MUNICIPALITY OF SOUTH BRUCE

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT FOR A NEW WATER STORAGE FACILITY (COMMUNITY OF TEESWATER)

PROJECT FILE REPORT

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MUNICIPALITY OF SOUTH BRUCE

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT FOR EXPANSION OF A NEW WATER STORAGE FACILITY (COMMUNITY OF TEESWATER)

PROJECT FILE REPORT

May 14, 2025

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File No. 21240

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List of Acronyms

ANSI	Areas of Natural and Scientific Interest
ASP	Archaeological Screening Process
ATRIS	Aboriginal and Treaty Rights Information System
BMROSS	B. M. Ross and Associates Limited
DGR	Deep Geologic Repository
DWS	Drinking Water System
DWWP	Drinking Water Works Permit
EA Act	Environmental Assessment Act
ERU	Equivalent Residential Unit
ESA	Endangered Species Act
ESR	Environmental Screening Report
GUDI	Groundwater Under Direct Influence
HSM	Historic Saugeen Metis
MCEA	Municipal Class Environmental Assessment
MCM	Ministry of Citizenship and Multiculturalism
MDD	Maximum Day Demand
MDWL	Municipal Drinking Water Licence
MECP	Ministry of Environment, Conservation and Parks
MNRF	Ministry of Natural Resources and Forestry
NHIC	Natural Heritage Information Centre
OP	Official Plan
PIC	Public Information Centre
PPS	Provincial Policy Statement
PPU	Persons Per Unit
PTTW	Permit to Take Water
SARA	Species at Risk Act
SON	Saugeen Ojibway Nation
SVCA	Saugeen Valley Conservation Authority
WHPA	Well Head Protection Area

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MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT FOR A NEW WATER STORAGE FACILITY (COMMUNITY OF TEESWATER)

1.0 INTRODUCTION

1.1 Project Introduction

The Municipality of South Bruce initiated a Municipal Class Environmental Assessment (MCEA) process to investigate options for resolving existing water storage deficiencies within the community of Teeswater. The study process followed the procedures set out in the Municipal Class Environmental Assessment document, dated, 2000, as amended in 2007, 2011, 2015, 2023, (Municipal Engineers Association, 2024). The purpose of this report is to document the planning and preliminary design process followed during the MCEA investigation to select a preferred alternative for the project. B. M. Ross and Associates Limited (BMROSS) was engaged to conduct the MCEA on behalf of the Municipality of South Bruce.

The Teeswater Drinking Water System (DWS) is a municipal drinking water system, supplied by a groundwater well. It services approximately 1,030 residents in the community of Teeswater. The Teeswater DWS currently does not include any water storage infrastructure. Current Ministry of Environment, Conservation and Parks (MECP) Design Guidelines for Drinking Water Systems - 2008 recommend including water storage facilities for peak flow equalization, fire flow protection, and emergencies.

The purpose of this report is to document the MCEA planning and design process followed for this project. This report includes the following major components:

- A description of the project area and environmental setting.
- A description of the existing water system and identified deficiencies.
- A description of the alternative solutions considered for resolving the identified problems.
- A synopsis of public consultation and decision-making process conducted to select a preferred alternative; and
- A detailed description of the preferred alternative.

1.2 MCEA Process

Municipalities must adhere to the Environmental Assessment Act of Ontario (EA Act) when completing road, sewer or waterworks activities. The Act allows the use of the Municipal Class Environmental Assessment process for most types of municipal infrastructure projects. A MCEA is an approved planning document which describes the process that proponents must follow in order to meet the requirements of the EA Act. The MCEA approach allows for the evaluation of alternatives to a project, and alternative methods of carrying out a project, and identifies potential environmental impacts. The process involves mandatory requirements for consultation. MCEA studies are a method of dealing with projects that include the following common characteristics:

- They are recurring.
- They are usually similar in nature.
- They are usually limited in scale.
- They have a predictable range of environmental effects.
- They are responsive to mitigating measures.

If a MCEA planning process is followed, a proponent does not have to apply for formal approval under the EA Act. The development of this investigation has followed the procedures set out in the MCEA. Figure 1.1 presents a graphical outline of the procedures. The MCEA planning process is divided into the following phases:

- Phase 1 – Problem identification.
- Phase 2 – Evaluation of alternative solutions to the defined problems and selection of the preferred solution.
- Phase 3 – Identification and evaluation of alternative design concepts and selection of a preferred design concept.
- Phase 4 – Preparation and submission of an Project File Report for public and government agency review.
- Phase 5 – Implementation of the preferred alternative and monitoring of any impacts.

Throughout the MCEA process, proponents are responsible for having regard for these principles of environmental planning:

- Consultation with affected parties throughout the process.
- Examination of a reasonable range of alternatives.
- Consideration of effects on all aspects of the environment.
- Application of a systematic methodology for evaluating alternatives.
- Clear documentation of the decision-making process to permit traceability.

Figure 1.1 Municipal Class Environmental Assessment Process

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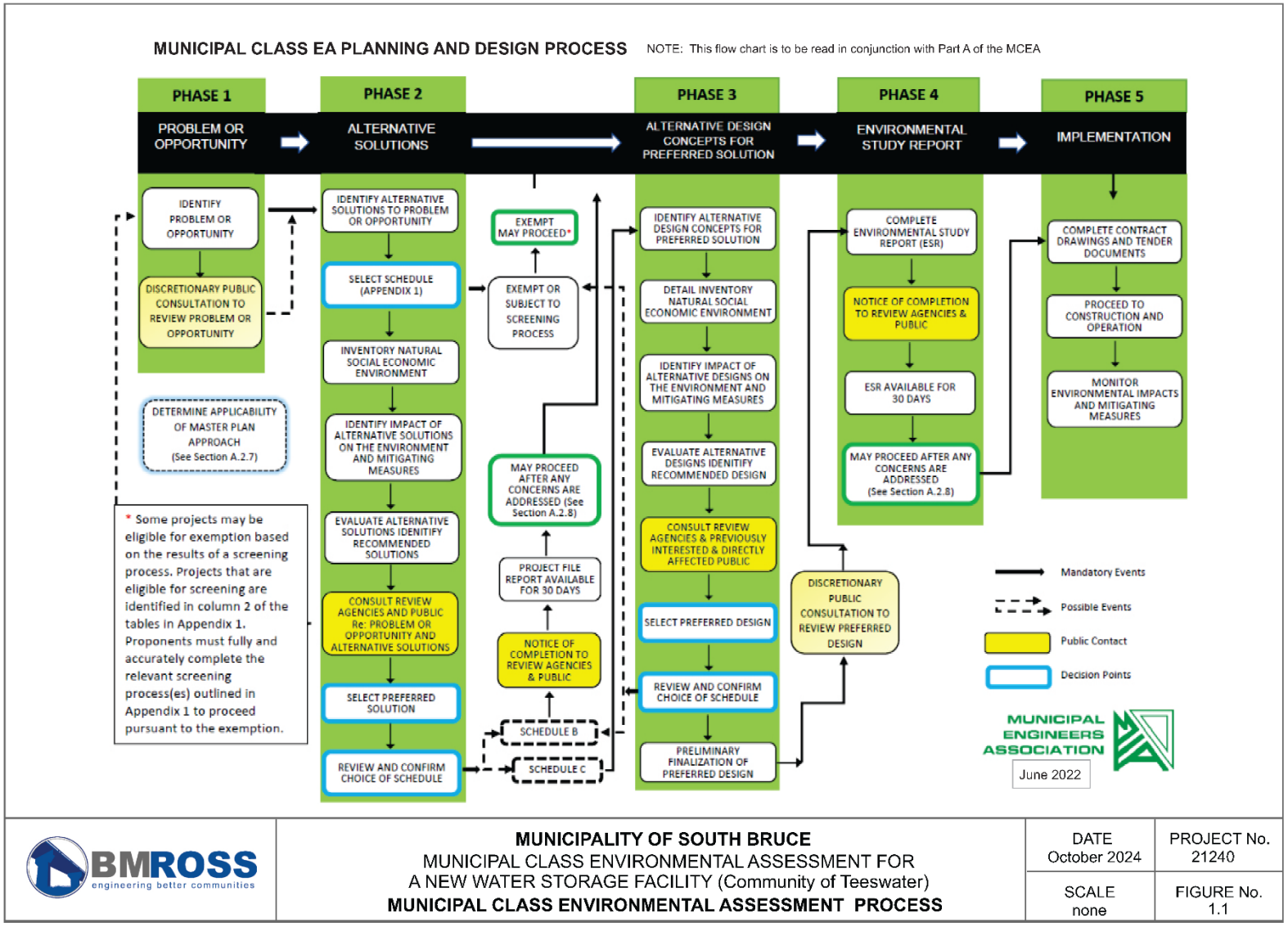


BMROSS engineering better communities	**MUNICIPALITY OF SOUTH BRUCE** MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT FOR A NEW WATER STORAGE FACILITY (Community of Teeswater) **MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PROCESS**	DATE October 2024	PROJECT No. 21240
		SCALE none	FIGURE No. 1.1

1.3 Classification of Project Schedules

Projects are classified into different project schedules according to the potential complexity and the degree of environmental impacts that could be associated with the project. The following schedules are included in the MCEA process:

- Exempt and exempt following completion of the archaeological potential screening and/or collector road screening.
- Schedule B – Projects that are approved following the completion of a screening process that incorporates Phase 1 and 2 of the MCEA process as a minimum.
- Schedule C – Projects that are approved subject to following the full MCEA process.

The MCEA process is self-regulating, and municipalities are expected to identify the appropriate level of environmental assessment based upon the project and alternatives they are considering.

