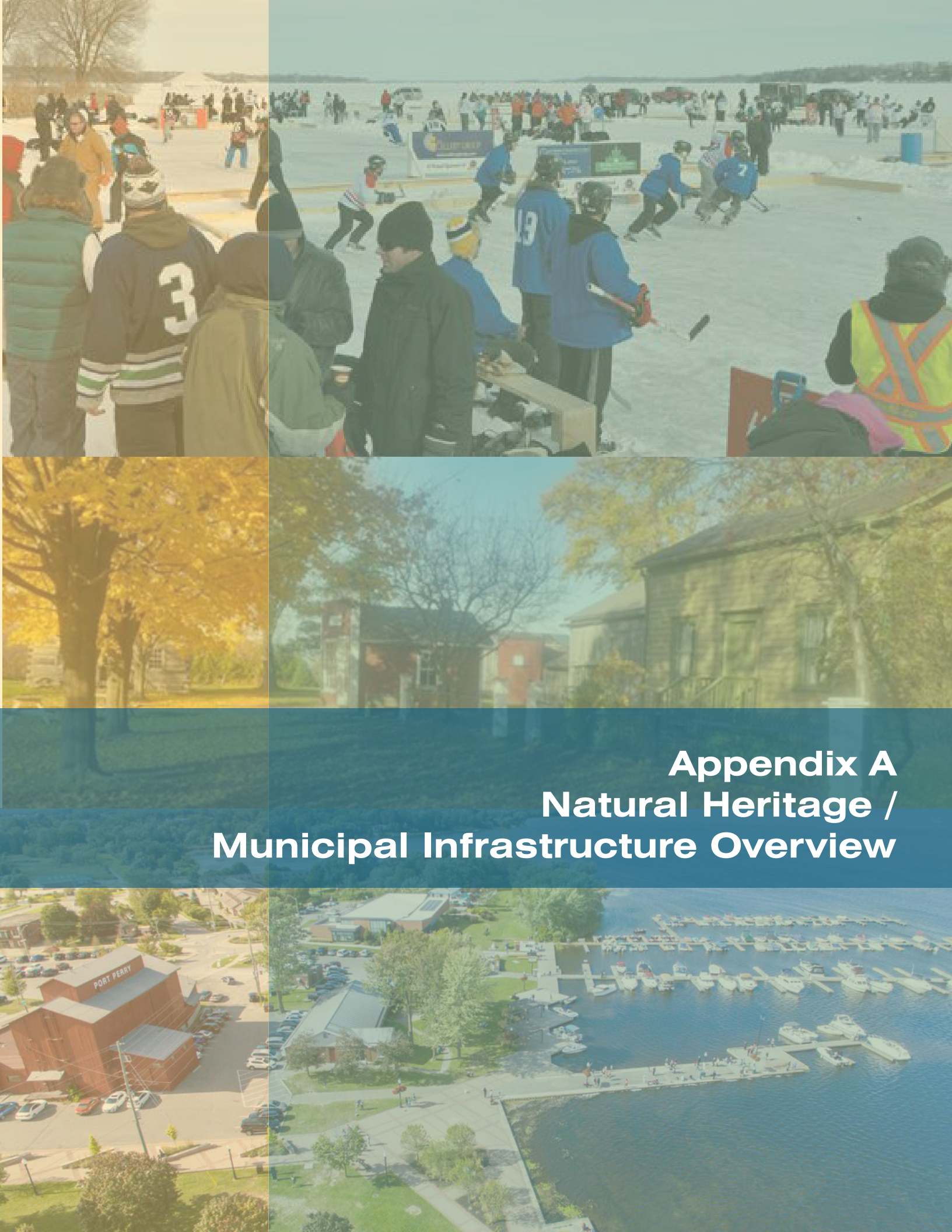

Appendix A
Natural Heritage / Municipal Infrastructure Overview

Greenbelt Planning Area Review for the Port Perry West Landowners Group

Submitted to (Owner):

Port Perry West Landowners Group

Submitted by:

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October 25, 2022
Project 2203850

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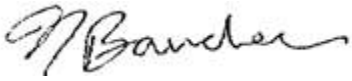

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Statement of Conditions

This Report / Study (the “Work”) has been prepared at the request of, and for the exclusive use of, the Owner and its affiliates (the “Intended User”). No one other than the Intended User has the right to use and rely on the Work without first obtaining the written authorization of GEI Consultants Ltd. GEI Consultants expressly excludes liability to any party except the Intended User for any use of, and/or reliance upon, the work.

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Executive Summary

GEI was retained by Port Perry West Landowners Group to review and suggest refinements to the Greenbelt Plan Area boundary within their property in Port Perry, Ontario. 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 Greenbelt Planning area boundary to optimize developable area within the Subject Lands.

The entirety of the Subject Lands is located within the Greenbelt Planning Area and is designated as Protected Countryside. The Protected Countryside designation includes lands that are dedicated as part of the agricultural system, natural system and/or settlement areas. No portions of the Greenbelt Natural Heritage System (**NHS**) were identified on or adjacent to the Subject Lands.

Currently the Subject Lands host a mixture of agricultural, residential and golf course land-uses. Cawkers Creek, a permanent watercourse, was identified along the eastern Subject Lands boundary. Two potential intermittent watercourses were also identified within the northern portion of the Subject Lands. These intermittent watercourses appear to be partially fed from the golf course ponds; however, many of the ponds displayed evidence of a high level of manipulation. The Sunnybrae Golf Club has a Permit To Take Water (**PTTW**), which could impact the hydrology of these features. Additional investigations are required to determine whether these intermittent watercourses are present within the landscape; however, as a precautionary approach they have been assumed on the landscape. Headwater drainage features (**HDFs**) are also likely present within the Subject Lands; however, they would not be considered intermittent or permanent streams. Watercourses (including online ponds) and HDFs may provide fish habitat within the Subject Lands. Isolated ponds that are not hydrologically connected are not identified as providing fish habitat.

Several wetlands were identified within the Subject Lands; therefore, it is possible that these units could be considered Provincially Significant, if a wetland evaluation were requested by the Conservation Authority or the Ministry Natural Resources and Forestry (**MNRF**). Wooded communities were also identified within the Subject Lands; further evaluation is required to determine whether these woodlands would meet the threshold for significance. Furthermore, potentially suitable habitats for Species at Risk (**SAR**) and Significant Wildlife Habitat (**SWH**) were identified on the Subject Lands. Detailed field investigations will be required to confirm whether the species are present and using the habitats. One Highly Vulnerable Aquifer (**HVA**) was identified in a small area in the northern part of the Subject Lands. Based on the expected soil conditions from the desktop review (low-permeability soils like clays, glacial tills at grade), seepage areas and springs are not expected across most of the Subject Lands. At a preliminary level, potential seepage locations (if any) are expected to be confined to the watercourse and wetland community areas identified on the Subject Lands. Detailed investigations are required to confirm the presence, function and size of Key Natural Heritage

Feature (**KNHF**), Key Hydrologic Feature (**KHF**) and Key Hydrologic Area (**KHA**). Formal feature staking exercises are required for wetland and woodland features to determine the limits of these features.

Based on existing conditions, refinement to the Greenbelt Planning Area boundary is recommended based on the presence of candidate KNHFs, KHFs and KHAs. The refinements are generally limited to existing managed areas (e.g., agricultural, golf course, residential) and a few smaller cultural meadow communities that are not known to meet any of the criteria to qualify as KNHFs or KHFs. A 30 m vegetation protection zone (**VPZ**) has been applied to all candidate KNHF and KHFs. In addition to these refinement areas, potential enhancement areas outside of the Greenbelt Planning Area were also identified to further strengthen and create a more resilient Greenbelt system.

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.

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.

In terms of municipal servicing, the Regional Municipality of Durham is responsible for providing sanitary sewage conveyance, treatment and water distribution to the Port Perry Community. Based on a review of Region of Durham background reports, it appears the existing Regional servicing infrastructure such as the Water Pollution Control Plant and Water Supply Wells exhibit spare capacity for future development. In addition, the Region of Durham has several sanitary and water servicing improvement projects planned within their Development Charges Study to support growth within the Port Perry Community.

Based on secondary planning completed by the Township and Region to advance servicing for the Future Employment Area located to the north of the Subject Lands, it appears that new major infrastructure is planned within the employment area, such as a new sanitary pumping station, new forcemain connected to the Water Pollution Control Plant and new water storage tower/reservoir. The preferred approach to providing sanitary and municipal water to the Subject Lands would be to extend servicing connections through the Future Employment Lands and initiate discussions with the municipalities to oversize such major infrastructure to be constructed within the employment lands to accommodate the Subject Lands.

Stormwater management for the Subject Lands will be accomplished through the use of traditional open air stormwater retention ponds for water quantity and quality treatment. The majority of the Subject Lands are located within Cawkers Creek subwatershed while the western corner of the Lands is located within the Nonquon River subwatershed, all draining towards Lake Scugog. Multiple stormwater management ponds shall be required at

topographic low points, located adjacent to existing natural heritage features to control post-development runoff.

1. Introduction

GEI Consultants Ltd. (**GEI**) has been retained by Port Perry West Landowners Group to complete a review of the Greenbelt Planning Areas within their properties in Port Perry, Ontario. Specifically, a review was completed for Port Perry West Landowners Group properties that are generally located southeast of Highway 7A, west of Old Simcoe Road and north of Scugog Line 4. These properties will be collectively referred to as the Subject Lands **(Figure 1).** When necessary to differentiate between the properties, the property north of King Street will be referred to as the Northern Subject Lands and the property south of King Street will be referred to as the Southern Subject Lands.

The Subject Lands are entirely located within the Greenbelt Planning Area (i.e., Greenbelt) and are currently assigned a land use designation of Protected Countryside (**Figure 2**). With the increased housing demand from our population and existing communities, a review of existing areas within the Greenbelt must be undertaken to understand whether additional development opportunities may be present. This review must also ensure the protection of natural heritage features within the landscape.

GEI has undertaken a high-level review to identify areas within the Subject Lands that are currently included within the Greenbelt where opportunities to refine and/or remove existing designations could be considered.

Figure 1: Location of Subject Lands

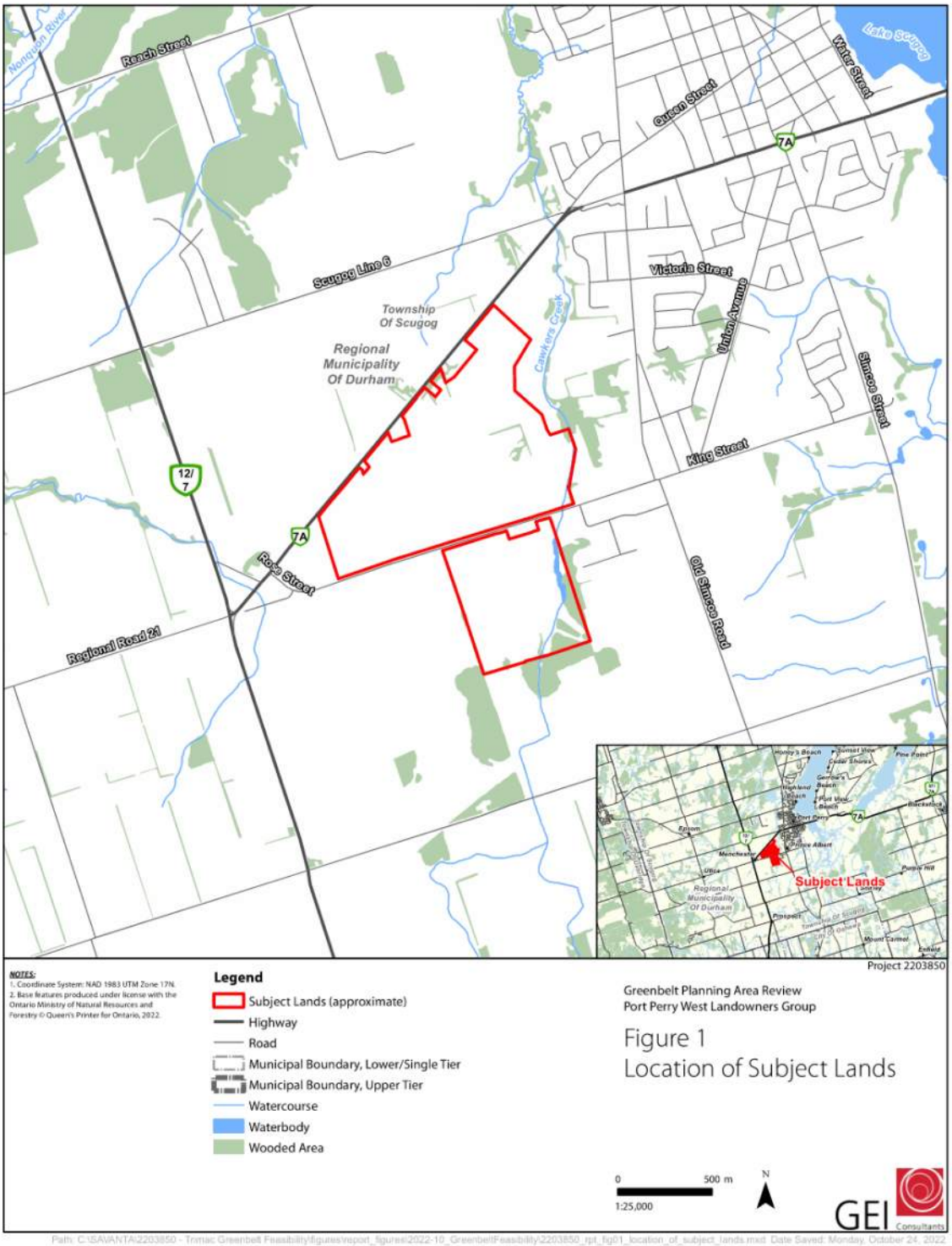
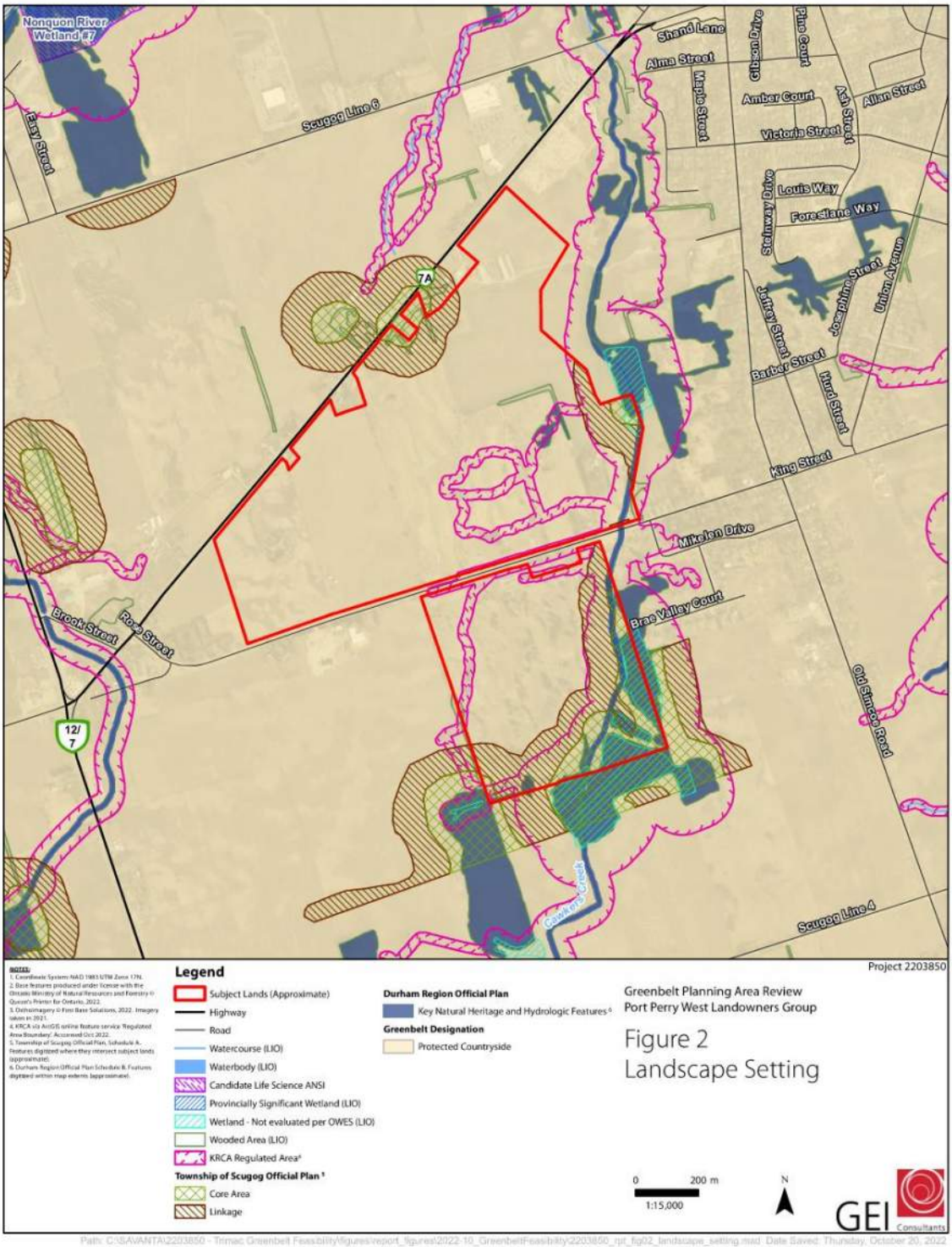


Figure 2: Landscape Setting



2. Planning Considerations

An assessment of the quality and extent of natural heritage features found on, and adjacent to, the Subject Lands and 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:

- Township of Scugog Official Plan (2017 Consolidation);
- Region of Durham Official Plan (2020 Consolidation);
- Kawartha Conservation (**KC**) Ontario Regulation (O. Reg.) 182/06 and their Plan Review and Regulation Policies (2013a);
- Provincial Policy Statement (**PPS**; MMAH 2020);
- Greenbelt Plan (2017);
- *Endangered Species Act* (**ESA**; 2021 Consolidation of S.O. 2007, c. 6); and
- *Fisheries Act* (R.S.C., 1985, c. F-14).

2.1 Township of Scugog Official Plan

The Greenlands System includes the Natural Core Areas and Natural Linkage Areas from the Greenbelt Plan, as well as Natural Core Areas, Natural Linkage Areas and Countryside Areas from the Oak Ridges Moraine Conservation Plan.

The Natural Heritage System that makes up the Natural Core Area in the Town of Scugog Official Plan (**OP**) consists of the following Key Natural Heritage Features (**KNHFs**) and Key Hydrologic Features (**KHFs**):

- Significant habitat of endangered, threatened and special concern species;
- Fish habitat;
- Wetlands;
- Life Science Areas of Natural and Scientific Interest (**ANSIs**);
- Significant valleylands;
- Significant woodlands;
- Significant wildlife habitat (**SWH**);
- Sand barrens, savannahs, tall grass prairies and alvars;
- Permanent and intermittent streams;
- Lakes;
- Seepage areas, springs, and wetlands; and
- A minimum 30 metre vegetative buffer around these features.

Core Areas and Linkages from the Township of Scugog OP were identified along the eastern and southern boundary of the Subject Lands (**Figure 2**). Development and/or site alteration is prohibited within KNHFs and KHFs and their associated vegetative buffers, in accordance with Section 6.3.1 of the OP.

In addition, the following features identified within the Town of Scugog OP (2017) Schedule E are located on or within 120 m of the Subject Lands:

- Warmwater streams;
- Significant wetland areas; and
- Significant forest areas.

2.2 Region of Durham Official Plan

Regional of Durham OP (2020) implements the same definitions for KNHF's and KHFs as noted above by the Township of Scugog OP. Section 2.3.17 of the Region of Durham OP (2020) indicates that outside of Urban Areas and Rural Settlements, an environmental impact study shall be required for any development or site alteration within 120 m of a key natural heritage or hydrologic feature to identify a vegetation protection zone which:

- is of sufficient width to protect the feature and its functions from the impacts of the proposed change and associated activities that may occur before, during, and after, construction;
- where possible, will restore or enhance the feature and/or its function; and will maintain natural self-sustaining vegetation.

The vegetation protection zone for KNHFs and KHF, as depicted on Schedule B1 of the OP (i.e., wetlands, seepage areas and springs, fish habitat, permanent and intermittent streams, lakes, and significant woodlands) shall be a minimum of 30 m wide, measured from the outside boundary of the feature.

Schedule B Map B1c of the Region of Durham OP (2020) shows the NHS, KNHFs and KHFs according to the Greenbelt Plan. These features are generally located along the south and eastern extent of the Subject Lands (**Figure 2**).

2.3 Kawartha Conservation Authority

Kawartha Conservation (**KC**) conducts reviews of planning processes associated with development properties within jurisdictional boundaries. In addition, KC 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*.

KC administers the Regulation of Development, Interference with Wetlands, Alternations to Shorelines and Watercourses, under O. Reg 182/06. Permission is required from KC 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 regulated areas were identified within the north, southern, eastern and central portions of the Subject Lands (**Figure 2**). Portions of these regulated areas are associated with wetland and wooded communities, as well as portions of Cawkers Creek.

KC's Plan Review and Regulation Policies (2013a) provides guidance regarding regulated features and their associated hazards.

2.4 Provincial Policy Statement

The Provincial Policy Statement (**PPS**; 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.

According to the Greenbelt Plan, the Subject Lands are identified as Protected Countryside (**Figure 2**). No portions of the Greenbelt Natural Heritage System (**NHS**) are illustrated on or immediately adjacent to the Subject Lands.

As discussed in Section 4.1.1 of the Greenbelt Plan, 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.

As described within Section 3.2 of the Greenbelt Plan (2017), the Protected Countryside contains a Natural System composed of a NHS and a Water Resource System. The NHS includes core and linkage areas of the Protected Countryside with the highest concentration of sensitive and significant natural features and functions, while the Water Resource System is made up of both ground and surface water features, areas and their associated functions. The Natural System protects natural heritage, hydrologic and/or landform features (key KHAs, KHFs and KNHFs) that contribute to conserving Ontario's biodiversity and the ecological integrity of the Greenbelt itself.

The Greenbelt Plan (2017) contains policies to protect 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 Endangered Species Act

The provincial ESA, 2007 (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.

2.7 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. A HADD is defined as "any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes" (DFO 2019).

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 (2019);
- 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 (2019) identifies the following features on or within 120 m of the Subject Lands (**Figure 2**):

Within the Subject Lands:

- Woodlands; and
- Unevaluated wetlands.

Within 120 m of Subject Lands:

- Woodlands;
- Unevaluated Wetlands

In addition to this, the Nonquon River Provincially Significant Wetland (**PSW**) is located 1.2 km from the Subject Lands; while the Lake Scugog Marsh (Osler Marsh) PSW is located 1.6 km from the Subject Lands.

3.1.2 Natural Heritage Information Centre

The NHIC database (2022) 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 nine squares overlapping the Subject Lands: 17PJ6183, 17PJ6283, 17PJ6383, 17PJ6182, 17PJ6282, 17PJ6382, 17PJ6181, 17PJ6281, and 17PJ6381.

In total, two species of interest were recorded in the atlas squares that overlap with the Subject Lands: Barn Swallow (*Hirundo rustica*), which is listed as Threatened on the SARO list and Snapping Turtle (*Chelydra serpentina*), which is listed as Special Concern.

The NHIC database also identified the presence of a Mixed Wader Nesting Colony Wildlife Concentration Area with these squares. This record may indicate the presence of certain SWH types and is considered as part of the SWH assessment in **Section 3.3.5**.

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 (17PJ68). 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, 133 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:
    - Bank Swallow (*Riparia riparia*)– Threatened;
    - Barn Swallow – Threatened;
    - Bobolink (*Dolichonyx oryzivorus*) – Threatened;
    - Chimney Swift (*Chaetura pelagica*) – Threatened;
    - Eastern Meadowlark (*Sturnella magna*)– Threatened;
    - Eastern Whip-poor-will (*Antrostomus vociferus*) – Threatened;
    - Least Bittern (*Ixobrychus exilis*) – Threatened; and
    - Red-headed Woodpecker (*Melanerpes erythrocephalus*) – Endangered.

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1-S3 species):
    - Black Tern (*Chlidonias niger*) – Special Concern;
    - Canada Warbler (*Cardellina canadensis*) – Special Concern;
    - Eastern Wood-Pewee (*Contopus virens*)– Special Concern;
    - Grasshopper Sparrow (*Ammodramus savannarum*) – Special Concern; and
    - Wood Thrush (*Hylocichla mustelina*) – Special Concern;
    - Common Nighthawk (*Chordeiles minor*) – Special Concern;
    - Golden-winged Warbler (*Vermivora chrysoptera*) – Special Concern;
    - Purple Martin (*Progne subis*) – S3B (Vulnerable);
    - Ruddy Duck (*Oxyura jamaicensis*) – S3B, S4N, S5M; and
    - Wilson's Phalarope (*Phalaropus tricolor*) – S2B (Imperiled), S4M.

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 (17PJ68).

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, 16 species were recorded in the atlas square that overlaps with the Subject Lands, with two species of interest noted: 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 2021, 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 (17PJ68). 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, 70 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 the Hermit Sphinx Moth (*Lintneria eremitus*) which is ranked as S3 (Vulnerable) 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. However, no species of interest were found on or within 120 m of the Subject Lands.

3.1.9 Landscape Ecology

From a broader landscape perspective, a desktop review was completed to understand the potential movement and linkage corridors surrounding the Subject Lands for abiotic and biotic movement of organisms, matter and energy. The Nonquon River is situated to the southwest of Lake Scugog. Water flows northward off of the Oak Ridges Moraine, and into the western basin of Lake Scugog east of the town of Seagrave. The Subject Lands are located 2.3 km from Lake Scugog and 2.4 km from the Oak Ridges Moraine. Given the developed nature of the landscape, it is likely that wildlife within the area will use this north-south NHS as a wildlife corridor. The Nonguon River would be considered a primary linkage within the landscape for terrestrial and aquatic species. A secondary linkage would be Cawkers Creek, as this permanent watercourse connects between various habitats before outletting into Lake Scugog. From the headwaters to Highway 7A, Cawkers Creek has been influenced by adjacent agricultural lands (Kawartha Conservation 2013b). Cawker's Creek bisects the east-most portion of the Subject Lands.

3.2 Site Reconnaissance Findings

A site reconnaissance was conducted by GEI's Ecology team on October 19, 2022 to generally characterize the Subject Lands. Findings and initial interpretations are provided in the following sections.

3.2.1 Vegetation Communities

GEI undertook preliminary delineation of vegetation communities using aerial imagery interpretation. Confirmation of vegetation communities was undertaken during the site reconnaissance visit. The delineation of vegetation communities within the Subject Lands is illustrated on **Figure 3a**.

