Commentary

5.1 Regulatory Requirements

The Subject Lands are not located within a WHPA A to E but are identified within a Well Head Protection Area Q2 Zone as shown on **Figure 6A**. A WHPA-Q1 Zone refers to an area where activities that take water without returning it to the same source may be a threat and a WHPA-Q2 Zone refers to an area where activities that reduce recharge may be a threat. The Subject Lands fall within a HVA as shown on **Figure 6B**. The Subject Lands fall within a SGRA as shown on **Figure 6C**. The Subject Lands are not located within an IPZ.

5.1.1 Source Water Protection

The Subject Lands are largely within the Humber River Watershed, within the jurisdiction of the TRCA. The watersheds specific to the Subject Lands can be divided into the Rouge River and Humber River (TRCA jurisdiction) and the East Holland River (LSRCA jurisdiction). Both the Rouge River and the East Humber River drain south into Lake Ontario while the East Holland River subwatershed drains north into Lake Simcoe. It is noted that there are some discrepancies between mapping sources, and the East Holland River watershed may not extend south of Bloomington Road onto the Subject Lands.

The MECP Source Protection Information Atlas (2022) shows the Subject Lands are located entirely within the Toronto Source Protection Area in the Credit Valley, Toronto and Region and Central Lake Ontario (**CTC**) Source Protection Region. The following document applies for source water protection:

- *"Approved Source Protection Plan: CTC Source Protection Region"* dated February 23, 2022, by CTC Source Protection Committee.

5.1.2 Other Official Plans and Conservation Plans

Section 2 in this report provides a summary of the various other plans that must be followed as part of the development process. This includes the Greenbelt Plan, the Regional Municipality of York OP, the City of Richmond Hill OP, and the ORMCP. The hydrogeological considerations from each of these plans is similar, which includes identifying and assessing the KHFs and KHAs on the Subject Lands.

It is the responsibility of planners / others to determine what types of development are feasible based on the land designation and other environmental / planning considerations. Where a major development is proposed, a detailed hydrogeological study must be completed that includes (but is not limited to) the following:

- Identification of the KHFs and KHAs within the Subject Lands and an assessment to verify these features will not be impacted by the proposed development.
- Analysis for maintaining the quantity and quality of groundwater and surface water and maintaining groundwater recharge.

- Groundwater quantity and recharge is assessed with a water balance that:
    - Characterizes groundwater and surface water flow systems by means of modelling.
    - Identifies the availability, quantity, and quality of water sources.
    - Identifies water conservation methods.
- This requires detailed subsurface investigations, field inspections, analysis and reporting.

5.1.3 Construction Dewatering

The volume of water entering an excavation during construction will be based on both groundwater seepage and precipitation events. Based on O.Reg. 63/16, the construction dewatering limits and requirements are as follows:

- Construction Dewatering less than 50,000 L/day: The takings of both groundwater and stormwater do not require a hydrogeological report and does not require a PTTW from the MECP.
- Construction Dewatering greater than 50,000 L/day and less than 400,000 L/day: The taking of groundwater and/or stormwater requires a hydrogeological report and registration on the Environmental Activity and Sector Registry (**EASR**) but does not require a PTTW from the MECP.
- Construction Dewatering greater than 400,000 L/day: The taking of groundwater and/or stormwater requires a hydrogeological report and a PTTW from the MECP.

For permanent dewatering, based on Section 34 of O.Reg. 387/04, the dewatering limits and requirements are as follows:

- Water Taking less than 50,000 L/day: A PTTW is not required from the MECP.
- Water Taking greater than 50,000 L/day: A PTTW is required from the MECP.

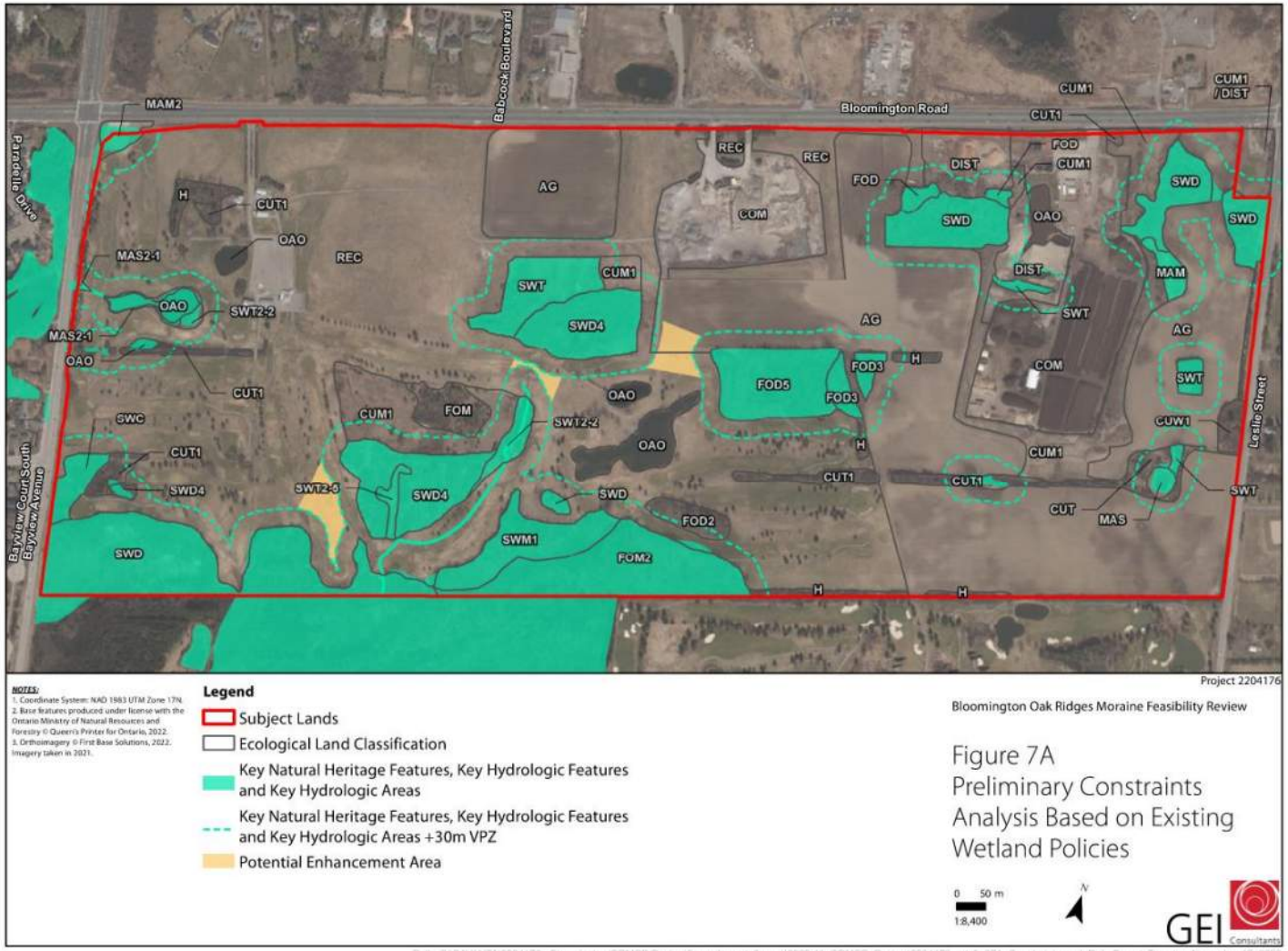
5.2 Key Hydrologic Features & Areas

For KHFs, permanent and intermittent streams and wetland areas were assessed and are discussed in **Section 3**.

Seepage areas and springs are a hydrogeological consideration. The expected soil conditions from the desktop review consist of a combination of low-permeability soils at grade like clayey silts or glacial tills, or more permeable soils like sands. There is a lower potential for seepage where low-permeability soils exist at grade, and a higher potential for seepage where sands exist. However, based on the Subject Land's topography, seepage areas or springs are not expected across most of the Subject Lands due to relatively flat conditions. The mapped watercourse was dry during a visual inspection and is considered a headwater drainage feature, as discussed in **Section 3.2.1**. This indicates groundwater may not emerge as seepage or baseflow into the feature. Seepage and spring areas, if present, are expected to coincide with the wetland areas identified on **Figure 3B** and are captured in the constraint areas noted on **Figure 7A.**

This assessment must be confirmed through additional visual inspections on the Subject Lands, boreholes, monitoring well installations, and groundwater seepage meters.

Figure 7A: Preliminary Constraints Analysis Based on Existing Wetland Policies



The following summarizes KHAs for the Subject Lands:

- The Subject Lands are located within an SGRA with a vulnerability score of 6 with a small portion of the site on the northwest corner considered to have a vulnerability score of 2-4. Parts of the Subject Lands are also within an ESGRA per high-level TRCA mapping, which may indicate that some seepage emerges into the wetland areas on site.
- The majority of the Subject Lands are within an HVA. Certain land uses that have a higher potential to contaminate the HVAs are not permitted in HVA locations.
- Significant Surface Water Contribution Areas are not mapped for the Subject Lands but may exist where permeable soils (e.g., sands and gravels) are at grade, there is a higher groundwater table, and groundwater emerges as baseflow into the watershed. As previously discussed, the mapped watercourse was dry during a visual inspection and is likely a headwater drainage feature, which may not receive baseflow from groundwater. The mapped wetland areas may receive some baseflow of groundwater. Since ESGRAs are also noted on the Subject Lands, this indicates portions of the Subject Lands may contribute to baseflow into the wetland areas. This assessment must also be confirmed through additional visual inspections on the Subject Lands, boreholes, monitoring well installations, and groundwater seepage meters.

5.3 Water Balance and Infiltration

One of the hydrogeological components for developing this site is maintaining the water balance from the pre- to post-construction scenario to the greatest extent possible, given that SGRAs, ESGRAs and Significant Surface Water Contribution Areas are likely present. A water balance is an accounting of the water resources within a given area. The water balance equates the precipitation over a given area to the summation of the change in groundwater storage, evapotranspiration/evaporation, surface water runoff and infiltration. The difference between the mean precipitation and evapotranspiration/evaporation is referred to as the water surplus. The water surplus is divided into two parts: as surface or overland runoff and the infiltration into the surficial soil. The infiltration is comprised of two end member components: one component that moves vertically downward to underlying aquifers (referred to as percolation, deep infiltration or net recharge) and a second component that moves laterally through the near surface soil profile or shallow soils as interflow that re-emerges locally to surface (i.e., as runoff) at some short distance and time following precipitation.

The amount of impermeable land increases with development (such as roads, buildings, Stormwater Management Ponds (**SWMPs**), etc.) and an infiltration deficit will occur between the pre- and post-construction scenarios. The increases in surface water runoff that will occur with urban development and mitigation of the potential impacts to the local water table due to reduction of infiltration may be minimized by using appropriate stormwater management and using low impact development (**LID**) measures to promote infiltration. The following constraints may exist for the site that could reduce the ability to implement infiltration-based LID measures to maintain the water balance:

- Deposits of low-permeability soils may be encountered at grade in portions of the Subject Lands. Low in-situ infiltration rates should be expected for these soils, which may require larger LIDs or a variety of LID measures to maintain the water balance. Depending on the actual soil types and in-situ infiltration rates, infiltration measures may not be practical or feasible for parts of the Subject Lands. Infiltration rates must be assessed on site through a detailed investigation and testing. Infiltration is more feasible in permeable soils like sands and gravel.
- Infiltration elevations must typically be kept 1 metre above the seasonal high groundwater table. Near-surface groundwater levels are currently unknown for the site.
- Infiltration from pollution hotspots (gas stations, waste storage areas, industrial areas, etc.) is typically not permitted.

The TRCA recognizes that the water balance cannot always be maintained on a site, for instance where there is already a high groundwater table or impermeable soils exist near grade. In this case, other mitigation strategies can be explored like off-site compensation to infiltrate water into the same underlying aquifer system but in a location where infiltration is more feasible.

5.4 Construction Dewatering

For typical low-rise land development, excavations for basement levels or site services often extend around 3 metres below grade, and footings may extend about 1.2 metres below grade. The near surface soils are expected to consist of a combination of low-permeability clayey silts (which preclude the free flow of water into excavations) or more permeable sands and gravels (which allow water to flow more freely). On a preliminary basis:

- There are fewer concerns for construction dewatering where cohesive soils are encountered. On sites with similar subsurface conditions, construction can often be completed using a methodology that keeps the water taking to less than 50,000 L/day, preventing the need for an EASR posting or PTTW. At the very least, an EASR posting should be expected if larger areas will be dewatered at the same time.
- Where cohesionless sands or gravels are encountered, higher dewatering rates should be expected that may necessitate an EASR or PTTW.

A detailed hydrogeological study must be completed to calculate the water taking rates and provide an impact assessment. The radius of influence to dewater 3-metre-deep excavations in low-permeability surficial soils is usually small, limiting potential impacts to nearby domestic wells, environmental / surface water features, settlement of nearby land, or overall groundwater quantity. The radius of influence would be greater for sands or gravels and further impact assessments would be required during future studies.

If pumping stations with wet wells are required, typical depths may extend around 10 metres below grade. Few issues with groundwater control are expected for excavations made entirely within cohesionless soils, but positive dewatering methods are anticipated where wet sand or gravel deposits are encountered. Detailed subsurface investigations are required for any potential pumping stations or deeper excavations. High groundwater inflows should be expected where the sands or gravels are encountered, which would likely require a PTTW from the MECP for short term water taking, and hydrostatic uplift resistance may be required as part of the wet well design. Another consideration is adequately sealing deeper excavations to prevent a preferential flow path for contaminants from the ground surface into the confined sand units. The radius of influence for dewatering cohesionless deposits will be much larger and more detailed analysis would be necessary to assess potential short-term impacts to nearby domestic wells or land stability.

6. Review of KNHF, KHF AND KHA Per the Oak Ridges Moraine Conservation Plan

A review of the presence of KNHF, KHF and KHAs in accordance with the ORMCP (2017) is provided below based on the preliminary data that was collected during the background review and site reconnaissance. This interpretation should be considered preliminary and should be refined through detailed site investigations to confirm the presence, extent and functionality of features within the Subject Lands.

Based upon the background information review, KHAs for the Subject Lands are summarized below:

- The Subject Lands are located within an SGRA. Parts of the Subject Lands are also within an ESGRA per high-level TRCA mapping, which may indicate that some seepage emerges into the wetland areas on site.
- Most of the Subject Lands are within an HVA. Certain land uses that have a higher potential to contaminate the HVAs are not permitted in HVA locations.
- Significant Surface Water Contribution Areas are not mapped for the Subject Lands but may exist where permeable soils (e.g., sands and gravels) are at grade, there is a higher groundwater table, and groundwater emerges as baseflow into the watershed. As previously discussed, the mapped watercourse was dry during a visual inspection and is likely a headwater drainage feature, which may not receive baseflow from groundwater. The mapped wetland areas may receive some baseflow of groundwater. Since ESGRAs are also noted on the Subject Lands, this indicates portions of the Subject Lands may contribute to baseflow into the wetland areas. This assessment must be confirmed through additional visual inspections on the Subject Lands, boreholes, monitoring well installations, and groundwater seepage meters.