1.4 Project File Report

A Project File Report provides documentation of the decision-making process followed by the proponent of a project. Included in a Project File Report are the following:

- A description of the problem or opportunity;
- Pertinent background information;
- The rationale for the selection of the preferred solution;
- Descriptions of the environmental considerations and impacts;
- Mitigating measures that will be undertaken to minimize environmental effects;
- A description of the consultation process; and
- A description of any monitoring programs to be carried out during the construction phase.

Upon completion, the Project File Report is made available to the public and review agencies for a period of 30 calendar days.

1.5 Mechanism to Request a Higher Level of Environmental Assessment

Under the terms of the MCEA, the requirements to prepare an Individual Environmental Assessment for approval is waived. However, if it is found that a project going through the MCEA process has associated with it significant environmental impacts, a person/party may request that the proponent voluntarily elevate the project to a higher level of environmental assessment. A request may be made to the MECP for an order requiring a higher level of study, or that a condition be imposed on the grounds that the requested order may prevent, mitigate or remedy adverse impacts on Aboriginal and treaty rights. Requests made to the Ministry on other grounds will not be considered.

2.0 BACKGROUND REVIEW

2.1 Methodology

A background review was carried out to obtain a general characterization of the project study area and to identify factors that could influence the selection of alternative solutions to the defined problem.

The background review for this MCEA process incorporated the following activities:

- Assembly of information on the existing infrastructure and the environmental setting.
- Identification of infrastructure deficiencies within the system.
- Preliminary assessment of the defined deficiencies and potential remediation.

A desktop analysis of the project setting was completed as part of the background review process. The following represents the key sources of information for this analysis:

- BMROSS files and related studies
- Bruce County GIS Mapping Services (Bruce County, 2023)
- Government of Canada, Species at Risk Public Registry website (Government of Canada, 2024).
- Ministry of Natural Resources and Forestry, Natural Heritage Information Centre website (Ministry of Natural Resources, 2023)
- Atlas of Breeding Birds of Ontario website (Bird Studies Canada, 2024).
- Saugeen, Grey Sauble, North Bruce Peninsula Source Protection Assessment Report (Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Region, 2015)
- Municipality of South Bruce, Official Plan (OP) (The Municipality of South Bruce, 2023) and Zoning By-Law (The Corporation of the Municipality of South Bruce, 2024).

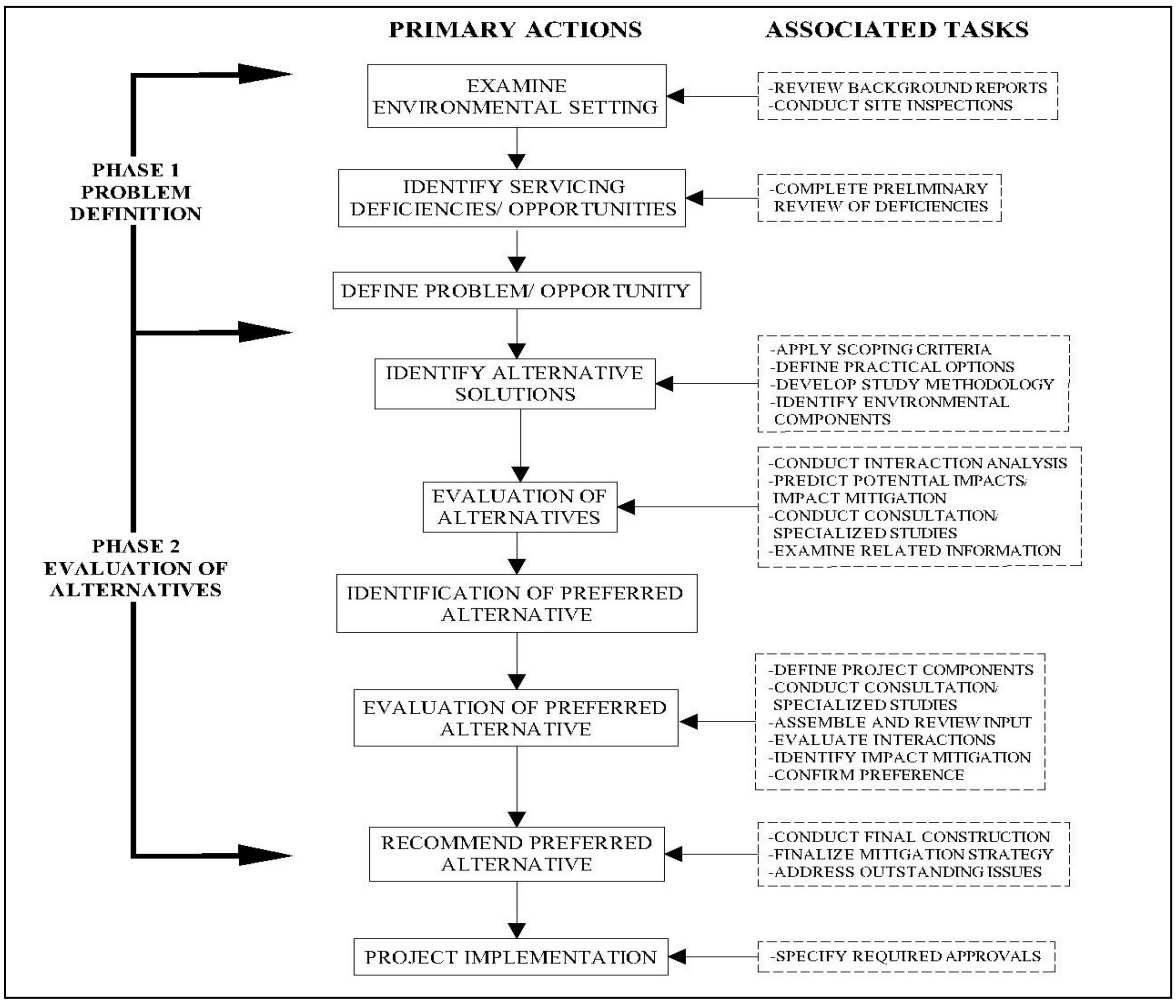
2.2 General MCEA Approach

The Municipality initiated the formal MCEA process in April 2024 to define and evaluate the impacts associated with the establishment of a water storage facility in the community of Teeswater. At the outset of the project, the Municipality was also investigating potential sites for an additional water supply well. Given this, the MCEA requirements for Schedule B projects was identified as the appropriate process. The assessment followed the environmental screening process prescribed for Schedule B projects in the MCEA document. The Schedule B screening process incorporates the following primary components:

- Background review.
- Problem/opportunity definition.
- Identification of practical solutions.
- Evaluation of alternative solutions.
- Selection of a preferred alternative solution and implementation.

Figure 2.1 illustrates the general tasks associated with the screening process. The following section of this report document the findings associated with each stage of the assessment.

Figure 2.1 MCEA Process and Tasks for Schedule B Activities



2.3 General Description of the Study Area

2.3.1 Municipality of South Bruce

The Municipality of South Bruce was established in 1999 as a result of a municipal restructuring that amalgamated the former townships of Mildmay–Carrick and Teeswater-Culross. It is located in the southeastern corner of the County of Bruce. The primary settlement area within the Municipality is Mildmay. Secondary urban communities include Teeswater and Formosa. There are also a number of hamlets throughout the rural areas of the Municipality, including Belmore and Carlsruhe. The Municipality is bordered by the Municipality of Brockton to the north, Township of Huron-Kinloss to the west, Municipality of West Grey in Grey County to the east, and Municipality of Morris-Turnberry and Township of Howick to the south in Huron County.

Prominent natural features in the municipality include the Teeswater River, Greenock Swamp Wetland Complex, and Saugeen Conservation Reserve.

2.3.2 Study Area – Community of Teeswater

The community of Teeswater is situated at the intersection of Bruce Road 4 (Clinton Street) and Bruce Road 6 (Hillcrest Street). Both Bruce Road 4 and Bruce Road 6 are the main arteries for vehicle traffic into and out of the community. The streets within the community follow a grid street plan creating a rectangular-shaped community, with a central commercial core along Bruce Road 4 and peripheral suburban residential neighborhoods. The residential neighborhoods are low-density consisting primarily of single detached houses. The community includes two elementary schools, community centre, and several industries. Future development lands are generally found on the west side of the community.

The Teeswater River bisects the community, north of Bruce Road 6. Based on the 2021 Census the population of Teeswater is 1,030 persons with 484 private dwellings (Government of Canada, 2024). The community is serviced by municipal-operated water and wastewater systems. Figure 2.2 illustrates the location of Teeswater within the southwestern portion of the Municipality of South Bruce.

2.4 Environmental Setting

2.4.1 General Physiography

The community of Teeswater is found within the physiographic region known as the Teeswater Drumlin Field (Chapman & Putnam, 1984). This area includes lands within Bruce, Grey, Huron, Perth, and Wellington counties and is characterized by low drumlins consisting of loamy till, intersected by large meltwater river valleys. These valleys are associated with terraces consisting of sand and gravel. The soils in this region are generally well-drained Harriston or imperfectly drained Listowel series soils (Chapman & Putnam, 1984).

2.4.2 Natural Heritage Features

The study area includes the community of Teeswater, which is adjacent to the Teeswater River. The Teeswater River is approximately 90 km in length and the watershed encompasses approximately 680 m^2**.** It drains generally north, from Teeswater, with an outlet to the Saugeen River at Paisley. The river has a cold/cool thermal regime and is a habitat for smallmouth bass, northern pike, white crappie, pugnose shiners, and rainbow mussels.

A desktop review of sensitive natural heritage features in the vicinity of the project area was carried out through the course of the MCEA process. The Ontario Ministry of Natural Resources and Forestry's (MNRF) Natural Heritage Information Centre (NHIC) database was consulted to determine the presence or potential for any significant natural features within the general vicinity of Teeswater. From this database, no significant natural areas were identified within the community of Teeswater.