Much of the Subject Lands are agricultural lands (i.e., pasture lands and row crops), hedgerows, the Sunnybrae Golf Course and a small number of residential properties. Naturalized vegetation is limited within the Subject Lands; and where present, patches were generally small in size and fragmented from one another.

In the Southern Subject Lands, Mixed Swamp (**SWM**), Coniferous Swamp (**SWC**) and Deciduous Forest (**FOD**) are present along the outer limits and several ponds were present. The remaining vegetation within the Sunnybrae Golf Course was considered manicured/ornamental in nature. The ponds all appeared artificial in origin; though, some are online on Cawkers Creek.

Cawkers Creek flows diagonally (southwest to northeast) from the Golf Course under King Street. Vegetation within the immediate vicinity of the creek on the south side of King Street was a Reed Canary Mineral Meadow Marsh (**MAM2-2**); although this community is primarily located outside the Southern Subject Lands.

In the Northern Subject Lands, four ponds where present within the northern portion of the golf course and a narrow band of Dry – Moist Old Field Cultural Meadow (**CUM1-1**) and MAM2-2, associated with one of the ponds was present along the easternmost limit of the northern portion of the golf course. All other vegetation within the golf course was considered manicured/ornamental in nature. At the northern central limit of the Northern Subject lands, a Cultural Plantation (**CUP**) was present. A small portion of Mixed Forest (**FOM**) enters the Northern Subject Lands on the east side. The remaining naturalized vegetation communities were located on the two residential properties in the southeastern corner of the Northern Subject Lands. The property located at 1473 King Street contained a number of naturalized vegetation communities as well as pasture lands. A small Deciduous Swamp (**SWD**) and MAM2-2 are present along the southernmost limit (i.e., near King Street) of this property. On the east of the property and behind the residential home, CUM1-1 is present. As well, to the northeast of the residential home, a remnant FOD with three apparently natural ponds (**OAO**) were present. Cawkers Creek crosses the property located at 1511 King Street; vegetation communities associated with the creek and along the southern limit of this property included MAM2-2 and CUM1-1 as well as a hedgerow.

Figure 3A: Ecological Land Classification

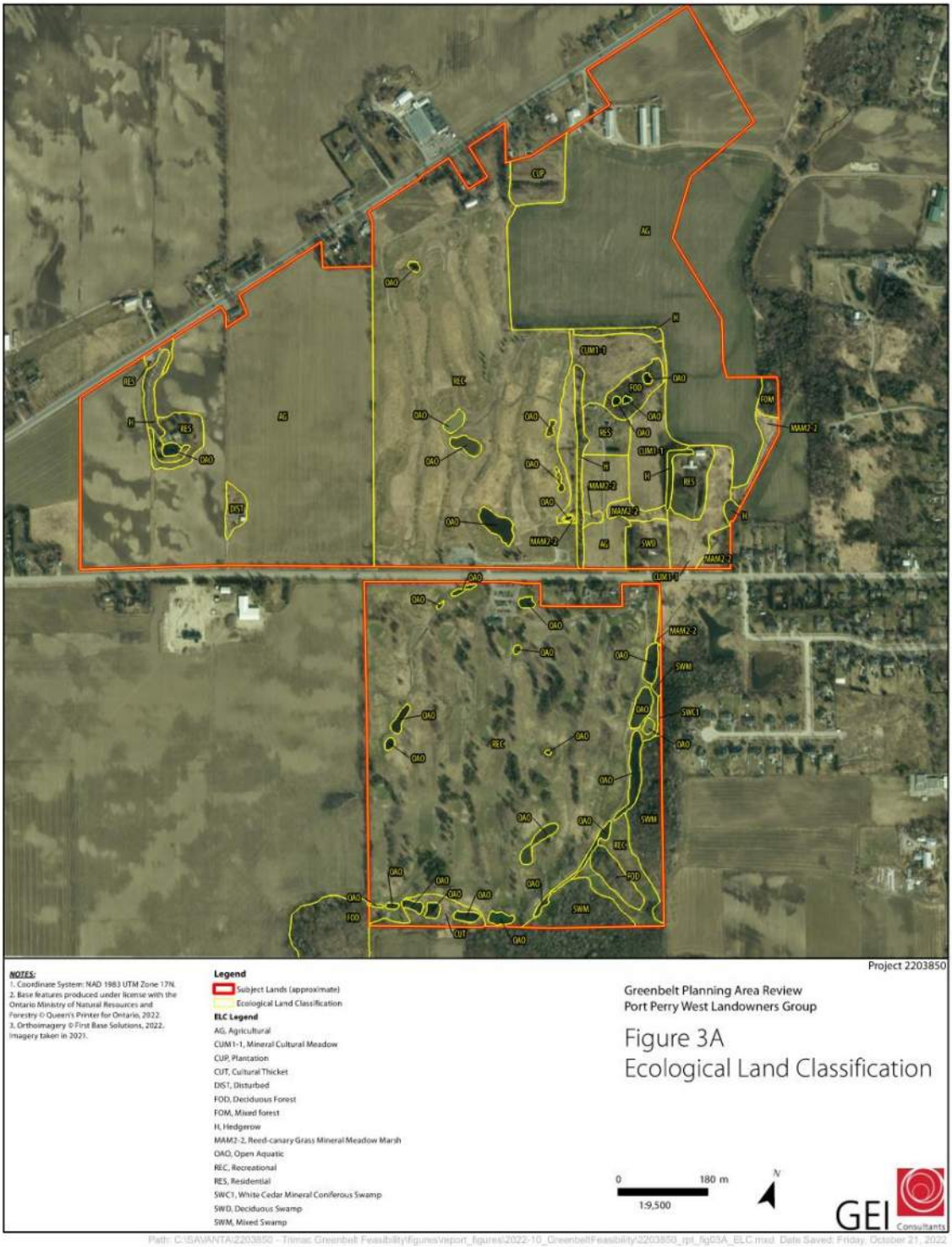
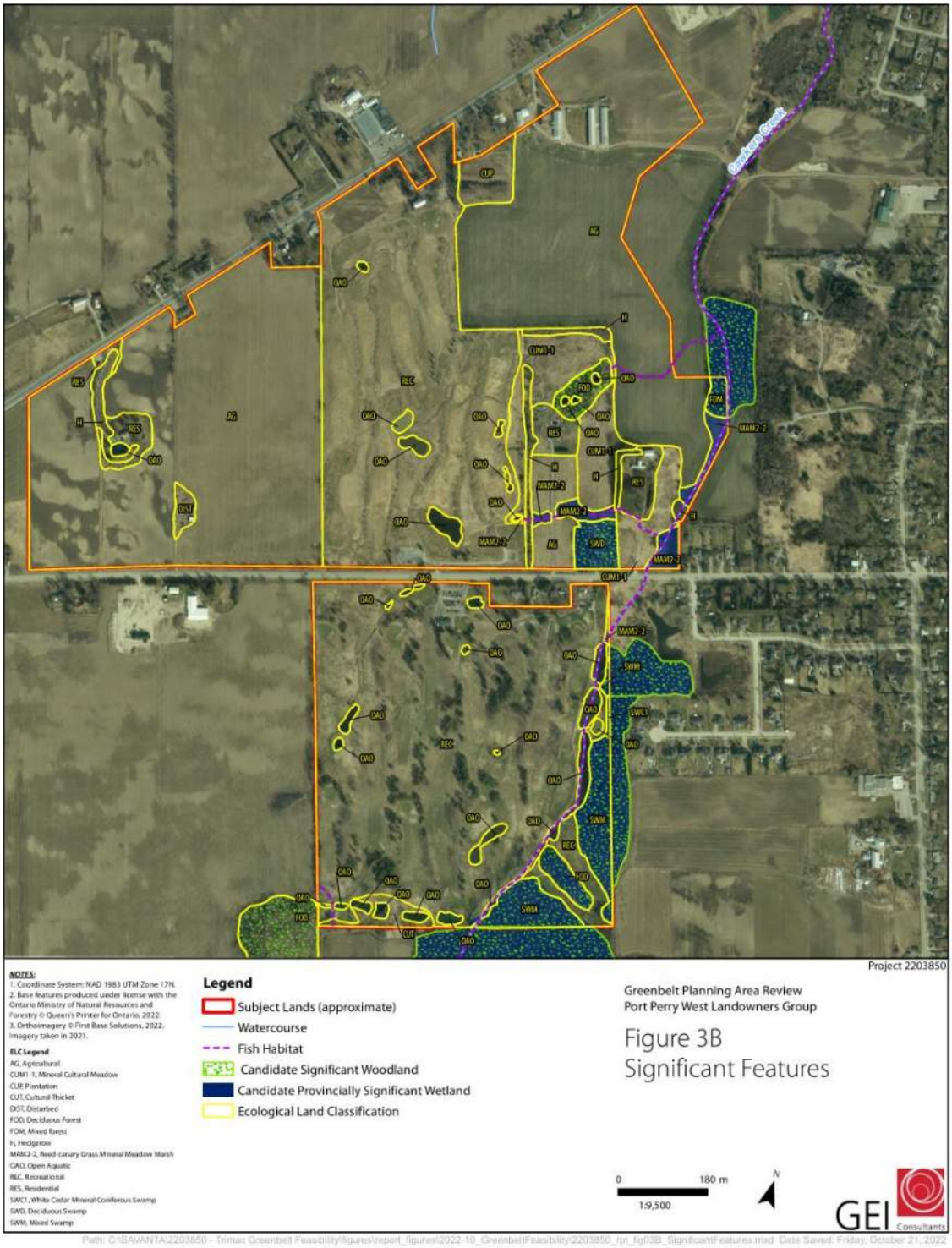


Figure 3B: Significant Features



3.2.2 Flora

No rare species of flora were noted within the Subject Lands during the site reconnaissance. Some invasive species noted within the Subject Lands included:

- European Buckthorn (*Rhamnus cathartica*);
- Canada Thistle (*Cirsium arvense*); and
- Purple Loosestrife (*Lythrum salicaria*).

Additional invasive species may also be present within the Subject Lands.

3.2.3 Fauna

The agricultural and golf course areas within the Subject Lands would provide only limited opportunities for use by wildlife; whereas the naturalized vegetation communities associated with Cawkers Creek, small remnant woodlands and large woodlands along the edges of the Subject Lands would provide higher quality potential wildlife habitat. Cawkers Creek also provides the primary linkage opportunity for the movement of biotic and abiotic flows across the landscape within the Subject Lands.

Several barn and shed structures were recorded within the Subject Lands that could support SAR bats and Barn Swallow. Detailed investigations are required to understand whether these species are present and using these structures. Further to this, a small number of bird nesting boxes have been installed within the golf courses and a bat roosting box was present on a residential property.

Several clusters of Common Milkweed (*Asclepias syriaca*) were recorded along Cawkers Creek and within naturalized communities within the Subject Lands. Common Milkweed is a host plant for Monarch; therefore, suitable habitat may be present to support this species. Additional surveys are required to confirm whether Monarch are using Milkweed to support breeding.

A number of ponds were observed within the Subject Lands; these features could support amphibian breeding habitat. As well, the online ponds associated with Cawkers Creek may also support habitat for turtles, particularly for Snapping Turtle. Muskrat (*Ondatra zibethicus*) and a muskrat burrow were also noted within ponds at the golf course.

Other species documented during the site reconnaissance included:

- American Crow (*Corvus brachyrhynchos*);
- Blue Jay (*Cyanocitta cristata*);
- Common Raven (*Corvus corax*);
- Coyote (*Canis latrans*); and
- Eastern Gray Squirrel (*Sciurus carolinensis*).

These species are all considered common and secure in Ontario.

3.2.4 Aquatic Ecology

Five KC regulated areas were identified within the Subject Lands (as shown on **Figure 2**. Since KC's mapping tool did not differentiate regulated watercourses from other regulated feature types, it is unclear how many regulated watercourses are identified within the Subject Land boundary.

One permanent watercourse and two potential intermittent watercourses were identified within the Subject Lands (**Figure 3b**)**.** The permanent watercourse (Cawkers Creek) is located along the eastern Subject Land boundary and hosts several online ponds. Several perched culverts along Cawkers Creek were recorded throughout the golf course property; these perched culverts would restrict fish movement into the upstream portions of the feature. Cawkers Creek enters the site from a swamp community and flows towards Lake Scugog (offsite). Potential evidence of groundwater interactions (i.e., iron staining) was observed at the upstream extent of the Subject Lands boundary near the swamp community. Discussion on potential groundwater seepages within the property is provided in **Section 5.2.**

Many of the ponds within the Subject Lands displayed evidence of a high level of manipulation as pumps were observed within several of the ponds, except for those along Cawkers Creek. The Sunnybrae Golf Club has a Permit To Take Water (**PTTW**) from these anthropogenic ponds. The PTTW is further discussed below within **Section 4.3**. The KC has identified several regulated areas associated with anthropogenic ponds and potential associated drainage features. Given the highly anthropogenic nature of golf courses and maintenance requirements, these features may not warrant regulation. Further investigations and consultation with the KC is required to determine whether these features should be regulated. Specifically, during the site visit some of these ponds were almost dry (or had low remaining volumes of water) and vegetation was beginning to establish along the banks of the ponds. All ponds appear to be anthropogenic in nature (i.e., dug in support of golf course activities) or anthropogenically influenced (i.e., installation of golf cart pathways with perched culverts caused upstream pooling), except for the ponds located within the FOD community locate at 1473 King Street. Given this level of manipulation of water quantities within the system, it is unclear whether the ponds within the Subject Lands are hydrologically connected to Cawkers Creek, as suggested by KC's mapping. It is possible that these features could be seasonally hydrologically connected, as evidenced by flow path, culvert placement and presence of wetland communities. It is GEI's recommendation that drainage features within the golf course currently identified as regulated by KC, aside from the wetland communities, would be more appropriately treated as headwater drainage features (**HDFs**) instead of regulated watercourses given their high degree of alteration, likely small drainage areas and first-order nature. Where these features exit the golf course property, the increase in naturalized vegetation communities is apparent and it is possible that these features could qualify as regulated watercourses. As a result, regulated features as shown by KC outside of the golf course areas have been treated as candidate regulated watercourses. Additional studies will be required under appropriate seasonal conditions to confirm the hydrological and riparian conditions as well as presence of fish and fish habitat within each feature type, as this will further inform whether features should be considered regulated watercourses or HDFs.

Several potential HDFs were identified within the Subject Lands within topographic lows in both the agricultural fields and golf course. Based on the existing riparian vegetation, high degree of alteration and dry conditions, 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).

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 areas of natural and scientific interest.

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**; MNR 2010).

3.3.1 Significant Wetlands

Within Ontario, significant wetlands are identified by the Ministry of Natural Resources and Forestry (**MNRF**) or by their designates. Other evaluated or unevaluated wetlands may be identified for conservation by the municipality or the conservation authority. There are no PSW's located within the Subject Lands; however, five units of unevaluated wetland are present within the Subject Lands as identified during the secondary source review (**Figure 2**). The Nonquon River and Lake Scugog Marsh (Osler Marsh) PSWs are located 1.2 km and 1.6 km from the Subject Lands, respectively.

The five units of unevaluated wetland were confirmed within the Subject Lands following the site reconnaissance (**Figure 2**). Further to this, additional wetland vegetation communities were identified within the Subject Lands during the site reconnaissance visit. These features are the MAM2 and MAM2-2 communities that are associated with Cawkers Creek and its associated tributaries (**Figure 3a)**. These previously unevaluated or unidentified wetlands can be classified as provincially significant either by complexing them with a nearby, hydrologically-connected PSW (i.e., if within 750 m) or by evaluating the wetland on its own to determine if it meets the test of significance. It is possible that the KC, the Township and Region may defer to the MNRF to assess whether these wetland units should be assessed following the Ontario Wetland Evaluation System (**OWES**). As a precautionary approach, these wetlands have been identified as candidate PSWs (Refer to **Figure 3b**).

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) and Durham Region OP 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...*

The Region of Durham further defines Significant Woodlands, off the Oak Ridge Moraine as follows:

> *"an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history."*

Meanwhile, in keeping the woodland density requirements outlined by the *Forestry Act* (1990), the Region of Durham By-law 30-2020 further defines Woodlands as:

> *"an area of land one hectare in size or greater on one or more properties with a minimum density of:*
>
> a) *1,000 Trees, of any size, per hectare;*
> b) *750 Trees, measuring over five (5) centimetres at DBH, per hectare;*

c) *500 Trees, measuring over twelve (12) centimetres, at DBH, per hectare; or*
d) *250 Trees, measuring over twenty (20) centimetres, at DBH, per hectare*".

It is noted that the Township of Scugog OP (2017) does not provide a definition for either Woodlands or Significant Woodland; therefore, the regional definition was relied upon for this analysis.

In accordance with the above-noted definitions, natural treed communities (FOC, FOM, FOD, SWC, SWM, SWD) and cultural woodland/plantation communities (CUW, CUP) may be considered woodlands (i.e., meets the *Forestry Act* woodland density requirements). Woodland patches are considered part of the same continuous woodland if they are within 20 m of each other.

Based on the preliminary review and site reconnaissance, it is likely that any features identified as Forest (FO) or Swamp (SWM and SWC) on or immediately adjacent to the Subject Lands could be considered significant woodlands. This includes the forest and swamp features present along the limits of the Subject Lands and beyond the Subject Lands. As a precautionary approach, these features have been identified as candidate Significant Woodlands (**Figure 3b**). The CUP present within the Subject Lands was not expected to be considered a significant woodland. This assumption was made as it appears that the feature had a low density of trees. Additional surveys will be required to confirm these assumptions.

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; no such study has been undertaken by the planning authorities to date.

Cawkers Creek bisects the eastern portion of Subject Lands and appears to be part of an unconfined valleyland system. Since this feature appears to lack prominence as a distinctive landform and appears to have been affected by ongoing land use practices (i.e., farming and use on golf course) which has reduced the degree of naturalness of the feature, no significant valleylands are present within the Subject Lands.

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.

Seasonal Concentration Areas

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:

- Bat Maternity Colonies (FOD, SWM);
- Turtle Wintering Areas (OAO online with Cawkers Creek);
- Colonial Bird Nesting Sites (tree/shrubs; SWD, SWM);
- Seeps and Springs (Forested ecosites);
- Woodland Amphibian Breeding Habitat (FO, SW);
- Wetland Amphibian Breeding Habitat (SW, MA);
- Amphibian Movement Corridors;
- Marsh Bird Breeding Habitat (MAM);
- Terrestrial Crayfish (MAM);
- Habitats for Special Concern and Rare Wildlife:
    - Canada Warbler
    - Eastern Wood-Pewee
    - Grasshopper Sparrow
    - Purple Martin
    - Wilson's Phalarope
    - Wood Thrush
    - Hermit Sphinx Moth
    - Monarch
    - Snapping Turtle

All candidate SWH types are associated with the wetland and forested communities found within the Subject Lands, except for candidate Habitat for Special Concern and Rare Wildlife for Monarch, Grasshopper Sparrow and Purple Martin. While unlikely, these SWH types may be present within the CUM vegetation communities or nesting boxes in the Subject Lands.

3.3.6 Fish Habitat

Fish habitat, as defined in the federal *Fisheries Act,* 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."

Three watercourses were identified within the Subject Lands during the site reconnaissance, of which one was identified as a permanent watercourse (i.*e.,* Cawkers Creek) and two identified as intermittent. Detailed investigations are required to determine whether they support direct or indirect fish habitat; however, it is likely that the two intermittent watercourses wouldn't provide direct fish habitat given the numerous fish migratory barriers (e.g., perched culverts) that were recorded throughout the features.

Similarly, other HDFs within the Subject Lands likely support seasonal fish habitat and/or indirect fish habitat. HDFs 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.

Several anthropogenic ponds were identified within the Subject Lands. Ponds not connected to a waterbody, regardless of whether they contain fish, are not considered to be fish habitat by DFO under the *Federal Fisheries Act*. Ponds that are hydrologically connected should be reviewed for presence/absence of fish to determine whether they provide direct or indirect fish habitat functions.

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 wildlife atlas search (**Section 3.1**).

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

- Barn Swallow;
- Bobolink;
- Chimney Swift;
- Eastern Meadowlark;
- Red-headed Woodpecker;
- Eastern Small-footed Myotis (*Myotis leibii*);
- Little Brown Myotis (*Myotis lucifugus*);
- Northern Myotis (*Myotis septentrionalis*); and
- Tri-colored Bat (*Perimyotis subflavus*).

Detailed ecological investigations are required to confirm the presence of SAR and SAR habitat.

3.4 Significant Areas of Natural and Scientific Interest

No ANSIs were identified on or within 120 m of the Subject Lands (**Figure 2**).

4. Desktop Review for Geotechnical & Hydrogeological Conditions

GEI has conducted a secondary source 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 Subject Lands. An overview of the subsurface conditions expected to be encountered within the Subject Lands were established using a range of publicly available information and previous subsurface investigations completed by GEI nearby, summarized below. The actual subsurface conditions within the Subject Lands may differ once detailed borehole investigations are carried out.

4.1 Physiology and Geology Mapping

Surficial geology mapping from the Ontario Geological Survey (**OGS**) was reviewed and is provided on **Figure 4A**. The OGS mapping indicates that most of the Subject Lands is dominated by Stone-poor, sandy silt to silt sand-textured till (noted as “diamicton” on **Figure 4A**) and silt and clay fine-textured glaciolacustrine deposits. To the northwest of the Subject Lands, a coarse-textured glaciolacustrine deposit was found.

The Subject Lands are within the Physiographic Region denoted as the Schomberg Clay Plains (Chapman&Putnam 1984), with the landform consisting of clay plains as shown on **Figure 4B**. Mapping indicates that several drumlins are present to the east and north of the Subject Lands. Although not specifically identified on the mapping, there may be local and discontinuous cohesionless alluvial deposits of sands and gravels along the watercourse alignments.

At depth, the Subject Lands are underlain by bedrock of the Lindsay Formation (Simcoe Group), which consists primarily of limestone as shown in **Figure 4C**. Bedrock topography mapping from Genivar in the Watershed Characterization (Groundwater) South Lake Scugog Watersheds report (**Appendix B**) indicates bedrock is about 80 metres below grade.

Geotechnical boreholes available on a database from the Ontario Ministry of Mines (2012) were reviewed. No boreholes were found within or near the Subject Lands.