Based on the background information review and site reconnaissance, the following provides the assessment of KHFs that may be present within the Subject Lands:

- Permanent and intermittent streams;
    - The two HDFs on the Subject Lands would not qualify as a permanent or intermittent stream.
- Lakes (and their littoral zones);
    - No lakes or their littoral zones are present within the Subject Lands.
- Kettle lakes:
    - No kettle lakes have been identified within the Subject Lands.
- Seepage areas and springs;
    - Based on the Subject Land's topography, seepage areas or springs are not expected across most of the Subject Lands due to relatively flat conditions. The mapped watercourse was dry during a visual inspection and is considered a

headwater drainage feature, as discussed in **Section 3.2.1**. This indicates groundwater may not emerge as seepage or baseflow into the feature. Seepage and spring areas, if present, are expected to coincide with the wetland areas identified on **Figure 3B** and are captured in the constraint areas noted on **Figure 7A** with the applicable 30 m VPZ**.**

- Wetlands
    - Wetland vegetation communities have been identified within the Subject Lands. Twelve PSW units (associated with the Wilcox-St. George wetland complex) are present within the Subject Lands. Other unevaluated wetlands are considered candidate PSWs given their proximity to the PSW units (based on the current wetland evaluation process in the province). All wetlands, regardless of significance status, are considered to be KHFs.

Based on the background information review and site reconnaissance, the following provides the assessment of KNHFs that may be present within the Subject Lands:

- Habitat of Endangered and Threatened species;
    - Potentially suitable habitat for species designated as Endangered or Threatened on the SARO list is present within the Subject Lands, generally in association with woodlands and wetlands.
- Fish habitat;
    - Fish habitat may be present within the Subject Lands in Drainage Features 1 and 2. These HDFs may provide seasonal direct fish habitat or indirect fish habitat.
- Wetlands;
    - PSW units and unevaluated wetlands (candidate PSWs) were identified within the Subject Lands.
- Life Science ANSIs;
    - The Lake St. George Provincially Significant Life Science ANSI is present within the Subject Lands.
- Significant valleylands;
    - No significant valleylands are present on the Subject Lands.
- Significant woodlands;
    - Significant woodlands may be present within the Subject Lands.
- SWH (including habitat of special concern species);
    - Candidate SWH types were identified within the Subject Lands. All candidate SWH types are generally associated with the forested or wetland communities, except for the Monarch SWH type, which was identified within the CUM vegetation communities and the reptile hibernacula SWH type, which is associated with old building foundations.
- Sand barrens, savannahs and tallgrass prairies; and
    - No sand barrens, savannahs or tall grass prairies were identified within the Subject Lands.
- Alvars.
    - No alvars were identified within the Subject Lands.

7. Preliminary Constraints Analysis Summary

Several candidate KNHFs and KHFs were identified as potentially present within the Subject Lands. The location of these candidate KNHF and KHF are illustrated on **Figure 7A** and **7B**.

A policy review of the required setbacks for each KNHF and KHF was undertaken to understand the minimum vegetated setbacks or VPZs. Development and site alteration is prohibited within KNHFs and their associated minimum VPZs in accordance with Section 22(2) of the ORMCP (2017). The KNHFs, KHFs, and ANSI Table within the ORMCP (2017) outlines the minimum VPZs. A minimum of a 30 m VPZ is required for all KNHF and KHFs, except for habitat for endangered and threatened species, ANSIs or SWH, as these are determined during detailed evaluations. Section 23 of the ORMCP states that a NHE is required to ensure that development or site alteration will not cause adverse effects to KNHF and their associated functions.

Regardless of the policies applied to the candidate features within the Subject Lands, provincial and local policies dictate that a minimum of a 30 m VPZ is required from the boundary of all KNHF and KHFs (based on the presence of the ORMCP designations). No alteration or development is permitted within the features and their associated VPZs, with some exceptions (e.g., infrastructure in accordance with Section 4 of the Greenbelt Plan). A 30 m VPZ has been applied to all candidate KNHF and KHFs for the purposes of this assessment. However, opportunities to refine the VPZs for these features (in accordance with provincial or municipal policies) should be considered during the next stage of development.

KHAs were identified on the Subject Lands. No minimum VPZ are prescribed for KHAs, but additional studies will be required for major developments to demonstrate that the hydrologic functions (such as quality and quantity of groundwater and surface water) are protected and, where possible, improved or restored.

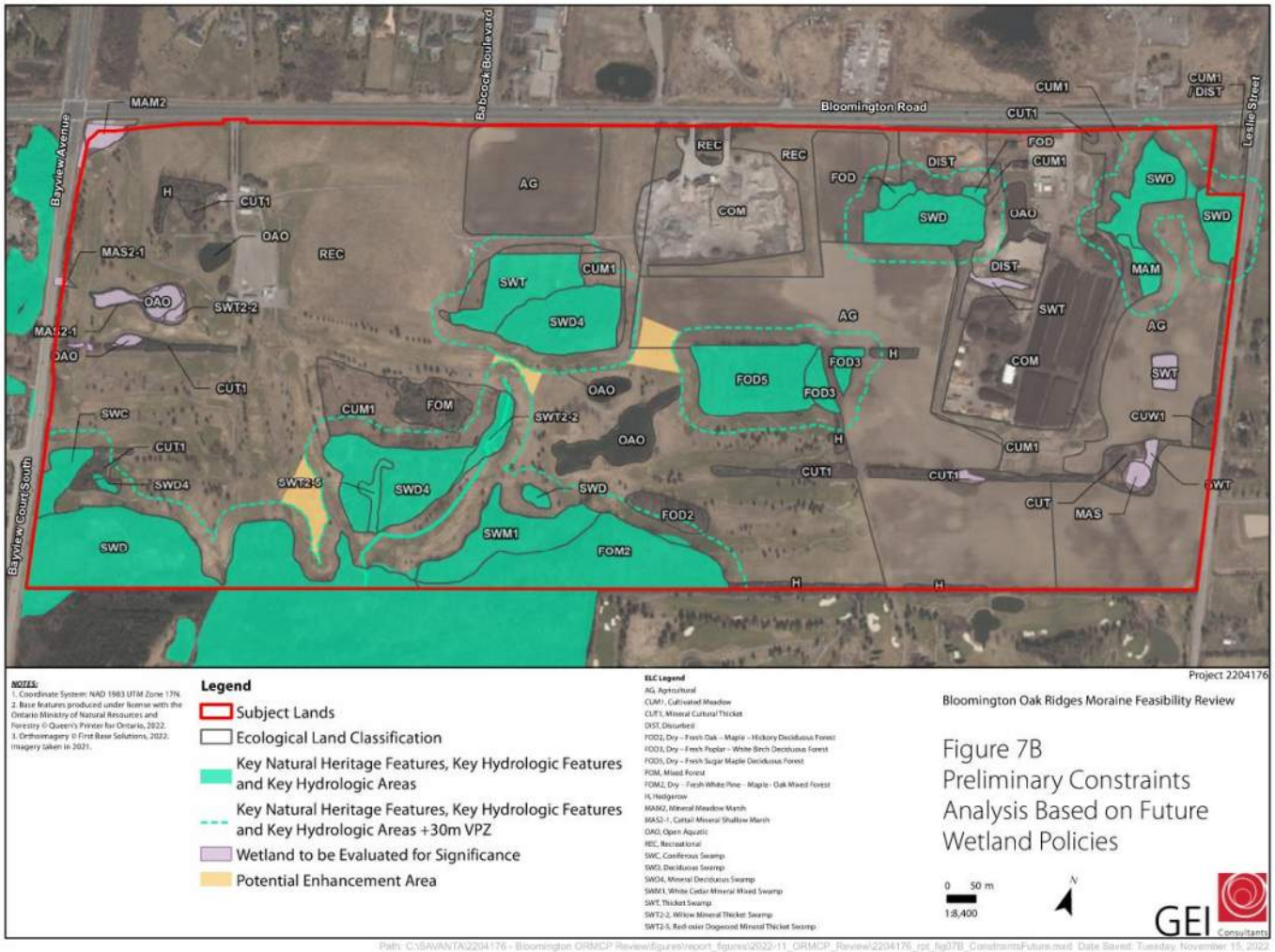
For the purposes of this assessment, two constraint scenarios have been identified. **Figure 7A** depicts the constraints associated with the existing wetland evaluation process in place at the time of preparation of this report. Under this scenario, all existing PSWs and all candidate PSWs have been identified as KNHFs and KHFs and protected in place with a 30 m VPZ. This scenario assumes that if all unevaluated wetlands were to be evaluated in accordance with the existing OWES (MNRF 2013) that they would be complexed into the existing PSW complex on and adjacent to the subject lands.

Figure 7B depicts an alternative potential scenario where the wetlands on the Subject Lands could be evaluated (or re-evaluated in the case of existing PSWs) using the OWES manual revisions that have recently been proposed by the Government of Ontario. Under this manual, complexing is not required, except where wetlands are within 30 m of each other. Wetland units beyond 30 m from any other wetland would be evaluated on their own, while any wetlands within 30 m of each other would be evaluated as a complex. Further, the proposed OWES manual revisions indicate that existing PSWs could be re-evaluated as individual units as opposed to part of a larger complex (provided they meet the minimum separation

distance of 30 m). If all wetlands on the Subject Lands were evaluated/re-evaluated, the results may demonstrate that these wetlands do not meet the criteria to be PSWs. Under such a scenario, the recently released Government of Ontario policies indicate that wetland removal and offsetting may be a possibility. Therefore, the development scenario depicted in **Figure 7B** identifies the wetlands that could potentially be evaluated/re-evaluated and removed and offset elsewhere on the Subject Lands (I.e., elsewhere within the NHS) if they were determined to not be significant. The potential feasibility of this scenario is dependent on the Government of Ontario approving the recently proposed changes to the wetland evaluation process as written. This would also require completion of evaluation/re-evaluation and identification of offsetting (where required). Additional ecological and biophysical field investigations would be required to complete the assessment process under this scenario.

As depicted on **Figures 7A** and **7B**, GEI has identified several “Potential Enhancement Areas” as part of the NHS. These enhancement areas are primarily intended to connect several KNHFs located within close proximity to each other within a contiguous NHS such that they do not become isolated within the developed landscape. These enhancement opportunities will need to be explored following detailed investigations. These enhancement areas may support infrastructure such as roadways, stormwater management facilities, recreational trails, or native vegetative plantings. These enhancements would strengthen and create a more resilient and connected system.

Figure 7B: Preliminary Constraints Analysis Based on Future Wetland Policies



8. Proposed Refinements

This assessment has evaluated the feasibility of local refinements to the ORMCP designations within the Subject Lands to facilitate future development while continuing to ensure that important natural heritage features are protected. The assessment process has been informed by the desktop review and site reconnaissance that is presented within the sections above.

Currently, there are three ORMCP land use designations on the Subject Lands. The northwestern part and a portion of the central part of the Subject Lands is identified as Countryside. The southwest portion is identified as a Natural Core Area and the eastern portion is identified as a Natural Linkage Area (as depicted on **Figure 2**).

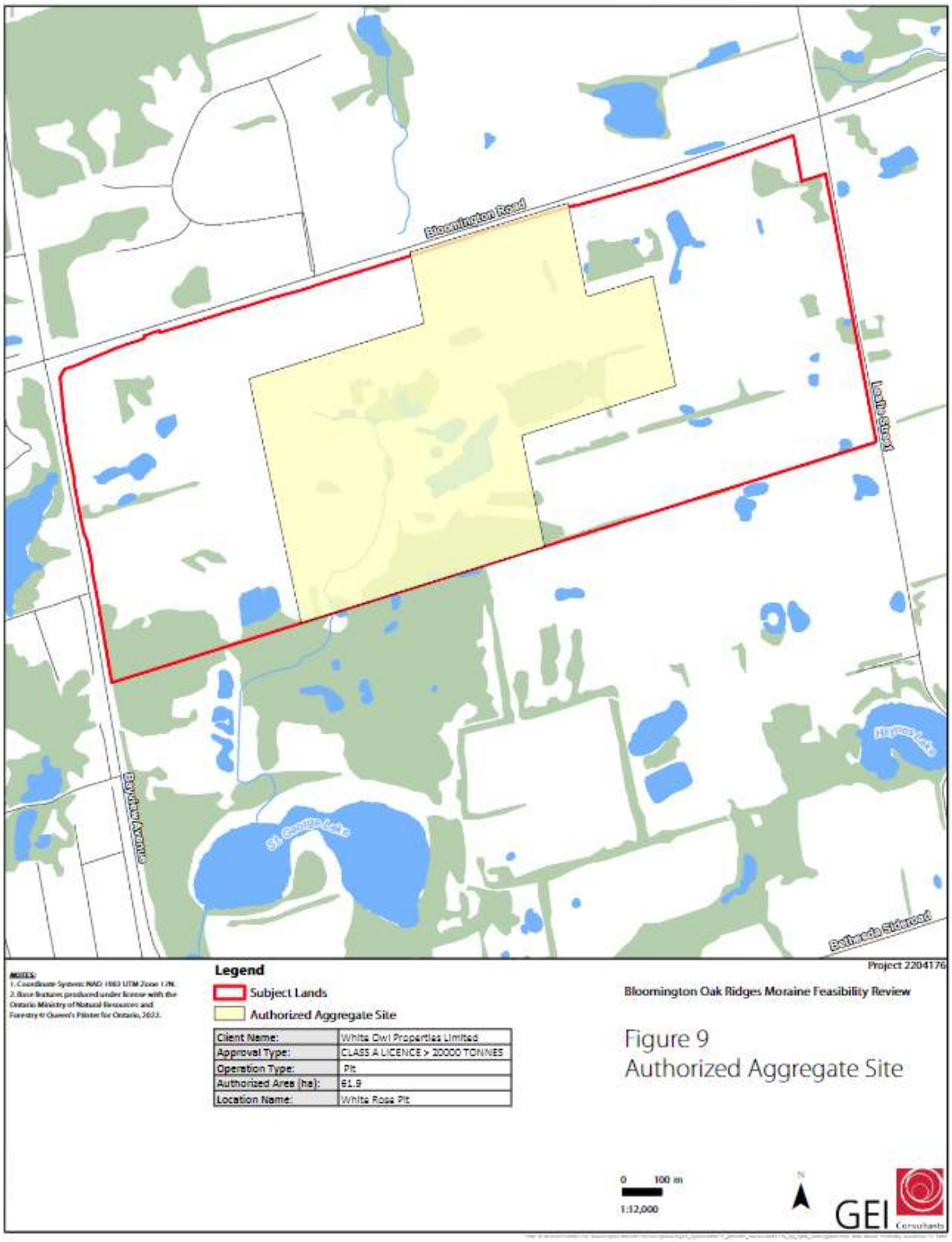
Based on GEI's analysis, redesignation of the existing Countryside Area to Settlement Area appears feasible to increase available land for residential development while still ensuring that important natural heritage and hydrologic features are protected. The proposed refinement is depicted on **Figure 8**. GEI understands that no alterations to the existing Natural Core Area or Natural Linkage Area designations or boundaries on the Subject Lands are proposed at this time.

Figure 8: Existing and Proposed ORMCP Land Use Designations

Even following the proposed ORMCP conversion of Countryside Area to Settlement Area, any KNHFs and KHFs within and adjacent to the Settlement Area will still need to be fully assessed and those meeting relevant criteria will need to be protected on the landscape in accordance with the local municipal OP policies. Therefore, the constraints identified on **Figures 7A** and **7B** (depending on the development scenario) will remain protected within the NHS (if they continue to warrant inclusion following completion of detailed investigations), even if some of them are located within the future Settlement Area.

Additionally, a 61.9 hectare (Ha) portion of the Subject Lands is noted as Authorized Aggregate Site as an Above Water Active Pit (ALPS ID 6550) identified as the Bloomington Aggregates site (**Figure 9**). The retention the ORMCP Natural Core Area boundary will ensure that those significant natural heritage features presently located within the existing Natural Core Area and that are part of larger features that extend off-site, will continue to be protected

Figure 9: Authorized Aggregate Site



9. Geotechnical Engineering Commentary

The commentary provided below is based on the desktop review and high-level background information available for the Subject Lands. The commentary may change once a site-specific investigation is carried out (including boreholes and monitoring wells), which are required to provide preliminary or detailed geotechnical engineering recommendations.