Figure 2.2 Study Area – Municipality of South Bruce and Teeswater

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STUDY AREA - MUNICIPALITY OF SOUTH BRUCE & COMMUNITY OF TEESWATER

DATE	PROJECT No.
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As Shown	2.2

2.4.3 Wetlands

The Natural Heritage Area mapping tool provided by the MNRF was consulted to determine if there are any wetlands within or adjacent to the project study area (the community of Teeswater). The NHIC database was consulted, and no significant wetlands were identified within the community of Teeswater. It is noted that there is the Teeswater Wetland Complex, an evaluated wetland, located 2.5 km west of the study area. Additionally, there is the Greenock Swamp a significant provincial wetland located 4.6 km northwest of the study area. There will be low to no impact on the Teeswater wetland and Greenock Swamp given their distance from the study area. See Figure 2.3 for the location of the natural heritage features.

2.4.4 Areas of Natural and Scientific Interest (ANSI)

The MNRF has identified significant natural features that are representative of significant terrestrial and geological features within the landscape. These features include wetlands, woodlands, and geologic formations. These areas, known as Areas of Natural and Scientific Interest (ANSI), are designated by the province and can be regionally or provincially significant. ANSI's take two forms; Earth Science, which is representative of significant landforms, and Life Science, which is representative of significant terrestrial features within the landscape such as wetlands and woodlands. The MNRF recommends that development in areas adjacent to ANSI consider impacts on the natural feature or their ecological function.

There are no ANSIs within the community of Teeswater or within the local (5 km) vicinity.

2.4.5 Species at Risk

As part of the background review, a desktop evaluation to determine the likelihood of the presence of significant species and their associated habitats within the study was conducted.

The following federal and provincial legislation directs the protection of species at risk and their associated habitats:

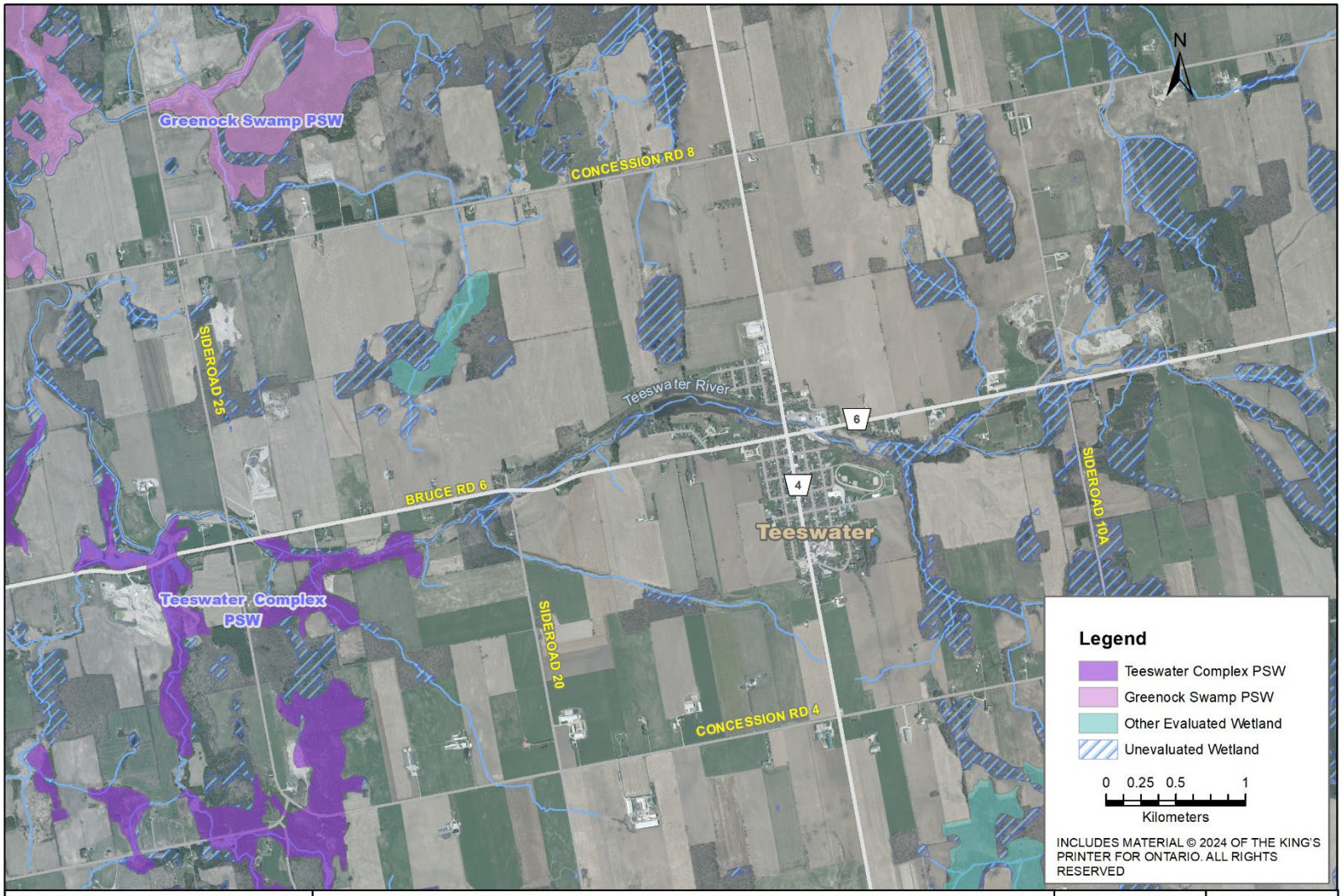
- The Federal *Species at Risk Act, 2002* (SARA) provides for the recovery and legal protection of listed wildlife species and associated critical habitats that are extirpated, endangered, threatened, or of special concern and secures the necessary actions for their recovery on lands that are federally owned. Only aquatic species, and bird species included in the *Migratory Birds Convention Act, 1994* are legally protected on lands not federally owned; and

- The Provincial *Endangered Species Act, 2007* (ESA) provides legal protection for endangered and threatened species and their associated habitat in Ontario. Under the legislation, measures to support their recovery are also defined.

A number of sources were consulted for the information related to the occurrence of species at risk and their associated habitats. The sources are listed below. A summary of the federally and provincially recognized species with the potential to be present within the project study area (community of Teeswater) are listed in Table 2.1.

- Natural Heritage Information Centre, *Make a Natural Heritage Map* (Ministry of Natural Resources, 2023).
- Environment Canada, Species at Risk Public Registry. SARA Schedule 1 Species List (Government of Canada, 2024)
- Federal Species at Risk Public Registry (Government of Canada, 2024)
- Species at Risk in Ontario (MNRF)

Figure 2.3 Natural Heritage Features



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A NEW WATER STORAGE FACILITY (Community of Teeswater)
NATURAL HERITAGE FEATURES

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As Shown	2.3

- Ontario's Butterfly Atlas (Toronto Entomologists' Association, 2024)
- Ontario's Breeding Bird Atlas (Bird Studies Canada, 2024)
- MNRF Mapping Tool – 17TMJ77 (Ministry of Natural Resources, 2023)
- Aquatic Species at Risk Mapping Tool (Department of Fisheries and Oceans Canada, 2024)
- Ontario Reptiles and Amphibian Atlas (Toronto Entomologists' Association , 2024)
- Atlas of the Mammals of Ontario (Jon (Sandy) Dobbyn, 1966)
- iNaturalist (Canadian Wildlife Federation , 2024)

Table 2.1 Species at Risk within General Study Area

Type	Common Name	Scientific Name	Federal Status	Provincial Status	Habitat Impact Likelihood
Bird	Acadian Flycatcher	*Empidonax virescens*	Endangered	Endangered	Low
Bird	Bald Eagle	*Haliaeetus leucocephalus*	Not at Risk	Special Concern	Low
Bird	Bank Swallow	*Riparia riparia*	Threatened	Threatened	Low
Bird	Barn Swallow	*Hirundo rustica*	Threatened	Threatened	Low
Bird	Black Tern	*Chlidonias niger*	Not at Risk	Special Concern	Low
Bird	Bobolink	*Dolichonyx oryzivorus*	Threatened	Threatened	Low
Bird	Canada Warbler	*Cardellina canadensis*	Threatened	Special Concern	Low
Bird	Chimney Swift	*Chaetura pelagica*	Threatened	Threatened	Low
Bird	Common Nighthawk	*Chordeiles minor*	Threatened	Special Concern	Low
Bird	Eastern Meadowlark	*Sturnella magna*	Threatened	Threatened	Low
Bird	Eastern wood-pewee	*Contopus virens*	Special Concern	Special Concern	Low
Bird	Peregrine Falcon	*Falco peregrinus*	Not on Schedule 1	Special Concern	Low
Bird	Prothonotary Warbler	*Protonotaria citrea*	Endangered	Endangered	Low
Bird	Short-Eared Owl	*Asio flammeus*	Special Concern	Threatened	Low
Bird	Whip-poor-will	*Antrostomus vociferus*	Threatened	Threatened	Low
Bird	Wood Thrush	*Hylocichla mustelina*	Threatened	Special Concern	Low
Insect	Yellow-breasted Chat	*Icteria virens*	Not at Risk	Endangered	Low

Type	Common Name	Scientific Name	Federal Status	Provincial Status	Habitat Impact Likelihood
Insect	Monarch	*Danaus plexippus*	Endangered	Special Concern	Low
Mammal	Eastern Small-footed Myotis	*Myotis leibii*	-	Endangered	Low
Mammal	Little Brown Bat	*Myotis lucifugus*	Endangered	Endangered	Low
Mammal	Northern Myotis	*Myotis septentrionalis*	Endangered	Endangered	Low
Mammal	Tri-colored Bat	*Perimyotis subflavus*	Endangered	Endangered	Low
Molluscs	Fawnsfoot	Truncilla donaciformis	Endangered	Endangered	Low
Molluscs	Rainbow	Villosa iris	Special Concern	Special Concern	Low
Plant	American Hart's Tongue Fern	Asplenium scolopendriumvar. Americanum	Special Concern	Special Concern	Low
Plant	Black Ash	Fraxinus nigra	Not on Schedule 1	Endangered	Potential
Reptile	Midland Painted Turtle	*Chrysemys picta marginata*	Special Concern	-	Low
Reptile	Snapping Turtle	*Chelydra serpentina*	Special Concern	Special Concern	Low

The above table represents potential species at risk that could be found in the general study area that encompasses the community of Teeswater. The evaluation of the site-specific potential for species at risk is included in Section 5.3.