Figure 4A: Surficial Geology

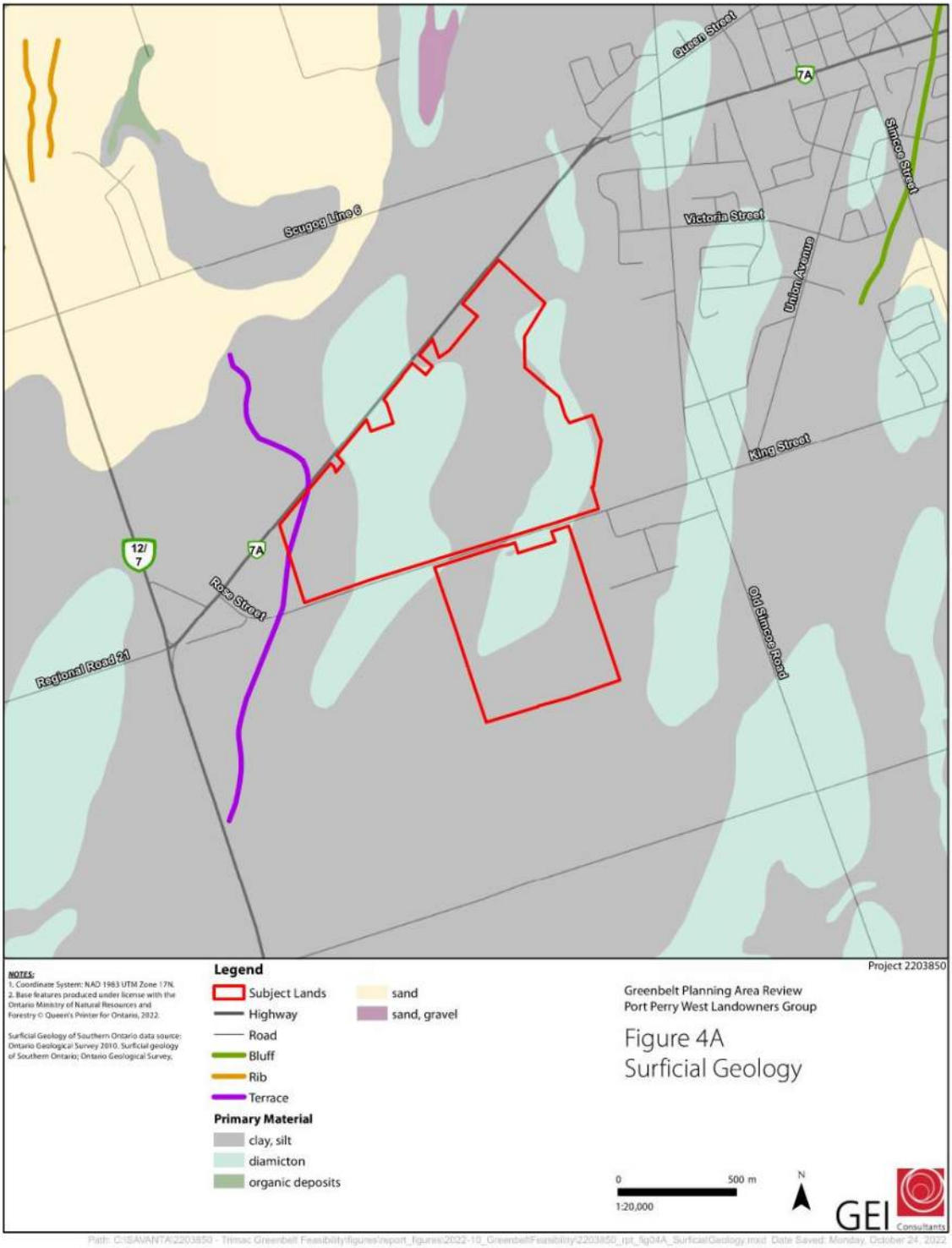


Figure 4B: Phyisiography

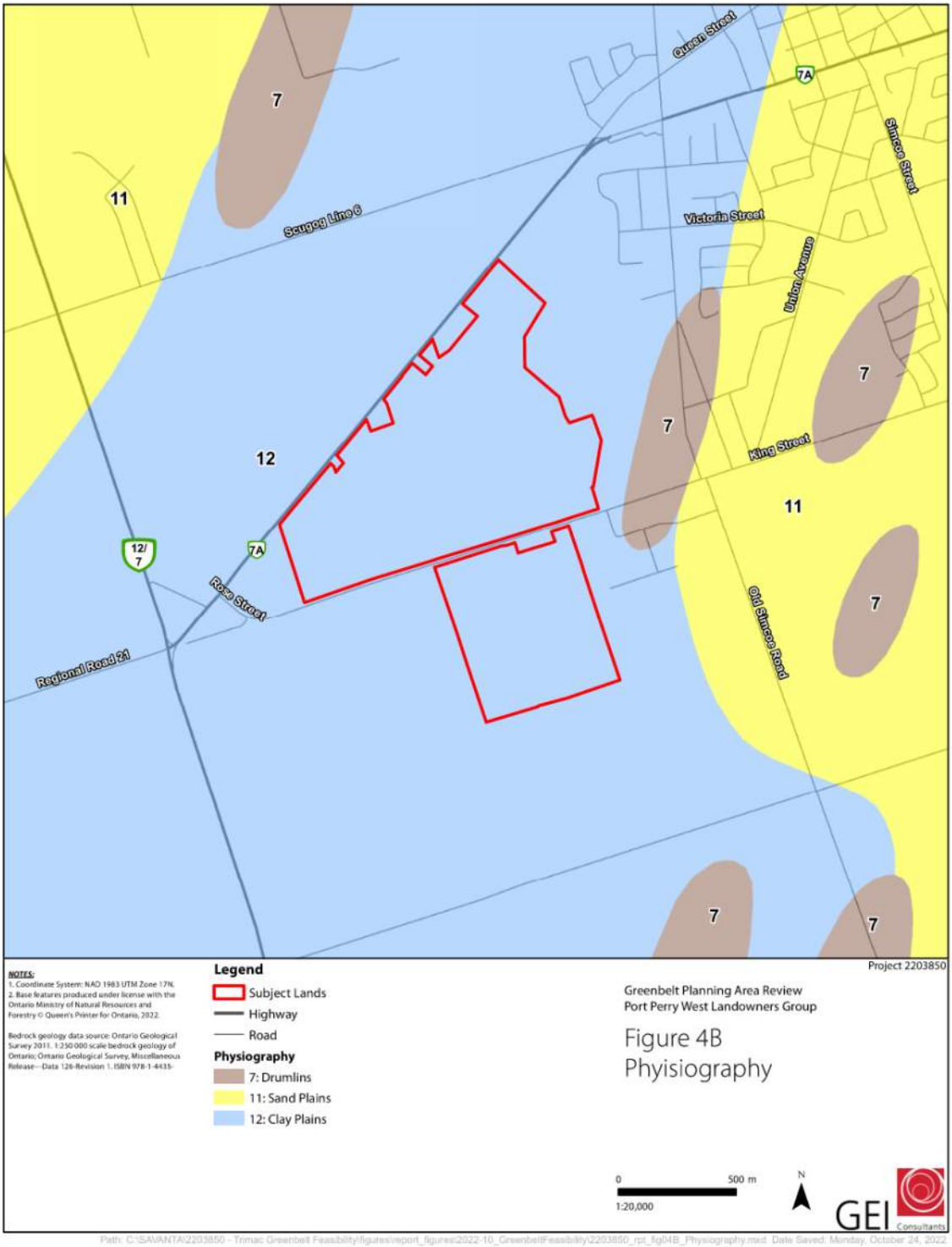
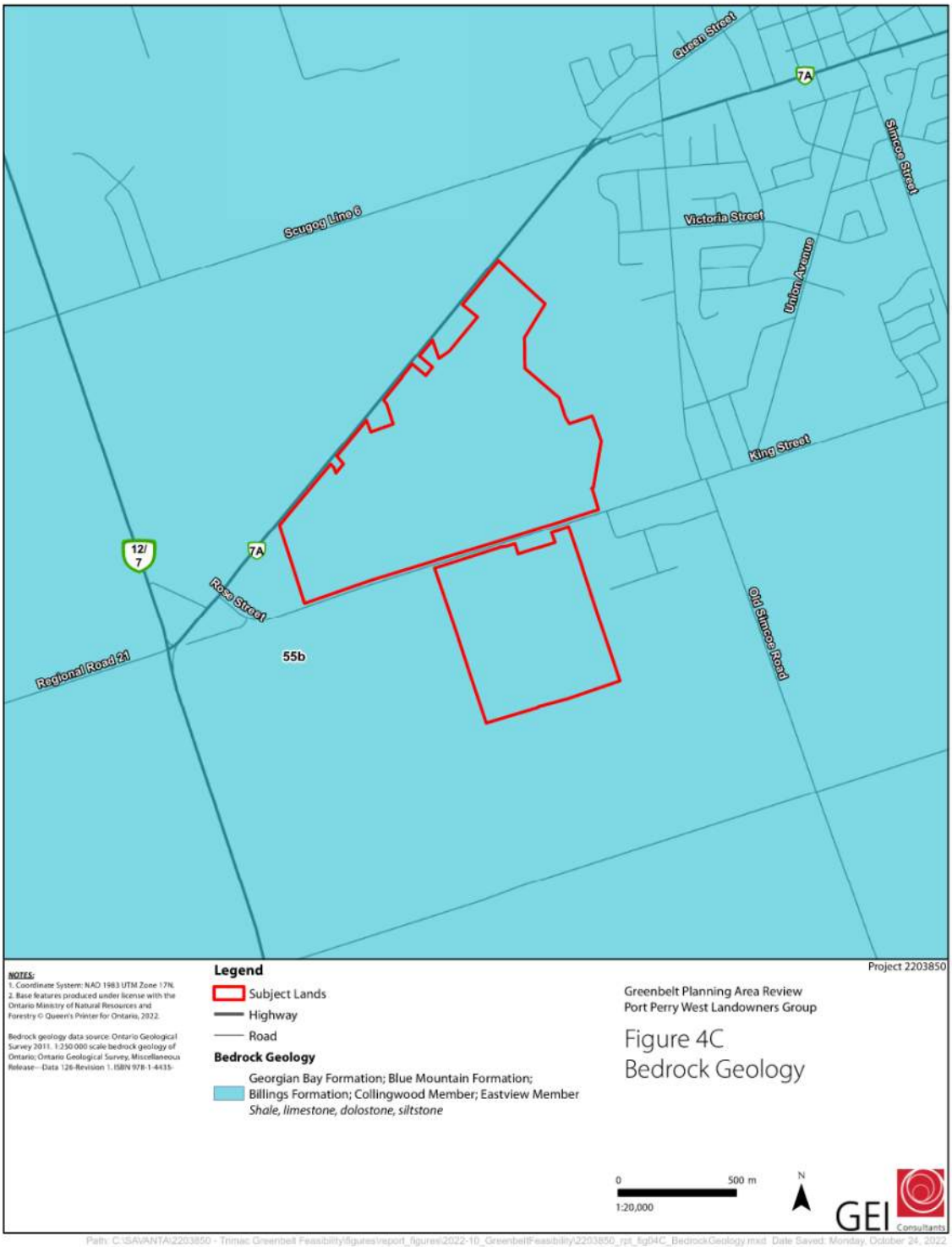


Figure 4C: Bedrock Geology



4.2 Topography and Drainage

Durham Region provides mapping with 1 metre contour intervals which shows that the Subject Lands are relatively flat with elevations between 270 and 290 metres. The Subject Lands slope down to near Elev. 270 metres along the watercourse to the east, and gradually slope up to near Elev. 290 metres to the west. It is expected that most of the Subject Lands drain to the east, with approximately the western third of the Subject Lands draining to the west.

The online Source Protection Information Atlas (MECP 2022) shows KC watershed mapping, which indicates that there is a watershed divide through the western part of the Subject Lands where the Subject Lands gradually slope either east or west. The majority of the Subject Lands are within Cawkers Creek watershed to the east, and the western portion of the Subject Lands are within the Nonquon River watershed. Both watersheds drain into Lake Scugog to the north of the Subject Lands. drain into Lake Scugog to the north of the Subject Lands.

The Ontario Watershed Information Tool (**OWIT**) by MNRF (2022) was also reviewed and shows that most of Subject Lands drain east into the watercourse, which flows north and eventually converges with Lake Scugog approximately 3 km to the north. The western third of the Subject Lands is shown to drain west into a tributary of Nonquon River.

Based on the topography and a preliminary visit to the Subject Lands conducted by GEI staff, it appears that the watercourses are unconfined and do not contain apparent valleyland.

4.3 MECP Water Well Records and PTTW Mapping

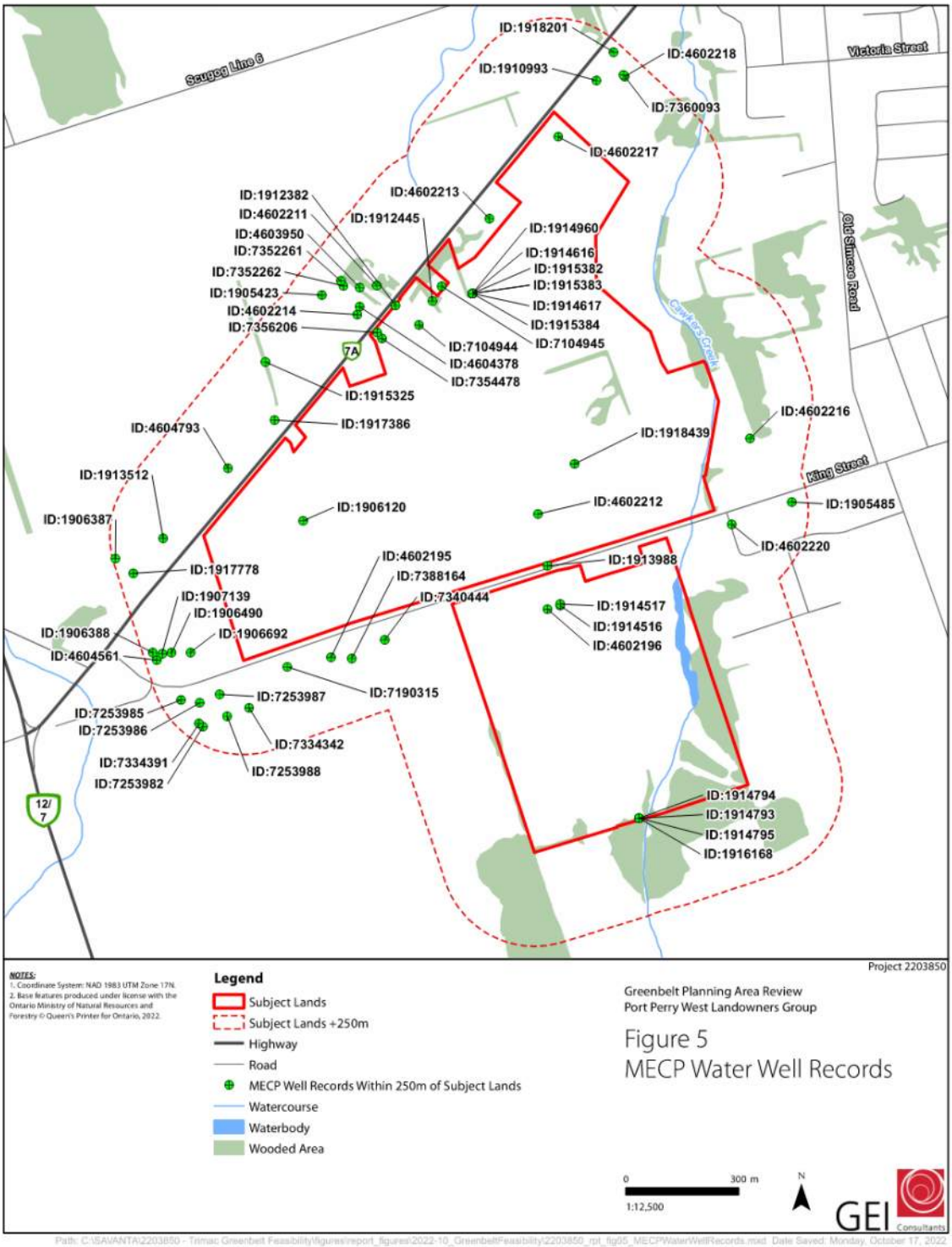
Water well records (MECP 2021) were reviewed for the Subject Lands and surrounding area. Numerous well records were found in the area, but 16 representatives well records were selected and are appended with their locations shown on **Figure 5** and details in **Appendix C**. The stratigraphic descriptions within the MECP well records (2021) 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.

The well records typically show layers of clay that typically extend to the depth of investigation. Some well records note that the clay contains stones and gravel. Based on the surficial geology mapping, the “clay with stones/gravel” may represent cohesive glacial till deposits. The clay layers are typically interbedded with cohesionless deposits of sand at depth. Stabilized water levels were measured to be 8 metres below ground surface or deeper. These water levels may not fully represent groundwater levels near the ground surface, as the wells may be screened within deeper aquifers.

The PTTW database (MECP 2022a) shows there is one active PTTW (3054-B9BPNS) for the Subject Lands located at Sunnybrae Golf Course, for both the clubhouse well and north irrigation pond. The clubhouse well consists of a drilled well and can take up to 27,500 L/day of groundwater for 365 days per year, used for drinking water. The north irrigation pond is permitted to take up to 400,000 L/day of surface water for 220 days per year, used for golf

course irrigation. The permit was issued on March 14, 2019 and expires on December 31, 2028.

Figure 5: MECP Well Records



4.4 Kawartha Conservation Watersheds

The eastern portion of the Subject Lands are within the Cawkers Creek watershed and the western third of the Subject Lands are within the Nonquon River watershed.

Figure 6.12 from Nonquon River Watershed Characterization Report (KC 2012) includes a regional west-east cross section which cuts directly through the northern portion of the Subject Lands. The cross-section shows that the stratigraphy of the Subject Lands includes glaciolacustrine deposits underlain by late-stage lacustrine deposits, a potential thin zone of the Oak Ridges Aquifer Complex (which extends beyond the limits of the Oak Ridges Moraine), the Upper and Lower Newmarket Aquitards, the Thorncliffe Formation, the Sunnybrook Aquitard, and the Scarborough Aquifer Complex, followed by bedrock approximately 100 m below existing grade.

The upper glaciolacustrine/lacustrine deposits are associated with the most recent glaciations (i.e., approximately 10,000 years ago) and typically consist of sandy silt to silty sand till and silt and clay fine-textured deposits, which were deposited by glacial meltwaters. The Oak Ridges Aquifer Complex below is characterized by silt and fine sands, with some large gravel seams. It receives the majority of groundwater recharge from the area and flows to surface water, laterally, or downward into other aquifers. The Newmarket Till consists of a fine-grained matrix of dense glacial till, which provides a protective barrier for the Thorncliffe Aquifer beneath it. The Thorncliffe Formation is generally described as fine grained interbedded with coarse grained material, which act as productive regional aquifers.

These expected conditions are consistent with the subsurface findings from the MECP well records (2021) and other nearby boreholes, which encountered thick clay deposits with interbedded sand layers at depth.

4.5 Kawartha Conservation and Source Protection Mapping

The online Source Protection Information Atlas from the MECP and mapping from KC was reviewed. The Subject Lands are not within a Wellhead Protection Area (WHPA) as shown on **Figure 6A**. One localized area near the northern limit of the Subject Lands is underlain by a HVA as shown on **Figure 6B**. No SGRAs were shown on the Subject Lands as shown on **Figure 6C**. The areas surrounding the watercourses are considered an Intake Protection Zone (**IPZ**) 3 but are not an IPZ 1 or 2.

Online mapping from KC shows that there are mapped watercourses flowing through the eastern quadrant of the Subject Lands. The watercourses and adjacent lands are shown to be Regulated Areas, as discussed above within **Section 2.3**.

Figure 6A: Wellhead Protection Areas

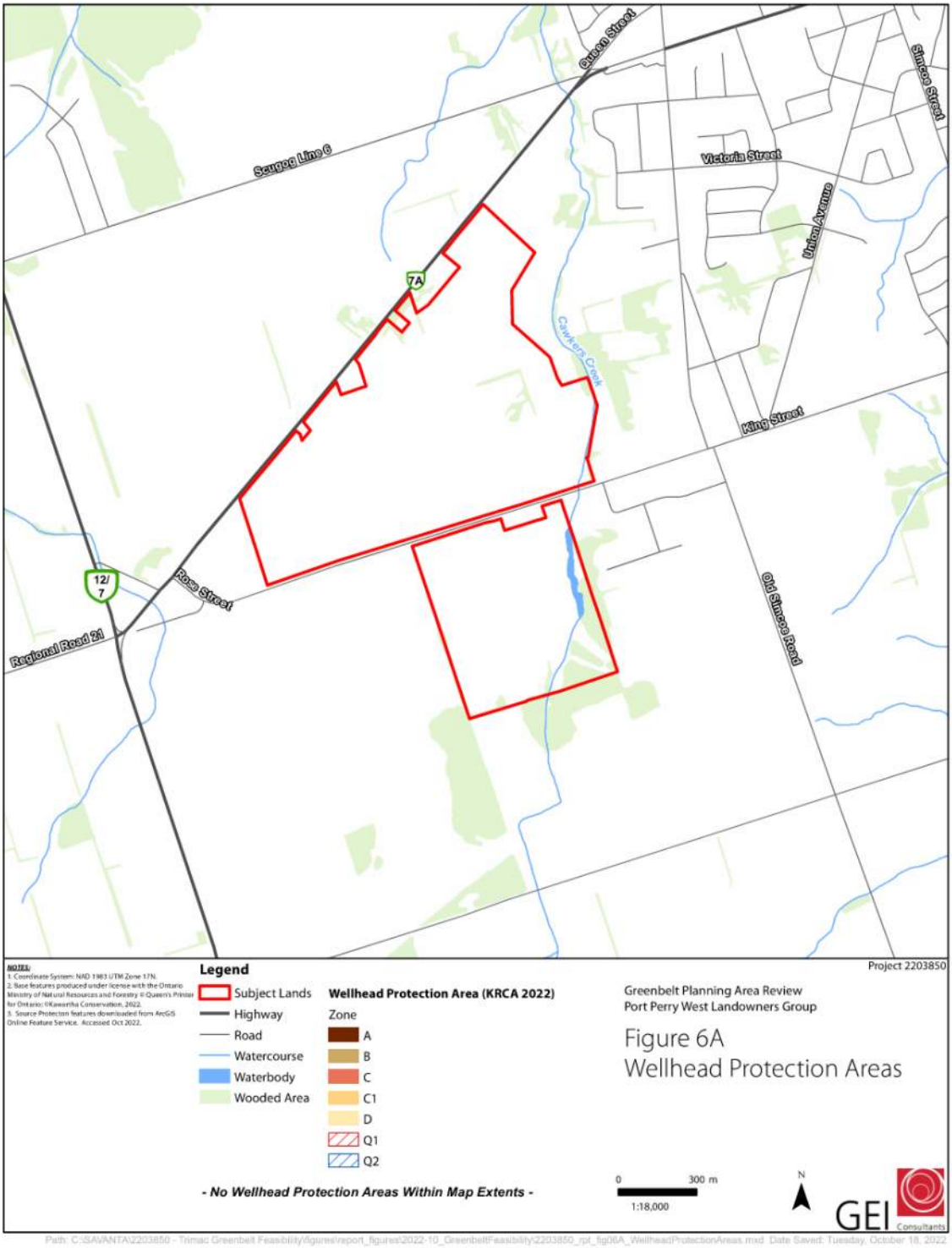


Figure 6B: Highly Vulnerable Aquifers

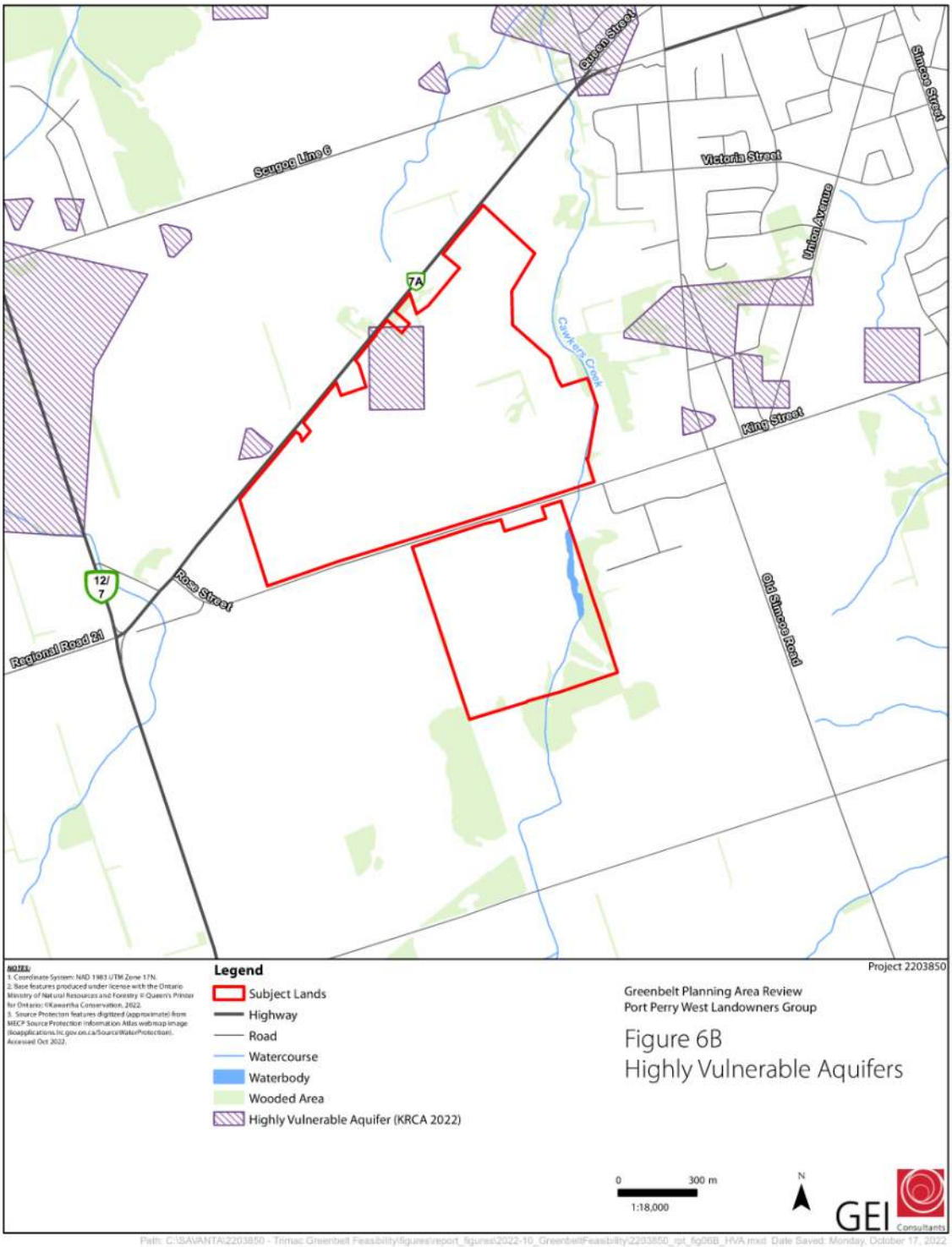
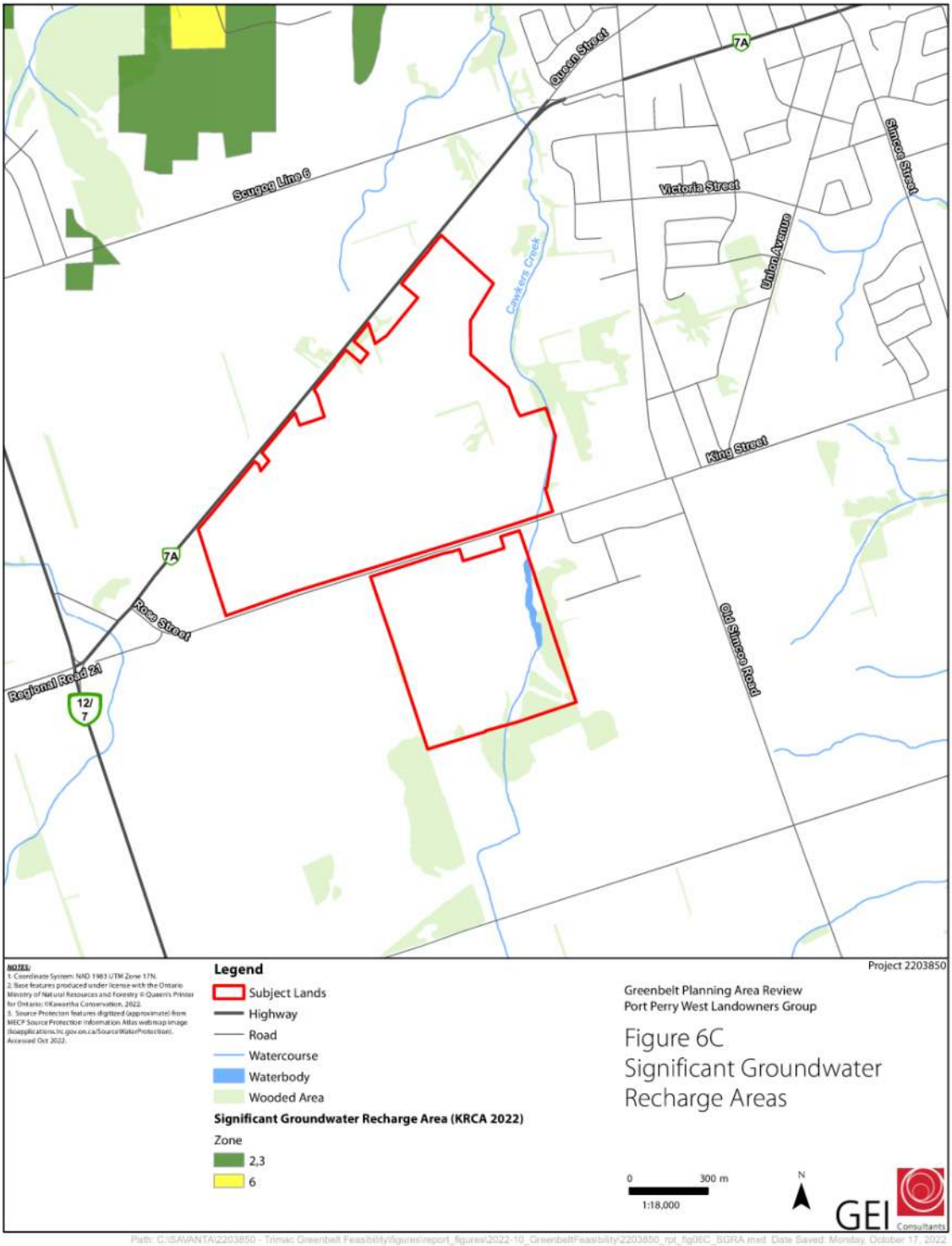


Figure 6C: Significant Groundwater Recharge Areas



4.6 Historic Aerial Photographs

Various aerial images of the Subject Lands from 1954 to 2022 were reviewed online from Google Earth. An aerial photograph dated 1954 was obtained from the University of Toronto Library. The Subject Lands have predominantly been used as a golf course and farmlands with some intermittent farmstead developments (barns, farmhouses, etc.) near the roadways. No obvious signs of infilling or other earthworks were observed, and no obvious signs of erosion along the watercourses were visible. The aerial images are appended (**Appendix D**).