The subsurface conditions are summarized in **Section 4**. Overall, a combination of cohesive deposits of clayey silts and glacial tills, to cohesionless sands and gravels are expected beneath the Subject Lands. Local fill may be encountered near the developed areas. It is common to encounter thicker topsoil layers in farm fields (on the order of 0.5 to 1 m could be encountered), and the upper 1 to 2 m of in-situ soil is often disturbed from farming activities or weathered from frost penetration. Otherwise, the soil deposits expected for the site are generally considered favourable for low-rise land development, as discussed below.

9.1 Site Grading

The Subject Lands are relatively flat; therefore, a cut and fill balance may not be necessary when considering site grading. The topsoil layer and any vegetation or existing pavements will need to be removed and typical recommendations for proof-rolling and/or subgrade inspections prior to fill placement, will likely apply. Depending on the presence, consistency, and thickness of potential weathered / disturbed zones near the ground surface, some further sub-excavation can be expected for settlement-sensitive areas or locations of engineered fill.

Depending on the extent of cut and fill across the Subject Land, it may be most practical to raise grades beneath building footprints using engineered fill. GEI defines “engineered fill” as material that will support foundations, and which is placed and compacted in a specified and controlled manner under full-time supervision of geotechnical engineering staff. A benefit of constructing an engineered fill pad beneath buildings is to provide uniform support and reduce the total bearing depth of foundations that would otherwise need to extend to the underlying native soils.

For soils containing a higher clay content, it can be difficult or impractical to increase or decrease moisture content to reach the optimum moisture content for soil compaction. In-situ moisture content must be tested during a future borehole program to determine any moisture conditioning requirements or potential constraints related to soil re-use on site, where higher compaction specifications are needed (e.g., for engineered fill).

9.2 Foundations and Slabs

It is expected that conventional shallow spread and strip footing foundations made at frost depth on the undisturbed native soils should be suitable for the support of typical low-rise residential, commercial and / or industrial buildings. Conventional spread and strip footing foundations can also be made on engineered fill where grades are raised beneath building locations.

Unreinforced concrete slabs can typically be set on weathered native soils, undisturbed native soils, or new compacted fill based on our experience on similar sites. Standard sub-slab drainage layers are expected. Cohesive soil deposits can be more susceptible to disturbance from the weather or construction traffic, so additional considerations for construction access lanes may be warranted where cohesive soils are encountered.

9.3 Site Servicing

The type of material and depth of granular bedding below the pipe will, to some extent, depend on the method of construction used by the contractor. Pipe bedding for flexible and rigid pipes normally follow the requirements set out in Ontario Provincial Standard Drawings (**OPSDs**). Based on the anticipated soil subgrade conditions, typical OPSD bedding requirements are likely sufficient.

9.4 Pavements

Topsoil and vegetation are not suitable subgrade material for pavement structures, but native soils or proof-rolled and inspected weathered / disturbed soils are likely suitable. Some local sub-excavation and replacement of weak or organic zones should be expected. The long-term performance of the pavement structure is highly dependent upon the subgrade support conditions. Stringent construction control procedures must be maintained to ensure that uniform subgrade moisture and density conditions are achieved as much as possible when fill is placed, and the natural subgrade is not disturbed or weakened after it is exposed.

Typical drainage provisions are expected, such as sloped subgrades towards roadside ditches or to subdrains that drain into catch basins and storm sewers.

The subgrade conditions are likely suitable to support a flexible asphaltic pavement structure (asphalt and granular courses) for a typical 15-to-20-year design life. A site-specific pavement design should be provided following a borehole investigation, but the minimum City pavement design standards should be suitable.

A close control on the pavement construction process will be required to obtain the desired pavement life. Regular inspection and testing should be conducted during the pavement construction to confirm material quality, thickness, and to ensure adequate compaction.

9.5 Excavations

Where workers must enter a trench or excavation the soil must be suitably sloped and/or braced in accordance with the Occupational Safety and Health Administration (**OHSA**). These regulations designate four (4) broad classifications of soils to stipulate appropriate measures for excavation safety. If firm to hard cohesive glacial till or clays are encountered on site, excavation slopes for Type 2 or 3 Soils could be expected. Cobbles and boulders embedded within glacial till deposits should be expected in construction excavations. If sands and gravels are encountered, slopes for Type 3 Soils should be expected above the groundwater table (or when the soils are dewatered) and slopes for Type 4 Soils below the groundwater table. Commentary on temporary groundwater control is provided in **Section 5.4**.

9.6 Erosion and Slope Stability Hazards

The watercourse on site is a Regulated Area by the TRCA and is therefore subject to policies related to slope instability and erosion hazards. Where the watercourse consists of a confined (apparent) valley system (including the river / creek, floodplain, slope, and tableland with a defined crest), the slope and erosion hazards and setback limits for development are calculated combining a toe erosion allowance, stable slope allowance, and erosion access allowance. A geotechnical investigation and slope stability study are typically recommended to determine the setback limits. In lieu of a detailed study, conservative setbacks can be applied but this potentially reduces the amount of developable space.

For unconfined systems, the development setbacks are calculated by meander belt analysis, carried out by a fluvial geomorphologist. As discussed in previous sections, the mapped watercourse on the Subject Lands was dry during a visual inspection, is likely a headwater drainage feature and confined / apparent valley systems were not identified on the Subject Lands. On a preliminary basis, any potential setbacks in this headwater drainage feature related to meander belt analysis are expected to be located within the constraint areas noted on **Figure 7A**. This must be confirmed through additional detailed studies.

10. Geoenvironmental Considerations

A preliminary geoenvironmental review for Potentially Contaminating Activities (PCAs) was completed for the Subject Lands using aerial images only. Additional detailed studies must be conducted to further assess and confirm the PCAs.

Aerial photographs were obtained in order to review the development and land use history of the Subject Lands, as well as to the land in the immediate vicinity of the Subject Lands. An aerial photograph dated 1954 was obtained from the University of Toronto Library, and aerial photographs dated 1985, 2002, 2005, 2009, 2015, 2016, 2017, 2018, 2019, 2020, 2021 and 2022, were obtained from Google Earth. The aerial photographs were collected based on availability from the archives at available intervals to best capture the changes to the Subject Lands. GEI notes that at the time of this review, the 1954 aerial photograph was the earliest available photograph for the Subject Lands and surrounding area.

The development and land use history of the Subject Lands and adjacent properties as depicted on the reviewed aerial photography is summarized in the table below.

Table 1: Aerial Photograph Observations

Aerial Photograph Year	Observations
1954	a. The Subject Lands appears to be developed for agricultural use.
1985	a. The Subject Lands appears to have two new developments near the northeast quadrant on Bloomington Road. Later images show that this development was likely the Miller Compost Depot and the Miller Paving Limited Depot.
2002	a. The Subject Lands appear to be developed with the Bloomington Downs Golf Course. This includes six (6) buildings and a parking lot with an access road from Bloomington Road. b. Some residential developments appear to be developed to the north and west of the Subject Lands.
2005	a. The Subject Lands remain unchanged since the 2002 aerial photograph. b. Additional residential dwellings appear to have been developed northwest of the Subject Lands.
2009	a. The Subject Lands remain unchanged since the 2002 aerial photograph.
2015	a. The Subject Lands remain unchanged since the 2002 aerial photograph.
2016	a. The Subject Lands remain unchanged since the 2002 aerial photograph.
2017	a. The Subject Lands remain unchanged since the 2002 aerial photograph.
2018	a. The Subject Lands remain unchanged since the 2002 aerial photograph.
2019	a. The Subject Lands remain unchanged since the 2002 aerial photograph.
2020	a. The Subject Lands remain unchanged since the 2002 aerial photograph.
2021	a. The Subject Lands remain unchanged since the 2002 aerial photograph.
2022	a. The Subject Lands remain unchanged since the 2002 aerial photograph.

Based on the review of the aerial photographs the following PCAs were identified:

- The Subject Lands were historically used for agricultural purposes from prior to 1954 to 2022. The Subject Lands were also historically used as a golf course. The Subject Lands are associated with PCA#40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications.
- The Subject Lands were also next to the Miller Compost Depot and the Miller Paving Depot. These practices are generally associated with PCA#5 – Asphalt and Bitumen Manufacturing.
- Multiple residential dwellings appeared to have been developed at the western, northwestern, and northern portions of the Subject Lands between 1954 and 2005. Fill material may have been brought to the Site. The Subject Lands are associated with PCA#30 – Importation of Fill Material of Unknown Quality.

Based on the review of the aerial photographs only, no additional PCAs as per Table 2, Schedule D of O.Reg.153/04, as amended, were identified.

11. Servicing Overview

The purpose of this servicing overview is to identify existing key major infrastructure related to sanitary sewage conveyance and municipal water distribution currently servicing the community (within the City of Richmond Hill) and identify potential opportunities for extending such municipal services to the Subject Lands.

This report considers that the proposed development will allow for both sanitary and water linear infrastructure to connect to, and internally within the Subject Lands. Future studies are required to assess this infrastructure within the context of a development plan. Regardless, external regional or municipal infrastructure connections will extend internally through the local road network and service the entire proposed development as presented further in **Sections 11.1** and **Section 11.2**. In terms of stormwater management perspective, the Subject Lands are discretized in three ways by quaternary subwatersheds overlapping the site and thus distinctly characterizes the stormwater management criteria applied to the various end-of-pipe facilities controlling the proposed development. A guideline for additional stormwater management studies and conceptual facility locations within the Subject Lands are discussed further in **Section 11.3**.

In addition, this overview will identify planned improvements to existing infrastructure and/or new infrastructure that may assist with providing municipal servicing to the Subject Lands. The governing authority in terms of sanitary sewage conveyance and water supply is the Regional Municipality of York and City of Richmond Hill. This overview will reference applicable documents and studies that pertain to such planned improvements.

It is envisioned that the intended land use densities for the proposed residential development and potential lot sizes will require provisions for municipal servicing as the desired approach for new development rather than private servicing (i.e., private septic systems and wells)

11.1 Sanitary Servicing

11.1.1 Existing

Existing regional and municipal sanitary sewers are in the vicinity of the Subject Lands as follows:

- A 1050mm Regional YDSS / The Yonge Street Trunk Sewer at the intersection of Bayview Avenue and Bloomington Road (see **Figure 10A**). Note, 1050mm regional sanitary sewer crosses the intersection westerly to Yonge Street from Bayview Avenue (north of Bloomington Road).
- A 250mm municipal sanitary sewer extends southerly along Bayview Avenue west of the Subject Lands (see **Figure 10B**) from Paradelle Drive via a 6.0m servicing block (0.25km from the intersection of Bayview Avenue and Bloomington Road).
- Municipal sanitary sewer along Leslie Street, approximately 1.5km south of the subject land's south boundary (see **Figure 10B**).

Figure 10A: York Region's Baseline Wastewater Infrastructure System in 2021

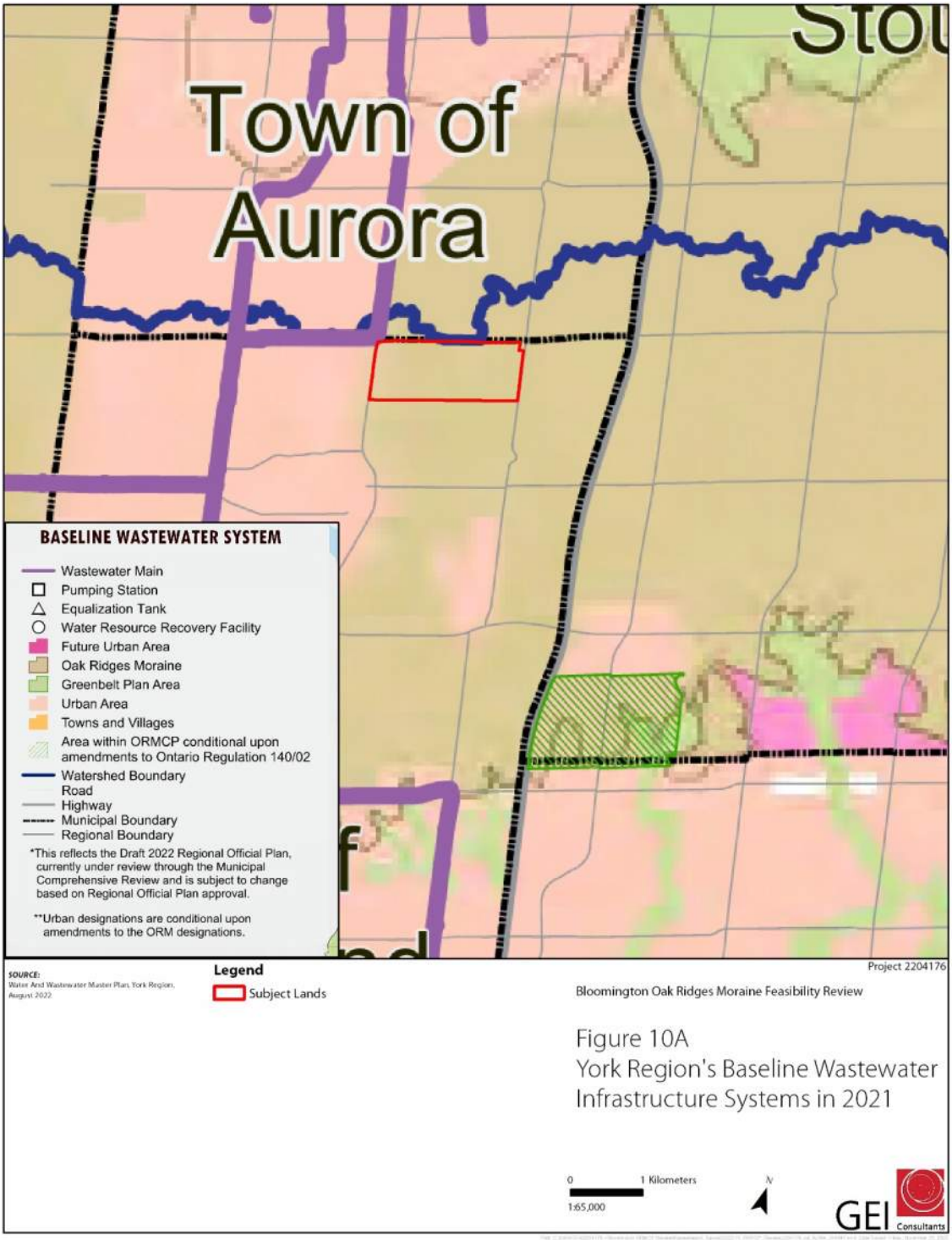
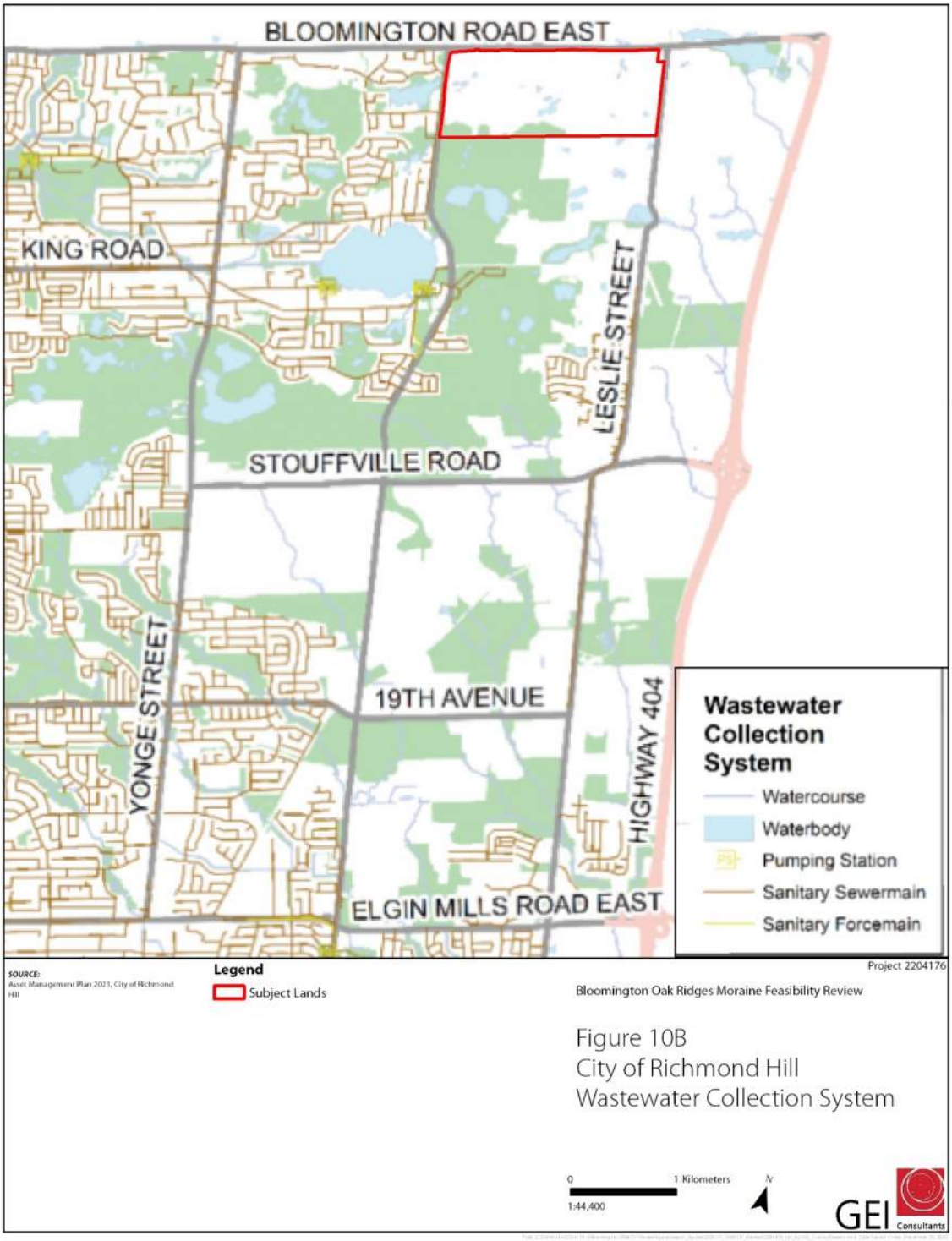