2.4.6 Breeding Birds

The Atlas of Breeding Birds of Ontario (2001-2005) was used to identify the bird species with confirmed, probable, and possible breeding habitats in proximity to the study area. The study area is encompassed within the 100 km^2 square area identified by the Atlas as Square 17TMJ77, in Region 8: Bruce. Within the square, a total of 574 birds are confirmed to be breeding within the area, including at-risk species such as the *Empidonax virescens* (Acadian Flycatcher), *Hirundo rustica* (Barn Swallow), *Riparia riparia* (Bank Swallow), *Sturnella magna* (Eastern Meadowlark), *Dolichonyx oryzivorus* (Bobolink), *Chaetura pelagica (*Chimney Swift), *Chordeiles minor* (Common Nighthawk), *Contopus virens* (Eastern Wood-Pewee), and *Hylocichla mustelina* (Wood Thrush). An additional 282 species were categorized as having probable breeding status and 144 were considered to have possible breeding status in the area.

The survey area includes key habitats for the identified species, such as forests (in all stages of growth), riverine areas, agricultural areas, wetlands, and shoreline areas. The project area forms a relatively small portion of this region.

2.5 Source Water Protection

The study area is located within the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Region. The community of Teeswater is serviced by the Teeswater DWS, a municipally owned and operated groundwater supply system. The water supply system is composed of a singular artesian bedrock well-referred to as Well No. 1. The Well was constructed in 1996 at a depth of 85.3 m with a casing extending 25.9 metres. The aquifer is protected from surface water by an existing confining layer. The well is centrally located in the community, northeast of the intersection of Clinton Street North (Bruce Road 4) and Hillcrest Street East (Bruce Road 6). The well is located 20-30m south of the Teeswater River and beyond the 1:100-year floodplain, but within the regional storm flood line, according to flood mapping from Saugeen Valley Conservation Authority (SVCA). The well is not considered Groundwater Under Direct Influence (non-GUDI) based on water quality analysis and artesian (i.e., flowing) conditions. Existing Wellhead Protection Areas (WHPAs) are shown in Figure 2.3. The WHPAs extend southeast from the well. WHPA B, the two-year Time of Travel capture zone has a vulnerability score of 10 within the urban settlement area of Teeswater. Beyond that, the vulnerability score decreases to 8. The vulnerability cores of WHPAs C and D range from 2 to 6.

2.6 Archaeological Resources

The Ministry of Multiculturalism and Citizenship (MCM) checklist for Evaluating Archaeological Potential was completed following the identification of the preferred solution (see Section 5.3 and Appendix A). Given the potential for a site within 300 m of the Teeswater River, and the community as the site of an early European settlement, it was assumed a Stage 1-2 Archaeological Assessment would be required once a site was identified.

2.7 Built Heritage Resources and Cultural Heritage Landscapes

The MCM checklist for Evaluating the Potential for Built Heritage Resources and Cultural Heritage Landscapes was completed following the identification of the preferred solution (see Section 5.3 and Appendix A). There was low potential for built heritage resources and cultural heritage landscapes at the preferred site.

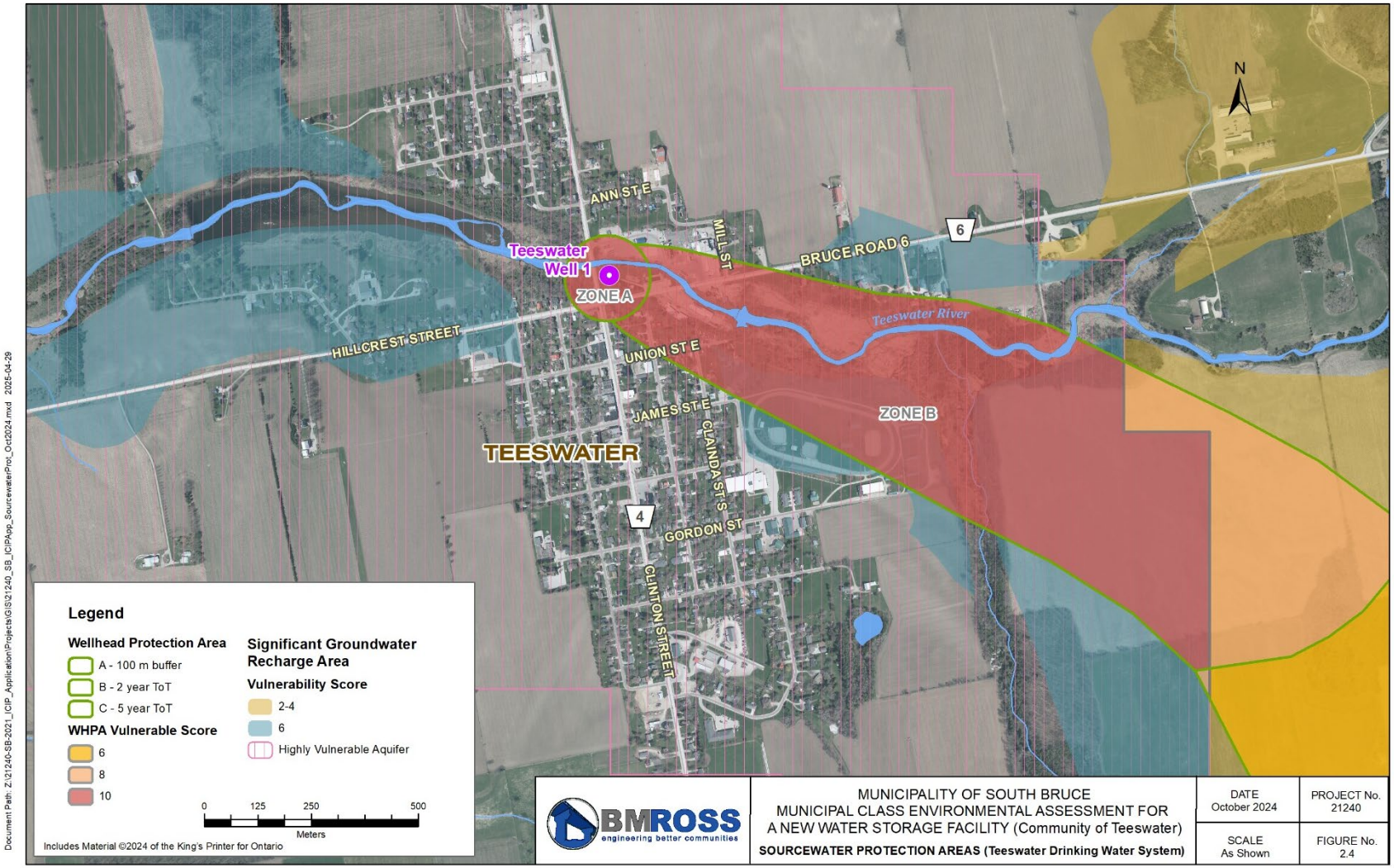
2.8 Planning Policy and Land Uses

2.8.1 Provincial Planning Statement

The 2024 Provincial Planning Statement (PPS) is the overarching planning and land use policy framework in Ontario. The PPS provides policy guidance on growth and development, as well as infrastructure, public facilities, and management of Ontario's natural and cultural resources. Local planning policies, such as official plans, are required to conform to the policies of the PPS. Generally, the PPS supports complete communities that accommodate a range and mix of housing types, land uses, public services facilities and employment lands, supported by the appropriate infrastructure.

Chapter 3 of the PPS contains policies relating to infrastructure and public facilities. The PPS states that infrastructure will be provided in an efficient manner, while accommodating the projected needs of the community. It also promotes coordinating and integrating infrastructure needs with land using planning and growth management efforts to ensure the infrastructure system are financially viable over their lifecycle and available to meet current and projected needs.

Figure 2.4 Source Water Protection Areas (Teeswater Drinking Water System)



Prior to the implementation of new infrastructure facilities, the PPS states that the use of existing facilities should be optimized, including any opportunities for adaptive re-use. It is noted that in Teeswater, there are no existing water storage infrastructure. New infrastructure should also be located strategically to support emergency management services and protection of public health and safety.

Water infrastructure, per section 3.6.1 of the PPS, should be planned to accommodate forecasted growth in a timely manner. The planning should also ensure that the services can be sustained by the water resources, are feasible and financially viable over their lifecycle, protect human health and safety, and align with municipal planning for services.

2.8.2 Land Uses

The study area includes the urban area of the community of Teeswater. The predominant land use within Teeswater is residential, including single detached, multi-unit, and apartment dwellings. Commercial uses are generally found along Clinton Street (Bruce County Road 4), from Gordon St. to Hillcrest St. E. Industrial uses include a milk processing plant, industrial laundry facilities, machine and tooling, and agricultural-related industries. There are two elementary schools located on the west side of the community. A community centre, fairground, and curling club are located on the east side of the village.

2.9 Air Quality, Dust and Noise

The study area includes residences and schools, which are considered sensitive receptors. There are no significant sources of dust or noise currently within the study area.

2.10 Contaminated Sites

The Teeswater-Culross Landfill, which is currently in operation is located approximately 2.5 km east of Teeswater. The location of the landfill is shown in Figure 2.5.