4.7 MTO Boreholes

The Ontario Ministry of Transportation (**MTO**) Foundation Library online database (2012) was searched for any MTO geotechnical reports and boreholes near the Subject Lands, but the nearest borehole was located approximately 11 km southeast of the Subject Lands.

4.8 Other Nearby Boreholes

Two studies were found within or nearby the Subject Lands. A report from GHD Limited (2019) was previously conducted at 1430 King Street, Port Perry, Ontario. A total of 11 boreholes were advanced to depths ranging from 3.5 to 9.6 metres below existing grade, four of which contained groundwater monitoring wells. The boreholes encountered an upper 3-metre-thick zone of soft to very stiff clayey silt underlain by typically dense to very dense silty sand glacial till. The monitoring wells measured groundwater within the glacial till at depths of about 4 to 6 metres below grade.

A second report was conducted approximately 1 km to the east of the Subject Lands by Soil Engineers Ltd. (2017). The fieldwork consisted of five boreholes on the property of 234 Union Avenue which were advanced to depths ranging from 6.4 to 6.6 metres below the ground surface. Topsoil was found to be between 0.15 and 0.2 metres thick, underlain by a layer of very loose to very dense silty sand/sandy silt glacial till. A layer of silt and sandy silt were found underneath the layer of glacial till followed by a layer of sand. All lower depth stratigraphy was noted to be dense to very dense.

5. Hydrogeological Commentary

5.1 Regulatory Requirements

As previously discussed, the Subject Lands are not within a WHPA as shown on **Figure 6A** and there are no SGRAs beneath the site as shown on **Figure 6C**. The entirety of the Subject Lands are located within the Greenbelt. One localized area near the northern limits of the Subject Lands is underlain by a HVA as shown on **Figure 6B**.

5.1.1 Source Water Protection

The Subject Lands are within the Lake Scugog – Scugog River Watershed, within the jurisdiction of the KC. The watershed specific to the Subject Lands can be divided into the Cawkers Creek and Nonquon River subwatersheds which drain into Lake Scugog. The Subject Lands are located within the Kawartha-Haliburton Source Protection Area, under the Trent Conservation Coalition Source Protection Region.

The following documents should be referenced for source water protection at this site:

- *"Lake Scugog Environmental Management Plan"* dated May 2010, by Kawartha Conservation, Durham Region & the City of Kawartha Lakes.
- *"Trent Source Protection Plan,"* Updated February 2, 2021, by the Trent Conservation Coalition Source Protection Committee under the Clean Water Act, 2006.
- *"Approved Trent Assessment Report,"* updated February 2, 2022, by the Trent Conservation Coalition Source Protection Committee under the Clean Water Act, 2006.

The Subject Lands are classified under a moderate Tier 1 surface water stress level, and a low Tier 1 groundwater stress level. The Source Protection Plans (2021) also describe a list of significant drinking water threats for groundwater systems in the area.

5.1.2 Other Official Plans and Conservation Plans

Section 2.0 (above) provides a summary of the various other plans that must be followed as part of the development process. This includes the Greenbelt Plan, Township of Scugog OP, and Region of Durham OP. 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 on the site 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

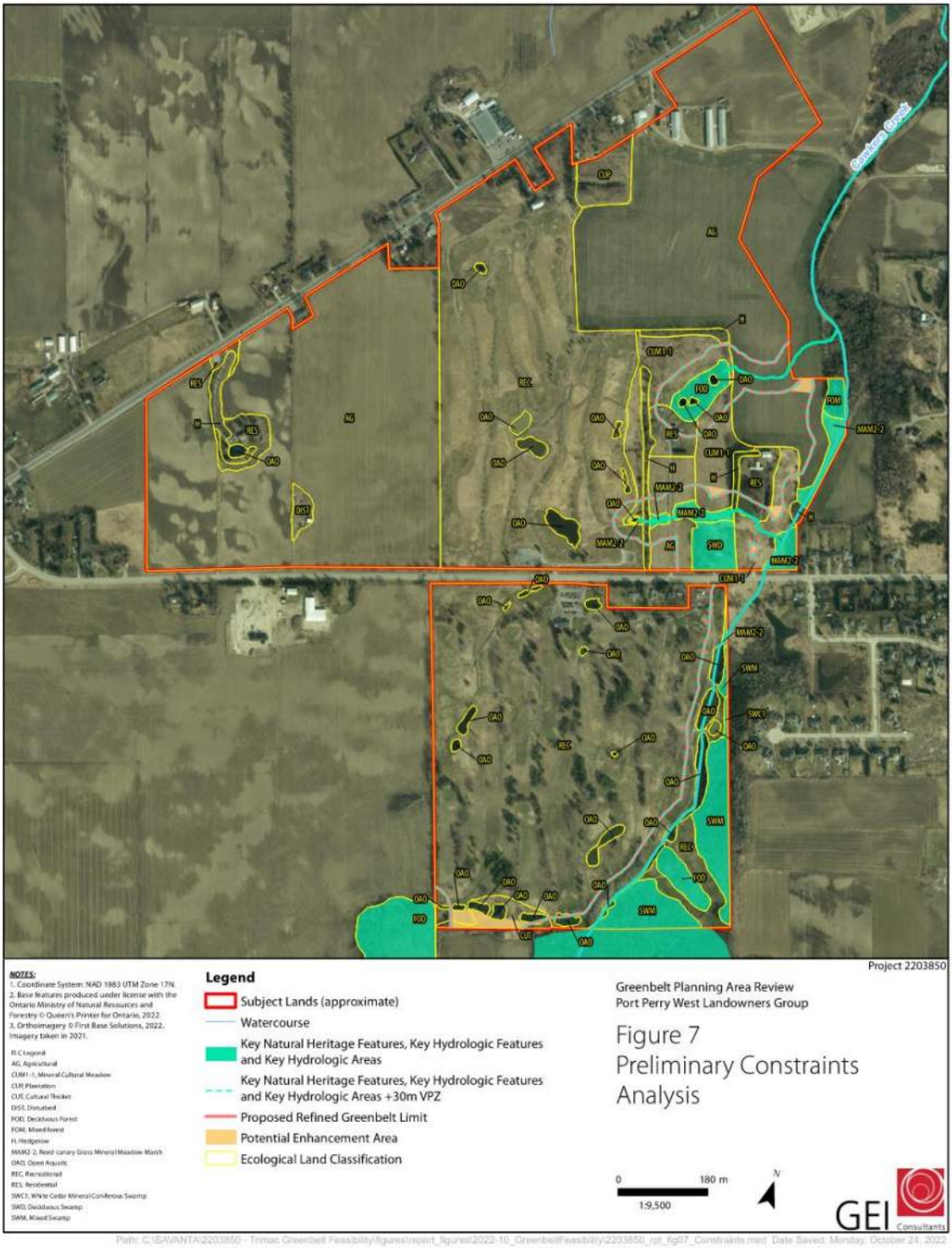
For KHFs, permanent and intermittent streams and wetland areas within the Subject Lands were identified and discussed in **Section 2**. These features were also assessed for ecological significance in **Section 3.3.**

Seepage areas and springs are a hydrogeological consideration. Based on the expected soil conditions from the desktop review (i.e., low-permeability soils like clays, glacial tills at grade), seepage areas and springs are not expected across most of the Subject Lands. At a preliminary level, potential seepage locations, if any, are expected to be confined to the watercourse and wetland areas identified on **Figure 2 and 3a.** These areas will also be considered a constraint areas where development cannot occur (see **Figure 7**). This assessment must be confirmed through further detailed investigations including visual site inspections, test pitting, boreholes, and monitoring well installations.

The following summarizes KHAs for the Subject Lands:

- No SGRAs were identified.
- One HVA is located in the northern portion of the Subject Lands, as shown on **Figure 6B**. Certain land uses that have a higher potential to contaminate the HVAs are not permitted in HVA locations. The desktop review indicates that low-permeability soil acting as an aquitard (clays, glacial till) likely overlies deeper aquifers (Oak Ridges Moraine Aquifer Units or deeper sands) used as a local water resource by domestic wells. Impacts to the confined aquifers are not expected. The surficial aquitards at grade are likely why there are no SGRAs on the Subject Lands, and why the HVA is only a small, localized area.
- Significant Surface Water Contribution Areas for the Subject Lands are not expected. The anticipated low-permeability soil conditions reduce groundwater flow rates through the soil. Depending on the near-surface groundwater levels, some minor baseflow could be expected to daylight into the watercourses, but the expected volumes are low such that they will not contribute significantly to overall flows in the watercourse or overall watershed.

Figure 7: Preliminary Constraints



5.3 Water Balance and Infiltration

One of the hydrogeological components for developing these Subject Lands is maintaining the water balance from the pre- to post-construction scenario to the greatest extent possible. 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, storm water management ponds, 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 Subject Lands that could reduce the ability to implement infiltration-based LID measures to maintain the water balance:

- Thick deposits of low-permeability soils are expected below grade, and SGRAs are not shown to exist on 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 the Subject Lands. Infiltration rates must be assessed on the Subject Lands through a detailed investigation and testing.
- Infiltration elevations must typically be kept 1 metre above the seasonal high groundwater table. Near-surface groundwater levels are currently unknown for the Subject Lands.
- Infiltration from pollution hotspots (gas stations, waste storage areas, industrial areas, etc.) is typically not permitted.

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. Cohesive, low-permeability soils are expected across most of the Subject Lands, which preclude the free flow of water into excavations. On a preliminary basis, there are fewer concerns for construction dewatering at the Subject Lands. 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.

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.

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 the glacial till or clay soils, but it is noted that deeper wet sands may be encountered below the upper aquitards. Detailed subsurface investigations are required for any potential pumping stations or deeper excavations to delineate the transition zone between the surficial aquitard and deeper sand units. High groundwater inflows should be expected where the sands 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 the confined aquifer units 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 Greenbelt Plan

A review of the presence of KNHF, KHF and KHAs in accordance with the Greenbelt Plan (2017) is provided below based on the preliminary data that was collected during the secondary source 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 secondary source review, KHAs for the Subject Lands are summarized below:

- No SGRAs were identified;
- One HVA is located in the northern portion of the Subject Lands, as shown on **Figure 6B**.
- Significant Surface Water Contribution Areas for the Subject Lands are not expected.

Based on the secondary source review and site reconnaissance, the following KHFs may be present within the Subject Lands:

- Permanent and intermittent streams;
    - One permanent stream (Cawkers Creek) and two intermittent streams were identified within the Subject Lands **(Figure 3b)**. HDFs would not meet the definition of a stream and, therefore, are not considered KHFs.
- Lakes (and their littoral zones);
    - No Lakes or their littoral zones are present within the Subject Lands.
- Seepage areas and springs; and
    - Based on the secondary source review, seepage areas and springs are not expected across most of the Subject Lands.
- Wetlands.
    - Several unevaluated wetlands and wetland vegetation communities have been identified within the Subject Lands **(Figure 3a).**

Based on the secondary source review and site reconnaissance, the following KNHFs 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 (**Table 2**, **Appendix A**)**.**
- Fish habitat;
    - Fish habitat may be present within the Subject Lands. It is likely that Cawkers Creek provides permanent, direct fish habitat, while the two intermittent features likely provide indirect fish habitat given the migratory barriers that were observed. HDFs may provide seasonal direct fish habitat, indirect fish habitat and/or no fish habitat.
- Wetlands;
    - Unevaluated wetlands and wetland vegetation communities were identified within the Subject Lands.

- Life Science ANSIs;
    - No ANSIs are present within the Subject Lands.
- Significant valleylands;
    - No significant valleylands are present within the Subject Lands.
- Significant woodlands;
    - Significant woodlands may be present within the Subject Lands.
- SWH (including habitat of special concern species);
    - Several candidate SWH types were identified within the Subject Lands. All SWH types were associated with the forested, wetland, cultural meadow communities as well as the nesting and roosting boxes within the golf course.
- 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 KNHF and KHF were identified as potentially present within the Subject Lands. The location of these candidate KNHF, KHF and KHAs are illustrated on **Figure 7**, except for candidate habitat for endangered and threatened species and candidate SWH. The rationale for not including these areas on **Figure 7** is as follows:

- Impacts associated with these habitats as a result of the proposed development can be addressed through numerous tools, including provincial legislation (e.g., through the provincial registration process or Overall Benefit Permit process under the *ESA 2007*) or through the enactment of mitigative and restorative measures (e.g., removal of habitat outside of species critical timing windows or creation of new habitat in a new location on the Subject Lands).
- The test of no negative impacts must be met if development and/or alteration is proposed within or immediately adjacent to SWH in accordance with Section 2.1.5 of the PPS (2020). No negative impacts on various types of SWH can typically be achieved through either avoidance, mitigation and/or restoration measures.
- As discussed within Section 2.1.7 of the PPS (2020), development and site alteration are only permitted within habitat for endangered and threatened species in accordance with provincial and federal requirements; otherwise, no development or alteration is permitted. Registrations and/or permits under the *ESA* (2007) could be obtained in order to permit alteration within these habitats.

It is recognized that these habitats would qualify as KNHFs under the Greenbelt Plan; however, given that there are provincially supported avenues to ensure that the functions of these features are maintained on the landscape, these habitats don't need to be maintained in their exact location.

A policy review of the required setbacks for each KNHF, KHF and KHA was undertaken to understand the minimum vegetated setbacks (or vegetation protection zones; VPZs). In accordance with Section 3.2.5 of the Greenbelt Plan (2017), development and site alteration are not permitted within KNHF and KHFs and their associated VPZs within the Greenbelt Plan area. The prescribed VPZ for these features is a minimum of 30 m, measured from the outside boundary of the KNHF and KHF.

The KC's Plan Review and Regulation Policies document (2013a) recommends the following VPZs from the candidate KNHFs and KHFs identified within the Subject Lands:

- 30 m from fish habitat is typically required; however, 15 m for warmwater systems and 20 m for coolwater systems may be accepted if it can be demonstrated that no negative impacts will occur to fish and fish habitat;

- 30 m from non-provincially significant wetlands that are less than 2 ha in size or 120 m from wetlands greater than 2 ha in size or are provincially significant unless it has been determined through an EIS that a smaller buffer is warranted;
- Other VPZs associated with natural hazards (e.g., flooding hazard, meander belt) allowances are 15 m.

The Durham Region OP reinforces the VPZs outlined within the Greenbelt Plan.

Regardless of the policies applied to the candidate features within the Subject Lands, provincial and local policies generally dictate that a minimum of a 30 m VPZ is required from the boundary of all KNHF and KHFs. 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 shown on **Figure 7**. No minimum VPZ are required for KHAs, but developments or land uses that pose a high risk to groundwater per Schedule E – Table E5 of the Durham Regional OP are restricted or prohibited within the small HVA in the northern portion of the Subject Lands.

8. Proposed Refinements

Several local refinements to the Greenbelt Plan area boundaries are recommended within the Subject Lands to better reflect the existing conditions. These refinements have been informed by the secondary source review and site reconnaissance that is presented within the sections above. These limits should be confirmed and further refined following detailed site investigations and feature staking exercises.

Figure 7 illustrates a 30 m VPZ around all candidate KNHF and KHFs, as required by the provincial and local planning documents (as discussed above within **Section 7**).

Currently the entirety of the Subject Lands is designated as Protected Countryside under the Greenbelt. The below refinements to this land-use designation are recommended to protect and enhance the existing KNHFs and KHFs. It is recognized that Protected Countryside also includes Prime Agricultural Areas. The proposed loss in agricultural lands should be evaluated by a qualified professional.

Proposed refinements to the Greenbelt Protected Countryside Areas include:

- All candidate KNHF and KHF will be retained in place and further enhanced through the establishment of a 30 m VPZ within existing agricultural and golf course lands. This will follow the minimum VPZs recommended under the Greenbelt Plan and will ensure the protection of ecosystem form and function in-place; and
- The exclusion of actively managed agricultural fields, manicured golf courses, hedgerows, residential areas, and small CUM vegetation communities is warranted given that they are assumed to provide limited ecological function and are not afforded protection under provincial or local planning guidelines.

In addition, several enhancement areas have been identified outside of the Greenbelt Planning Areas based on their existing functions within the landscape. The intent of the enhancement areas is to provide opportunities to connect existing KNHFs and KHFs where existing connections may not be present and/or to strengthen connections where they may be limited. These opportunities will be explored following detailed investigations. These enhancement areas may support infrastructure such as roadways, Storm Water Management facilities, recreational trails, or native vegetative plantings. These enhancements would strengthen and create a more resilient and connected system. Potential enhancement areas are shown on **Figure 7**. The bulk of the natural heritage features are located along the southern and eastern Subject Land boundaries. These KNHFs and KHFs appear to be associated with the Cawkers Creek corridor. The protection of these features will ensure that this wildlife corridor is maintained on the landscape while preserving the existing functions through the establishment of VPZs. Other areas within the Subject Lands are highly altered and have limited ecological value to the overall Natural Heritage System. Impacts associated with development adjacent to these KNHFs and KHFs should be assessed following detailed investigations to ensure that no negative impacts can be achieved.

9. Geotechnical Engineering Commentary

The commentary provided below is based on the secondary source 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 above within **Section 4**. Overall, cohesive deposits of clays, clayey silts or glacial tills are expected to be encountered across the site. It is common to encounter thicker topsoil layers in farm fields (on the order of 0.5 to 1 metre could be encountered), and the upper 1 to 2 metres of in-situ soil is often disturbed from farming activities or weathered from frost penetration. Some zones of earth fill may be encountered across the golf course. Otherwise, the soils expected beneath the site are generally considered favourable for low-rise land development, as discussed below.

9.1 Site Grading

The Subject Lands have a gradually sloping topography so a cut and fill balance may be considered for the site grading strategy. The topsoil layer and any vegetation, existing pavements or other structures 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 Lands, 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.

Existing boreholes from the Subject Lands indicate that some zones of softer clays could be encountered near grade. Additional analysis and investigations are required to verify that grade raises will not induce longer-term consolidation settlements within potential upper soft clay deposits.

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

We expect 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 buildings. The potential for longer-term consolidation settlement of softer clays near grade must be investigated and considered during future geotechnical investigations on the Subject Lands. Where higher bearing capacities are needed for larger commercial or industrial buildings, other foundation options such as shallow drilled piers, helical piles, or raft slabs may need to be considered if softer clays are encountered. Where glacial till deposits are encountered at grade, there is a lower potential for long-term consolidation settlement and a higher potential for improved bearing capacities.

Conventional spread and strip footing foundations can also be made on engineered fill where grades are raised beneath building locations. Floating engineered fill pads may be feasible to help improve bearing capacities for commercial or industrial buildings, but the potential for settlement of any underlying soft clay deposits must be checked.

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.

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 Township of Scugog 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 and Groundwater Control

Where workers must enter a trench or excavation the soil must be suitably sloped and/or braced in accordance with the Occupational Health and Safety Act. These regulations designate four broad classifications of soils to stipulate appropriate measures for excavation safety. If glacial till or clay deposits 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.

Lower-permeability soils are expected at grade which typically preclude the free flow of water into excavations. This can significantly reduce groundwater taking rates and potential complications during construction dewatering. More details for groundwater control are discussed in **Section 5.4**.

9.6 Erosion and Slope Stability Hazards

The watercourses are Regulated Areas by the KC and are, therefore, subject to policies related to slope instability and erosion hazards. Where the watercourse consists of a confined 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 erosion hazard limit and development setbacks are calculated by meander belt analysis, carried out by a fluvial geomorphologist. It appears that the watercourses on the Subject Lands are unconfined systems without apparent valley land, therefore meander belt analysis may be required to define the erosion hazard limit for the Subject Lands.

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 2005, 2009, 2012, 2013, 2016, 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 1** below.

Table 1: Aerial Photograph Observations

Aerial Photograph Year	Observations
1954	a. The Subject Lands appears to be developed for agricultural use with one (1) residential dwelling developed at the eastern portion of the Subject Lands, north of King Street.
2005	a. The Subject Lands appear to be developed with two (2) residential dwellings at the eastern portion of the Subject Lands, north of King Street, and one (1) residential dwelling at the northwestern portion of the Subject Lands, south of Highway 7A. Five (5) agricultural buildings appear developed at the northern portion of the Subject Lands, south of Highway 7A. b. The central portion of the Subject Lands between King Street and Highway 7A appear to be undergoing development of a golf course. c. The southern portion of the Subject Lands south of King Street appear to have been developed with a golf course. d. Multiple residential dwellings appear to have been developed east of the Subject Lands.
2009	a. The Subject Lands remain unchanged since the 2005 aerial photograph. b. Additional residential dwellings appear to have been developed east of the Subject Lands.
2012	a. The Subject Lands remain unchanged since the 2009 aerial photograph. b. The property located at 1535 Highway 7A, approximately 30 m north of the Subject Lands appears developed and undergoing additional development of multiple commercial buildings.

Aerial Photograph Year	Observations
2013	a. The Subject Lands remain unchanged since the 2009 aerial photograph. b. The surrounding area remains unchanged since the 2012 aerial photograph.
2016	a. The Subject Lands and surrounding area remain unchanged since the 2012 aerial photograph.
2021	a. The Subject Lands and surrounding area remain unchanged since the 2012 aerial photograph.
2022	a. The Subject Lands remain unchanged since the 2012 aerial photograph. b. The property north adjacent to the Subject Lands appears to be undergoing development.

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, with the course south of King Street appearing to have been developed between 1954 and 2005, and the course north of King Street appearing to have been developed in 2005. The Subject Lands are associated with PCA#40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications.
- Multiple residential dwellings appeared to have been developed at the eastern, 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, municipal water distribution and treatment facilities currently servicing the Port Perry Community (within the Township of Scugog) and identify potential opportunities for extending such municipal services to the Subject Lands.

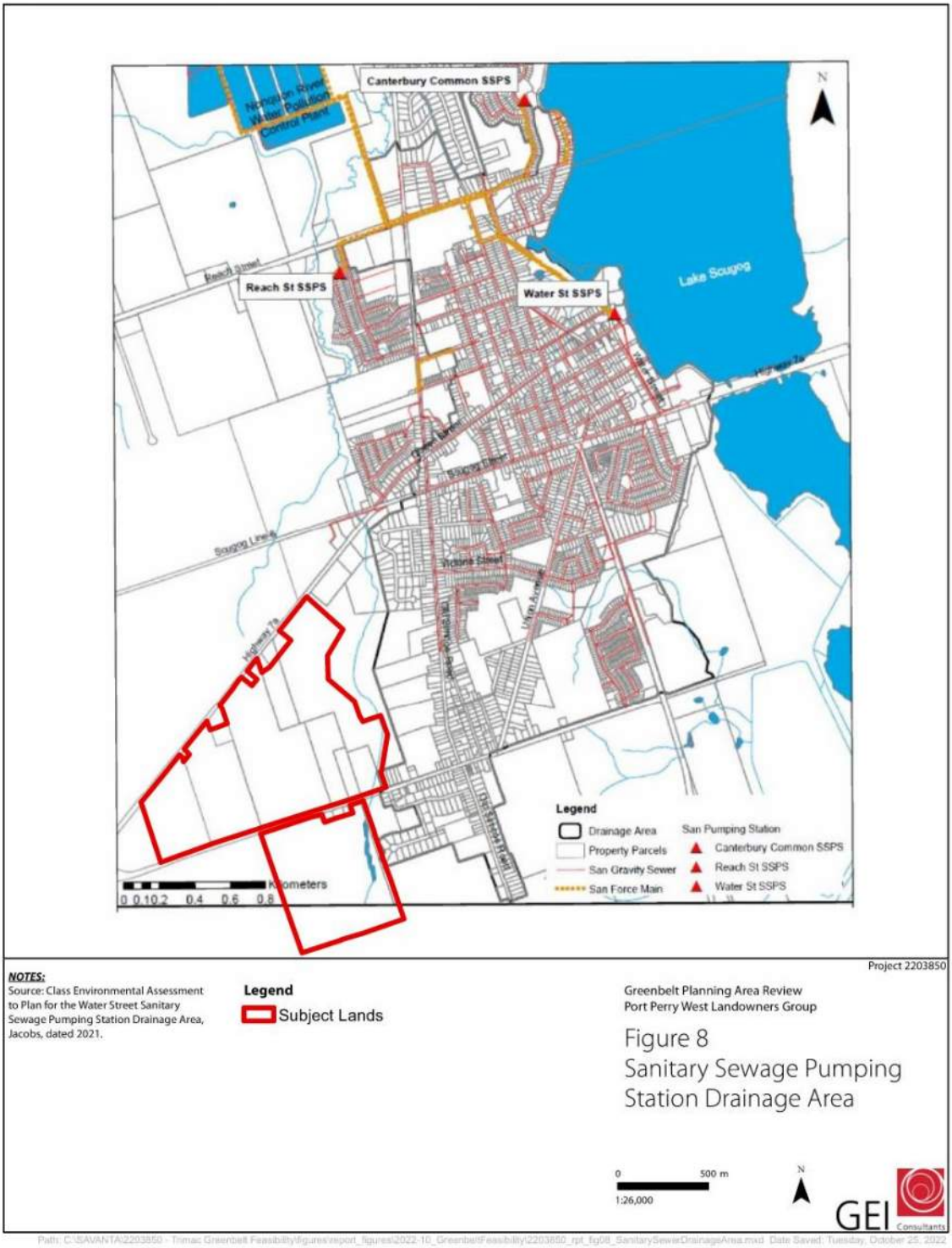
In addition, this overview will identify planned improvements to existing infrastructure and/or new infrastructure that may assist with providing municipal servicing to the Subject Lands. The governing authority in terms of sanitary sewage conveyance and water supply is the Regional Municipality of Durham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

It is envisioned that intended land use densities for 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

The Community of Port Perry is serviced by a network of municipal sanitary sewers and three sanitary sewage pumping stations (**SSPS**). These include the Water Street SSPS, Reach Street SSPS and Canterbury Common SSPS, which all direct sewage via pump and forcemain to the Nonquon River Water Pollution Control Plant (**WPCP**). The WPCP is located at the northern limit of the Community, at the southwest quadrant of Scugog Line 8 and Old Simcoe Road. This infrastructure is illustrated on **Figure 8**.