Figure 10B: City of Richmond Hill Wastewater Collection System



11.1.2 Proposed (Options A & B)

Each of the three options listed below will require a downstream capacity analysis which the results thereof may include various downstream infrastructure upgrades. Sanitary servicing strategies are presented below as Options A through C and illustrated as **Figure 10C** and **Figure 10D**, respectively.

As illustrated in **Figure 10C**, Option A proposes approximately 0.7km of proposed forcemain from the intersection of Babcock Boulevard & Bloomington to connect to the existing 1050mm regional Yonge Street Trunk Sewer at the intersection of Bayview Avenue and Bloomington Road northwest of the Subject Lands. Note, a proposed sanitary pumping station located at the intersection of Bloomington Road and Babcock Boulevard.

As illustrated in **Figure 10D**, Option B proposes to connect the Subject Lands directly to a 375mm municipal gravity sewer at the intersection of Bayview Avenue and Snively Street. Note, the 375mm gravity sewer traverses southerly along Bayview Avenue west of the Subject Lands.

As proposed in the York Region Water and Wastewater Master Plan (York Region 2022), a new pumping station located near the Yonge Street & Henderson Drive intersection will be connected to the YDSS as recommended by a completed Environmental Assessment (**EA**) in 2019 and scheduled for operation by 2031. Additionally, an ongoing EA Schedule B (York Region 2022) recommends twinning sanitary sewer along Yonge Street from Henderson Drive to 19th Avenue and is scheduled for operation by 2031. Both of these EA based recommendations will increase the conveyance capacity of regional Yonge Street Sewer which may be required as part of above-mentioned sanitary servicing options.

Figure 10C: Sanitary Sewer Connection – Option A

Figure 10D: Sanitary Sewer Connection – Option B

11.2 Water Servicing

11.2.1 Existing

Existing regional and municipal watermains are in the vicinity of the subject lands as follows:

- Regional 400mm CCP on Bloomington Road is located west of the intersection of Bayview Avenue and Bloomington Road and traverses west along Bloomington Avenue (see **Figure 10E**). Note, a 400mm CPP stub exists on Bayview Avenue immediately south of the intersection.
- Municipal 150mm PVC pipe is located west of the Subject Lands along Bayview Avenue (see **Figure 10F**) as extended from Paradelle Drive via s 6.0m servicing block (0.25km south of the intersection of Bayview Avenue and Bloomington Road).

11.2.2 Proposed (Options A & B)

The proposed watermain servicing strategy, as illustrated in **Figures 10G**, connects the Subject Lands with a proposed watermain from the intersection of Babcock Boulevard and Bloomington Road to the existing regional 400mm CPP watermain stub immediately south of the intersection of Bayview Avenue and Bloomington Road. The watermain service for the Subject Lands is further looped by connecting directly to an existing 150mm municipal watermain at the intersection of Bayview Avenue and Snively Street. Note, the looped service connection to external infrastructure would be completed in the Subject Lands proposed development.

As proposed in the York Region Water and Wastewater Master Plan (York Region 2022), the proposed development may require an EA Schedule B scheduled expansion of the Aurora East Booster Pumping and watermain upgrades along Leslie Street between Henderson Drive and Eglin Mills Road. Additionally, the York East Water Servicing EA Schedule B (York Region 2022) recommends a new pumping station at the Markham reservoir as well as a new reservoir & pumping station in Aurora to bring additional supply from Lake Ontario. Both of these EAs recommend infrastructure to be operational by 2031 and will be reviewed to further inform the above proposed works. Further analysis will be required to determine if the Subject Lands' domestic water demand and fire flow requirements are satisfied by currently planned system upgrades.

11.3 Stormwater Management

Management of stormwater will be required to provide quantity and quality control of runoff. These control criteria can be accomplished by constructing open air stormwater ponds (for large drainage areas) or by installing underground storage and treatment structures (on a localized site basis). The use of traditional open air stormwater ponds should be utilized as the preferred method to control runoff for the Subject Lands.

Figure 10E: York Region's Baseline Water Infrastructure Systems in 2021

Figure 10F: City of Richmond Hill Water Distribution Systems

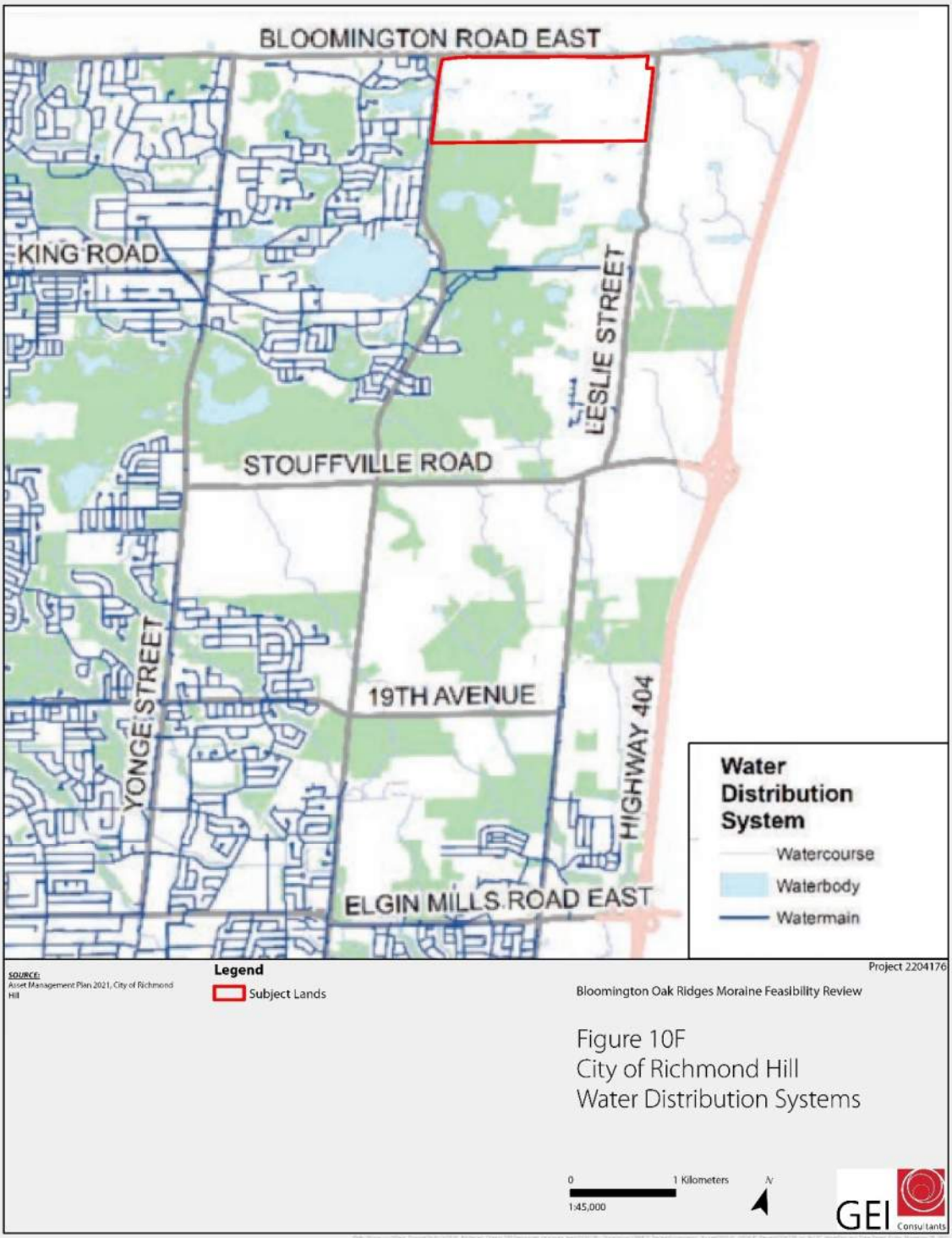


Figure 10G: Watermain Connections

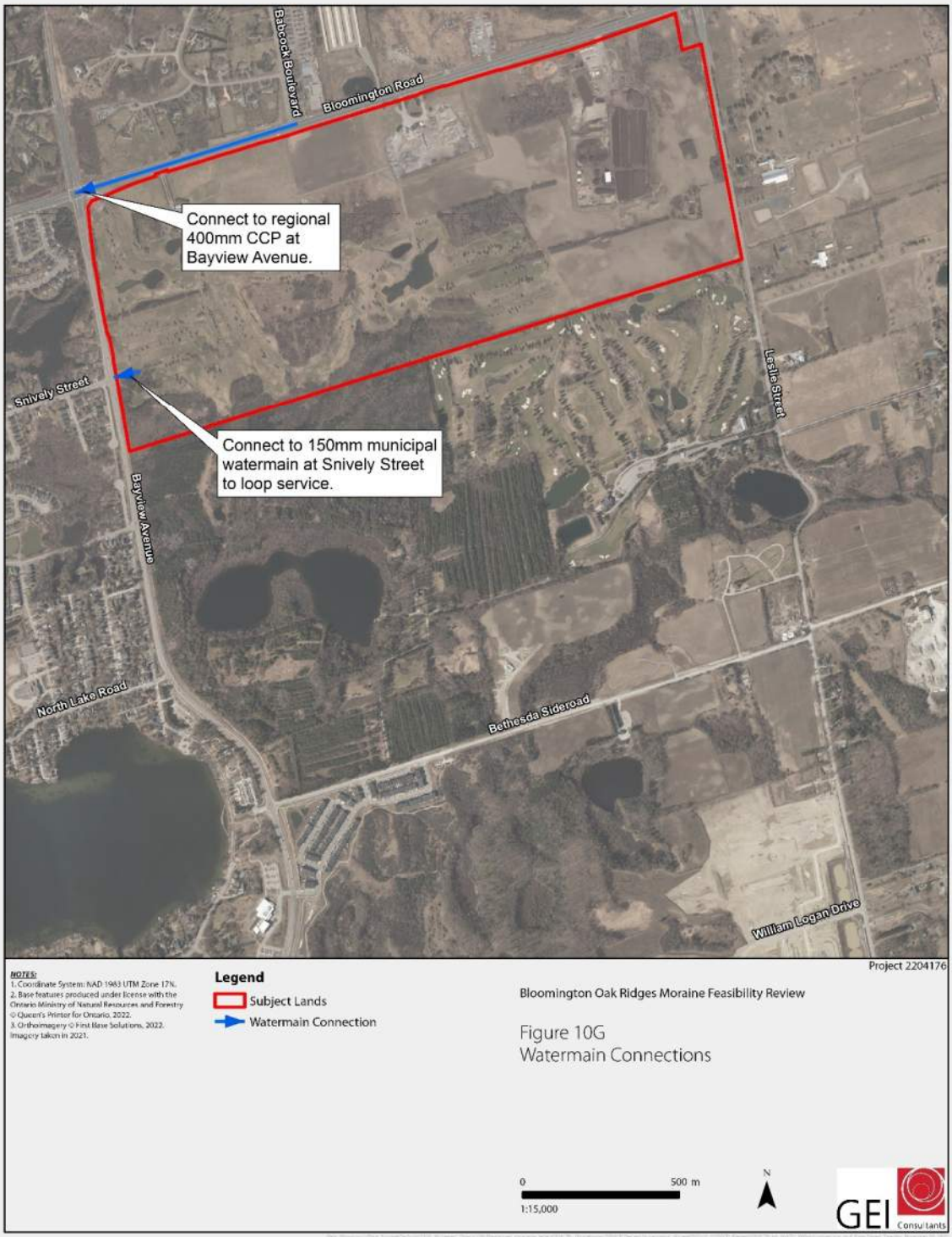
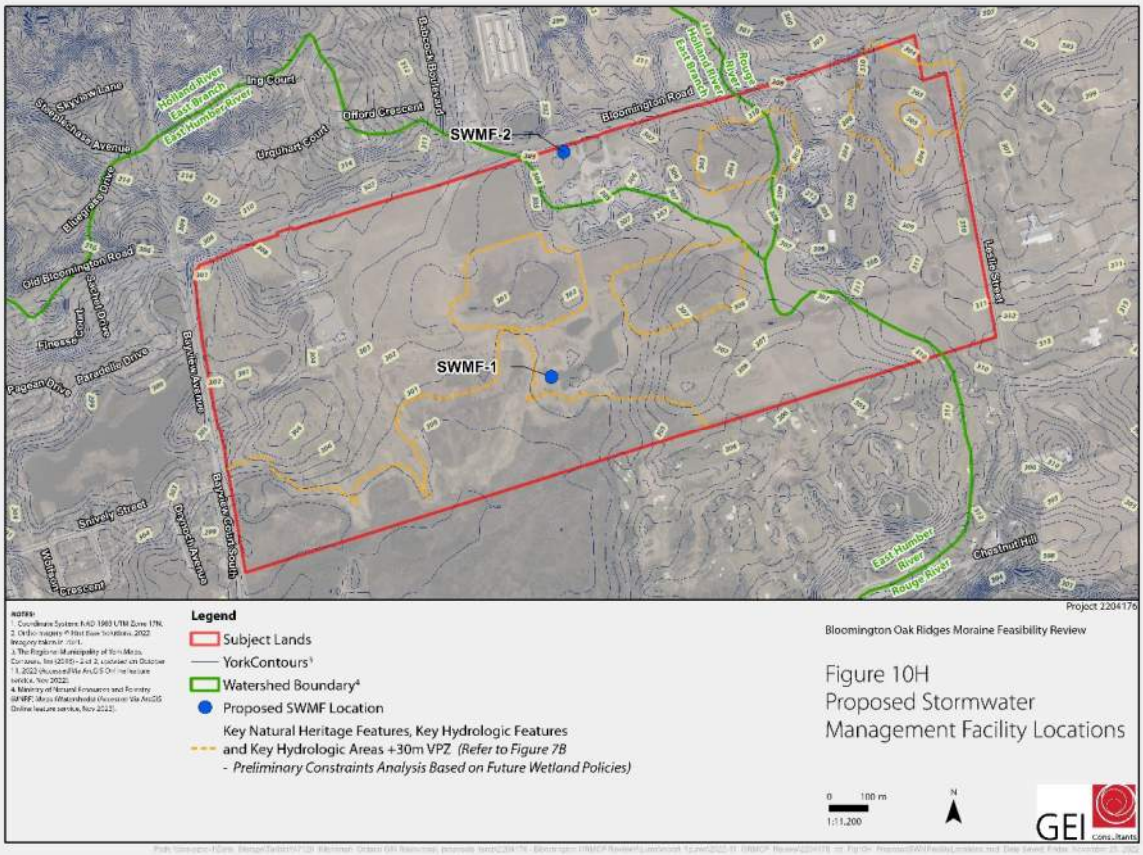


Figure 10H: Proposed Stormwater Management Facility Locations



Most of the Subject Lands are situated within TRCA jurisdiction and divided between the Humber River watershed and The Rouge River watershed, while the remaining of the Subject Lands (north portion) is within LSRCA jurisdiction / Holland River watershed (refer to **Figure 10G**). In general, post-development drainage design should respect the pre-development drainage patterns in terms of maintaining similar flow rates and contributing areas towards their respective watershed, i.e., no diversion of stormwater from one watershed to another.