During preliminary geotechnical investigations looking at potential well sites in the southern portion of the Teeswater Fair Grounds, south of the grandstands, one borehole had a significant hydrocarbon odour, but no soil staining or free product was observed in the borehole. In the area north of the agricultural buildings in the northeast portion of the fairgrounds, construction materials (bricks, glass, metals) and hydrocarbon odour were encountered. This suggests the northeastern area of the fairgrounds may have been used as a landfill some time in the past.

2.11 Climate Change

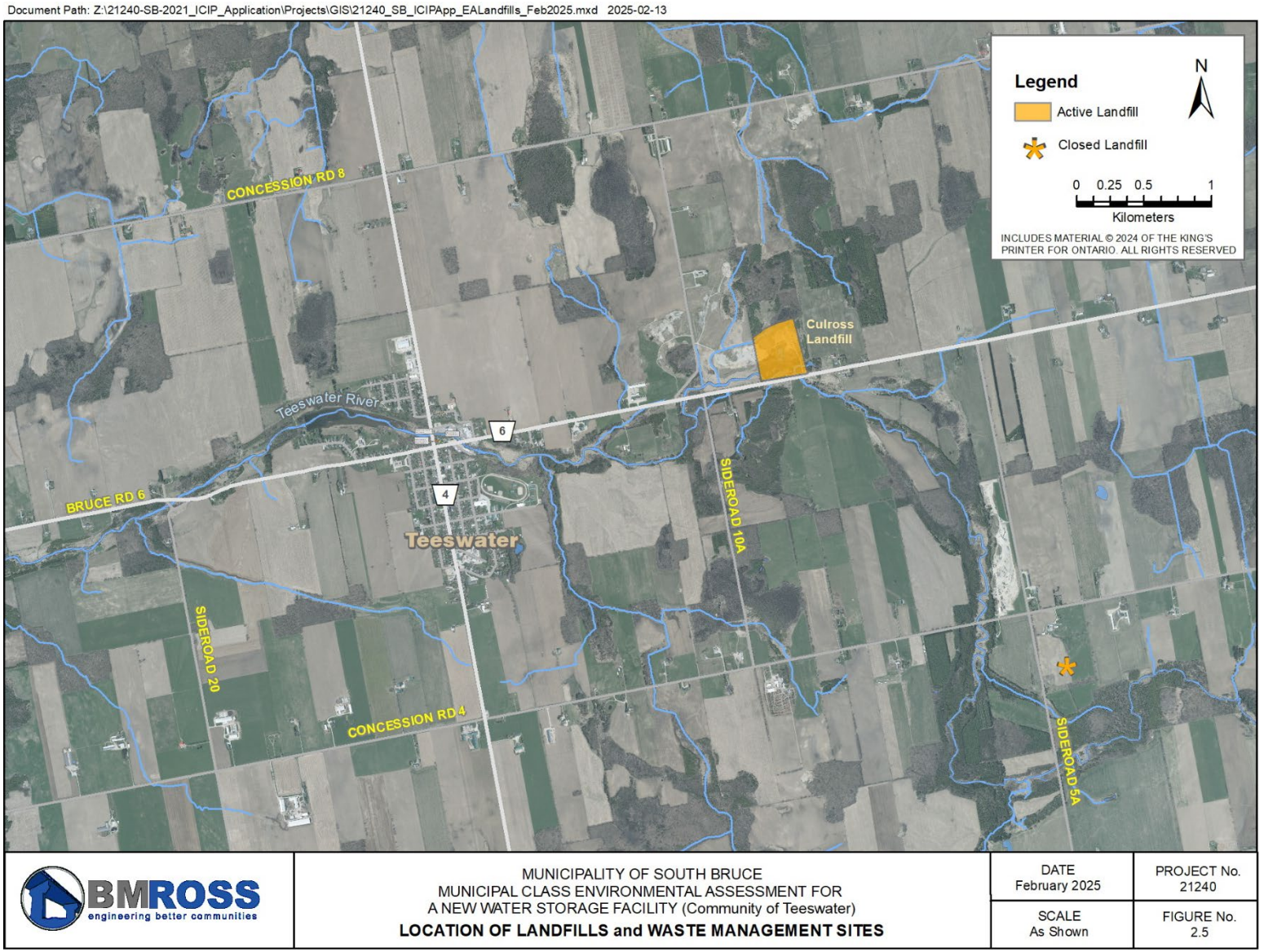
As part of the MCEA process, the impacts associated with climate change must be evaluated. Some of the phenomena associated with climate change that will need to be considered include:

- Changes in the frequency, intensity, and duration of precipitation, wind, and heat events.
- Changes in soil moisture.
- Changes in sea/lake levels.
- Shifts in plant growth and growing seasons; and
- Changes in the geographic extent of species ranges and habitats.

Two approaches can be utilized to address climate change in project planning. These are as follows:

1) Reducing a project's impact on climate change (climate change mitigation):
    a. Impact of greenhouse gas emissions related to the project.

Figure 2.5 Location of Landfills and Waste Management Sites



a. Are there alternative methods to completing the project that would reduce any adverse contributions to climate change?

2) Increasing the projects and local ecosystem's resilience to climate change (climate change adaptation):
    a. How vulnerable is the project to climate-related severe events?
    b. Are there alternative methods of carrying out the project that would reduce the negative impacts of climate change on the project?

The impacts of climate change are considered during the evaluation of alternatives (see Section 5.4).

3.0 TECHNICAL REVIEW

3.1 Water Infrastructure

The Teeswater water distribution system is supplied by one groundwater well (Well No. 1). The well is located in a small building, approximately 10 m south of a pumphouse and treatment building located on Clinton Street North. The well, drilled in 1996, is 200 mm in diameter and 85.3 m deep. The Teeswater well is an artesian well, capable of naturally providing water at 76 L/s. The Teeswater DWS operates under Drinking Water Works Permit (DWWP) No. 095-202, Issue No. 3, and Municipal Drinking Water License (MDWL) No. 095-102, Issue No. 3.

The pumphouse contains three high lift pumps and one emergency fire pump that distribute water to the system. The pumphouse is also equipped with a sodium hypochlorite disinfection system.

The water distribution system consists of approximately 11 km of watermains. The majority of the watermains are 150 mm in diameter. There are approximately 500 service connections, serving around 1,030 people. There is currently no treated water storage in Teeswater, and no standby well. See Figure 3.1 for details of Teeswater existing infrastructure and water system.

3.2 System Capacity

The well pumphouse has a rated capacity of 2,160 m^3/day (25 L/s) as outlined in Schedule C, Table 1 of the MDWL. The Permit to Take Water (PTTW) for the system (Permit No. 3848-9KCPAX) states a maximum daily water taking of 1,600,000 L/d, which equates to 1,600 m^3/day or 18.5 L/s and a maximum per minute taking of 3,900 L (65 L/s). The unrestricted flow of the artesian well is approximately 76 L/s, based on past well records. This information indicates that the short-term natural capacity of the well supply is significantly greater than what would be permitted as total water taking over a full 24-hour period.

The firm capacity of a drinking water system is considered to be the capacity of the system with the largest well out of service. Because the Teeswater DWS has only one well, the firm capacity of the system is zero. There is no redundancy or standby source of raw water in the Teeswater DWS, and with no storage facility, there is no redundancy for the provision of treated water.

3.3 Water Usage

System pumping records from 2021 to 2023 were used to determine existing average and maximum day water demand values, as summarized in Table 3.1.

Table 3.1 Water Supply Information

Year	Annual Average Demand (m^3/day)	Maximum Day Demand (m^3/day)[1,2]	Ratio Max./Avg.
2021	401	742	1.85
2022	464	831	1.79
2023	320	637	1.99
Average	**395**	**---**	**---**
Maximum	**---**	**831**	**1.99**

Notes:

1. The two highest maximum day values in 2022 were disregarded due to inaccurate values being reported.
2. The highest maximum day value in 2023 was disregarded due to a watermain break.

Figure 3.1 Existing Teeswater Water System

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BMROSS engineering better communities	MUNICIPALITY OF SOUTH BRUCE TEESWATER DRINKING WATER SYSTEM **EXISTING TEESWATER DRINKING WATER SYSTEM**	DATE October 2024	PROJECT No. 21240
		SCALE As Shown	FIGURE No. 3.1