Figure 8: Sanitary Sewage Pumping Station Drainage Area



Nonquon River Water Pollution Control Plant

In 2017, the Regional Municipality of Durham upgraded the WPCP at a total cost of $30,000,000. This upgrade increased the rated capacity of the plant from 3,870 m^3/day to 5,900 m^3/day to support the long-term plan of servicing the Port Perry urban area. Based on the WPCP's Annual Performance Report (Regional Municipality of Durham 2021), the plant is operating at 50% of its rated capacity, with a service population of 8,792 residents.

Opportunity: The plant appears to exhibit considerable excess capacity to service additional residential development.

Sanitary Sewage Pumping Stations

The existing Water Street SSPS services approximately 75% of the Port Perry Community (service population of 6,642 persons in 2017) and is located in the downtown core, near the shores of Lake Scugog. Durham Region has identified this pumping station to be operating at capacity and has completed a Class Environmental Assessment (Jacobs 2021) to upgrade the station in two stages. At full build out, the Water Street SSPS is expected to service a population of 13,000 people, which includes an allowance of converting approximately 1,000 residents currently on private septic systems to municipal sewers.

Opportunity: At full build out, the Water Street SSPS appears to exhibit excess capacity to service additional residential development, however this would require connecting new sanitary sewers from the Subject Lands to existing sewers at the intersection of Scugog Street and Old Simcoe Road which then convey sewage via existing sewers through the core of the Community. Based on a review of topography, we expect the existing sanitary sewers at the noted intersection would not be sufficiently deep to accept a gravity connection, therefore the Subject Lands would require a new sewage pumping station and forcemain to connect to existing gravity sewers at Scugog Street and Old Simcoe Road. Capacity analysis would be required to demonstrate that existing gravity sewers downstream of this intersection have the capacity to accept additional flow. It is expected that significant upgrades to existing downstream sanitary sewers would be required to facilitate such a connection. If this sanitary routing option is deemed feasible, consideration should be given to oversizing the Water Street SSPS at full build out to accommodate all flows from the Subject lands.

The remaining two existing sanitary sewage pumping stations (Reach Street SSPS and Canterbury Common SSPS) are considerably smaller stations and directing new sewage flows to such facilities does not appear to be feasible.

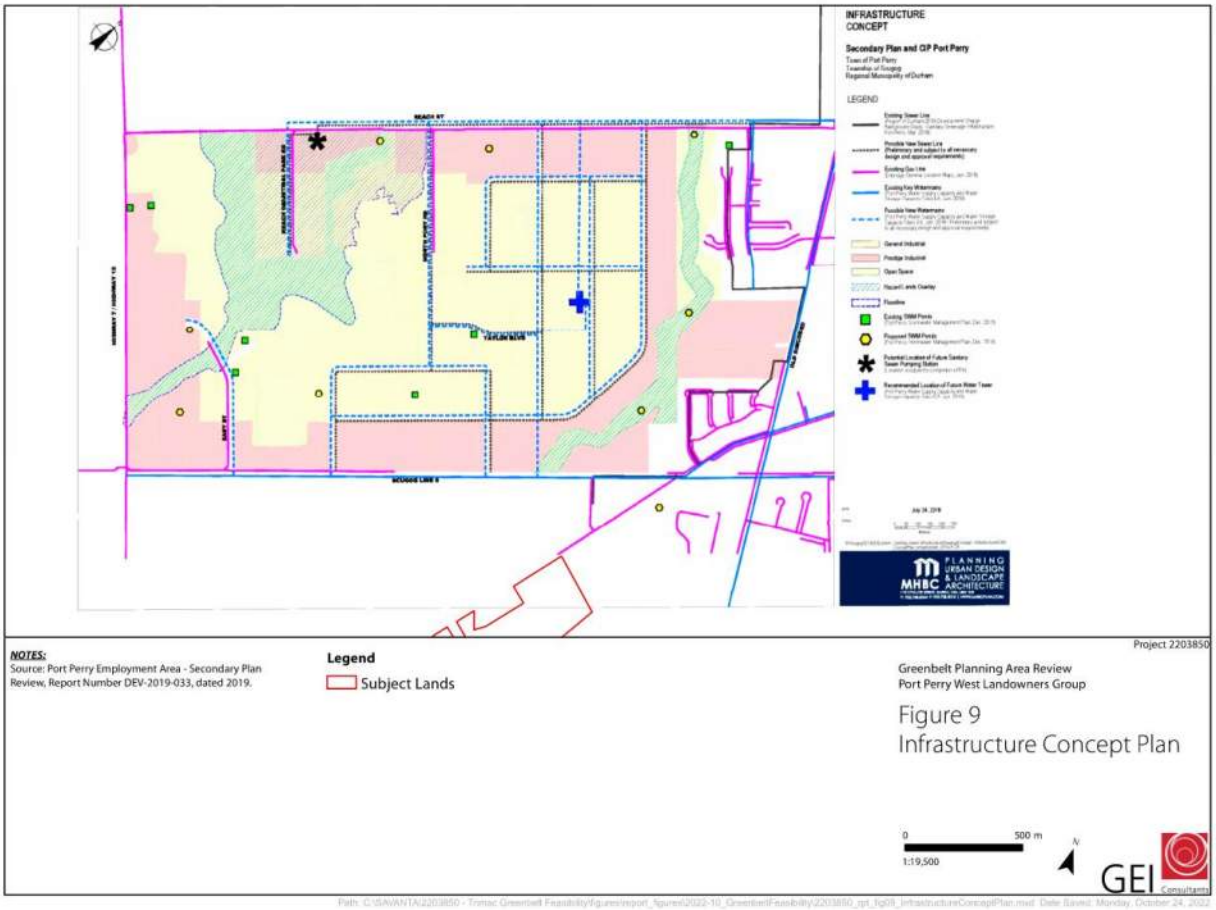
Port Perry Future Employment Area:

A future employment area within the current urban boundary is envisioned by the Township of Scugog at the western limits of Port Perry Community. The Region of Durham has undertaken studies to identify infrastructure requirements to service the employment area and based on the Region's report (2020), the following future infrastructure is included in the Development Charges Study:

- A new sanitary sewage pumping station located at the southeast corner of Reach Street and North Port Road.
- A new forcemain along Reach Street, from the new pumping station to the Nonquon River WPCP.

<u>Opportunity:</u> Based on the close proximity of the Subject Lands to the Future Employment Area, the Subject Lands should consider directing sanitary sewage towards the future sanitary sewage pumping station to be constructed at Reach Street/North Port Road and ensure the new infrastructure is oversized to accommodate the additional flow. From a topographic perspective, the Subject Lands are approximately 20m higher in elevation than the new sanitary sewage pumping station which could allow all gravity drainage from the Subject Lands to the station via new trunk sanitary sewers routed through the employment lands. Refer to ***Figure 9****.*

Figure 9: Sanitary Sewage Pumping Station Drainage Area



11.2 Water Servicing

The Community of Port Perry is serviced by three municipal water wells (one primary well and two secondary wells), specifically Well No. 6 (primary) and Wells No. 3 & 5 (secondary), all located along Simcoe Road approximately 3km south of the Community. The total capacity of the three wells is 11,781 m^3/day. Existing key watermains near the Subject Lands are located along Old Simcoe Road and along Scugog Line 6, from the Community, westerly to Highway 7.

While existing water usage rates for Port Perry were not found in the Region's online records, we compared the daily average sewage generation rate of 3,000 m^3/day (service population of 8,792 residents) based on Port Perry Drinking Water System 2021 Annual Report (The Regional Municipality of Durham, 2021) and calculated an average water demand by existing residents of approximately 340 L/person/day, which is within the typical range of resident water usage. Actual water usage rates are likely higher than measured inflow to the WPCP to account for residents on private septic systems that may be connected to municipal water supply.

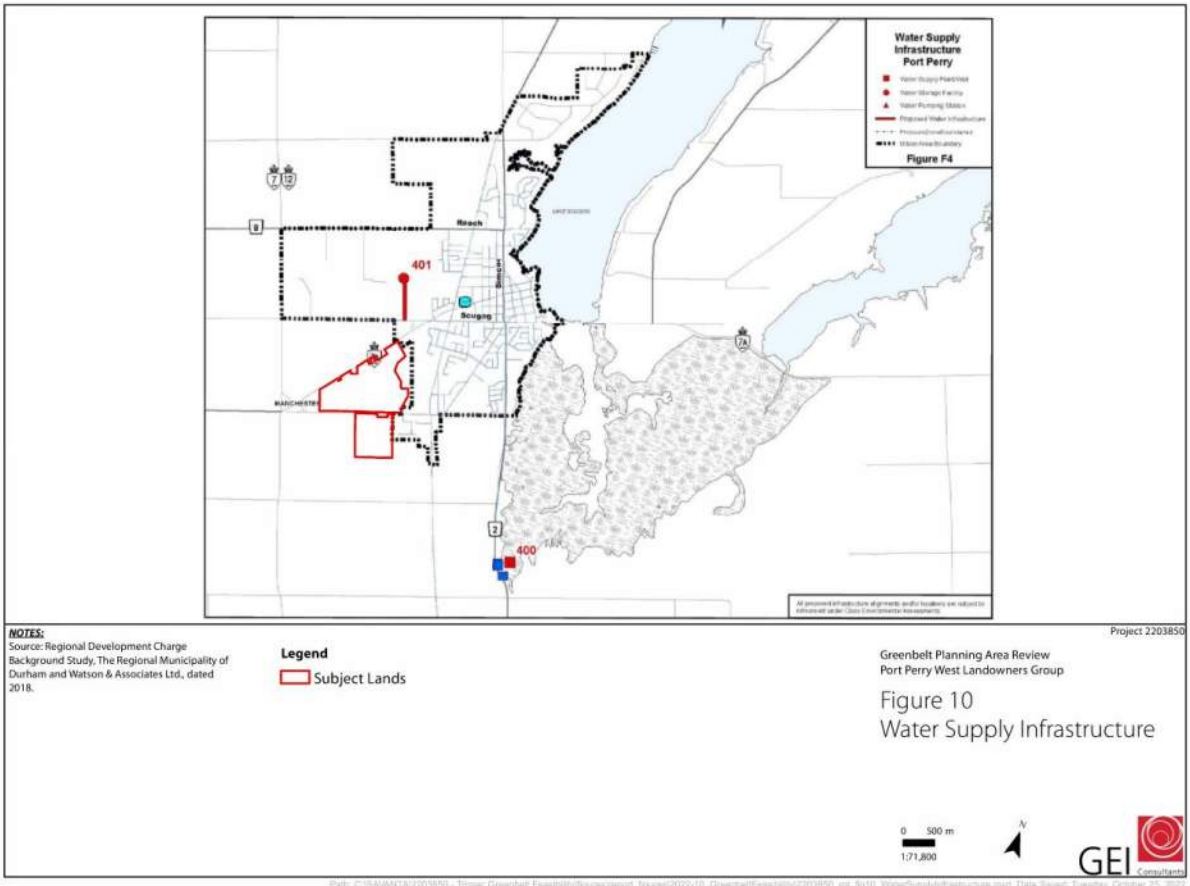
Securing of additional water supply has been studied by Durham Region over the previous decade to improve water aesthetic characteristics (taste, odour and colour) and plan for new development within the Port Perry urban area.

Based on the Regional Development Charge Background Study (2018), the following future infrastructure has been identified for construction (**Figure 10**):

- New Water Supply Source/Treatment Plant, located near the existing municipal water supply wells on Simcoe Road.
- Additional Water Storage Facility (2.8 ML), located within the future employment area lands.

<u>Opportunity:</u> Based on the measured sewage inflow rates at the WPCP, it appears that Port Perry's municipal water supply is operating below capacity and the Region is investing in additional water supply/storage to support growth. Based on the close proximity of the Subject Lands to the future employment area, new water connections should be considered for the Subject Lands extended: a) easterly along Highway 7A to Scugog Line 6, b) extended northerly to loop through the future employment area and c) extended easterly along King Street to the village of Prince Albert. The proposed 2.8 ML Water Storage Facility should be oversized to accommodate new development in the Subject Lands, or new water storage may be required within the Subject Lands if pressure district boundaries dictate.

Figure 10: Water Supply Infrastructure



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.

Stormwater management ponds will be located at the topographic low points, generally close to existing outlets/watercourses. Ponds shall be placed outside of KNHFs, flood limits and their associated buffers. Generally for planning purposes, it would be reasonable to reserve approximately 8% of the proposed development land area towards a stormwater management pond, per contributing drainage area. Based on an estimated gross land are of 119.50 ha, a total of 9.5 ha should be initially dedicated towards stormwater management. Actual pond area and footprint requirements will be refined during the engineering design stage.

Approximately 85% of the Subject Lands are situated within the Cawkers Creek subwatershed, while the remaining 15% of the Lands (western corner of site) are situated within the Nonquon River subwatershed, all draining towards Lake Scugog. 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 subwatershed (i.e., no diversion of stormwater from one subwatershed to another).

King Street effectively divides the Subject Lands into two post-development drainage areas. Each area, north and south of King Street shall require separate stormwater management ponds.

Area North of King Street

The majority of the Subject Lands north of King Street drains from west to east towards Cawkers Creek from a high elevation of 287m to a low elevation of 273m. The remaining western corner of the Subject Lands, north of King Street, drain from east to west towards Nonquon River. Separate stormwater management ponds will be required within each of the two subwatersheds.

For the drainage area within the Nonquon River subwatershed, a new stormwater management facility should be located near the topographic low point adjacent to Highway 7A. For the drainage area discharging to Cawkers Creek, new stormwater management ponds should be generally located along the western limits of Cawkers Creek, as shown in the concept plan. To gain efficiencies in pond performance and to limit new outfalls to the Creek, future stormwater management strategies should attempt to minimize the number of new ponds and consolidate contributing drainage areas, wherever possible.

Area South of King Street

The area of Subject Lands south of King Street is approximately one third of the overall gross land area and topography generally slopes from west to east towards Cawkers Creek from a

high elevation of 283 m to a low elevation of 274 m. Stormwater management pond(s) for the lands south of King Street shall be generally located along the western limits of Cawkers Creek and sited to respect existing environmental features.

12. Conclusions

This Greenbelt Planning Area review was completed for the Subject Lands to inform whether any refinements may be warranted given the existing conditions within the Subject Lands. These refinements were recommended based on secondary source 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.

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

- A small HVA in the northern portion of the Subject Lands;
- Permanent and intermittent streams;
- Wetlands (unevaluated);
- Habitat for Endangered and Threatened species;
- Fish habitat;
- Significant woodlands; and
- SWH.

It is our opinion, based on the analysis outlined in this letter, that refinements to the Greenbelt Plan area boundary on the Subject Lands may be considered based on the existing footprint of candidate KNHFs and KHFs. The refinements are generally limited to existing managed areas (e.g., agricultural, golf course, residential) and a few smaller cultural meadow communities that are not known to meet any of the criteria to qualify as KNHFs or KHFs. Additional ecological restoration and enhancement areas are proposed to strengthen and enhance existing features outside of the Greenbelt Planning Area. 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 and wetland features. These investigations would be undertaken in spring, summer and fall 2023. The proposed refinements to the Greenbelt Protected Countryside areas are associated with natural features; impacts associated with the potential loss of agricultural lands were not considered as part of this review.

The commentary for geotechnical, hydrogeological, and geoenvironmental conditions was based on the secondary source 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.

In terms of municipal servicing, the Regional Municipality of Durham is responsible for providing sanitary sewage conveyance, treatment and water distribution to the Port Perry Community. Based on a review of Region of Durham background reports, it appears the existing Regional servicing infrastructure such as the Water Pollution Control Plant and Water

Supply Wells exhibit spare capacity for future development. In addition, the Region of Durham has several sanitary and water servicing improvement projects planned within their Development Charges Study to support growth within the Port Perry Community.

Based on secondary planning completed by the Township and Region to advance servicing for the Future Employment Area located to the north of the Subject Lands, it appears that new major infrastructure is planned within the Employment Area, such as a new sanitary pumping station, new forcemain connected to the Water Pollution Control Plant and new water storage tower/reservoir. The preferred approach to providing sanitary and municipal water to the Subject Lands would be to extend servicing connections through the Future Employment Area and initiate discussions with the municipalities to oversize such major infrastructure to be constructed within the employment lands to accommodate the Subject Lands.

Stormwater management for the Subject Lands will be accomplished through the use of traditional open air stormwater retention ponds for water quantity and quality treatment. The majority of the Subject Lands are located within Cawkers Creek subwatershed while the western corner of the Lands is located within the Nonquon River subwatershed, all draining towards Lake Scugog. Multiple stormwater management ponds shall be required at topographic low points, located adjacent to existing natural heritage features to control post-development runoff.

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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 – suitable vegetation communities are not present within the Subject Lands.	N/A	No	No – SWH type is not present
Shorebird Migratory Stopover Areas	Yes – MAM vegetation communities are 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.	No – The forested communities in and adjacent to the Subject Lands do not meet the minimum combined site criteria (>20 ha).	No	No – SWH type is not present
Bat Hibernacula	No – Caves and crevices are absent from the Subject Lands.	N/A	No	No – SWH type is not present
Bat Maternity Colonies	Yes – Forested (FOD) and swamp (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

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?
Turtle Wintering Areas	Yes –OAO/Ponds are present within the Subject Lands. Isolated Ponds associated with the golf course are considered man-made ponds do not qualify as SWH for this specific SWH type. However, the pools/ponds online with Cawker's Creek will be 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.	No – No anthropogenic or natural features provide any subsurface access below the frost line to provide suitable habitat.	No	No – SWH type is not present
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)	No – SWD and SWM vegetation communities are not present within the Subject Lands.	No nests were observed within the Subject Lands, though they be present within the swamp communities adjacent to the Subject Lands. As well, NHIC reports both a mixed Colonial Waterbird Nesting Area and a Mixed Wader	Yes	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?
		Nesting Colony within the NHIC grids that overlap the Subject Lands. Therefore, this SWH type may be present within these communities.		
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
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	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?
	wintering areas on or adjacent to the Subject Lands.			
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
2b. Specialized Wildlife Habitat				
Waterfowl Nesting Area	Yes – MAM and SWD vegetation communities are present within the Subject Lands.	No – Upland areas are heavily disturbed from existing land-uses practices (golf course, agricultural).	No	No – SWH type is not present
Bald Eagle and Osprey Habitats	Yes – FO and SW ecosites are present within the Subject Lands.	No - Large aquatic features are absent from the Subject Lands.	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?
Woodland Raptor Nesting Habitat	Yes – FO, CUP and SW ecosites are present within the Subject Lands.	No – Woodlands are small and generally fragmented from one another. The minimum woodland size (>30 ha) and interior habitat size (>4 ha that is greater than 200 m from woodland edge) is not achieved.	No	No – SWH type is not 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
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.	No – Woodlands are small and generally fragmented from one another. The required woodland size	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?
		(>30 ha) and presence of interior habitat is not achieved.		
3. SPECIES OF CONSERVATION CONCERN				
Marsh Bird Breeding Habitat	Yes – MAM ecosites are present within and adjacent to 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
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 – CUW and 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 ecosites are present within the Subject Lands.	Additional studies will be required to confirm if habitat conditions are met.	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 2.1)				
(i) Black Tern - SC	N/A	No – Shallow marshes capable of supporting floating nest colonies are not present within the	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?
		Subject Lands.		
(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
(iii) Common Nighthawk - SC	N/A	No – preferred habitat types of the species (i.e., logged or burned-over areas, forest clearings, rock barrens, peat bogs, lakeshores, and mine tailing) are not present within the Subject Lands	No	No – SWH type is not present
(iv) 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

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?
(v) Golden-winged Warbler - SC	N/A	No – While field edges, a preferred habitat type of the species, are present within the Subject Lands; the Subject Lands are not located within the known occurrence range of the species (MECP 2021).	No	No – SWH type is not present
(vi) Grasshopper Sparrow -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 – Breeding bird surveys are recommended.	Yes – SWH type may be present
(vii) Purple Martin – S3B	N/A	Possibly – This species almost exclusively nests in artificial roosting boxes. Nesting boxes were present within the golf course during the site reconnaissance.	Yes – Breeding bird surveys are recommended.	Yes – SWH type may be present
(viii) Ruddy Duck -S3B	N/A	No – the species migrates though Southern Ontario but does not breed within the Southern Ontario. Therefore, the Subject	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?
		Lands would not provide nesting habitat for the species.		
(ix) Wilson's Phalarope – S2B	N/A	Possibly – this species nests in wetlands, upland shrubby areas, marshes, and roadside ditches. Potentially suitable habitats are within the Subject Lands. Site is within vicinity of two well-known staging areas (Nonquon Sewage Lagoons and Lake Scugog). Additional studies will be required to confirm if habitat conditions are met.	Yes – Breeding bird surveys are recommended.	Yes – SWH type may be present
(x) 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
(xi) Hermit Sphinx Moth – S3	N/A	Possibly – this species utilizes moist meadows and fields. It's host plants include those from the mint	Yes – observation of Hermit Sphinx Moth or their associated host plants should be	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?
		family (*Lamiaceae*),Bee-balms (*Monarda sp.*), Mints (*Mentha sp.*) and Sage (*Salvia Sp.*). Additional studies will be required to confirm if habitat conditions are met.	recorded.	
(xii) Monarch - SC	N/A	Possibly – Cultural meadow ecosites are present within the Subject Lands; however, they are located adjacent to agricultural lands and are likely disturbed. Additional studies will be required to confirm if habitat conditions are met.	Yes – observation of Monarch or their foodplants should be recorded.	Yes – SWH type may be present
(xiii) Snapping Turtle	N/A	Possibly – Anthropogenic ponds and online ponds along Cawkers Creek 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
4. ANIMAL MOVEMENT CORRIDORS				

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?
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)	Transition Species (06-30-2013)	Newly-listed Species (01-24-2013)	Habitat Protection Type	Most recent occurrence	Source	Ontario Range and Occurrences	Description of Suitable Habitat in Ontario	Habitat Suitability Assessment of Study Area
REPTILES												
Blanding's Turtle	*Emydoidea blandingii*	THR	S3	THR	x		General Habitat Protection July 2, 2013			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.
BIRDS												
Bank Swallow	*Riparia riparia*	THR	S4B	THR			General Habitat Description July 2, 2013			Found across southern Ontario, with sparcer populations scattered across northern Ontario. The largest populations are found along the Lake Erie and Lake Ontario shorelines, and the Saugeen River (MECP 2022)	Bank swallows nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. Many nests are on banks of rivers and lakes, but they are also found in active sand and gravel pits or former ones where the banks remain suitable (MECP 2022)	**No** - potentially suitable river bank habitats are not present within the Subject Lands.
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, sheds) are present within the Subject Lands.
Bobolink	*Dolichonyx oryzivorus*	THR	S4B	THR			General Habitat Description July 2, 2013			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).	**Yes** - potentially suitable grasslands may present within the Subject Lands.
Chimney Swift	*Chaetura pelagica*	THR	S4B,S4N	THR			General Habitat Description July 2, 2013			In Ontario, the species is most widely distributed in the Carolinian zone in the south and southwest of the province, but has been detected throughout most of the province south of the 49th parallel (MECP 2022).	They are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures. They also tend to stay close to water as this is where the flying insects they eat congregate (MECP 2022).	**Yes** - potentially suitable anthropogenic structures which may contain chimneys are present within the Subject Lands.

Species Common Name	Species Scientific Name	Provincial Status (ESA)	S-Rank	Federal Status (SARA Sched. 1)	Transition Species (06-30-2013)	Newly-listed Species (01-24-2013)	Habitat Protection Type	Most recent occurrence	Source	Ontario Range and Occurrences	Description of Suitable Habitat in Ontario	Habitat Suitability Assessment of Study Area
Eastern Meadowlark	*Sturnella magna*	THR	S4B	THR			General Habitat Description July 2, 2013			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).	**Yes** - potentially suitable grasslands may present within the Subject Lands.
Eastern Whip-poor-will	*Caprimulgus vociferus*	THR	S4B	THR						In Ontario they breed as far north as the shore of Lake Superior. Although Eastern Whip-poor-wills were once widespread throughout the central Great Lakes region of Ontario, their distribution in this area is now fragmented (MECP 2022).	The Eastern Whip-poor-will is usually found in areas with a mix of open and forested areas, such as savannahs, open woodlands or openings in more mature, deciduous, coniferous and mixed forests (MECP 2022)	**No** - The Subject Lands lack open woodlands or Savannahs.
Least Bittern	*Ixobrychus exilis*	THR	S4B	THR	x		General Habitat Protection June 30, 2013			Least Bittern are mostly found in central and eastern Ontario, south of the Canadian Shield (MECP 2022).	In southern Ontario, Least Bittern inhabit wetlands but strongly prefer cattail marshes with open water and channels (MECP 2022).	**No** - The Subject Lands lack suitably sized large cattail wetlands.
Red-headed Woodpecker	*Melanerpes erythrocephalus*	SC	S4B	THR						The Red-headed Woodpecker is found across southern Ontario, where it is widespread but rare (MECP 2022).	The Red-headed Woodpecker lives in open woodland and woodland edges and is often found in parks, golf courses and cemeteries that contain many dead trees, which the bird uses for nesting and perching (MECP 2022).	**Yes** - potentially suitable woodlands may 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 may present within the Subject Lands.
Little Brown Myotis	*Myotis lucifugus*	END	S4	END		x				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.	**Yes** - potentially suitable woodlands may present within the Subject Lands.

Species Common Name	Species Scientific Name	Provincial Status (ESA)	S-Rank	Federal Status (SARA Sched. 1)	Transition Species (06-30-2013)	Newly-listed Species (01-24-2013)	Habitat Protection Type	Most recent occurrence	Source	Ontario Range and Occurrences	Description of Suitable Habitat in Ontario	Habitat Suitability Assessment of Study Area
Northern Myotis	*Myotis septentrionalis*	END	S3	END		x	General Habitat Protection January 24, 2013			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 may 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 may present within the Subject Lands.