Stormwater management facilities are labeled as SWMF-1 and SWMF-2 are conceptually located at the topographic low points and generally close to existing outlets/watercourses as illustrated in **Figure 10G**. Generally, SWMF are placed outside of key natural heritage features, flood limits, their associated buffers and “linkage” areas.

A portion of the Subject Lands’ drainage area within the Humber River watershed is proposed to be controlled by SWMF-1 as conceptually located near the topographic low point approximately at the Subject Lands’ southern midpoint. Additionally, the drainage area within Holland River subwatershed is proposed to be controlled by SWMF-2 as conceptually located at topographic low point at the northern boundary limits of the Subject Lands (refer to **Figure 10G**). Given that this drainage area of the Holland River subwatershed is relatively small, all end of pipe facilities will be considered. The eastern portion of the Subject Lands’ drainage area, generally within the Rouge River watershed, is not proposed to be controlled by a SWMF given there are no alterations contemplated for this area. Note, drainage area within the Subject Lands north-west corner will require further review in future studies as will the external drainage area north of Bloomington Road within the Humber River watershed.

12. Conclusions

This Greenbelt and Oak Ridges Moraine Planning Area review was completed for the Subject Lands to inform whether any refinements may be warranted given the existing conditions on site. These refinements were recommended based on background reviews and observations from the site reconnaissance; however, further refinements may be feasible following detailed investigations to confirm whether candidate features are present within the Subject Lands.

Potential candidate KNHF, KHF and potential KHAs were identified within the Subject Lands, including:

- Permanent and/or intermittent streams;
- HVAs;
- SGRAs and ESGRAs;
- Significant Surface Water Contribution Areas;
- Wetlands (PSW and unevaluated);
- Habitat for Endangered and Threatened species;
- Fish habitat;
- Significant woodlands; and
- SWH.

It is our opinion based our desktop review that refinements it appears feasible to convert the existing Countryside Area to a Settlement Area while still ensuring that important natural heritage features are protected. GEI understands that no alterations to the existing Natural Core Area or Natural Linkage Area designations or boundaries are proposed. . The proposed refinement is generally associated with active agricultural areas, existing industrial occupied portions of the Subject Lands and managed golf course areas that are not known to meet any of the criteria to qualify as a KNHFs or KHFs. KNHFs and KHFs that are present within the Settlement Area (generally associated with existing woodlands and wetlands) will need to be protected from impacts associated with the development and site alteration. Potential enhancement areas are proposed, will better connect the two planning areas and create a more resilient system. Confirmatory investigations are required to:

(1) Determine whether the candidate KNHF and KHFs are present within the Subject Lands; and,
(2) Confirm their form and functionality within the landscape.

Feature staking exercises are required to determine the exact boundaries for woodland, wetland and valleyland features. These investigations would be undertaken in Spring, Summer and Fall 2023.

The commentary for geotechnical, hydrogeological, and geoenvironmental conditions was based on the desktop review and high-level background information available for the Subject Lands. The commentary may change once detailed site-specific investigations and reports

are carried out. Overall, there were no geotechnical, hydrogeological, or geoenvironmental constraints identified that should significantly inhibit design and construction above or beyond typical approaches for similar sites.

Servicing strategies proposed within this study are an extension of existing municipal and regional infrastructure within the area. These strategies provide flexibility with multiple sanitary options to confirm servicing functionality of the subject lands inclusive of connecting to YDSS Regional servicing systems. Overall, the site is functionally serviceable by sanitary, water distribution, and stormwater based on the strategies presented.

It should also be noted that the Provincial government has proposed a number of legislative and guidance policy changes via the More Homes, Built Faster: Ontario's Housing Supply Action Plan (MMAH 2022). The various proposed policy changes are still under the review and but may result in considerable changes to the land development planning and the guidelines pertaining to development in and around Natural Heritage Features such as wetlands, woodlands and watercourses.

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Appendix A

Tables

Table 1: Significant Wildlife Habitat Assessment (6E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	POTENTIAL FOR SWH TYPE PRESENCE?
1. SEASONAL CONCENTRATION AREAS				
Waterfowl Stopover and Staging Areas (terrestrial)	No – the CUM and CUT vegetation communities are too small to support sufficient numbers of species.	N/A	No	No – SWH type is not present
Waterfowl Stopover and Staging Areas (aquatic)	No– The MAS features within the subject Lands were considered too small to support sufficient number of the species. While the SWD features, particularly along the southern limit of the Subject Land may be of sufficient size, they lacked open water necessary to support these wildlife species.	N/A	No	No – SWH type is not present
Shorebird Migratory Stopover Areas	Yes – a MAM2 vegetation communities is present within the Subject Lands.	No – Muddy, unvegetated shorelines not present.	No	No – SWH type is not present
Raptor Wintering Areas	Yes – Forested and upland vegetation communities are present within the Subject Lands.	Yes – The forested and upland communities in and adjacent to the Subject Lands meet the minimum combined site criteria (>20 ha).	Yes	Yes – SWH type may be present
Bat Hibernacula	No – Caves and crevices are absent from the Subject Lands.	N/A	No	No – SWH type is not present

Table 1: Significant Wildlife Habitat Assessment (6E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	POTENTIAL FOR SWH TYPE PRESENCE?
Bat Maternity Colonies	Yes – Forested (FOD, FOM) and swamp (SWD, SWM) vegetation communities are present within and immediately adjacent to the Subject Lands.	Additional studies will be required to confirm if habitat conditions are met.	Yes – Surveys targeting bats are recommended.	Yes – SWH type may be present
Turtle Wintering Areas	Yes –OAO/Ponds are present within the Subject Lands. Most of the isolated ponds associated with the golf course are considered man-made ponds and do not qualify as SWH for this specific SWH type. However, the large semi-naturalized pond associated with the PSW considered as candidate SWH.	Additional studies will be required to confirm if habitat conditions are met.	Yes - surveys targeting reptiles and their habitat are recommended.	Yes – SWH type may be present
Reptile Hibernacula	Yes – ecosites are present on the Subject Lands.	Yes – the foundation of an old barn and grain silo were identified within the Subject Lands. These foundations were open and crumbling and may extend below the frost line. Additional studies will be required to confirm if habitat conditions are met	Yes - surveys targeting reptiles and their habitat are recommended.	Yes – SWH type may be present

Table 1: Significant Wildlife Habitat Assessment (6E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	POTENTIAL FOR SWH TYPE PRESENCE?
Colonial Bird Nesting Sites (bank/cliff)	Yes – CUM and CUT vegetation communities are present on the Subject Lands.	No – Exposed or eroding banks, hills, steep slopes and sand piles were not observed.	No	No – SWH type is not present
Colonial Bird Nesting Sites (tree/shrubs)	Yes – SWD and SWM vegetation communities are present within the Subject Lands.	While no nests were observed within the Subject Lands during the site reconnaissance, they be present within the swamp communities within and along the southern limits of the Subject Lands. Additional studies will be required to confirm if habitat conditions are met.	Yes	Yes – SWH type may be present
Colonial Bird Nesting Sites (ground)	No – No rocky islands or peninsulas are present on the Subject Lands.	N/A	No	No – SWH type is not present
Migratory Butterfly Stopover Areas	Yes – CUM and CUT vegetation communities are identified within the Subject Lands.	No – The Subject Lands are located greater than 5 km away from Lake Ontario.	No	No – SWH type is not present

Table 1: Significant Wildlife Habitat Assessment (6E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	POTENTIAL FOR SWH TYPE PRESENCE?
Migratory Landbird Stopover Areas	Yes – FO and SW vegetation communities are identified within the Subject Lands.	No – The Subject Lands are located greater than 5 km away from Lake Ontario.	No	No – SWH type is not present
Deer Yarding Areas	No – Mapping from the MNRF LIO database did not depict any deer yarding areas on or adjacent to the Subject Lands.	N/A	No	No – SWH type is not present
Deer Winter Congregation Areas	No – Mapping from the MNRF LIO database did not depict any deer wintering areas on or adjacent to the Subject Lands.	N/A	No	No – SWH type is not present
2. RARE VEGETATION COMMUNITIES OR SPECIALIZED HABITAT FOR WILDLIFE				
2a. Rare Vegetation Communities				
Rare Vegetation Types (cliffs, talus slopes, sand barrens, alvars, old-growth forests, savannahs, and tallgrass prairies)	No – None identified through the background information review or site reconnaissance.	N/A	No	No – SWH type is not present
Other Rare Vegetation Types (S1 to S3 communities)	No – None identified though the background information review or site reconnaissance.	N/A	No	No – SWH type is not present

Table 1: Significant Wildlife Habitat Assessment (6E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	POTENTIAL FOR SWH TYPE PRESENCE?
2b. Specialized Wildlife Habitat				
Waterfowl Nesting Area	Yes – MAS, MAM, SWT and SWD vegetation communities are present within the Subject Lands.	No – Upland areas are heavily disturbed from existing land-uses practices (golf course, agricultural, industrial).	No	No – SWH type is not present
Bald Eagle and Osprey Habitats	Yes – FO and SW ecosites are present within the Subject Lands.	Yes -While large aquatic features are absent from the Subject Lands, a number of large aquatic features and wetland are present within close proximity to the Subject Lands (i.e., Lake St. George).	Yes	Yes – SWH type may be present
Woodland Raptor Nesting Habitat	Yes – FO and SW ecosites are present within the Subject Lands.	Yes – the large woodland feature present within and along the southern limit of the Subject Lands would meet the minimum woodland size (>30 ha) and interior habitat size (>4 ha that is greater than 200 m from woodland edge).	Yes	Yes – SWH type may be present
Turtle Nesting Areas	No – suitable vegetation communities are not present within the Subject Lands.	No gravel or sandy areas were observed during the Site reconnaissance.	No	No – SWH type is not present

Table 1: Significant Wildlife Habitat Assessment (6E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	POTENTIAL FOR SWH TYPE PRESENCE?
Seeps and Springs	Yes – Forested ecosites are present within the Subject Lands.	Additional studies will be required to confirm if habitat conditions are met.	Yes	Yes – SWH type may be present
Woodland Amphibian Breeding Habitats (within or < 120m from woodland)	Yes – FO and SW ecosites are present within the Subject Lands.	Additional studies will be required to confirm if habitat conditions are met.	Yes – Amphibian call surveys are recommended.	Yes – SWH type may be present
Wetland Amphibian Breeding Habitats (wetland >120m from woodland)	Yes – SW and MA ecosites are present within the Subject Lands.	Additional studies will be required to confirm if habitat conditions are met.	Yes – Amphibian call surveys are recommended.	Yes – SWH type may be present
Woodland Area-Sensitive Bird Breeding Habitat	Yes – FO and SW ecosites are present within and adjacent to the Subject Lands.	Yes – the large woodland feature present within and along the southern limit of the Subject Lands would meet (>30 ha) with the presence of interior habitat.	Yes	Yes – SWH type may be present
3. SPECIES OF CONSERVATION CONCERN				
Marsh Bird Breeding Habitat	Yes – a MAM ecosite is present within the Subject Lands; however, this feature is located in the southeast quadrant of the intersection of Bayview Ave and Bloomington Road E. Given the high level of disturbance associated with these busy roads, the feature is not expected to support nesting marsh bird.	No	No	No – SWH type is not present

Table 1: Significant Wildlife Habitat Assessment (6E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	POTENTIAL FOR SWH TYPE PRESENCE?
Open Country Bird Breeding Habitat	Yes – CUM vegetation communities are present on the Subject Lands.	No – Minimum size criteria is not met (>30 ha).	No	No – SWH type is not present
Shrub/Early Successional Bird Breeding Habitat	Yes – CUT vegetation communities are present within the Subject Lands.	No – Minimum size criteria is not met (>10 ha).	No	No – SWH type is not present
Terrestrial Crayfish	Yes – MAM, MAS, SWT, SWM, SWD ecosites are present within the Subject Lands.	Additional studies will be required to confirm if habitat conditions are met. No terrestrial crayfish chimneys were observed during the site investigation.	Yes – Terrestrial crayfish surveys are recommended.	Yes – SWH type may be present
Special Concern and Rare Wildlife Species (based on the Secondary Source Review – Section 3.1)				
(i) Black-Crowned Night Heron – S3B	N/A	Yes – This species feeds in wetland habitat and communally nests in treed habitat near a water source. Potentially suitable wetland and treed habitat is present within the Subject Lands.	Yes – Breeding bird surveys are recommended.	Yes – SWH type may be present
(ii) Canada Warbler - SC	N/A	Possibly – Forested ecosites are present within the Subject Lands. Additional studies will be required to confirm if habitat conditions are met.	Yes – Breeding bird surveys are recommended.	Yes – SWH type may be present

Table 1: Significant Wildlife Habitat Assessment (6E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	POTENTIAL FOR SWH TYPE PRESENCE?
(iii) Eastern Wood-Pewee - SC	N/A	Possibly – Forested ecosites are present within the Subject Lands. Additional studies will be required to confirm if habitat conditions are met.	Yes – Breeding bird surveys are recommended.	Yes – SWH type may be present
(iv) Evening Grosbeak -SC	N/A	No – this species breeds in coniferous forests across northern Ontario and as far south as southern Georgian Bay. The Subject Lands are located in southern Ontario and are not considered to be located within the breeding range of this species. As such, suitable habitat is not considered present.	No	No – SWH type is not present
(v) Purple Martin – S3B	N/A	No – This species almost exclusively nests in artificial roosting boxes. Suitable nesting boxes were not observed during the site reconnaissance.	No	No – SWH type is not present
(vi) Wood Thrush - SC	N/A	Possibly – Forested ecosites are present within the Subject Lands. Additional studies will be required to confirm if habitat conditions are met.	Yes – Breeding bird surveys are recommended.	Yes – SWH type may be present