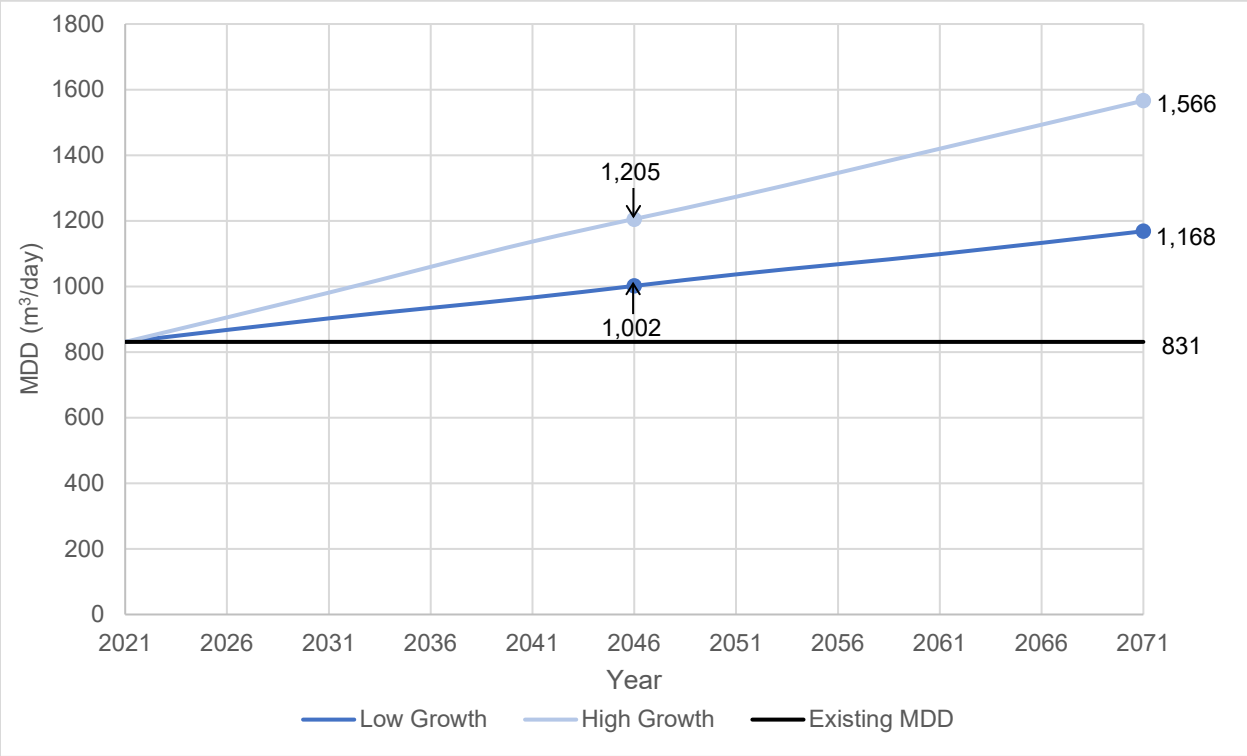
In the last three years, the maximum day demand (MDD) was 831 m^3/day, recorded in 2022. The population of Teeswater in 2022 was approximately 1,030. The maximum demand per capita is therefore:

Maximum Demand per Capita = Maximum Day ÷ Population
= 831 m^3/day / 1,030 persons
= 0.81 m^3/day per person

3.4 Projected Maximum Day Demand

Water demand was projected to 2071 using a low and high population growth scenario. The low growth scenario is based on historic building permit data trends. The high growth scenario considered population growth in Teeswater in the event the Deep Geologic Repository (DGR) project at the nearby Bruce Power facility was to move forward. The 2021 baseline MDD was established as 831 m^3/day. The per capita demand was established at 0.81 m^3/day. Projected maximum day demands were estimated using population projection values and the per capita demand value. Figure 3.2 illustrates projected maximum day demand for the low and high growth scenario.

Figure 3.2 Teeswater Projected Maximum Day Demand



Based on Figure 3.2, the 25- and 50-year projected MDDs under the low growth scenario are 1,002 m^3/day and 1,168 m^3/day, respectively. Under the high growth scenario, the MDDs at 25 and 50 years are 1,205 m^3/day and 1,556 m^3/day, respectively.

3.5 Reserve Capacity Analysis

3.5.1 Assumptions

System capacity was established through a review of the MDWL, DWWP, and PTTW for the Teeswater DWS. The existing demand condition was established as the maximum daily demand between 2021-2023.

The uncommitted reserve value was determined by subtracting the expected flow to development commitments from the total reserve value. Commitments are defined as residential units that are planned and approved, but not yet connected to the water distribution system.

For the purposes of quantifying servicing requirements for current development commitments and future growth, water demands are described in terms of Equivalent Residential Units (ERUs). An ERU is defined as the unit flow design value for a detached residential unit. Design flows for other types of residential units are proportioned to single detached units based on expected per-person unit (PPU). The following values were used for calculation purposes, as developed from 2021 Census data, and rounded upwards:

- Single detached = 2.69 PPU = 1.00 ERU
- Multi-family = 1.44 PPU = 0.55 ERU
- Apartments = 1.79 PPU = 0.70 ERU

The current customer count for Teeswater includes both residential and non-residential, and total flows include water supplied to both. For calculation purposes, it is assumed that for every residential unit built, there will be a proportional increase in non-residential. The historical “per customer demand” plus 10% is used as the flow for one ERU to account for non-residential development.

3.5.2 Current Development Commitments and Proposals

The commitments listed in Table 3.2 are based on plans and draft plans of development that are approved, for which approval is pending, or are already under construction. Vacant serviced lots are included as commitments.

Table 3.2 Development Commitments and Proposals

Development Name	Number of Units	Number of ERUs	Type
Churchill Estates	S – 158 M – 112	220	Commitment
Vacant Serviced Lots	S – 22	22	Commitment
Total		**242**	

Additionally, preliminary proposals for industrial/commercial development within the community have a total design maximum day demand in the order of 30 m^3/day. Although preliminary, this value is carried as a commitment for the purposes of the analyses in this project.

3.5.3 Total Reserve Capacity

The total capacity of the Teeswater drinking water well, for evaluation purposes, is taken as the lower maximum daily water taking of 1,600 m^3/day as stated in the PTTW (see Section 3.2 for

further discussion). The current maximum demand is 831 m^3/day. The total reserve is equal to system capacity minus current usage.

System Capacity	= 1,600 m^3/day
Current Demand	= 831 m^3/day
Total Reserve	= 769 m^3/day

3.5.4 Per Customer Demand

As of 2022, there were 500 water customers in Teeswater. The per customer demand is:

Per customer demand = 831 m^3/day / 500 customers
= 1.66 m^3/day per customer

With an additional 10% added to account for non-residential development (see Section 3.5.1), water demand per ERU is 1.83 m^3/day.

3.5.5 Uncommitted Reserve Capacity

The uncommitted reserve capacity is equal to the total reserve minus commitments.

Commitments (242 ERUs x 1.83)	= 442 m^3/day
Industrial/commercial development	= 30 m^3/day
Uncommitted Reserve	= 297 m^3/day

The uncommitted reserve in Teeswater is approximately 297 m^3/day, which is equivalent to 162 ERUs at 1.83 m^3/day per ERU. It is important to note that a significant industrial or commercial development could affect the total available reserve capacity in the future.

3.5.6 Peak Demand Considerations

Because there is currently no treated water storage in Teeswater to attenuate short-term peak demands, all demands must be satisfied via the well supply. When not known, peak demand is typically taken as 1.5x the maximum day demand value. The maximum day demand in Teeswater is 831 m^3/d (9.6 L/s). Therefore, the peak demand is estimated at 1.5 x 9.6 = 14.4 L/s.

If all commitments and proposals were to become real customers, the projected maximum day demand would increase from 831 m^3/day to 1,412 m^3/day, or 16.3 L/s. Assuming a peak factor of 1.5x, the peak demand would be 24.5 L/s, which is less than the PTTW per minute limitation of 3,900 L (65 L/s) but similar to the MDWL rated capacity of 2,160 m^3/day when converted to a short term value (i.e., 25 L/s).

3.6 Water Storage Requirements

3.6.1 Purpose of Storage

Municipal water storage facilities are typically used for fire protection and attenuation of peak flows. The theoretically recommended storage volume is based on a formula in the MECP Design Guidelines, which recommends storage be provided for peak flow equalization, fire flows, and emergencies. Equalization storage is a function of maximum day demand. Fire flow rates and durations are linked to the population served. Emergency storage is a function of

equalization and fire storage values. Essentially, all three storage components are linked to the population served, and are calculated based on the following equation:

Treated water storage requirement = A + B + C

Where:

A = Fire storage (Table 8-1 of MECP Guidelines);
B = Equalization storage (25% of maximum day demand); and
C = Emergency storage (25% of A + B)

3.6.2 Storage Needs

Table 3.3 provides the total storage required for the existing and committed serviced scenarios.

Table 3.3 Treated Water Storage Requirements

Scenario	Volume Required (m^3)[1] For Equalization	Volume Required (m^3)[1] For Fire[2]	Volume Required (m^3)[1] For Emergencies	Volume Required (m^3)[1] Total
Existing	208	467	169	844
Existing + Commitments	318	610	232	1,161

Notes:

1. Volumes are based on formulas in MECP Guidelines - 2008.
2. Where population is between MECP Guideline categories, fire flow rate and duration are interpolated.

As previously stated, Teeswater does not have any treated water storage. Therefore, the storage deficit is equal to the total reported above. Under existing conditions, the deficit is equal to 844 m^3. When current commitments are considered, the deficit increases to 1,161 m^3. As the population of Teeswater increases, the water demand is anticipated to increase as well. Because any increase in peak demand diminishes the ability of the treatment system to meet that demand, the need for treated water storage is increasingly important.

3.6.3 Future Storage Requirements

Teeswater water storage needs were projected to 2071. Water demands were projected using a low-growth and high-growth scenario (see Section 3.4). These projected demands were used, in conjunction with MECP Design Guidelines, to determine future water storage requirements.

Total existing and projected storage requirements under both scenarios are listed in Tables 3.4 and 3.5 and illustrated in Figure 3.3.