Appendix B

Watershed Cross Section

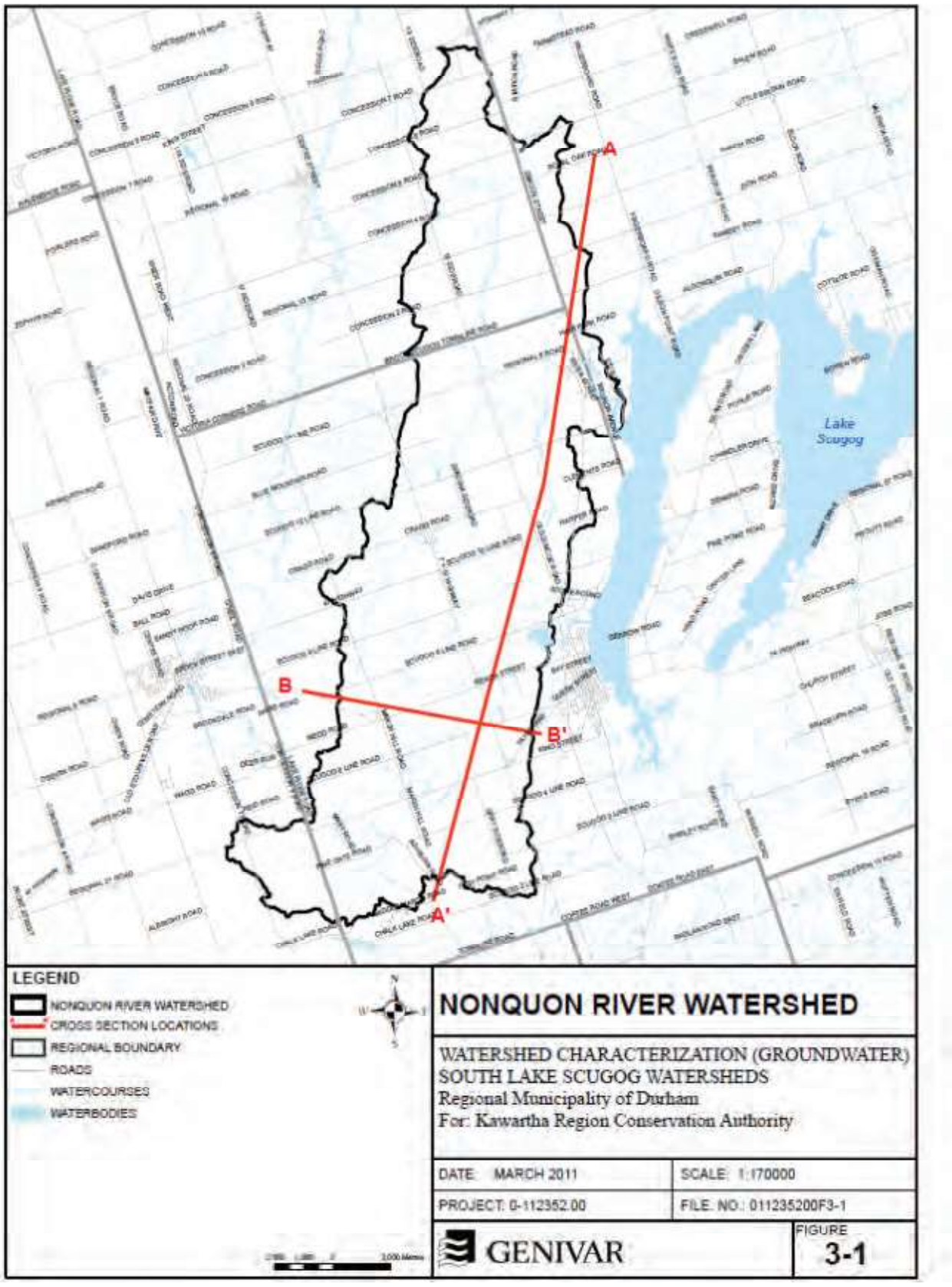


Figure 6.10: Locations of stratigraphic crosssections.

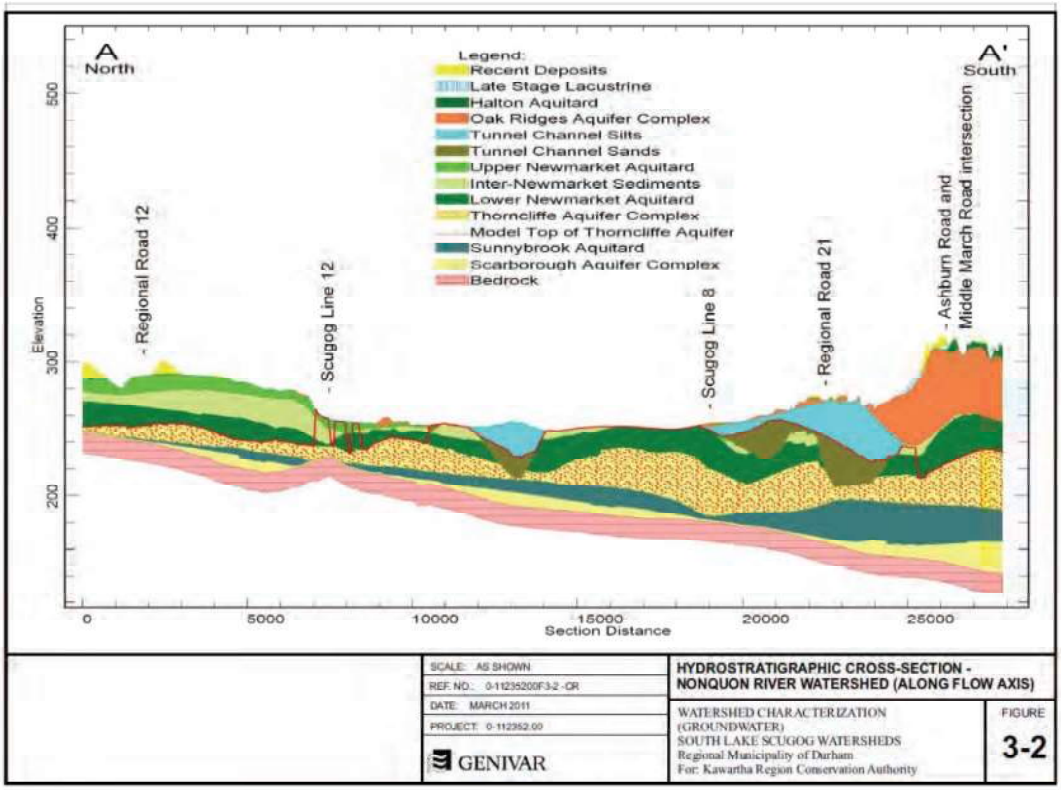


Figure 6.11: Crosssection A - A'.

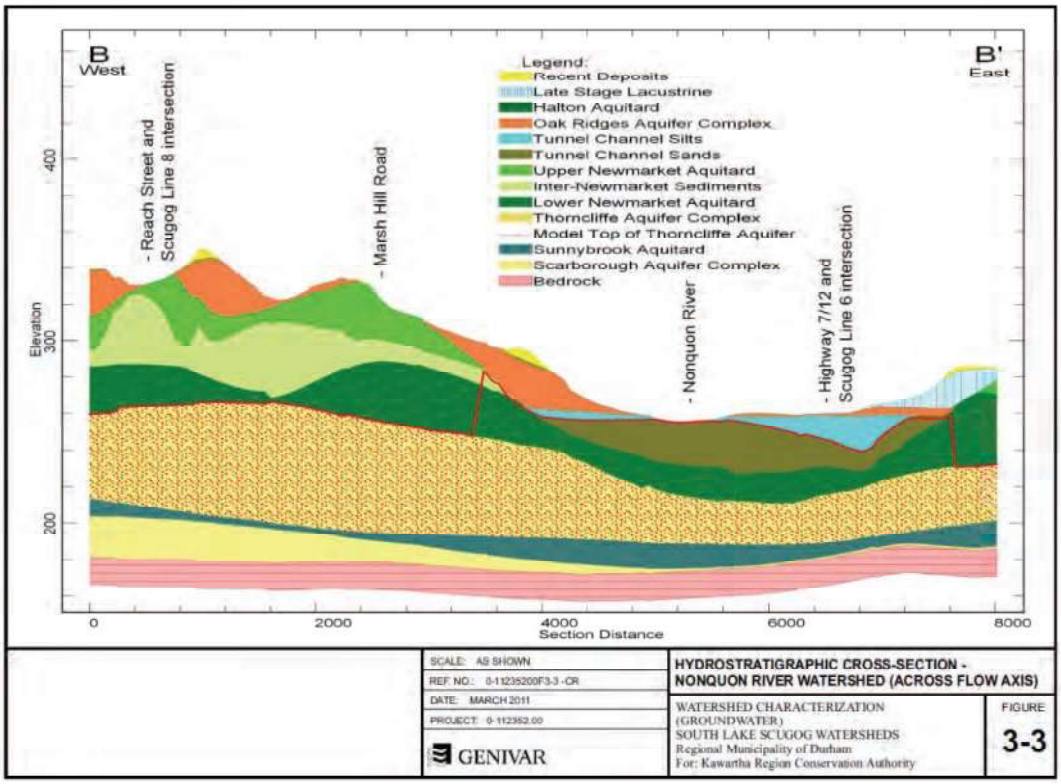


Figure 6.12: Crosssection B - B'.

Appendix C

Well Records

Ministry of the Environment
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

-81 3102W

11 | 1906120 | MUNICIP. 19009 | CON. CON | 05

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
[redacted]	Reach	V	014

[redacted] 4 Port Perry

DATE COMPLETED: DAY 30 MO JUN YR 81 (06)

[redacted] 882850 | 5 | 0925 | RC 5 | BASIN CODE 24 | II | III | IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
Brown	Clay	Stones		0	27
Grey	Clay	-	Soft	27	54
Brown	Sand		Medium	54	68
Grey	Clay		Hard	68	77
Grey	Sand	Coarse Sand	Hard	77	90

31 | 0027605 12 | 0054205 85 | 0068609 | 0077205 73 | 0090210 73
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0077	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
06¼	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.188	0	0078
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
~~20 30~~ 025	06000 INCHES	12 FEET
MATERIAL AND TYPE: Stainless Steel		DEPTH TO TOP OF SCREEN: 0074 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER | PUMPING RATE: 0030 GPM | DURATION OF PUMPING: 04 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
025 FEET	056 FEET	040 FEET	043 FEET	051 FEET	056 FEET

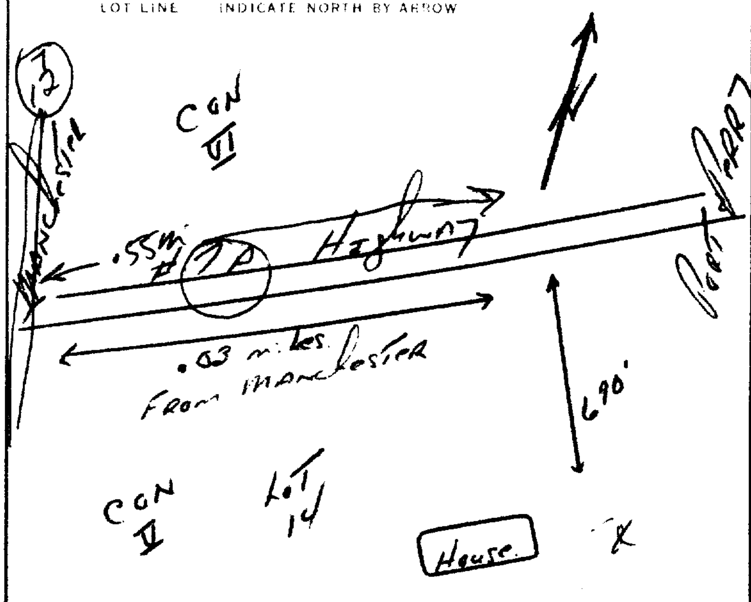
WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY

IF FLOWING, GIVE RATE: GPM | PUMP INTAKE SET AT: FEET | WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING: 078 FEET | RECOMMENDED PUMPING RATE: 0030 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

FINAL STATUS OF WELL: 1
1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE: 01
1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING: 1
1 ☒ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Kawartha Well Drillers | LICENCE NUMBER: 3136
ADDRESS: RR#1 Janetville Ont.
NAME OF DRILLER OR BORER: Joe Fisher + Gary Byrne | LICENCE NUMBER: 2121
SIGNATURE OF CONTRACTOR: D J Byrne | SUBMISSION DATE: DAY 30 MO. Jun YR. 81

OFFICE USE ONLY

DATA SOURCE: 1 | CONTRACTOR: 3136 | DATE RECEIVED: 030981
DATE OF INSPECTION: | INSPECTOR:
REMARKS: loc only 06/1/82 CSS.S.82 Bode left for owner.

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77 FORM 7

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 (1 2) **1912445** Municipality 19009 (10 14) Con. CON 05 (15 22 23 24)

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot (25-27)
Durham	Scugog (Reach)	Con.5	15

Owner's surname (28-47)	First name	Address	Date completed (48-53)
907 Landscape		Box 445, Port Perry, Ont. L9L 1A4	27 day 04 month 95 year

21 (1 2) U T M | Zone (10) | Easting (12 17) | Northing (18 24) | RC (25) | Elevation (26 30) | RC | Basin Code (31 47) | ii | iii | iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
Black	Top Soil		soft	0	1
Brown	Clay	Stones	soft	1	3
Brown	Sand	silt	soft	3	45
Gray	Clay	Sand, Gravel	soft	45	55
Gray	Silt	sand	tight	55	83
Gray	Clay	Gravel	soft	83	110
Gray	Silt	sand	loose	110	184
Gray	Clay		soft	184	202
Gray	Coarse Gravel	sand, silt	tight	202	205

31 (10 14 15 21) 32 (22 32 43 54 65 75 80)

41 WATER RECORD

Water found at – feet	Kind of water
202–205 (10-13) UNTESTED	1 ☒ Fresh 3 ☐ Sulphur 14 ☐ Minerals 4 ☐ Salty 6 ☐ Gas
(15-18)	1 ☐ Fresh 3 ☐ Sulphur 19 ☐ Minerals 2 ☐ Salty 4 ☐ Gas 6 ☐
(20-23)	1 ☐ Fresh 3 ☐ Sulphur 24 ☐ Minerals 2 ☐ Salty 4 ☐ Gas 6 ☐
(25-28)	1 ☐ Fresh 3 ☐ Sulphur 29 ☐ Minerals 2 ☐ Salty 4 ☐ Gas 6 ☐
(30-33)	1 ☐ Fresh 3 ☐ Sulphur 34 ☐ Minerals 2 ☐ Salty 4 ☐ Gas 6 ☐ 60

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
(10-11) 6¼	1 ☒ Steel 12 ☐ 2 Galvanized ☐ 3 Concrete ☐ 4 Open hole ☐ 5 Plastic ☐	.188	+ 2½	(13-16) 202
(17-18)	1 ☐ Steel 19 ☐ 2 Galvanized ☐ 3 Concrete ☐ 4 Open hole ☐ 5 Plastic ☐			(20-23)
(24-25)	1 ☐ Steel 26 ☐ 2 Galvanized ☐ 3 Concrete ☐ 4 Open hole ☐ 5 Plastic ☐			(27-30)

SCREEN

Sizes of opening (Slot No.) (31-33)	Diameter (34-38)	Length (39-40)
20	6 inches	4 feet

Material and type	Depth at top of screen (41-44)	30
SS	201 feet	

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
(10-13) 0	(14-17) 20	Bentonite/Mud Slurry
(18-21)	(22-25)	
(26-29)	(30-33) 80	

71 PUMPING TEST

Pumping test method (10)	Pumping rate (11-14)	Duration of pumping (15-16 Hours ... 17-18 Mins)
1 ☐ Pump 2 ☒ Bailer	8 GPM	4 Hours ... Mins

Static level	Water level end of pumping	25 Water levels during 1 ☒ Pumping 2 ☐ Recovery			
(19-21)	(22-24)	15 minutes (26-28)	30 minutes (29-31)	45 minutes (32-34)	60 minutes (35-37)
40 feet	90 feet	68 feet	85 feet	90 feet	90 feet

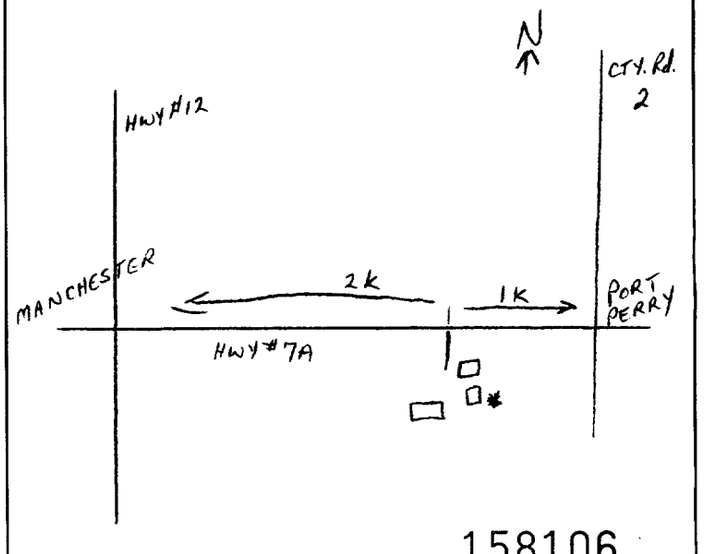
If flowing give rate (38-41)	Pump intake set at	Water at end of test (42)
GPM	feet	☐ Clear ☐ Cloudy

Recommended pump type	Recommended pump setting (43-45)	Recommended pump rate (46-49)
☐ Shallow ☒ Deep	150 feet	5 GPM

50-53

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.



158106

FINAL STATUS OF WELL (54)

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE (55-56)

1 ☒ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other .....

METHOD OF CONSTRUCTION (57)

1 ☒ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☐ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other .....

Name of Well Contractor	Well Contractor's Licence No.
G. Hart & Sons Well Drilling Ltd.	2662

Address
Box 850, Fenelon Falls, Ontario

Name of Well Technician	Well Technician's Licence No.
Greg Bullock	T-2108

Signature of Technician/Contractor	Submission date (day mo yr)

MINISTRY USE ONLY

Data source (58)	Contractor (59-62)	Date received (63-68)	80
	2662	MAY 29 1995	

Date of inspection	Inspector

Remarks

CSS.BD

2 - MINISTRY OF ENVIRONMENT & ENERGY COPY

0506 (07/94) Front Form 9

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 (1 2) **1913988**

Municipality 19009 (10 14) Con. CON (15 22 23 24) 04

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot (25-27)
Durham	Scugog Reach	Con 4	15

Address: Prince Albert

Date completed: 11 day 3 month 99 year

21 (1 2) T M (10 12 17) Northing (18 24) RC (25) Elevation (26 30) RC Basin Code (31) ii iii iv (47)

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
Brown	clay		sandy	0	17
Gray	"	stones		17	28
"	"		hard	28	79
"	"		sandy	79	123
"	"		soft	123	170
Gray	sand		silt	170	178

31

32 (10 14 15 21 32 43 54 65 75 80)

41 WATER RECORD

Water found at – feet	Kind of water
172 (10-13)	1 ☒ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (14)
(15-18)	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (19)
(20-23)	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (24)
(25-28)	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (29)
(30-33)	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (34) (60)

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6 1/4 (10-11)	1 ☒ Steel (12) 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	0	172 (13-16)
(17-18)	1 ☐ Steel (19) 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			(20-23)
(24-25)	1 ☐ Steel (26) 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			(27-30)

SCREEN

Sizes of opening (Slot No.) (31-33)	Diameter (34-38)	Length (39-40)
10 - 12	6 inches	6 feet

Material and type: SS

Depth at top of screen (41-44): 172 feet (30)

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
0 (10-13)	18 (14-17)	Bensea
(18-21)	(22-25)	
(26-29)	(30-33) (80)	

71 PUMPING TEST

Pumping test method (10): 1 ☐ Pump 2 ☒ Bailer

Pumping rate (11-14): 5 GPM

Duration of pumping (15-16 Hours, 17-18 Mins): 3 Hours 30 Mins

Static level (19-21)	Water level end of pumping (22-24)	Water levels during (25): 1 ☒ Pumping 2 ☐ Recovery 15 minutes (26-28)	30 minutes (29-31)	45 minutes (32-34)	60 minutes (35-37)
26 feet	170 feet	125 feet	170 feet	170 feet	170 feet

If flowing give rate (38-41): GPM

Pump intake set at: 170 feet

Water at end of test (42): ☒ Clear ☐ Cloudy

Recommended pump type: ☐ Shallow ☒ Deep

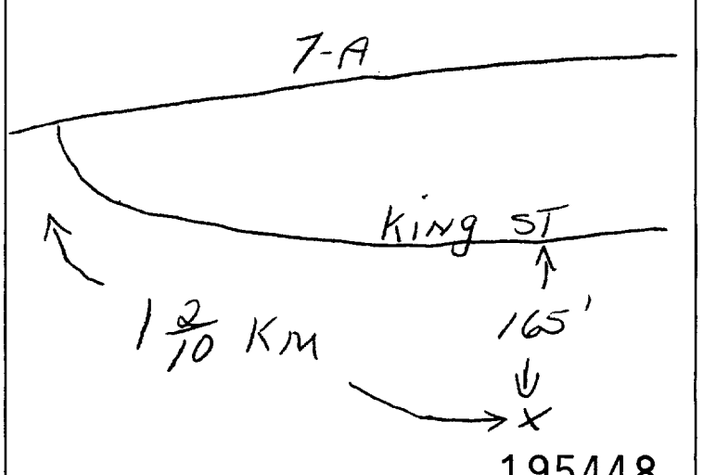
Recommended pump setting (43-45): 170 feet

Recommended pump rate (46-49): 5 GPM

(50-53)

LOCATION OF WELL

In diagram below show distances of well from road and lot line.
Indicate north by arrow.



195448

FINAL STATUS OF WELL (54)

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE (55-56)

1 ☒ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other .....

METHOD OF CONSTRUCTION (57)

1 ☒ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☐ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other .....

Name of Well Contractor	Well Contractor's Licence No.
Wilson Water Wells	5459
Address: RR#4 Stouffville	
Name of Well Technician	Well Technician's Licence No.
Norm Renton	10339
Signature of Technician/Contractor: Pete Wilson	Submission date: day 17 mo 3 yr 99

MINISTRY USE ONLY

Data source (58)	Contractor (59-62)	Date received (63-68) (80)
	5459	APR 09 1999

Date of inspection | Inspector

Remarks: CSS.ES9

0506 (07/94) Front Form 9

2 - MINISTER OF ENVIRONMENT & ENERGY COPY

#1

Ontario Ministry of the Environment

The Ontario Water Resources Act

WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 **1914516** Municipality 19009 Con. CON 04

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
[redacted]	Dungog Reach	Con 4	15
	Address Prince Albert	Date completed 26 day 4 month 00 year	
	Nothing RC Elevation RC Basin Code		

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	clay	stones & sand		0	9
Grey	clay	stones & sand		9	77
Brown	sand	silt		77	92
Grey	clay	stones		92	106
Grey	clay	silty		106	134
Grey	sand	silt		134	139
Grey	clay	stones		139	165
Grey	clay	silty		165	203
Grey	clay	sandy		203	207
Grey	sand			207	209
Grey	clay	sand & silt		209	215

41 WATER RECORD

Water found at - feet	Kind of water
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet
Material and type	Depth at top of screen feet	

61 PLUGGING & SEALING RECORD

☐ Annular space ☑ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
0	315	Bensea

71 PUMPING TEST

Pumping test method 1 ☐ Pump 2 ☐ Bailer | Pumping rate GPM | Duration of pumping ..... Hours ..... Mins

Static level feet	Water level end of pumping feet	Water levels during ☐ Pumping ☐ Recovery			
		15 minutes feet	30 minutes feet	45 minutes feet	60 minutes feet

If flowing give rate GPM | Pump intake set at feet | Water at end of test ☐ Clear ☐ Cloudy

Recommended pump type ☐ Shallow ☐ Deep | Recommended pump setting feet | Recommended pump rate GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.

1 of 2

211672

FINAL STATUS OF WELL

1 ☐ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well
5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering
9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

1 ☐ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial
5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning
9 ☐ Not use 10 ☐ Other .....

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☐ Rotary (air)
5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting
9 ☐ Driving 10 ☐ Digging 11 ☐ Other .....