Table 1: Significant Wildlife Habitat Assessment (6E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	POTENTIAL FOR SWH TYPE PRESENCE?
(vii) Monarch - SC	N/A	Possibly – Cultural meadow ecosites are present within the Subject Lands. Additional studies will be required to confirm if habitat conditions are met.	Yes – observation of Monarch and/or their foodplants should be recorded.	Yes – SWH type may be present
(viii) Walnut Caterpillar Moth- S3/S4	N/A	Possibly – This species utilizes deciduous forests where it can feed on its required host plants of Walnuts (*Juglans sp.*) and Hickories (*Carya sp.*). Potentially suitable woodland habitats are present within the Subject Lands. Additional studies will be required to confirm if habitat conditions are met.	Yes – observation of Walnut Caterpillar Moths and/or their foodplants should be recorded.	Yes – SWH type may be present
(ix) Snapping Turtle - SC	N/A	Possibly – ponds with the Subject Lands, particularly the semi-naturalized pond associated with the PSW may provide suitable habitat. Additional studies will be required to confirm if habitat conditions are met.	Yes – surveys targeting reptiles and their habitats are recommended.	Yes – SWH type may be present

Table 1: Significant Wildlife Habitat Assessment (6E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	POTENTIAL FOR SWH TYPE PRESENCE?
4. ANIMAL MOVEMENT CORRIDORS				
Amphibian Movement Corridors	N/A	Potentially – should amphibian breeding SWH be identified, opportunities for movement corridors will need to be explored.	Yes – Amphibian call count surveys should be conducted.	Yes – SWH type may be present

Species Common Name	Species Scientific Name	Provincial Status (ESA)	S-Rank	Federal Status (SARA Sched. 1)	Ontario Range and Occurrences	Description of Suitable Habitat in Ontario	Habitat Suitability Assessment of Study Area
VASCULAR PLANTS							
Black Ash	*Fraxinus nigra*	END	S4	-	Black Ash occurs throughout most of Ontario, except the Far North, ranging from southern Ontario east to the Quebec border, west to the Manitoba border and north to approximately 51° latitude. Approximately 25% of the global range of Black Ash occurs in Ontario (MECP 2022).	Black Ash is predominantly a wetland species found in swamps, floodplains and fens (MECP 2022).	**Yes** - potentially suitable swamps are present within the Subject Lands.
INSECTS							
Gypsy Cuckoo Bumble Bee	*Bombus bohemicus*	END	S1S2	END	In Ontario, the Gypsy Cuckoo Bumble Bee was historically found throughout most of the province; however in recent years it is known only to occur in Pinery Provincial Park (MECP 2022).	In Canada, the Gypsy Cuckoo Bumble Bee occurs in diverse habitats such as open meadows, agricultural and urban areas, boreal forest and woodlands. Gypsy Cuckoo Bumble Bees are a parasitic species which follows the life cycle pattern and therefore, in part, the habitat of its hosts which are other bumble bees (e.g., the Rusty-patched and Yellow-banded Bumble Bees).	**No** - This species is dependent its host species [i.e., Rusty-patched Bumble Bee (*B. affinis*), the Yellow-banded Bumble Bee (*B. terricola*)]; since these species were not identified through the background review, it is deemed unlikely that the Subject Lands would support this Gypsy Cuckoo Bumble Bee.
AMPHIBIANS							
Jefferson Salamander	*Ambystoma jeffersonianum*	END	S2	END	Jefferson salamander is only found in southern Ontario, typically along the Niagara Escarpment (MECP 2022).	Adults live in moist, loose soil, under logs or in leaf litter of deciduous forests. They spend much of their time underground in rodent burrows or under rocks and stumps. They breed in vernal pools and lay their eggs in clumps attached to underwater vegetation (MECP 2022).	**Yes** - potentially suitable woodlands which may contain vernal pools are present within the Subject Lands. As well, the Subject Lands and in proximity to known Jefferson Salamander population in Richmond Hill, as mapped by the MECP (2012)
REPTILES							
Blanding's Turtle	*Emydoidea blandingii*	THR	S3	THR	Blanding's Turtles can be found throughout southern, central and eastern Ontario (MECP 2022).	Blanding's Turtles live in shallow water, usually in large wetlands and shallow lakes with lots of water plants. Blanding's Turtles hibernate in the mud at the bottom of permanent water bodies from late October until the end of April (MECP 2022).	**No** - The Subject Lands appear to lack large open wetlands. The species is not considered likely to be present within the Subject Lands.

Species Common Name	Species Scientific Name	Provincial Status (ESA)	S-Rank	Federal Status (SARA Sched. 1)	Ontario Range and Occurrences	Description of Suitable Habitat in Ontario	Habitat Suitability Assessment of Study Area
BIRDS							
Barn Swallow	*Hirundo rustica*	THR	S4B	THR	The Barn Swallow may be found throughout southern Ontario and can range as far north as Hudson Bay, wherever suitable locations for nests exist (MECP 2022).	Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from year to year. They prefer unpainted, rough-cut wood, since the mud does not adhere as well to smooth surfaces (MECP 2022).	**Yes** - potentially suitable anthropogenic structures (residential dwellings, barns, outbuildings) are present within the Subject Lands.
Bobolink	*Dolichonyx oryzivorus*	THR	S4B	THR	Bobolink is widespread in Ontario and is found throughout the province, generally south of the boreal forest (MECP 2022).	Historically, Bobolinks lived in North American tallgrass prairie and other open meadows. With the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses. Both parents usually tend to their young, sometimes with a third Bobolink helping (MECP 2022).	**No** - potentially suitable grasslands are not present within the Subject Lands.
Eastern Meadowlark	*Sturnella magna*	THR	S4B	THR	Eastern Meadowlark is widespread in Ontario and found mostly south of the Canadian Shield (MECP 2022).	Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Small trees, shrubs or fence posts are used as elevated song perches (MECP 2022).	**No** - potentially suitable grasslands are not present within the Subject Lands.
MAMMALS							
Eastern Small-footed Myotis	*Myotis leibii*	END	S2S3	-	The eastern small-footed bat has been found from south of Georgian Bay to Lake Erie and east to the Pembroke area. There are also records from the Bruce Peninsula, the Espanola area, and Lake Superior Provincial Park (MECP 2022)	In the spring and summer, eastern small-footed bats will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. In the winter, these bats hibernate, most often in caves and abandoned mines. They seem to choose colder and drier sites than similar bats and will return to the same spot each year (MECP 2022)	**Yes** - potentially suitable woodlands and anthropogenic structures (i.e., barns) are present within the Subject Lands.
Little Brown Myotis	*Myotis lucifugus*	END	S4	END	Widespread in southern Ontario and found as far north as Moose Factory and Favourable Lake (MECP 2022)	Bats are nocturnal. During the day they roost in trees and buildings. They often select attics, abandoned buildings and barns for summer colonies where they can raise their young. Little brown bats hibernate from October or November to March or April, most often in caves or abandoned mines that are humid and remain above freezing (MECP 2022).	**Yes** - potentially suitable woodlands and anthropogenic structures (i.e., barns) are present within the Subject Lands.

Species Common Name	Species Scientific Name	Provincial Status (ESA)	S-Rank	Federal Status (SARA Sched. 1)	Ontario Range and Occurrences	Description of Suitable Habitat in Ontario	Habitat Suitability Assessment of Study Area
Northern Myotis	*Myotis septentrionalis*	END	S3	END	The northern long-eared bat is found throughout forested areas in southern Ontario, to the north shore of Lake Superior and occasionally as far north as Moosonee, and west to Lake Nipigon (MECP 2022)	Northern long-eared bats are associated with boreal forests, choosing to roost under loose bark and in the cavities of trees. These bats hibernate from October or November to March or April, most often in caves or abandoned mines (MECP 2022).	**Yes** - potentially suitable woodlands and anthropogenic structures (i.e., barns) are present within the Subject Lands.
Tri-colored Bat	*Perimyotis subflavus*	END	S2S3	END	This bat is found in southern Ontario and as far north as Espanola near Sudbury. Because it is very rare, it has a scattered distribution (MECP 2022).	During the summer, the Tri-colored Bat is found in a variety of forested habitats. It forms day roosts and maternity colonies in older forest and occasionally in barns or other structures. They overwinter in caves where they typically roost by themselves rather than part of a group (MECP 2022).	**Yes** - potentially suitable woodlands and anthropogenic structures (i.e., barns) are present within the Subject Lands.

Appendix B

Watershed Cross Section

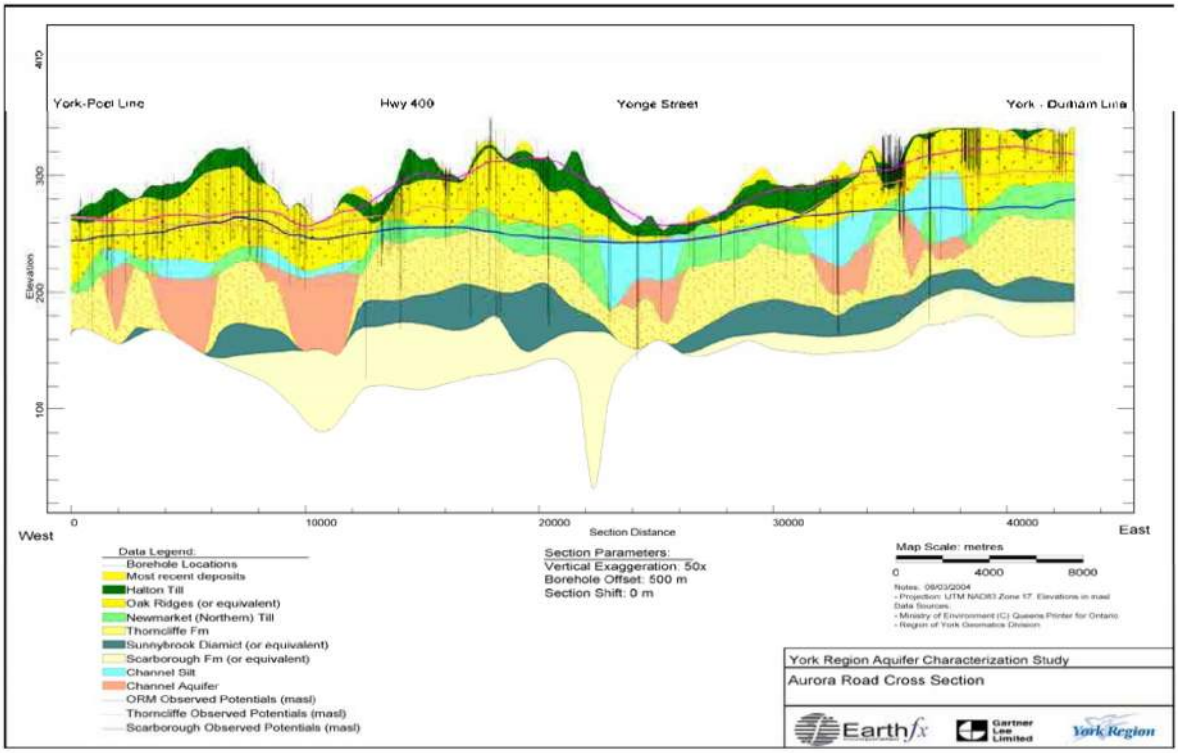

Figure 2-14 West-east cross section along Aurora Road (figure from Earthfx, 2006)

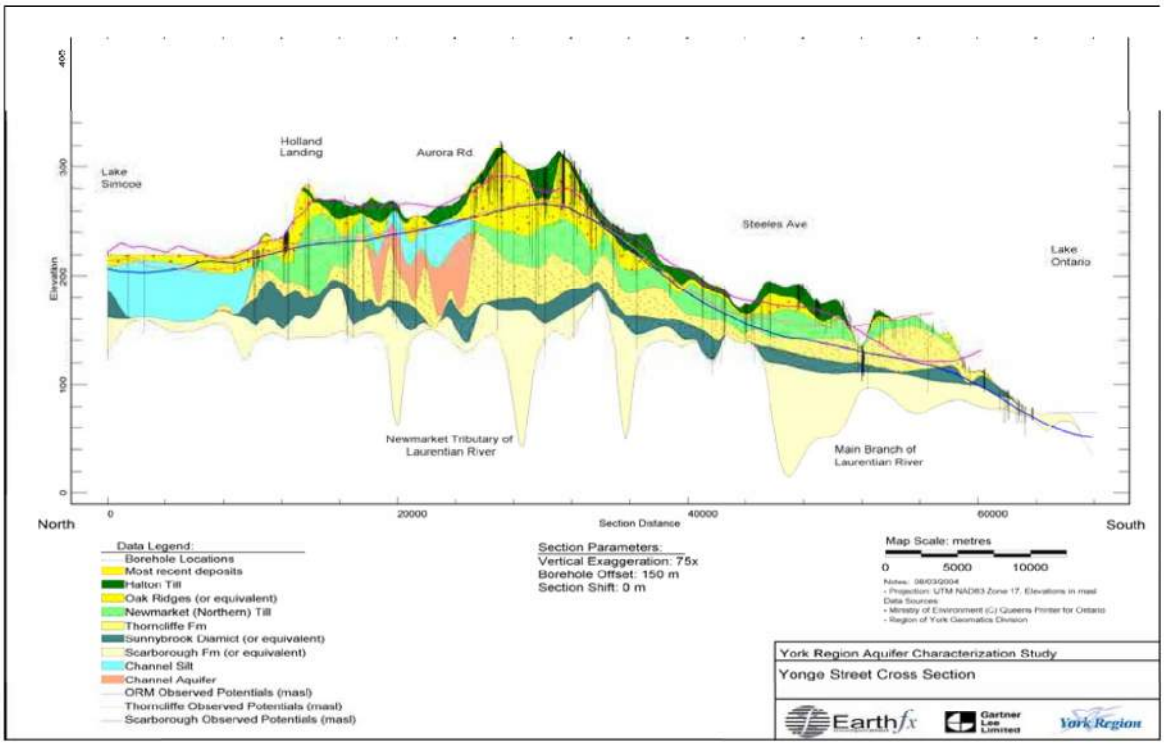

Figure 2-15 North-south cross section along Yonge Street (figure from Earthfx, 2006)

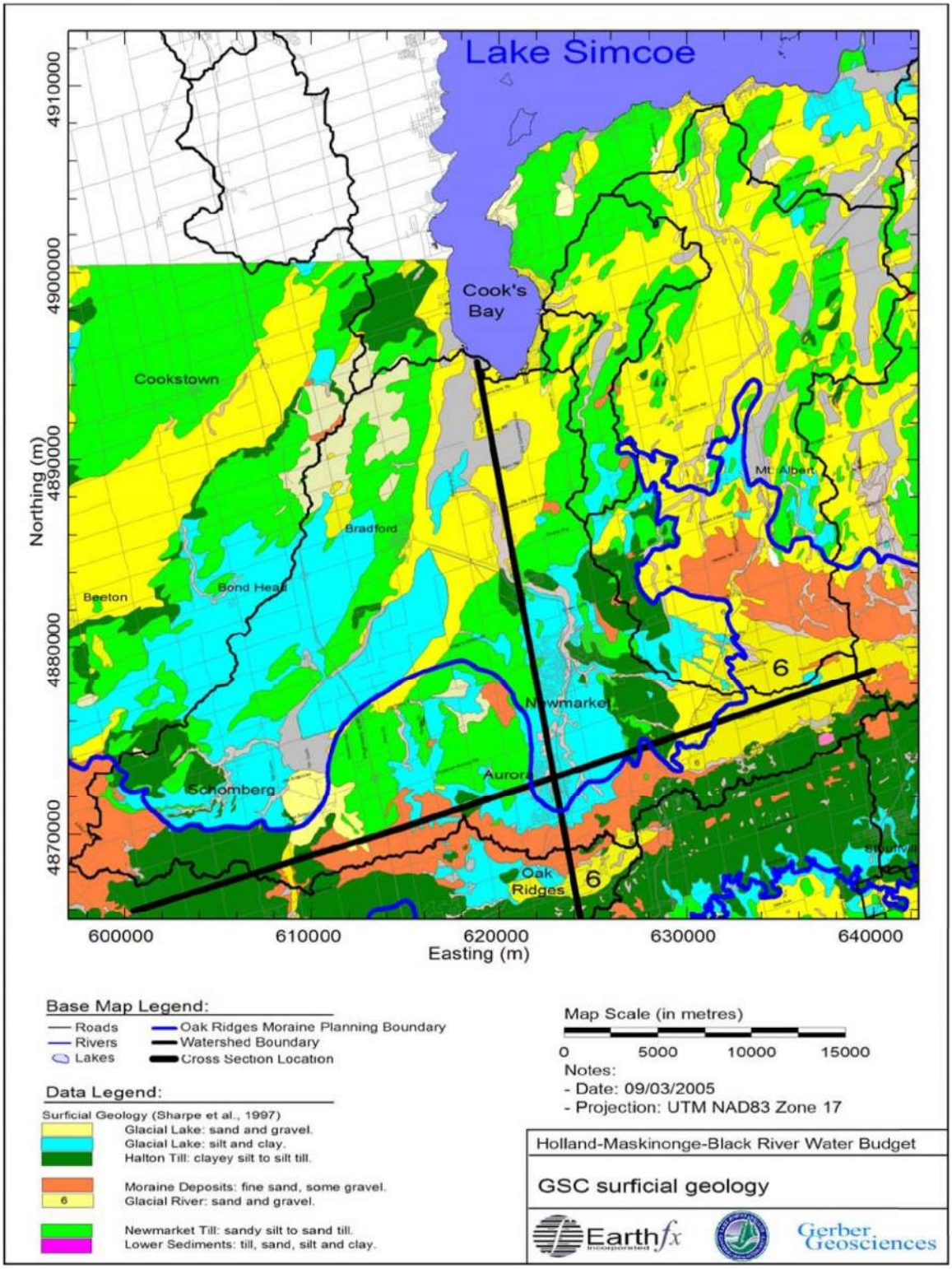

Figure 2-12 Surficial geology (from Sharpe et al., 1997). West-east cross section line shown in Figure 2-14 and north-south cross section line shown in Figure 2-15.