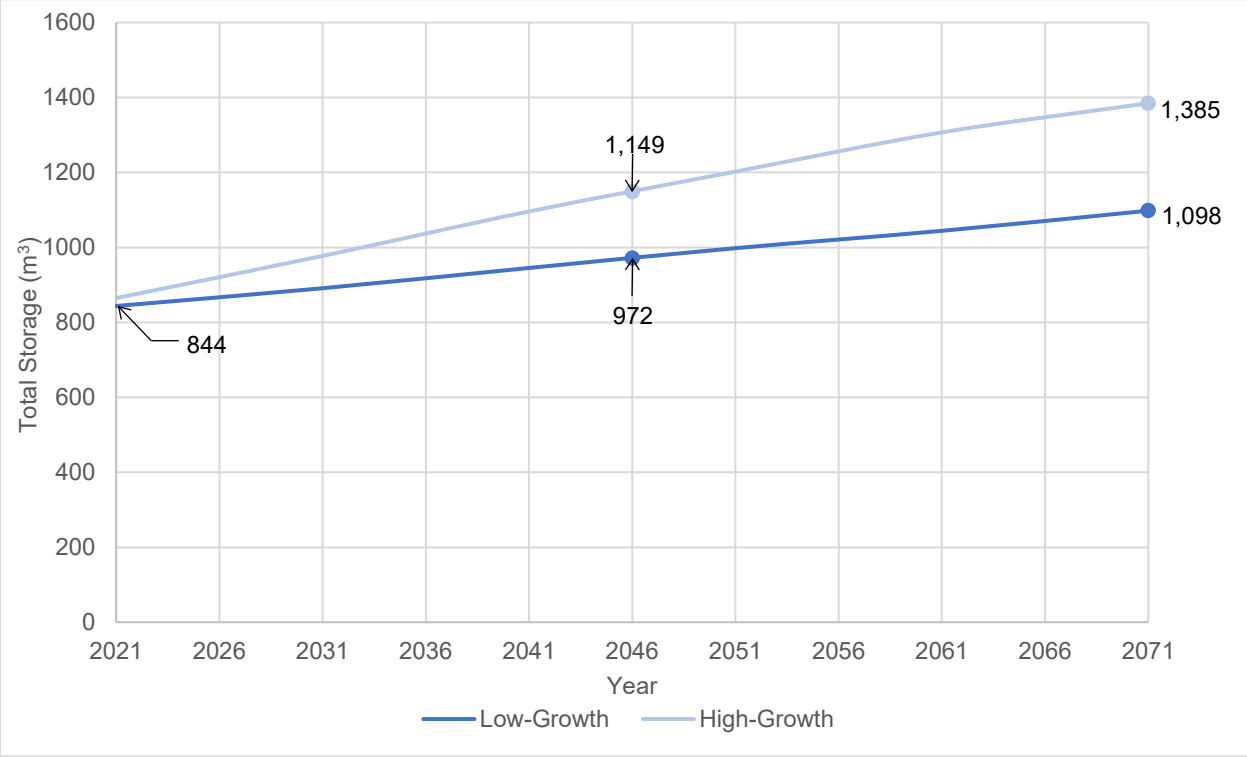
Table 3.4 Low Growth Projected Water Storage Requirements

Year	Total Storage Requirements (m^3) For Equalization	Total Storage Requirements (m^3) For Fire	Total Storage Requirements (m^3) For Emergencies	Total Storage Requirements (m^3) Total
Existing	208	467	169	844
50-Year Projection	292	586	220	1,098

Table 3.5 High Growth Scenario Water Storage Requirements

Year	Total Storage Requirements (m^3) For Equalization	Total Storage Requirements (m^3) For Fire	Total Storage Requirements (m^3) For Emergencies	Total Storage Requirements (m^3) Total
Existing	208	467	169	844
50-Year Projection	392	716	277	1,385

Figure 3.3 Teeswater Projected Water Storage Needs



As shown in Tables 3.4 and 3.5, and Figure 3.3, the existing water storage requirement (i.e., the deficit as Teeswater currently has no storage facilities) is approximately 844 m^3. Under the low-growth scenario, the water storage requirement in 50 years is projected to be approximately 1,098 m^3. Under the high-growth scenario, the storage requirement is estimated to be around 1,385 m^3 by 2071.

4.0 MCEA PHASE 1 – IDENTIFICATION OF PROBLEM/OPPORTUNITY

4.1 Historical Background

The original Engineer's Report for the Teeswater DWS in 2001 recommended a second well to ensure a secure source of firm capacity and an elevated storage facility. Beginning in 2018, BMROSS was engaged by the Municipality to commence with preliminary sizing and preparation of budgets related to implementing these two recommendations. In April 2024, the Municipality of South Bruce formerly initiated a MCEA study to investigate the construction of a new water supply well and treated water storage facility. Two key issues exist for the current municipal drinking water system in Teeswater. First, the supply has no firm capacity and therefore there is lack of security in the supply. Second, the system lacks treated water storage.

4.2 Identification of Problem/Opportunity

The first phase of the MCEA process involves the identification of the problem or opportunity to be addressed. Based on the deficiencies above, the following problem was identified:

The existing water supply for the community of Teeswater is a single well with no standby source. The system contains no treated water storage infrastructure. Additional supply and storage capacity are needed to meet the Ministry of Environment, Conservation and Parks design recommendations for the existing service population and future needs.

5.0 IDENTIFICATION AND EVALUATION OF ALTERNATIVES

5.1 Preliminary Review of Alternative Solutions

The second phase of the MCEA process involves the identification and evaluation of alternative solutions to address the issues. Once the feasible and practical alternatives are identified, the technical, economic, and environmental impacts associated with the implementation of each are evaluated. Mitigation measures that could lessen the environmental impacts are also defined. A preferred solution or solutions is then selected.

5.2 Initial List of Alternative Solutions

Several alternatives to the MCEA process were identified to address the need for a standby water supply and increased storage capacity. These alternatives include the following.

- Alternative 1A: Construct a new well and storage facility at a new site in the community of Teeswater.
- Alternative 1B: Construct a standby well at the current well site, and a storage facility at a new site in the community of Teeswater.
- Alternative 2: Obtain water from an alternative source.
- Alternative 3: Limit water usage and community growth.
- Alternative 4: Do Nothing.

These alternatives are explained in depth in the following subsections:

5.2.1 Alternative 1A: Construct a new well and storage facility at a new site in the community of Teeswater

Implementation of Alternative 1A would involve the construction of a new municipal well and water storage facility within the community of Teeswater. This alternative would require, in addition to the drilling of a new municipal well, the construction of pumping and treatment

facilities, a storage facility, and the installation of a transmission watermain from the new facilities to a connection point in the existing system. The construction of a new well and water storage facility would resolve issues related to supply redundancy, emergency flows, and increased supply and storage for future development.

A review of this alternative includes an evaluation of alternative sites for the new facilities. The requirements for the new well and storage facility site include:

- the availability of three-phase power;
- adequate property size;
- considerations of possible impacts relating to the Source Water Protection Plan;
- a location close to existing servicing infrastructure to minimize costs related to connecting the new facilities and to limit the land base affected by construction;
- access for system operators;
- adequate aquifer capacity;
- the minimization of interference with existing wells.

This alternative would be subject to the requirements of a Schedule B project under the MCEA.

5.2.2 Alternative 1B: Construct a standby well at the current well site, and a storage facility at a new site in the community of Teeswater

This option is generally similar to Alternative 1A, with the exception that the additional well would be installed at the current well site. The new standby well could be connected to the existing treatment and high-lift pumping equipment at the existing well site. Similar to Alternative 1A, the construction of a standby well and storage facility will resolve issues related to redundancy, emergency flows, and future development.

The wells would function as one duty plus one standby. In this case, the addition of the well would be considered exempt from MCEA Schedule B requirements following completion of the Archaeological Screening Process (ASP). The addition of a storage facility would still require a new site and would continue to be subject to MCEA Scheule B requirements.

5.2.3 Alternative 2: Obtain water from an alternative source

This alternative involves obtaining water for the purposes of serving the community of Teeswater from private wells, a surface water source, and/or a pipeline from another municipal water supply.

The development of private groundwater wells to augment the existing municipal water system in Teeswater is not considered a viable solution. The development of private wells within an urban community where there is already a municipal water system is contrary to provincial and municipal policies. Thus, development of new private wells was not considered a practical long-term alternative for water supply in Teeswater.

A surface water-based system typically involves the installation of a water supply intake into a suitable surface water source capable of meeting long-term water demands, low and high lift pumping equipment, and filtration and disinfection facilities. The Teeswater River or Lake Huron could be considered as a surface water source. However, the capital costs associated with developing a water supply intake and related infrastructure, including watermain to the community, are substantial, especially given the distance to Lake Huron. A local surface water supply such as the Teeswater River is, based on our experience, likely to have more variable and complex treatment requirements relative to a groundwater source that is relatively stable in

terms of available quantity and quality. As a result, the development of a surface water supply is not considered a practical alternative for the community of Teeswater.

A third potential water source is piped water from another municipal system. In the Municipality of South Bruce, there is one additional municipal water system aside from the Teeswater system; the Mildmay DWS. The key considerations with respect to importing piped water are the capital costs associated with the constriction of transmission watermain, the availability of adequate capacity, and pipeline operating costs. The community of Mildmay is approximately 15 km from Teeswater. The capital costs of constructing a transmission pipeline from the Mildmay system would be substantial, given the distance. Additionally, the system may not be of sufficient capacity to accommodate the demands of Teeswater. For these reasons, piped water from another municipal system was not considered further in this investigation.

Under this alternative, a water storage facility would be required. However, given the limitations relating to the aforementioned sources of water, the opportunities for water storage supplied by another municipal system are severely limited and not considered practical.

Given the above, this alternative is not considered feasible and was not evaluated further.

5.2.4 Alternative 3: Limit water usage and community growth

To maintain water demand at the existing values, this alternative would require the Municipality to implement water conservation and use restriction policies in addition to land use planning policies restricting new development in the community of Teeswater.

The implementation of this strategy would require the Municipality to amend its Official Plan and Zoning By-law to restrict new development in and adjacent to the community of Teeswater, in addition to implementing a program for water-use restrictions. Such amendments, however, would be contrary to the overall goals of the Official Plan (The Municipality of South Bruce, 2023) reflected in Section 4.2.1(a) of the Plan:

> "*To recognize Formosa, Mildmay, and Teeswater as the three primary settlement areas in the Municipality and direct population growth and community services to these areas.*"

Additionally, this alternative does not address the existing deficiencies in the drinking water system, namely the lack of redundancy in supply and the total absence of a storage facility. As such, limiting community growth and water usage is not considered a viable approach to resolving the defined problems. This approach was rejected, and the alternative was not further considered.