Name of Well Contractor	Well Contractor's Licence No.
Wilson's Water Wells	5459
Address 13787 Hwy 48 Stouffville	
Name of Well Technician	Well Technician's Licence No.
J Hadcock	02341
Signature of Technician/Contractor	Submission date day 3 mo 5 yr 00
Pete Wilson	

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MINISTRY USE ONLY

Data source | Contractor 5459 | Date received MAY 08 2000

Date of inspection | Inspector

Remarks

CSS.ES0

Ontario **Ministry of the Environment**

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 **1914793**

Municipality 19009 Con. CON 04

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
Durham	Scugog Reach	Con 4	15

Address: Prince Albert — Date completed: 12 (day) 9 00 (month year)

21 UTM — Northing — RC — Elevation — RC — Basin Code — ii — iii — iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	Topsoil		Soft	1	4
Brown	Clay	Silt stones	Dense	4	11
Grey	Clay	Stones silt	Dense	11	90
Grey	Clay	Silt	Soft	90	143
Grey	Clay	Stones, Silt	Hard	143	220

31

32

41 WATER RECORD

Water found at - feet	Kind of water
10-13	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 14
15-18	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 19
20-23	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 24
25-28	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 29
30-33	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas 34 60

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
10-11	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic 12			13-16
17-18	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic 19			20-23
24-25	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic 26			27-30

SCREEN

Sizes of opening (Slot No.) 31-33	Diameter 34-38 inches	Length 39-40 feet
Material and type	Depth at top of screen 41-44 feet	30

61 PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at - feet From	To	Material and type (Cement grout, bentonite, etc.)
0 10-13	220 14-17	bentonite
18-21	22-25	
26-29	30-33	80

71 PUMPING TEST

Pumping test method 10: 1 ☐ Pump 2 ☐ Bailer — Pumping rate 11-14 GPM — Duration of pumping 15-16 Hours 17-18 Mins

Static level 19-21 feet	Water level end of pumping 22-24 feet	Water levels during 25: 1 ☐ Pumping 2 ☐ Recovery			
		15 minutes 26-28 feet	30 minutes 29-31 feet	45 minutes 32-34 feet	60 minutes 35-37 feet

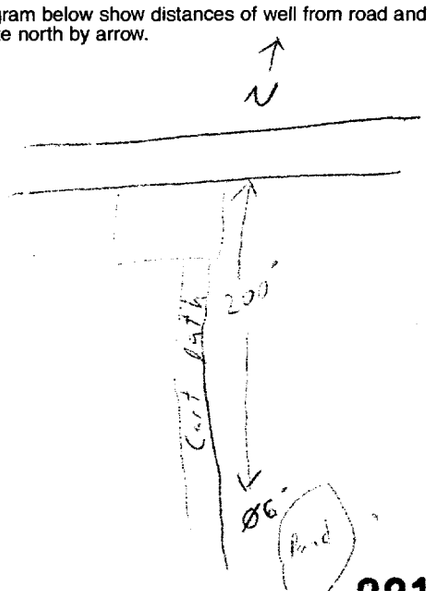
If flowing give rate 38-41 GPM — Pump intake set at feet — Water at end of test 42: ☐ Clear ☐ Cloudy

Recommended pump type: ☐ Shallow ☐ Deep — Recommended pump setting 43-45 feet — Recommended pump rate 46-49 GPM

50-53

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



221529

FINAL STATUS OF WELL 54

1 ☐ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☑ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE 55-56

1 ☐ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION 57

1 ☐ Cable tool 2 ☑ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☐ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
Wilsons Water Wells	5459
Address: 13787 #48 Hwy Stouffville ON	
Name of Well Technician: Jim R Smith	Well Technician's Licence No.: 00-980
Signature of Technician/Contractor	Submission date: 19 (day) 9 (mo) 00 (yr)

MINISTRY USE ONLY

Data source 58	Contractor 59-62	Date received 63-68 80
	5459	SEP 25 2000
Date of inspection	Inspector	
Remarks		CSS.ES0

0506 (11/98) Front Form 9

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Ontario Ministry of the Environment

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 (1 2) **1914793**

Municipality (10-14) 19009 Con. (15-22) CON (23-24) 04

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot (25-27)
Durham	Scugog Reach	Con 4	15

Owner's surname (26-47) First Name	Address	Date completed (48-53)
Sunny Base GC	Prince Albert	17 day 9 00 month year

21 (1 2) UTM: Zone (10) Easting (12-17) Northing (18-24) RC (25) Elevation (26-30) RC Basin Code (31) ii iii iv (47)

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	Top soil		Soft	0	4
Brown	Clay	Silt stones	Dense	4	11
Grey	Clay	Stones silt	Dense	11	90
Grey	Clay	Silt	Soft	90	143
Grey	Clay	Stones, Silt	Hard	143	220

31 (1 2) 32 (10 14 15 21 32 43 54 65 75 80)

41 WATER RECORD

Water found at - feet	Kind of water
10-13	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (14)
15-18	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (19)
20-23	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (24)
25-28	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (29)
30-33	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas (34) (60)

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
10-11	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic (12)			13-18
17-18	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic (19)			20-23
24-25	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic (26)			27-30

SCREEN

Sizes of opening (Slot No.) (31-33)	Diameter inches (34-38)	Length feet (39-40)
Material and type	Depth at top of screen feet (41-44)	(30)

61 PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
0 (10-13)	220 (14-17)	bentonite
(18-21)	(22-25)	
(26-29)	(30-33) (80)	

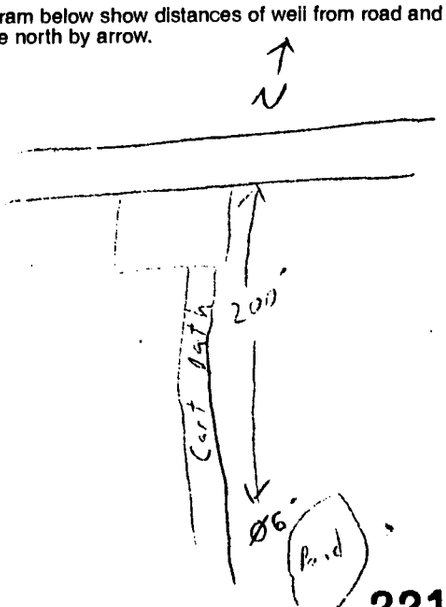
71 PUMPING TEST

Pumping test method (10) 1 ☐ Pump 2 ☐ Bailer	Pumping rate (11-14) GPM	Duration of pumping (15-18) Hours (17-18) Mins
Static level (19-21) feet	Water level end of pumping (22-24) feet	Water levels during (25) 1 ☐ Pumping 2 ☐ Recovery
15 minutes (26-28) feet	30 minutes (29-31) feet	45 minutes (32-34) feet / 60 minutes (35-37) feet
If flowing give rate (38-41) GPM	Pump intake set at feet	Water at end of test (42) ☐ Clear ☐ Cloudy
Recommended pump type ☐ Shallow ☐ Deep	Recommended pump setting (43-45) feet	Recommended pump rate (46-49) GPM

(50-53)

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



221529

FINAL STATUS OF WELL (54)

1 ☐ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☑ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE (55-56)

1 ☐ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not use 10 ☐ Other

METHOD OF CONSTRUCTION (57)

1 ☐ Cable tool 2 ☑ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☐ Rotary (air) 5 ☐ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
Wilsons Water Wells	5459
Address	
13787 #48 Hwy Stouffville ON	
Name of Well Technician	Well Technician's Licence No.
Jim R Smyth	00-980
Signature of Technician/Contractor	Submission date: 19 day 9 mo 00 yr

Jim Smyth

MINISTRY USE ONLY

Data source (56)	Contractor (59-62)	Date received (63-68) (80)
	5459	SEP 25 2000
Date of Inspection	Inspector	
Remarks		

CSS.ES0

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Ontario Ministry of the Environment

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 | **1914795** | Municipality 19009 | Con. CON 04

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
[redacted]	Scugog Reach	Con 4	15
[redacted]	Address: Prince Albert	Date completed	day 1 month 9 year 00

21 | Northing | RC | Elevation | RC | Basin Code | ii | iii | iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
Brown	Top soil		soft	0	4
Brown	Clay	silty	Dense	4	6
Grey	Clay	stones silt	Dense	6	19
Grey	Clay	boulder	packed	19	22
Grey	Clay	silt stones		22	95
Grey	Clay	silt	soft	95	150
Grey	Clay	silty, stones	soft	150	163
Grey	Sand		Loose	163	175

31
32

41 WATER RECORD

Water found at - feet	Kind of water
163-175	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☑ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	To
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet
Material and type	Depth at top of screen feet	

61 PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at - feet From	To	Material and type (Cement grout, bentonite, etc.)
0	175	bentonite

71 PUMPING TEST

Pumping test method	Pumping rate	Duration of pumping
1 ☐ Pump 2 ☐ Bailer	GPM	Hours Mins

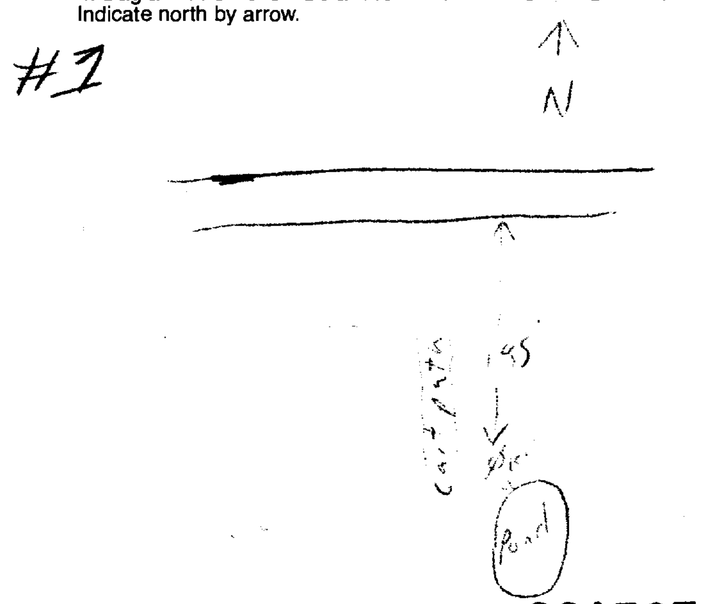
Static level	Water level end of pumping	Water levels during 1 ☐ Pumping 2 ☐ Recovery: 15 minutes	30 minutes	45 minutes	60 minutes
feet	feet	feet	feet	feet	feet

If flowing give rate GPM | Pump intake set at feet | Water at end of test ☐ Clear ☐ Cloudy

Recommended pump type ☐ Shallow ☐ Deep | Recommended pump setting feet | Recommended pump rate GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



221527

FINAL STATUS OF WELL

1 ☐ Water supply
2 ☐ Observation well
3 ☐ Test hole
4 ☐ Recharge well
5 ☑ Abandoned, insufficient supply
6 ☐ Abandoned, poor quality
7 ☐ Abandoned (Other)
8 ☐ Dewatering
9 ☐ Unfinished
10 ☐ Replacement well

WATER USE

1 ☐ Domestic
2 ☐ Stock
3 ☐ Irrigation
4 ☐ Industrial
5 ☐ Commercial
6 ☐ Municipal
7 ☐ Public supply
8 ☐ Cooling & air conditioning
9 ☐ Not use
10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool
2 ☑ Rotary (conventional)
3 ☐ Rotary (reverse)
4 ☐ Rotary (air)
5 ☐ Air percussion
6 ☐ Boring
7 ☐ Diamond
8 ☐ Jetting
9 ☐ Driving
10 ☐ Digging
11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
Wilson Water Wells	5459
Address: 13757 Hwy #48 Stouffville ON	
Name of Well Technician: Jim R Smith	Well Technician's Licence No.: 00-980
Signature of Technician/Contractor: [signature]	Submission date: day 17 mo 9 yr 00

MINISTRY USE ONLY

Data source	Contractor 5459	Date received SEP 25 2000
Date of inspection	Inspector	
Remarks		CSS.ES0

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Ontario **Ministry of the Environment**

The Ontario Water Resources Act

WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 (1 2) **1915198** Municipality 19009 (10 14) Con. CON (15 22 23 24) 05

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot (25-27)
DURHAM	SCUGOG	CONC 5	15

[redacted]

Address: 1465 KING ST (PRINCE ALBERT)

Date completed (48-53): 03 day 05 month 01 year

21 (1 2) UTM (10) Northing (12-17) (18-24) RC (25) Elevation (26) RC (30) Basin Code (31) ii iii iv (47)

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet From	Depth - feet To
	TOPSOIL			0	1
	CLAY			1	55
	SILT + CLAY			55	110
	SILT			110	124
	COARSE SAND + GRAVEL			124	127

31 (1 2)

32 (10 14 15 21 32 43 54 65 75 80)

41 WATER RECORD

Water found at - feet (10-13)	Kind of water (14)	(19)	(24)	(29)	(34)
127	1 ☒ Fresh 2 ☐ Salty	3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas			
(15-18)	1 ☐ Fresh 2 ☐ Salty	3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas			
(20-23)	1 ☐ Fresh 2 ☐ Salty	3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas			
(25-28)	1 ☐ Fresh 2 ☐ Salty	3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas			
(30-33)	1 ☐ Fresh 2 ☐ Salty	3 ☐ Sulphur 4 ☐ Minerals 6 ☐ Gas			60

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material (12)	Well thickness inches	Depth - feet From	Depth - feet To
(10-11) 6 1/4	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	0	(13-16) 124
(17-18)	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic (19)			(20-23)
(24-25)	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic (26)			(27-30)

SCREEN

Sizes of opening (Slot No.) (31-33)	Diameter (34-38)	Length (39-40)
30	5 inches	3 feet

Materiel and type	Depth at top of screen (41-44)	(30)
US FILTER STAINLESS	124 feet	

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at - feet From (10-13)	Depth set at - feet To (14-17)	Material and type (Cement grout, bentonite, etc.)
0	20	HOLEPLUG
(18-21)	(22-25)	
(26-29)	(30-33)	(80)

71 PUMPING TEST

Pumping test method (10): 1 ☐ Pump 2 ☒ Bailer

Pumping rate (11-14): 10 GPM

Duration of pumping (15-16): 3 Hours (17-18): — Mins

(25) Water levels during: 1 ☐ Pumping 2 ☒ Recovery

Static level (19-21)	Water level end of pumping (22-24)	15 minutes (26-28)	30 minutes (29-31)	45 minutes (32-34)	60 minutes (35-37)
12 feet	110 feet	40 feet	20 feet	12 feet	12 feet

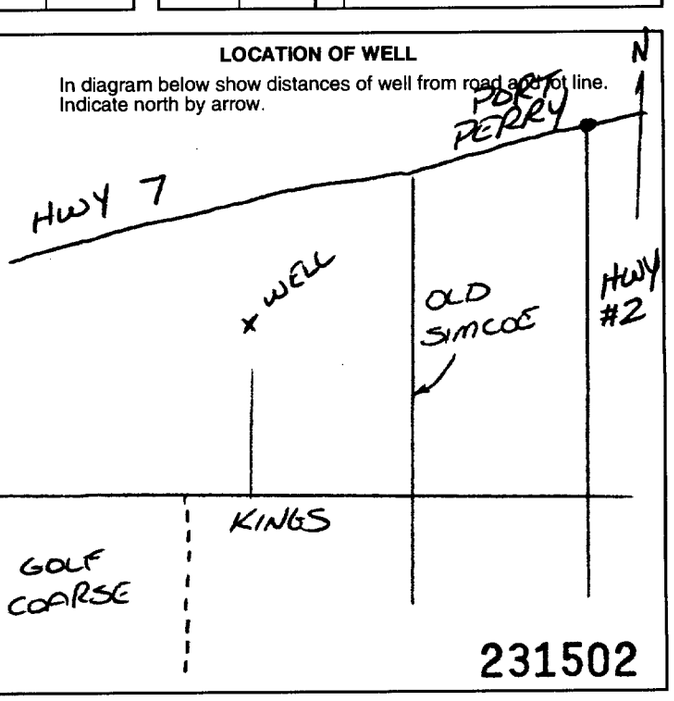
If flowing give rate (38-41)	Pump intake set at	Water at end of test (42)	
GPM	120 feet	☒ Clear	☐ Cloudy

Recommended pump type	Recommended pump setting (43-45)	Recommended pump rate (46-49)
☐ Shallow ☒ Deep	120 feet	10 GPM

(50-53)

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



231502

FINAL STATUS OF WELL (54)

1 ☒ Water supply
2 ☐ Observation well
3 ☐ Test hole
4 ☐ Recharge well
5 ☐ Abandoned, insufficient supply
6 ☐ Abandoned, poor quality
7 ☐ Abandoned (Other)
8 ☐ Dewatering
9 ☐ Unfinished
10 ☐ Replacement well

WATER USE (55-56)

1 ☒ Domestic
2 ☐ Stock
3 ☐ Irrigation
4 ☐ Industrial
5 ☐ Commercial
6 ☐ Municipal
7 ☐ Public supply
8 ☐ Cooling & air conditioning
9 ☐ Not use
10 ☐ Other

METHOD OF CONSTRUCTION (57)

1 ☒ Cable tool
2 ☐ Rotary (conventional)
3 ☐ Rotary (reverse)
4 ☐ Rotary (air)
5 ☐ Air percussion
6 ☐ Boring
7 ☐ Diamond
8 ☐ Jetting
9 ☐ Driving
10 ☐ Digging
11 ☐ Other

Name of Well Contractor	Well Contractor's Licence No.
COUNTRY-WIDE WELL DRILLING LTD	1673
Address: BOX 128 LITTLE BRITAIN	
Name of Well Technician: ALLAN CAVERS	Well Technician's Licence No.: T-0618
Signature of Technician/Contractor: [signature]	Submission date: dey mo yr

MINISTRY USE ONLY

Data source (58)	Contractor (59-62)	Date received (63-68) (80)
	1673	AUG 16 2001
Date of inspection	Inspector	
Remarks		

0506 (07/00) Front Form 9

2 - MINISTRY OF THE ENVIRONMENT COPY

Ontario — Ministry of the Environment

Well Tag Number (Place sticker and print number below): NO TAG — WELL ABANDONMENT

Well Record

Regulation 903 Ontario Water Resources Act

page 1 of 3

Instructions for Completing Form

- For use in the **Province of Ontario** only. This document is a permanent **legal** document. Please retain for future reference.
- All Sections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Management Coordinator at 416-235-6203.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only: MUN 19009 CON CON 05 LOT 14

Well Owner's Information and Location of Well Information

[redacted]

Durham — Scugog — 14 — 11

RR#/Street Number/Name: #7A HIGHWAY #1345 — City/Town/Village: PORT PERRY RR#4 — Site/Compartment/Block/Tract etc.

GPS Reading — NAD: 83 — Zone: 17 — Easting: 662185 UTM — Northing: 4883841 — Unit Make/Model: GARMIN — Mode of Operation: ☒ Undifferentiated ☐ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To (Metres)
	ABANDONMENT		RECORD		
	118'	DRILLED WELL	6 5/8" O.D WELL		
	2'	PIPE CUT OFF	AND REMOVED AND CAPPED		
	WELL	SEALED	BLOW.		

Hole Diameter

Depth From	Depth To (Metres)	Diameter (Centimetres)

Water Record

Water found at ___ Metres / Kind of Water

- ___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
- ___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
- ___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

After test of well yield, water was ☐ Clear and sediment free ☐ Other, specify

Chlorinated ☒ Yes ☐ No

Construction Record

Inside diam (centimetres)	Material	Wall thickness (centimetres)	Depth From	Depth To (Metres)

Casing

- ☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized
- ☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized
- ☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized

Screen

Outside diam: ☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized — Slot No.

No Casing or Screen

☐ Open hole

Test of Well Yield

Pumping test method	Draw Down Time (min)	Draw Down Water Level (Metres)	Recovery Time (min)	Recovery Water Level (Metres)
Pump intake set at - (metres)	Static Level			
Pumping rate - (litres/min)	1		1	
Duration of pumping ___hrs + ___ min	2		2	
Final water level end of pumping ___metres	3		3	
Recommended pump type. ☐ Shallow ☐ Deep	4		4	
Recommended pump depth. ___metres	5		5	
Recommended pump rate. (litres/min)	10		10	
If flowing give rate - (litres/min)	15		15	
If pumping discontinued, give reason.	20		20	
	25		25	
	30		30	
	40		40	
	50		50	
	60		60	

Plugging and Sealing Record

☐ Annular space ☒ Abandonment

Depth set at - From	Depth set at - To (Metres)	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
35.9	31.6	WASHED STONE	
31.6	29.5	BENTONITE HOLE PLUG 3/8"	
29.5	2.4	VOLCLAY 200	
2.4	2.1	BENSEAL	
2.1	0	NATIVE SOIL	

Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☐ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☐ Water Supply ☐ Recharge well ☐ Unfinished ☒ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

14/Oct/04

Well Contractor/Technician Information

Name of Well Contractor: KAWARTHA WELL DRILLERS — Well Contractor's Licence No.: 3136

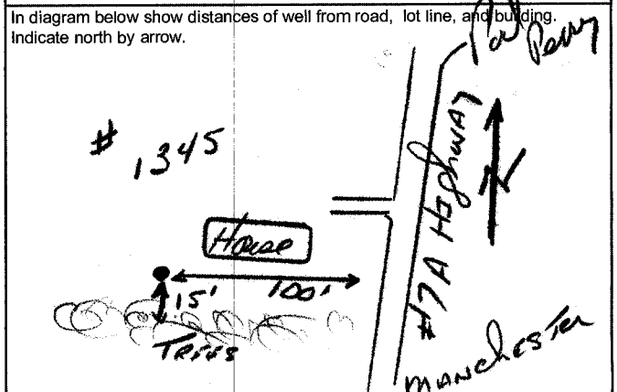
Business Address (street name, number, city etc.): RR#1 Keene K0L 2G0

Name of Well Technician (last name, first name): BYRNE, GARY — Well Technician's Licence No.: 0227

Signature of Technician/Contractor: X — Date Submitted: 2004 / 10 / 16

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Audit No. Z 12719 — Date Well Completed: YYYY MM DD

Was the well owner's information package delivered? ☐ Yes ☐ No — Date Delivered: YYYY MM DD

Ministry Use Only

Data Source — Contractor: 3136

Date Received: DEC 01 2004 — Date of Inspection: YYYY MM DD

Remarks: D.W.C. via fax 2004 / 10 / 14 — Well Record Number: 1917386

0506E (09/03) — Contractor's Copy ☐ Ministry's Copy ☐ Well Owner's Copy ☐

Cette formule est disponible en français

UTM 17 Z 1 6 6 2 9 0 0 E

5 R 4 8 8 2 6 1 5 N

Elev. 5 R

Basin 24

46 № 2196

B

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District Ontario .... Township, Village, Town or City REACH

Con. 4 .... Lot 15 .... Date completed 18 (day) Dec. month 67 year)

[redacted] dress Port Perry

Casing and Screen Record

Inside diameter of casing 30"

Total length of casing 30'

Type of screen clay

Length of screen 2

Depth to top of screen 16

Diameter of finished hole 30"

Pumping Test

Static level 16

Test-pumping rate 3 G.P.M.

Pumping level

Duration of test pumping Observation

Water clear or cloudy at end of test clear

Recommended pumping rate 2 G.P.M.

with pump setting of 29 feet below ground surface

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Top soil	0	1		
Rocky clay	1	30	16	fresh

For what purpose(s) is the water to be used? Golf showers

Is well on upland, in valley, or on hillside? upland

Drilling or Boring Firm T. Kehoe

Address Box 7 Pickering

Licence Number 118

Name of Driller or Borer T. Kehoe

Address Pickering

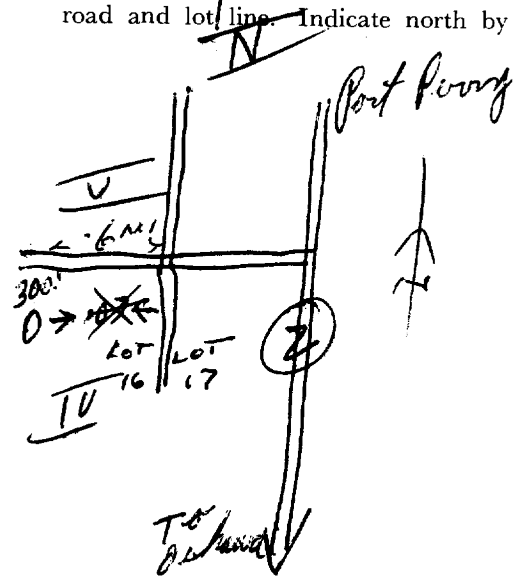
Date Dec. 18/67

Terry Kehoe

(Signature of Licensed Drilling or Boring Contractor)

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Form 7 15M-60-4138

OWRC COPY

CSS.S8

2

UTM 17 Z 662875 E
5 R 4882868 N
Elev. 5 R
Basin 29

ONTARIO

The Well Drillers Act

Department of Mines, Province of Ontario

46 No. ~~2212~~ 1

Water Well Record

County or District. Ontario Tp. Reach Con. 5 Lot. 15 Pt. Lot.

Owner. TOWN OF PORT PERRY Address. PORT PERRY, ONT. Acres.

Date Completed. APRIL 28/47 Cost of Well (not including pump).

Pipe and Casing Record NONE

Casing diameter(s).
Length(s) of casing(s).
Length of screen.
Type of screen.
Type of pump.
Capacity of pump.
Depth of pump setting.

Pumping Test NONE

Date. 5 3/8" Rotary hole
Developed Capacity. Negative
Duration of Test. Abandoned site
Pumping Rate.
Drawdown.
Static level of completed well.
Is well a gravel-wall type?

Water Record

Kind (fresh or mineral) / Quality (hard, soft, contains iron, sulphur etc.)	Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
Appearance (clear, cloudy, coloured)			
For what purpose(s) is the water to be used?			
How far is well from possible source of contamination?			
What is source of contamination?			
Enclose a copy of any mineral analysis that has been made of water			

TEST Well Log

Drift and Bedrock Record	From	To
CLAY	0 ft.	12 ft.
CLAY WITH SAND, GRAVEL & BOULDERS	12	65

Location of Well #15

In diagram below show distances of well from road and lot line

N. SIDE CONCESSION 4, 1 MILE E. OF MANCHESTER, G. CHRISTIAN'S FARM

Situation: Is well on upland, in valley, or on hillside?

Drilling Firm. INTERNATIONAL WATER SUPPLY, LTD.,

Address. 12 MAITLAND ST., LONDON, ONTARIO

Recorded by. W. FAULDS Address. SAME

Date. NOVEMBER 1948 Licence Number. 6 (1947)

CSS.88

UTM 17 z 6631439 E
1 R 4883069 N
Elev. 1 R
Basin 24

2/10 m. W. of P.A. — No. 46 — No 2216

GROUND WATER BRANCH
NOV 24 1958
ONTARIO WATER RESOURCES COMMISSION

ONTARIO

The Water-well Drillers Act, 1954
Department of Mines

Water-Well Record

County or Territorial District Ontario Township, Village, Town or City Reach
[redacted] n Village, Town or City) Prince Albert
Address ~~Prince Albert~~ Port Perry RR#4
(day) (month) (year)

Pipe and Casing Record

Casing diameter(s) ....
Length(s) ....
Type of screen ....
Length of screen ....

Pumping Test

Static level 7 FT.
Pumping rate ....
Pumping level ....
Duration of test ....

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
clay loam	0	1			
sub soil	1	3	19 ft	12 ft	fresh
clay	3	19			
sand & gravel	19	25			

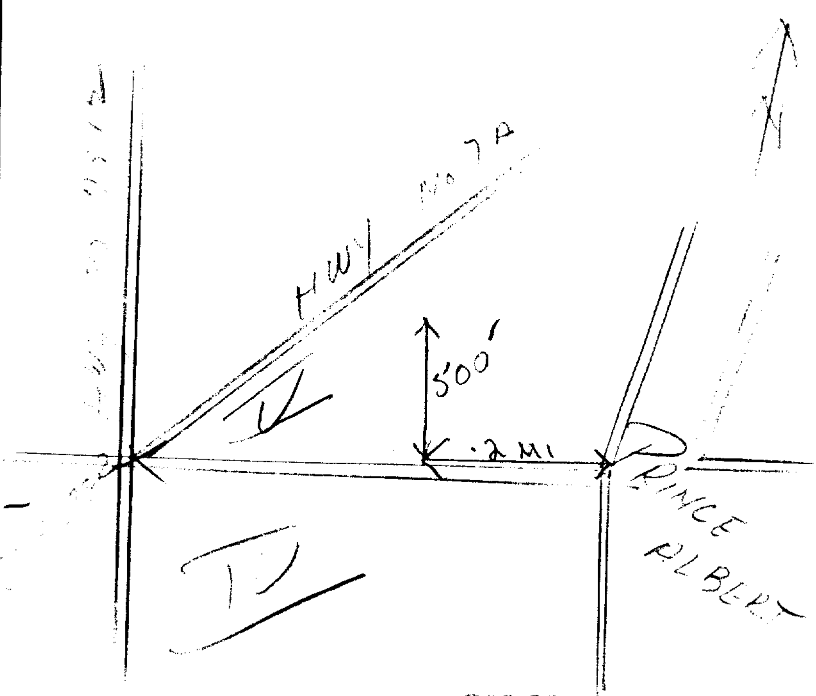
For what purpose(s) is the water to be used? [illegible]
Is water clear or cloudy? Clear
Is well on upland, in valley, or on hillside? upland
Drilling firm [illegible] Bros
Address Bucketon RR#1
Name of Driller [illegible]
Address Bucketon RR#1
Licence Number [illegible]

I certify that the foregoing statements of fact are true.