Appendix C

Well Records

GEI Consultants

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
AURORA TOWN 02 071	17 625864 4869739 W	2007/04 4102	6.42 5.30	FR 0113	95/96/9/1:	DO	0114 8	7045989	BRWN SAND STNS 0010 BRWN CLAY STNS 0060 GREY CLAY STNS 0063 BRWN CLAY STNS SAND 0113 SAND GRVL 0122
AURORA TOWN (WHITCHU	17 626062 4869898 W	2019/06 3108						7337858	
AURORA TOWN (WHITCHU	17 626596 4870067 W	2006/06 6809	2				0036 10	6930526	BLCK LOAM 0006 GREY CLAY SILT TILL 0041 BRWN MSND CSND GRVL 0062
AURORA TOWN (WHITCHU	17 625490 4869549 W	2011/05 7314						7166933	
AURORA TOWN (WHITCHU 01 071	17 625310 4869490 W	1987/06 1350	6	FR 0137	104/117/10/ 1:0	DO	0137 3	6918964	YLLW CLAY 0024 GREY SILT CLAY 0035 BRWN SAND CMTD 0116 GREY CLAY 0125 BRWN SAND FSND 0135 BRWN SAND MSND 0140
AURORA TOWN (WHITCHU CON 02 011	17 626058 4869893 W	2019/03 6915	6.25	UT	102/124/12/ 1:	DO	0157 5	7331195	BLCK LOAM 0001 BRWN SAND CLAY SILT 0162
AURORA TOWN (WHITCHU CON 02 011	17 627241 4870049 W	2017/10 7215						7337044	
AURORA TOWN (WHITCHU CON 02 011	17 627255 4870103 W	1977/04 5459	6	FR 0153	70/150/10/2 :0	DO		6914047	BLCK LOAM 0001 GREY GRVL CLAY 0031 BLUE CLAY SOFT 0083 BLUE GRVL CLAY HARD 0100 BLUE CLAY SOFT 0153 BLUE GRVL 0156
AURORA TOWN (WHITCHU CON 02 011	17 625795 4869703 W	1976/10 2407	6	FR 0100	43/105/6/4: 30	DO	0104 5	6913765	BLUE LOAM 0001 BLUE CLAY 0022 BRWN SAND 0060 BLUE CLAY 0106 BLUE SAND 0112
AURORA TOWN (WHITCHU CON 02 011	17 626877 4869954 W	1988/03 5459	6	FR 0100	52/90/30/1: 30	DO	0103 3	6919399	BRWN CLAY STNS 0019 BRWN SAND 0024 BRWN SAND CLAY 0046 BLUE CLAY SOFT 0083 BRWN CLAY SAND 0100 BRWN MSND 0106
AURORA TOWN (WHITCHU CON 02 011	17 625750 4869816 W	1995/08 3108	6 5	FR 0159	117/155/30/ 2:0	DO	0159 3	6923380	BRWN CLAY 0036 BRWN CLAY GRVL 0127 BRWN SAND 0162
AURORA TOWN (WHITCHU CON 02 011	17 626019 4869845 W	1995/06 3108	6 5	FR 0161	119/160/20/ 1:0	DO	0161 6	6923378	BRWN CLAY 0047 BLUE CLAY SAND 0087 BLUE CLAY 0152 SAND 0167
AURORA TOWN (WHITCHU CON 02 011	17 625760 4869757 W	1995/07 3108	6 5	FR 0132	93/103/75/1 :0	DO	0134 6	6923377	BRWN CLAY 0078 BRWN CLAY GRVL 0108 BRWN SAND 0140
AURORA TOWN (WHITCHU CON 02 011	17 626247 4869808 W	1995/10 3108	30			NU		6923443	BLUE CLAY DRY 0017
AURORA TOWN (WHITCHU CON 02 011	17 626013 4869894 W	1989/10 3108	6	FR 0135	98/159/8/3: 0	DO	0159 4	6920753	BRWN CLAY 0015 BRWN CLAY SAND 0062 BRWN SAND 0067 BRWN CLAY 0098 BRWN SAND 0112 BRWN CLAY SAND 0135 BRWN SAND 0157 BLUE SAND 0163
AURORA TOWN (WHITCHU CON 02 011	17 625991 4869867 W	1989/09 3108	6	FR 0144	110/160/50/ 1:0	DO	0160 6	6920691	BRWN CLAY 0015 BRWN CLAY SAND 0098 SILT 0108 BRWN SAND 0112 SILT 0120 BRWN SAND 0126 BLUE SILT 0144 BRWN SAND 0167

GEI Consultants

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
AURORA TOWN (WHITCHU CON 02 011	17 626464 4870027 L	2003/06 1350	6	FR 0122	90/99/20/1: 0	DO	0113 6	6927183	BRWN CLAY GRVL 0010 BRWN SAND SLTY 0065 BRWN SAND CLAY 0106 BRWN SAND GRVL STNS 0115 BRWN SAND CLN 0122
AURORA TOWN (WHITCHU CON 02 011	17 626464 4870027 L	2002/11 3108	6 5	FR 0110	68/70/10/1: 0	CO	0110 9	6926807	GRVL FILL 0002 BRWN CLAY 0017 BLUE CLAY GRVL LYRD 0098 BRWN SAND CLAY 0105 BRWN SAND 0120
AURORA TOWN (WHITCHU CON 02 011	17 625704 4869721 W	1998/03 3108	6 5	FR 0135	93/134/20/1 :30	DO	0138 11	6924323	YLLW CLAY SAND 0073 YLLW CLAY SAND 0135 BLUE FSND 0150
AURORA TOWN (WHITCHU CON 02 011	17 626464 4870027 L	2003/07 1350	6	FR 0163	94/104/25/1 :0	DO	0153 10	6927192	BRWN LOAM 0002 YLLW CLAY 0045 GREY SILT CLAY 0102 BRWN SILT 0118 BRWN FSND SILT VERY 0150 BRWN FSND 0163
AURORA TOWN (WHITCHU CON 02 011	17 625658 4869699 W	1999/07 1663	6	FR 0094	94/101/15/1 :0	DO	0163 3	6925120	BRWN SILT CLAY 0068 BRWN CLAY SILT 0082 BRWN FSND 0123 GREY FSND 0159 GREY FSND 0166 GREY CSND DRTY 0171 BLUE CLAY GRVL 0171
AURORA TOWN (WHITCHU CON 02 011	17 626464 4870027 L	2000/08 1663	6	FR 0125	101/104/15/ 1:	DO	0153 3	6925739	BLCK LOAM 0001 BRWN FILL 0006 BRWN CLAY SAND 0026 BLUE CLAY 0047 BRWN CLAY 0051 BRWN SILT CLAY 0115 GREY FSND SILT 0123 GREY FSND 0147 GREY CSND GRVL 0158
AURORA TOWN (WHITCHU CON 02 011	17 626154 4869927 W	1999/02 1663	6	FR 0128	86/95/15/1: 0	DO	0153 3	6925117	BRWN CLAY 0006 BRWN SAND CLAY 0017 BRWN FSND 0128 BRWN MSND 0146 GREY CSND GRVL 0158
AURORA TOWN (WHITCHU CON 02 011	17 626128 4869834 W	1999/07 1663	6	FR 0097	97/99/15/1: 0	DO		6925119	BRWN CLAY GRVL SAND 0016 BLUE CLAY GRVL 0046 BRWN CLAY 0049 BRWN FSND SILT 0118 GREY FSND 0144 GREY GRVL SAND 0158
AURORA TOWN (WHITCHU CON 02 011	17 626032 4869836 W	1997/10 3108	6 5	FR 0166	105/160/60/ 1:0	DO	0160 6	6924159	BRWN CLAY 0012 BRWN CLAY STNS DNSE 0022 BLUE CLAY GRVL 0130 BRWN FSND 0154 BLUE SAND GRVL 0166
AURORA TOWN (WHITCHU CON 02 011	17 625844 4869772 W	1999/12 3108	6 5	FR 0140	97/150/30/1 :	DO	0149 6	6925202	BRWN CLAY SAND STNS 0020 BRWN CLAY SAND 0060 BRWN CLAY HARD 0071 BLUE CLAY HARD 0128 BRWN SAND 0136 BLUE CLAY 0140 BRWN SAND 0155
AURORA TOWN (WHITCHU CON 02 011	17 625950 4869796 W	1999/06 3108	6 5	FR 0152	114/158/75/ 1:0	DO	0160 10	6924891	BRWN CLAY GRVL 0152 SAND 0170
AURORA TOWN (WHITCHU YS E 01 071	17 625342 4869500 W	1974/12 3903	5	UK 0144	70/145/10/3 :0	DO	0143 8	6912410	BRWN CLAY STNS SAND 0042 BLUE CLAY STNS 0144 BRWN SAND GRVL 0151
AURORA TOWN (WHITCHU YS E 01 071	17 625415 4869663 W	1976/10 3903	5	UK 0168	90/150/5/4: 0	DO	0173 5	6913904	BRWN CLAY STNS LYRD 0119 BRWN CLAY SAND LYRD 0154 BRWN SAND GRVL CLAY 0178
AURORA TOWN (WHITCHU YS E 01 071	17 625355 4869543 W	1976/11 3903	5	UK 0140	64/140/5/4: 0	DO	0153 4	6913910	BRWN CLAY SAND STNS 0097 BRWN SAND CLAY LYRD 0135 BRWN SAND GRVL LOOS 0158
AURORA TOWN (WHITCHU YS E 01 071	17 625415 4869663 W	1976/10 3903	5	UK 0170	94/170/5/3: 0	DO	0173 5	6913668	BRWN CLAY STNS 0120 BRWN CLAY SAND LYRD 0150 BRWN SAND GRVL CLAY 0178
RICHMOND HILL TOWN (	17 626645 4869688 W	2018/01 7282						7320336	
RICHMOND HILL TOWN (	17 625470 4868799 W	6946						7355074	

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TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
RICHMOND HILL TOWN (	17 625804 4869452 W	2019/06 1413	6.25	FR 0141	73//12/1:	DO	0138 3	7339092	BRWN SAND CLAY TILL 0017 GREY CLAY SOFT 0057 GREY CLAY DNSE 0097 GREY SAND SILT CLAY 0125 BRWN SAND GRVL CLN 0141
RICHMOND HILL TOWN (	17 625540 4868831 W	2016/03 7147	3.53 3.15			MO	0009 10	7260604	BRWN FILL 0005 BRWN TILL 0019 ---- 0019
RICHMOND HILL TOWN (CON 02 008	17 627361 4868947 W	1964/03 2407	4	FR 0279	145/185/5/24:0	ST DO	0279 4	6907479	PRDG 0005 BRWN CLAY MSND 0032 BLUE CLAY 0087 BLUE MSND 0088 BLUE CLAY 0160 BLUE FSND 0200 BLUE CLAY 0279 BLUE CSND 0283
RICHMOND HILL TOWN (CON 02 008	17 627025 4869148 W	1989/07 5459	6	FR 0190	/190//16:0		0190 20	6920582	BRWN CLAY STNS 0022 GREY CLAY STNS 0034 BRWN SAND STNS 0071 GREY CLAY STNS 0099 GREY SAND SLTY 0113 GREY FSND 0124 GREY CLAY STNS 0155 GREY CLAY SLTY 0159 GREY CLAY STNS 0187 GREY SAND STNS 0213 GREY CLAY SNDY 0220
RICHMOND HILL TOWN (CON 02 008	17 626985 4869104 W	1989/06 5459				NU		6920581	BRWN CLAY STNS 0022 GREY CLAY STNS 0034 BRWN SAND STNS 0071 GREY CLAY STNS 0099 GREY SAND SILT 0113 GREY FSND 0124 GREY CLAY STNS 0155 GREY CLAY SLTY 0159 GREY CLAY STNS 0188 WHIT CLAY STNS 0202 GREY CLAY SNDY 0221 GREY CLAY SLTY 0256 GREY CLAY SNDY 0287 GREY CLAY STNS 0298 GREY CLAY STNS 0310
RICHMOND HILL TOWN (CON 02 009	17 626962 4868951 W	1991/02 1413	7	FR 0317	130/270/150/5:0	IR	0277 40	6921386	BRWN CLAY STNS SNDY 0009 BRWN MSND 0029 BRWN CLAY STNS SNDY 0043 GREY CLAY STNS PCKD 0049 BRWN FSND CSND 0110 GREY CLAY STNS PCKD 0157 BRWN SAND MSND 0158 GREY CLAY STNS PCKD 0179 GREY CLAY STNS SNDY 0188 GREY CLAY STNS PCKD 0237 GREY CLAY SAND SLTY 0254 BRWN SAND CSND CLN 0317
RICHMOND HILL TOWN (CON 02 009	17 626971 4868908 W	1991/02 1413	6	FR 0272	130//80/17:0	IR	0240 30	6921385	BRWN SAND LOOS 0009 BRWN CLAY STNS PCKD 0013 BRWN SAND CGVL 0028 BRWN CLAY STNS SNDY 0033 GREY CLAY STNS PCKD 0052 BRWN CSND CLN 0067 GREY CLAY PCKD 0068 BRWN CSND 0088 GREY CLAY PCKD 0091 BRWN SAND MSND CLN 0107 GREY CLAY PCKD 0158 GREY CLAY STNS SLTY 0216 BRWN SAND STNS SLTY 0234 GREY CLAY STNS SNDY 0238 BRWN GRVL SAND CGVL 0250 BRWN SAND CLN MSND 0272 BRWN SAND FSND 0294 GREY CLAY SNDY 0360
RICHMOND HILL TOWN (CON 02 009	17 626610 4869193 L	2001/02 7110	6	FR 0170	151/160/12/1:30	DO	0212 12	6925797	BRWN SAND CLAY 0026 BRWN CLAY SAND STNS 0057 GREY CLAY STNS 0092 GREY CLAY 0141 GREY SILT SAND DRTY 0170 BRWN SAND SILT LYRD 0226
RICHMOND HILL TOWN (CON 02 010	17 625826 4869431 W	2018/09 1413	5		60///:			7322609	
RICHMOND HILL TOWN (CON 02 010	17 625918 4869296 W	2018/09 1413	6.25	117	60/100/20/1:30	PS DO	0114 3	7322596	BRWN SAND PCKD 0010 GREY CLAY SILT SOFT 0080 GREY SILT CLAY LYRD 0095 GREY CLAY HARD 0108 GREY GRVL CGVL CLN 0117
RICHMOND HILL TOWN (CON 02 010	17 627229 4870025 W	2018/01 7215						7337043	
RICHMOND HILL TOWN (CON 02 010	17 625804 4869478 W	1967/12 1413	5	FR 0124	80/85/12/4:0	ST DO	0116 8	6907481	PRDG 0006 MSND 0007 YLLW CLAY 0022 BLUE CLAY 0106 BLUE SILT CLAY 0114 RED MSND GRVL 0124
RICHMOND HILL TOWN (CON 02 010	17 627484 4870095 W	1949/10 2210	2	FR 0044	//4/:	PS	0065 4	6907480	YLLW CLAY 0010 BLUE CLAY 0050 MSND 0069

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
RICHMOND HILL TOWN (CON 02 010	17 626535 4869723 W	1979/07 2407	6	FR 0047	12/55/30/2:0	DO	0061 3	6915268	YLLW CLAY SAND 0047 BRWN SAND 0067
RICHMOND HILL TOWN (CON 02 010	17 627195 4869923 W	1983/06 1663	6	FR 0135	64/100/6/2:30	IN DO	0136 3	6917087	BRWN CLAY SAND GRVL 0009 BRWN SAND GRVL 0023 BRWN CLAY 0026 BLUE CLAY GRVL 0048 GREY SAND CLAY 0053 BLUE CLAY SANI SILT 0093 BLUE CLAY HARD 0135 GREY CSND CGVL 0144 BLUE CLAY GRVL 0152
RICHMOND HILL TOWN (CON 02 010	17 627455 4870083 W	1980/06 1711	2	UK 0054	//4/2:0	DO	0061 4	6915623	GREY CLAY SAND 0054 SAND 0069
RICHMOND HILL TOWN (CON 02 010	17 626510 4869233 W	1989/07 1413	7	FR 0164	56/140/95/8:30	IR	0152 12	6920517	BRWN SAND SOFT 0029 GREY CLAY SAND SOFT 0095 BLCK GRVL SAND LOOS 0096 GREY CLAY SOFT 0101 GREY FSND 0108 GREY CLAY STNS LYRD 0148 BLCK GRVL SAND LOOS 0164
RICHMOND HILL TOWN (CON 02 010	17 626541 4869613 L	1997/09 1350	6	MN 0134	104/108/20/1:0	DO	0131 6	6924080	YLLW CLAY GRVL BLDR 0037 BRWN CLAY SAND 0074 BRWN CLAY FSND VERY 0117 BRWN SAND 0134 BRWN SAND GRVL 0140
RICHMOND HILL TOWN (CON 02 010	17 625907 4869317 W	1995/07 1413	9	FR 0155	60/80/300/4:0	IR IN	0150 7	6923324	BRWN SAND PCKD 0020 GREY CLAY SILT SAND 0145 GREY GRVL CSND 0155
RICHMOND HILL TOWN (CON 02 010	17 627471 4870072 W	1998/09 1350	6	MN 0071 FR	16/50/9/1:0	DO	0068 4	6924549	BRWN CLAY SAND 0006 YLLW CLAY 0027 GREY CLAY 0048 BRWN SILT 0065 GREY CLAY 0068 BRWN SAND 0075
RICHMOND HILL TOWN (CON 03 008	17 627712 4869194 W	1975/04 2407	6	FR 0077	57/80/6/2:0	DO	0082 5	6913070	BLCK LOAM 0001 BLUE SAND 0023 BRWN CLAY SAND 0082 BLUE CSND 0087
RICHMOND HILL TOWN (CON 03 009	17 627669 4869341 W	1965/09 3519	4	FR 0082	54/60/10/6:0	DO		6907589	LOAM 0002 CLAY 0025 CLAY STNS 0080 HPAN GRVL 0132
RICHMOND HILL TOWN (CON 03 009	17 627648 4869664 W	1962/11 2407	7	FR 0079	36/56/12/5:0	ST DO		6907587	LOAM 0002 BRWN MSND 0030 BLUE CLAY 0071 HPAN CLAY STNS 0079 GRVL 0083
RICHMOND HILL TOWN (CON 03 009	17 627746 4869861 W	1964/06 2407	7	FR 0082	50/57/10/2:0	ST DO	0082 4	6907590	LOAM 0001 BRWN MSND 0008 BLUE CLAY 0023 BLUE CLAY STNS 0051 BLUE CLAY 0077 FSND 0081 GRVL 0087
RICHMOND HILL TOWN (CON 03 010	17 625773 4869143 W	1971/05 1413	5	FR 0063	28/32/10/2:0	ST	0059 4	6910282	BRWN MSND 0008 BRWN MSND CLAY 0025 RED MSND 0063
RICHMOND HILL TOWN (YS E 01 069	17 625527 4869038 W	2020/04 7360	2			MO	0015 10	7369094	BRWN CLAY DNSE 0020 GREY TILL DNSE 0025
RICHMOND HILL TOWN (YS E 01 069	17 625492 4869001 W	2020/04 7360	2			MO	0010 10	7369069	BRWN CLAY DNSE 0015 GREY TILL DNSE 0020
RICHMOND HILL TOWN (YS E 01 069	17 625526 4869039 W	2020/04 7360	2			MO	0040 10	7369093	BRWN CLAY DNSE 0020 GREY TILL DNSE 0050
RICHMOND HILL TOWN (YS E 01 069	17 625608 4868764 W	1955/10 2318	4	FR 0148	60/110/12/12:0	DO	0150 4	6907387	PRDG 0030 BLUE CLAY 0148 BLUE MSND 0154

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
RICHMOND HILL TOWN (YS E 01 069	17 625639 4869013 W	1960/02 2314	4	FR 0138	30/75/20/4:0	DO	0138 4	6907392	BRWN CLAY 0013 FSND 0070 BLUE CLAY 0117 FSND 0123 CSND 0142
RICHMOND HILL TOWN (YS E 01 069	17 625516 4869502 W	1956/07 2314	4	FR 0132	32/32/4/6:0	DO	0143 3	6907388	BLUE CLAY 0116 GRVL 0132 FSND 0140 CSND 0146
RICHMOND HILL TOWN (YS E 01 069	17 625591 4868898 W	1961/09 1804	4	FR 0098	43/60/3/40:0	DO		6907393	PRDG 0025 CLAY 0050 MSND 0097 GRVL 0098
RICHMOND HILL TOWN (YS E 01 069	17 625578 4868855 W	1961/10 2407	4	FR 0115	95/110/5/24:0	DO	0130 4	6907394	LOAM 0002 BLUE CLAY 0100 GRVL 0101 BLUE CLAY GRVL 0115 FSND 0125 CSND 0134
RICHMOND HILL TOWN (YS E 01 069	17 625484 4868878 W	1965/03 2407	4	FR 0120	70/122/3/3:0	DO	0122 3	6907396	LOAM 0002 BRWN MSND 0018 BLUE CLAY 0120 FSND 0125
RICHMOND HILL TOWN (YS E 01 069	17 625434 4868791 W	1959/08 3108	4	FR 0112	90/112/2/8:0	DO	0112 3	6907391	LOAM 0002 FSND 0020 BLUE CLAY 0080 BLUE CLAY GRVL 0112 GRVL 0115
RICHMOND HILL TOWN (YS E 01 069	17 625515 4868803 W	1977/10 2341	5	FR 0128	48/150/9/3:0	DO	0169 3	6914350	FILL 0010 BRWN CLAY SAND 0035 BLUE CLAY 0055 BLUE CLAY SAND 0063 BLUE CLAY SNDY 0105 BLUE CLAY 0128 GRVL 0129 FSND 0140 GRVL 0141 SILT 0168 MSND CLN 0175
RICHMOND HILL TOWN (YS E 01 069	17 625515 4868803 W	1977/10 2341				NU		6914349	FILL 0010 BRWN CLAY SAND 0035 BLUE CLAY 0055 BLUE CLAY SAND 0063 BLUE CLAY SNDY 0105 ROCK VERY HARD 0105
RICHMOND HILL TOWN (YS E 01 070	17 625435 4869343 W	1978/10 5459	6	FR 0093	50/85/15/:	DO	0093 3	6915029	LOAM 0002 BRWN CLAY 0024 BRWN SAND 0090 BRWN CLAY 0093 BRWN SAND 0096

Appendix D

Aerial Photographs

NOTES:
Airphoto Source: University of Toronto

Legend

Subject Lands

Project 2204176

Bloomington Oak Ridges Moraine Feasibility Review

1954 Airphoto

0 300 m

1:13,000

N

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NOTES:
Airphoto Source: Google Earth

Legend

Subject Lands

Project 2204176

Bloomington Oak Ridges Moraine Feasibility Review

1985 Airphoto

0 300 m

1:11,000

N

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NOTES:
Airphoto Source: First Base Solutions

Legend

Subject Lands

Project 2204176

Bloomington Oak Ridges Moraine Feasibility Review

2002 Airphoto

0 300 m

1:13,000

N

GEI Consultants

NOTES:
Airphoto Source: First Base Solutions

Legend

Subject Lands

Project 2204176

Bloomington Oak Ridges Moraine Feasibility Review

2007 Airphoto

0 300 m

1:13,000

N

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NOTES:
Airphoto Source: First Base Solutions

Legend

Subject Lands

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Bloomington Oak Ridges Moraine Feasibility Review

2011 Airphoto

0 300 m

1:13,000

N

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NOTES:
Airphoto Source: First Base Solutions

Legend

Subject Lands

Project 2204176

Bloomington Oak Ridges Moraine Feasibility Review

2012 Airphoto

0 300 m

1:13,000

N

GEI Consultants

NOTES:
Airphoto Source: First Base Solutions

Legend

Subject Lands

Project 2204176

Bloomington Oak Ridges Moraine Feasibility Review

2013 Airphoto

0 300 m

1:13,000

N

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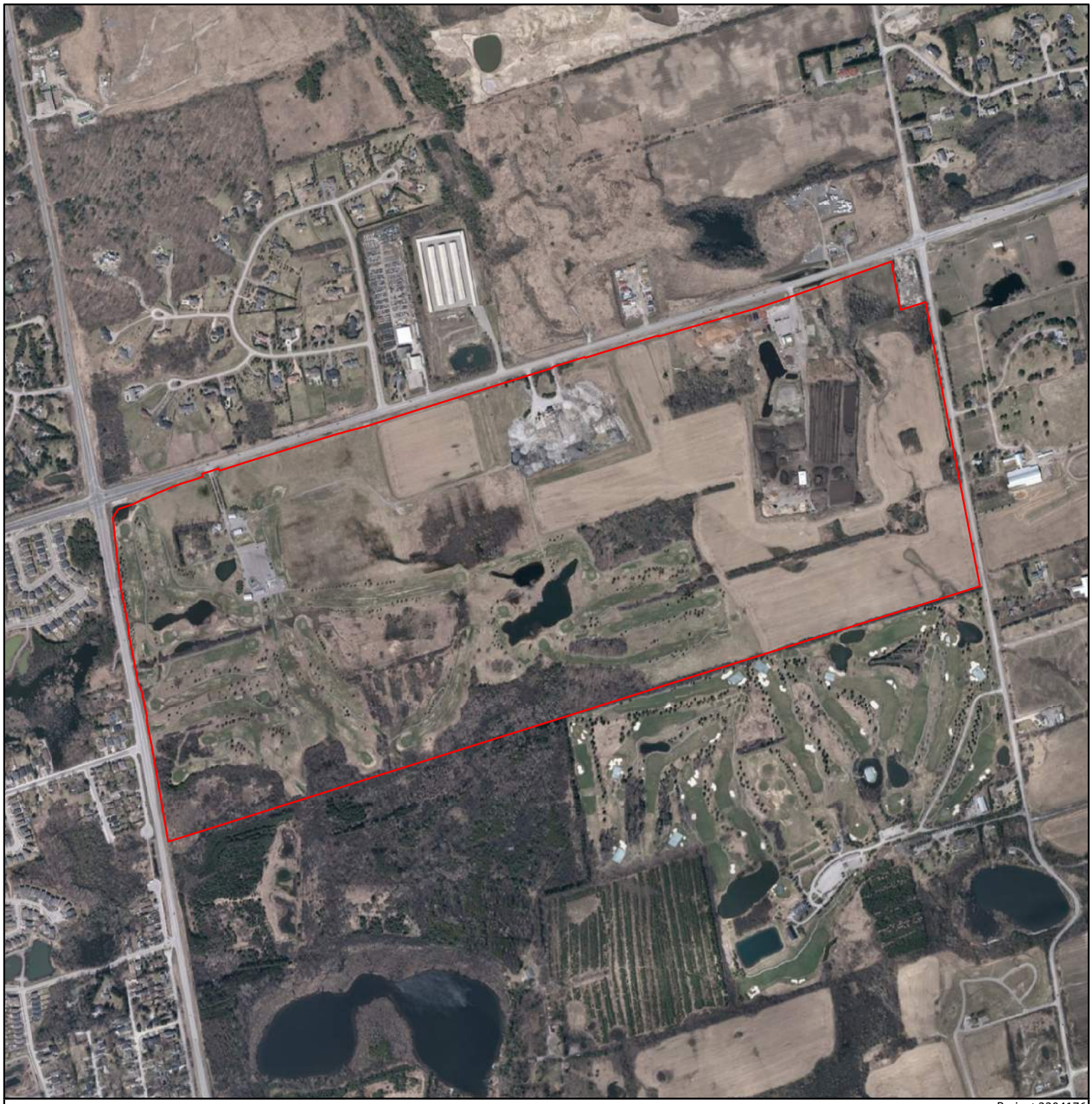

NOTES:
Airphoto Source: First Base Solutions

Legend

Subject Lands

Project 2204176

Bloomington Oak Ridges Moraine Feasibility Review

2014 Airphoto

0 300 m

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NOTES:
Airphoto Source: First Base Solutions

Legend

Subject Lands

Project 2204176

Bloomington Oak Ridges Moraine Feasibility Review

2015 Airphoto

0 300 m

1:13,000

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NOTES:
Airphoto Source: First Base Solutions

Legend

Subject Lands

Project 2204176

Bloomington Oak Ridges Moraine Feasibility Review

2016 Airphoto

0 300 m

1:13,000

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NOTES:
Airphoto Source: First Base Solutions

Legend

Subject Lands

Project 2204176

Bloomington Oak Ridges Moraine Feasibility Review

2017 Airphoto

0 300 m

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NOTES:
Airphoto Source: First Base Solutions

Legend

Subject Lands

Project 2204176

Bloomington Oak Ridges Moraine Feasibility Review

2018 Airphoto

0 300 m

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NOTES:
Airphoto Source: First Base Solutions

Legend

Subject Lands

Project 2204176

Bloomington Oak Ridges Moraine Feasibility Review

2019 Airphoto

0 300 m

1:13,000

N

GEI Consultants

NOTES:
Airphoto Source: First Base Solutions

Legend

Subject Lands

Project 2204176

Bloomington Oak Ridges Moraine Feasibility Review

2020 Airphoto

0 300 m

1:13,000

N

GEI Consultants

NOTES:
Airphoto Source: First Base Solutions

Legend

Subject Lands

Project 2204176

Bloomington Oak Ridges Moraine Feasibility Review

2021 Airphoto

0 300 m

1:13,000

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