Date Oct 3/58 [illegible signature]
Signature of Licensee

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Form 5

CSS.S8

UTM 17 Z 662928 E
9 R 4831872 N
Elev. 9 R
Basin 24
LOT 16

6 m 46 No. 6
GROUND WATER BRANCH
NOV 24 1958
ONTARIO WATER RESOURCES COMMISSION

ONTARIO

The Water-well Drillers Act, 1954
Department of Mines

Water-Well Record

County or Territorial District ...Ont... Township, Village, Town or City ...REACH...
[redacted] n Village, Town or City) ...Port Perry...
[redacted] Address ...Port Perry R.R. 1...
(day) (month) (year)

Pipe and Casing Record

Casing diameter(s) ...36" Cement...
Length(s) ...
Type of screen ...
Length of screen ...

Pumping Test

Static level ...1 FT....
Pumping rate ...
Pumping level ...
Duration of test ...

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
sandy loam	0	1	9 ft	8 ft	fresh
sub soil	1	3			
sandy gravel	3	9			
sand	9	17½			

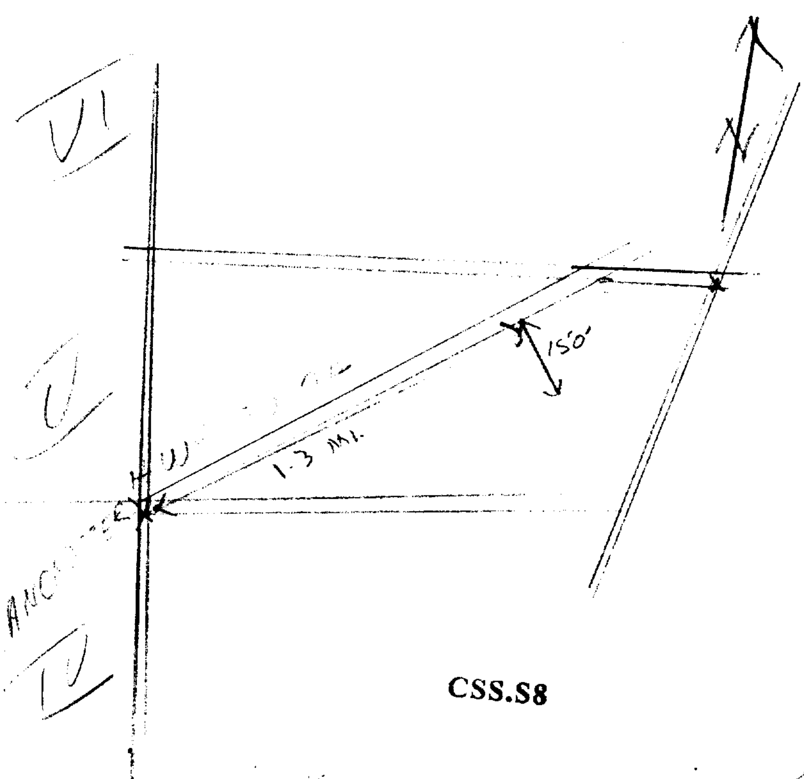
For what purpose(s) is the water to be used? ...House...
Is water clear or cloudy? ...clear...
Is well on upland, in valley, or on hillside? ...upland...
Drilling firm ...Hoskin Bros...
Address ...Burketon R.R. 1...
Name of Driller ...Lorne Hoskin...
Address ...Burketon R.R. 1...
Licence Number ...644...

I certify that the foregoing statements of fact are true.

Date ...Oct 8/58... Lorne Hoskin
Signature of Licensee

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Form 5

CSS.S8

UTM 17 Z 663015 E

4884031 N

Elev. R

Basin 21

46 No 2218

ONTARIO WATER RESOURCES COMMISSION

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District: Ontario

Township, Village, Town or City: Reach

Con. V Lot 16

Date completed: 14th. (day) May (month) 1966 (year)

[redacted] dress R.R. No. 4 Port Perry, Ont.

Casing and Screen Record	
Inside diameter of casing	6¼"
Total length of casing	231
Type of screen	Johnson 6" - 10 slot
Length of screen	4' with 7'4" 6" Pipe
Depth to top of screen	228'8"
Diameter of finished hole	6¼"

Pumping Test	
Static level	175'
Test-pumping rate	6 G.P.M.
Pumping level	222'
Duration of test pumping	4 hours
Water clear or cloudy at end of test	clear
Recommended pumping rate	6 G.P.M.
with pump setting of	225' feet below ground surface

Well Log / **Water Record**

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Top soil	0	2		
Brown sandy clay and gravel	2	20		
Grey sandy clay and gravel	20	75		
Fine grey sand and clay	75	110		
Fine grey sand and water	110	160		
Grey sandy clay	160	230		
Coarse black water sand & clay	230	235		
Grey clay and stones	235	240	231-235'	Fresh untested.

For what purpose(s) is the water to be used? Farm

Is well on upland, in valley, or on hillside? Upland

Drilling or Boring Firm: Faulkner Well Drilling Co. Ltd.

Address: 687 Water St. Peterborough, Ont.

Licence Number: 2202

Name of Driller or Borer: Allan Taylor

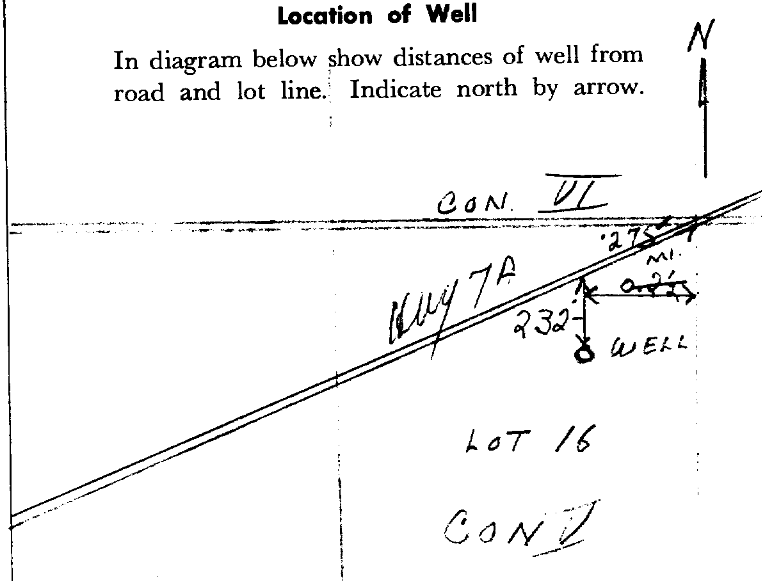
Address: R.R. No. 4 Peterborough, Ont.

Date: May 14th. 1966

G. Faulkner
(Signature of Licensed Drilling or Boring Contractor)

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



CSS.S8

Form 7 15M-60-4138

OWRC COPY

Ontario | Ministry of the Environment

Well Tag No. (Place Sticker and/or Print Below): **A 061108**
A 061108

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Imperial Units

Well Owner's Information

First Name	Last Name	E-mail Address	
Century Home & Garden Greenhouses			☐ Well Constructed by Well Owner

Mailing Address (Street Number/Name, RR)	Municipality	Province	Postal Code	Telephone No. (inc. area code)

Part A Construction and/or Major Alteration of a Well

Address of Well Location (Street Number/Name, RR)	Township	Lot	Concession
#1431 Hwy 7A	Scugog - Reach	15	5

County/District/Municipality	City/Town/Village	Province	Postal Code
Durham	Port Perry	Ontario	

UTM Coordinates	Zone	Easting	Northing	GPS Unit Make	Model	Mode of Operation
NAD 83	17	6 [illegible] 26	33 4 88 369 17	MAGELLAN	MERIDIAN	☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Overburden and Bedrock Materials (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (Metres) From	To
GREY	SANDY CLAY		SOFT	0'	63'
BROWN	FINE SAND		LOOSE	63'	68'
GRAY	GRAVELY	SAND/FINE	LOOSE	68'	74'
GREY	CLAY		DENSE	74	110
GREY	SILT		SOFT	110	114
GREY	CLAY		DENSE	114	148
GREY	SILT	FINE SAND	SOFT	148	153
GREY	CLAY		DENSE	153	175
			#10 SCREEN - 3'	75'	72'

Annular Space/Abandonment Sealing Record

Depth Set at (Metres) From	To	Type of Sealant Used (Material and Type)	Volume Placed (Cubic Metres)
0	20'	BENTONITE SLURRY	

Results of Well Yield Testing

Check box if after test of well yield, water was: BROWN WATER
☐ Clear and sand free
☐ Cannot develop to sand-free state

If pumping discontinued, give reason:

Pumping test method:

Pump intake set at (Metres): 72

Pumping rate (Litres/min): 5 GPM TILL 45 min / 4 AT 45 min

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (Metres): 55.2

Recommended pump type: ☐ Shallow ☐ Deep

Recommended pump depth: ____ Metres

Recommended pump rate (Litres/min):

If flowing give rate (Litres/min):

Draw Down Time (Min)	Water Level (Metres)	Recovery Time (Min)	Water Level (Metres)
Static Level	20.5	Static Level	
1	27.0	1	
2	27.8	2	
3	29.2	3	
4	32.4	4	
5	35.0	5	
10	40.1	10	
15	47.7	15	
20	57.1	20	
25		25	
30	64.8	30	4 GPM / AT INTAKE
40		40	
50		50	
60	55.2	60	

Method of Construction

☐ Cable Tool ☐ Rotary (Conventional) ☐ Rotary (Reverse) ☒ Rotary (Air) ☐ Air percussion ☐ Other, specify ☐ Diamond ☐ Jetting ☐ Driving ☐ Digging ☐ Boring

Water Use

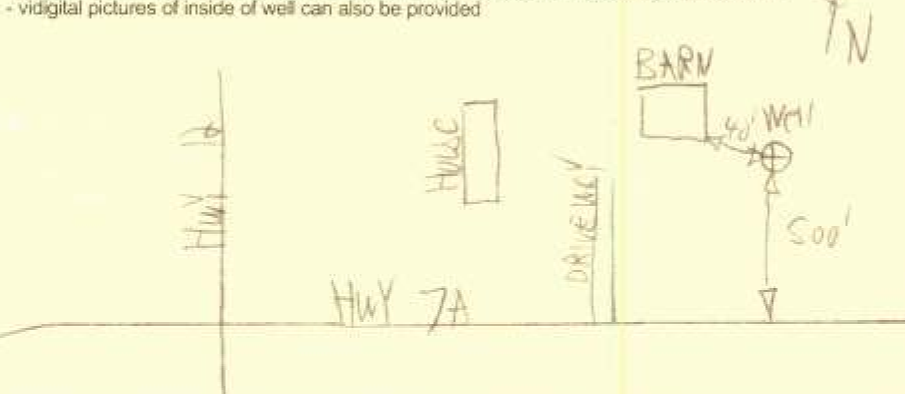
☐ Public ☒ Domestic ☐ Livestock ☐ Irrigation ☐ Industrial ☐ Other, specify ☐ Commercial ☐ Municipal ☐ Test Hole ☐ Cooling & Air Conditioning ☐ Not used ☐ Dewatering ☐ Monitoring

Status of Well

☒ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Other, specify

Location of Well

Please provide a map below showing:
- all property boundaries, and measurements sufficient to locate the well in relation to fixed points,
- an arrow indicating the North direction
- detailed drawings can be provided as attachments no larger than legal size (8.5" by 14")
- vidigital pictures of inside of well can also be provided



Date Well Completed (yyyy/mm/dd)	Was the well owner's information package delivered?	Date the Well Record and Package Delivered to Well Owner (yyyy/mm/dd)
2008 04 06	☐ Yes ☐ No	

Water Details

Water found at Depth	Kind of Water
75' Metres ☐ Gas	☒ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals
Metres ☐ Gas	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals

Casing Used	Screen Used
☐ Galvanized	☐ Galvanized
☒ Steel	☒ Steel
☐ Fibreglass	☐ Fibreglass
☐ Plastic	☐ Plastic
☐ Concrete	☐ Concrete

No Casing and Screen Used

☐ Open Hole

Disinfected? ☒ Yes ☐ No

Casing and Well Details

- Diameter of the Hole (Centimetres): 6
- Depth of the Hole (Metres): 75
- Wall Thickness (Metres): .188
- Inside Diameter of the Casing (Metres): 6
- Depth of the Casing (Metres): 72

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
WILSON'S WATER WELLS	5 4 5 9

Business Address (Street No./Name, number, RR)	Municipality
12737 HWY 48 STOUFFVILLE	

Province	Postal Code	Business E-mail Address
ONTARIO	L4A 7X3	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
905 640 4261	OBRIEN MICHAEL

Well Technician's Licence No.	Signature of Technician	Date Submitted (yyyy/mm/dd)
2 5 1 1 6	M. O'Brien	2008 04 17

Ministry Use Only

Audit No.	Well Contractor No.
Z75662	

Date Received (yyyy/mm/dd)	Date of Inspection (yyyy/mm/dd)
MAY 06 2008	

Remarks:

Ontario — Ministry of the Environment and Climate Change

Well Tag No. *(Place Sticker and/or Print Below)* A231171

Well Record

Regulation 903 Ontario Water Resources Act

Page 1 of 1

[redacted]

Measurements recorded in: ☐ Metric ☑ Imperial

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
Hwy 7E	Port Perry	15	5

County/District/Municipality	City/Town/Village	Province	Postal Code
Durham	Reach Albert	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	666474	4883558		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Clay	Stones	Soft, Sticky	0	36
Brown	Fine Sand	Silt	Loose	36	47
Brown	Clay	Stones	Soft	47	53
Grey	Fine Sand	Silt	Loose	53	74
Grey	Coarse Sand	Gravel	Hard	74	82

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	20	Bentonite Slurry	7.86

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☒ Other, *specify* Air Dual Rotary

Well Use

☐ Public ☐ Commercial ☐ Not used
☒ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify*

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6	Steel	.188	0	76

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
5	Stainless Steel	10	76	82

Status of Well

☒ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify*
☐ Other, *specify*

Water Details

Water found at Depth (m/ft)	Gas	Kind of Water	Other, *specify*
74	☐	☐ Fresh ☒ Untested	
	☐	☐ Fresh ☐ Untested	
	☐	☐ Fresh ☐ Untested	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	82	6
0	20	10

Results of Well Yield Testing

After test of well yield, water was:
☒ Clear and sand free
☐ Other, *specify*

If pumping discontinued, give reason:

Pump intake set at (m/ft): 70

Pumping rate (l/min / GPM): 10

Duration of pumping: 1 hrs + ____ min

Final water level end of pumping (m/ft): 43.3

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft): 70

Recommended pump rate (l/min / GPM): 15

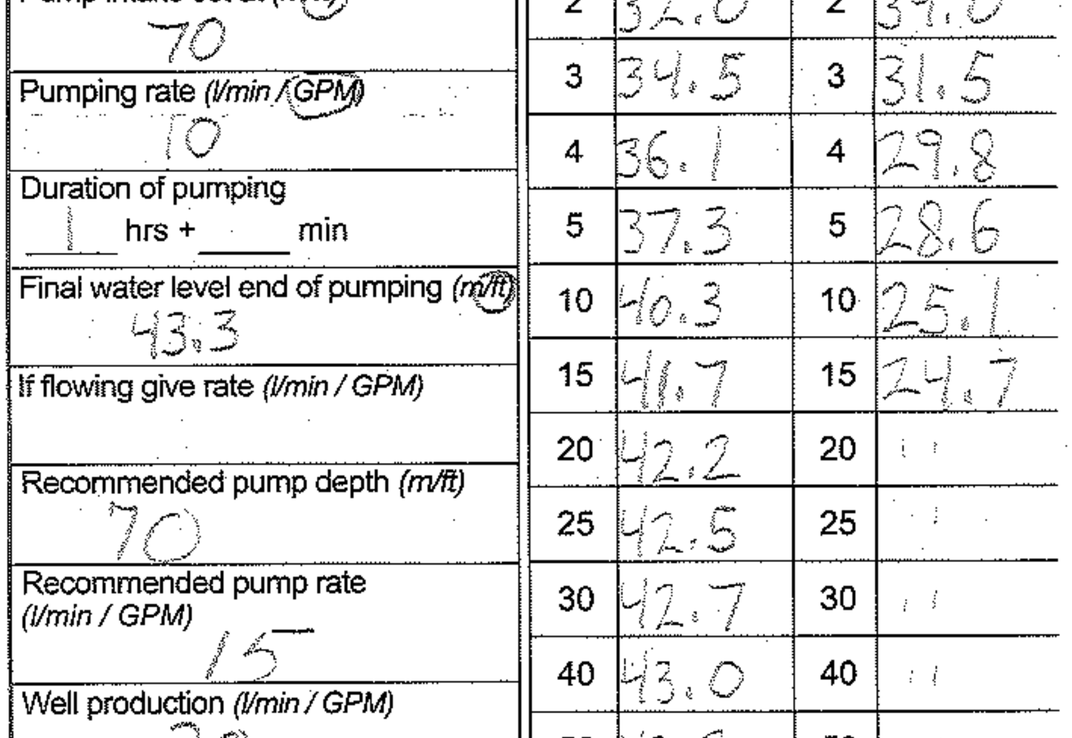
Well production (l/min / GPM): 20

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	24.7		
1	28.7	1	37.7
2	32.0	2	34.0
3	34.5	3	31.5
4	36.1	4	29.8
5	37.3	5	28.6
10	40.3	10	25.1
15	41.7	15	24.7
20	42.2	20	"
25	42.5	25	"
30	42.7	30	"
40	43.0	40	"
50	43.2	50	"
60	43.3	60	"

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

200 PPm 100 PPm Residule 14 Hrs

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Wilson's Water Wells LTD	5459

Business Address (Street Number/Name)	Municipality
13787 Hwy 48	Stouffville

Province	Postal Code	Business E-mail Address
ON	L4A3B3	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
9056404369	Hinves, Jesse

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3662		2019 09 06

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☒ Yes ☐ No	2019 09 05	2019 09 05

Ministry Use Only

Audit No. Z304021

SEP 25 2019

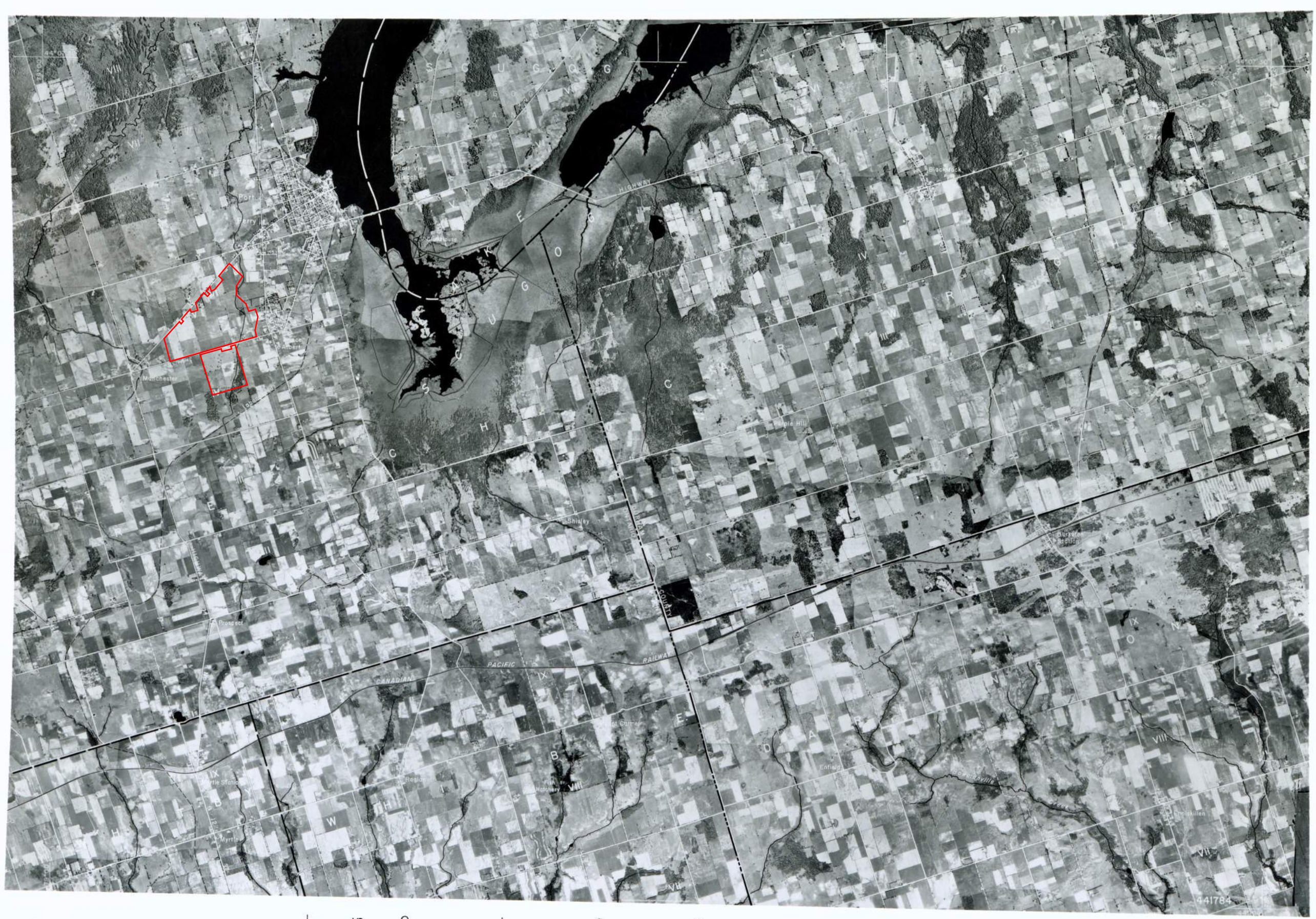
Received

0506E (2014/11)

Contractor's Copy

Appendix D

Aerial Photographs

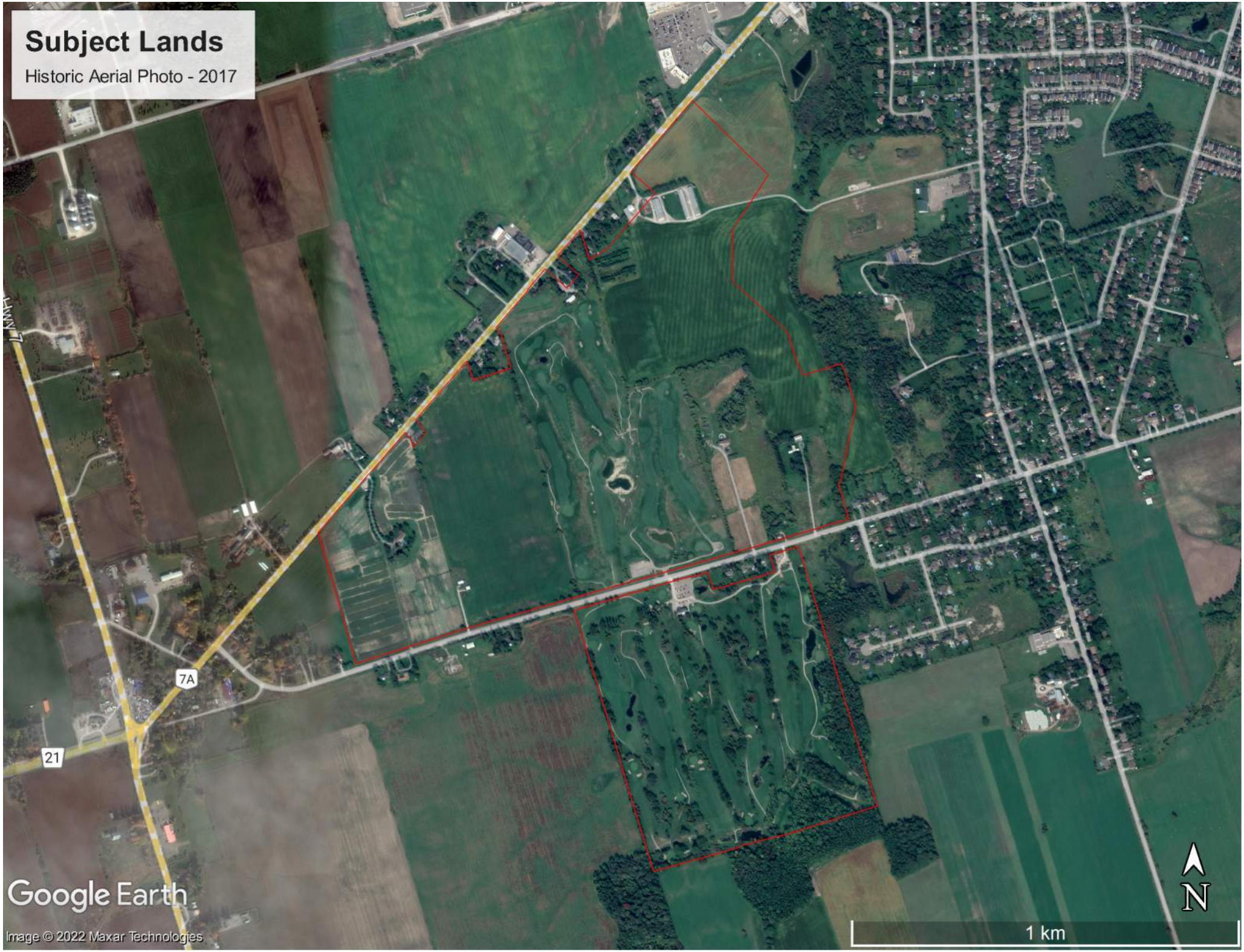

S C U G O G
Port View Beach
Port Perry
Prince Albert
Manchester
HIGHWAY
Blackstock
Purple Hill
Shirley
Burketon Station
Prospect
CANADIAN PACIFIC RAILWAY
COUNTY
Mount Carmel
Raglan
Myrtle Station
Myrtle
Enfield
Enniskillen
VII
VIII
IX
441784
Miles. 1 1/2 0 1 2 3 4 5 Miles.


Subject Lands
Historic Aerial Photo - 2005
HWY 7
7A
21
Google Earth
Image © 2022 First Base Solutions
N
1 km


Subject Lands
Historic Aerial Photo - 2009
HWY 7
7A
21
Google Earth
Image © 2022 CNES / Airbus
N
1 km


Subject Lands
Historic Aerial Photo - 2012
HWY 7
7A
21
Google Earth
Image © 2022 Maxar Technologies
N
1 km


Subject Lands
Historic Aerial Photo - 2016
HWY 7
7A
21
Google Earth
Image © 2022 Maxar Technologies
N
1 km


Subject Lands
Historic Aerial Photo - 2017
Hwy 7
7A
21
Google Earth
Image © 2022 Maxar Technologies
N
1 km


Subject Lands
Historic Aerial Photo - 2021
7A
21
Google Earth
Image © 2022 Maxar Technologies
N
1 km


Subject Lands
Historic Aerial Photo - 2022
TWN 7
7A
21
Google Earth
Image © 2022 Maxar Technologies
N
1 km