5.2.5 Alternative 4: Do Nothing

This option proposes that no improvements or changes be made to address the identified problems. The Do Nothing approach may be implemented at any time in the design process prior to constriction. This decision is typically made when the costs of all alternatives, both financial and environmental, significantly outweigh the benefits.

The Do Nothing alternative represents the least expensive alternative. However, it does not resolve the problem of a lack of system redundancy and storage. The implementation of this alternative would therefore not address the identified deficiencies or provide the opportunity for additional future growth in the community. This option would only be considered if the negative impacts of the implementation of other alternatives were considerable and could not be mitigated to an acceptable degree

5.3 Summary of Preliminary Review

From the preliminary analysis of the identified alternatives, there are three alternatives that are carried forward for further evaluation:

- Alternative 1A – Construct a new well and storage facility at a new site
- Alternative 1B – Construct a standby well at the existing well site and a storage facility at a new site
- Alternative 4 – Do Nothing

Alternatives 2, 3 and 4 are not being carried forward for further investigation. This is primarily because these alternatives are not considered practical or feasible to implement.

5.4 Evaluation of Alternative Solutions

5.4.1 Review of Alternative Sites – Alternative 1A

Alternative sites for the location of a new well and storage facility were considered as part of the evaluation of Alternative 1A. A number of factors were considered when identifying potential sites for a new well and storage facility. These factors included:

- Hydrogeologic potential for a well with sufficient supply capacity
- Potential for interference with existing wells
- Connections points and minimizing distance to the existing distribution system
- Impacts to adjacent properties by Source Water Protection policies
- Impact on future development lands
- Geotechnical feasibility, namely sufficiently thick overburden for well and suitable foundation soils for storage facility
- Presence of significant natural or cultural features
- Sufficient area and space for construction
- Disruption of natural features
- Need to purchase property

Initially, a number of sites were identified for a potential new well and storage facility. The sites were reviewed by hydrogeologist, Geoff Rether P. Geo. of Ian D. Wilson Associates Limited for their hydrogeological potential, likelihood of interference with private or public wells, and overburden thickness (Appendix B). The evaluation of the sites, based on the above-noted criteria is summarized in Table 5.1.

Table 5.1 Evaluation of Alternative Locations for a New Well and Storage Facility

Location	Advantages	Disadvantages	Decision
Clinton St. (central area of Teeswater)	• Municipally owned site, property acquisition not required.	• Would require tree removal. • Site is small for a municipal well site, additional land may be required for construction purposes. • Potential for contamination from past gas station adjacent to site. • Thin, granular overburden (less natural protection of the aquifer). • Potential for Source Water Policy impacts on adjacent properties.	• Unsuitable site given size, potential for contamination, and thin overburden.
Janet St. (western area of Teeswater)	• Conventional well drilling may be feasible. • Reduced likelihood of flowing well conditions. • Potential to acquire sufficient space to accommodate well and storage facility.	• Thin overburden (less natural protection of the aquifer). • Strong potential for GUDI conditions. • Property acquisition required. • Potential for impacts on future development lands.	• Unsuitable given potential for GUDI conditions and thin overburden.
Railway St. (southern area of Teeswater)	• Potential to acquire sufficient space to accommodate well and storage facility.	• Potential for significant Source Water Policy impacts on current and existing adjacent agricultural activities and use. • Property acquisition required .	• Unsuitable due to potential significant impacts on adjacent agricultural uses.
Fairgrounds (eastern area of Teeswater)	• Large space sufficient for construction of well and water storage facility. • Municipally-owned site, property acquisition not required.	• Thin overburden (less natural protection of the aquifer). • Boreholes and soil testing found probable petroleum hydrocarbon and solvent impacts. • Potential former landfill on site.	• Unsuitable due to potential for contaminated soils.

Location	Advantages	Disadvantages	Decision
Anne St East (northeastern area of Teeswater)	• Potential to acquire sufficient space to accommodate well and storage facility.	• Thin overburden (less natural protection of the aquifer). • Close proximity to petroleum storage facility. • Potential for Source Water Policy impacts on petroleum storage facility.	• Unsuitable due to thin overburden and proximity to petroleum storage facility.
Isabella St (northeastern area of Teeswater)	• Potential to acquire sufficient space to accommodate well and storage facility. • More isolated from potential contaminate sources.	• Thin overburden (less natural protection of the aquifer). • Property acquisition required.	• Unsuitable due to thin overburden.

From the initial review of potential sites for a new well and water storage facility, a preferred site for further investigations (i.e. drilling a test well) was not identified. In general, the thin overburden which increases the vulnerability of the underlying aquifer, limits the potential for a suitable site for a municipal supply well.

Given the absence of a suitable site for a new municipal well, this alternative was not evaluated further.

5.4.2 Review of Alternative Sites - Alternative 1B

This alternative includes the construction of standby well at the existing municipal site and construction of a storage facility at a different location. Similar to the evaluation of alternative sites for Alternative 1A, criteria for the evaluation of potential sites were defined. The criteria used to identify and evaluate potential sites include:

- Connections points and minimizing distance to the existing distribution system
- Need to purchase property
- Impacts to adjacent properties by Source Water Protection policies
- Presence of significant natural or cultural features
- Disruption of natural features
- Impact on future development
- Sufficient area and space for construction
- Geotechnical feasibility, namely sufficiently thick overburden for well and suitable foundation soils for storage facility

The sites considered for a new well were also considered for a water storage facility. The evaluation of the sites for a water storage facility are summarized in Table 5.2.

Table 5.2 Evaluation of Alternative Locations for a New Well and Storage Facility

Location	Advantages	Disadvantages	Decision
Clinton St. (central area of Teeswater)	• Municipally-owned site, property acquisition not required.	• Would require tree removal • Site is small for a water storage facility, additional land may be required for construction purposes • Potential for contamination from past gas station adjacent to site.	• Unsuitable site given size of the property.
Janet St. (western area of Teeswater)	• Potential to acquire sufficient space to accommodate storage facility. • Higher elevation site • Potential for multiple connections the distribution system.	• Property acquisition required. • Potential for impacts to future development lands. • Potential impacts to adjacent properties (shading, visual intrusion).	• Not preferred in comparison to fairground site.
Railway St. (southern area of Teeswater)	• Potential to acquire sufficient space to accommodate storage facility. • Higher elevation site. • Potential for multiple connections the distribution system.	• Property acquisition required • Will take agricultural land out of production. • Less potential for multiple connection points with the distribution system.	• Not preferred in comparison to fairground site.
Fairgrounds (eastern area of Teeswater)	• Large space sufficient for construction water storage facility. • Municipally-owned site, property acquisition not required. • Potential for multiple connections the distribution system. • Benefit to having site near major community assets (downtown core, arena) for fire flows.	• Impact to adjacent residential property. • Removal of trees will be required.	• Preferred site.

Location	Advantages	Disadvantages	Decision
Anne St East (northeastern area of Teeswater)	• Potential to acquire sufficient space to accommodate storage facility.	• Isolated from large area of the community. • Need to acquire property. • Impacts to adjacent residential properties.	• Not preferred compared to fairground site.
Isabella St (northeastern area of Teeswater)	• Potential to acquire sufficient space to accommodate storage facility.	• Isolated from large area of the community. • Need to acquire property. • Impacts to adjacent residential properties.	• Not preferred compared to fairground site.

The preferred site for the water storage facility is at the fairgrounds, 21 Marcy Street East, Teeswater. The site, as shown in Figure 5.1, is small portion of the fairgrounds site, located between the track and riverbank to the north. A review of the NHIC data (1 km grid) identified only one species record for this area, the Fawnsfoot mussel, which is endangered.

A site visit was conducted on August 28, 2024. The site is currently used as parkland and is characterized by regularly mowed grass and approximately a dozen small (i.e. less than 6 m tall) apple and black willow trees. Approximately half the trees were either dead or showing signs of decline (i.e. dead sections). The trees are in rows, indicating they were planted for landscaping purposes. There is a more established area of trees to the east of the site, where the trees are significantly larger and more diverse. The steep riverbank to the north is a barrier to species, such as turtles, that may utilize the river and river valley habitat. Given that the site is used and maintained as parkland and the condition of trees present, the site is believed to have limited habitat opportunities. No species at risk vegetation or wildlife was observed during the site visit.

5.4.2.1 Archaeological Screening Process – Existing Municipal Well Site

Under Alternative 1B, a new standby well will be constructed at the existing municipal well site at 12 Hillcrest Street East. Under the MCEA, a new well at an existing municipal well site is eligible for screening and may be exempt from the MCEA process subject to the outcome of the ASP.

The first step in completing the ASP is identifying if the project area includes known or potential archaeological resources by completing the Criteria for Evaluating Archaeological Potential Checklist. The completed checklist is included in Appendix A. In completing the checklist, local records and mapping was consulted. The MCM was consulted to determine if there are any known archaeological sites within 300 m of the site. The response from MCM indicated one archaeological site in Teeswater, but beyond the 300 m threshold. The study area has been subjected to recent, extensive and intensive disturbance as a result of the installation of the existing well and water treatment plant. A site plan of the site, showing the location of the existing water infrastructure is included in Appendix A. Photos of the site have not been included as most of the infrastructure, including water, telephone and natural gas services is buried.

Given the extensive disturbance, the checklist indicates an archaeological assessment is not required. Further, given that an archaeological assessment is not required, further evaluation under the MCEA (i.e. to meet the requirements for a Schedule B project) is not required.

5.4.3 Review of Alternative Storage Types (Alternative 1B)

Consideration must be given to the alternative types of water storage facilities as part of Alternative 1B. Municipal water storage facilities are designed to maintain adequate flows and pressures during peak water demands, and the ability to meet critical water demands during emergency fire flow. The three types of water storage facilities most frequently used in Ontario are elevated tanks, reservoirs, and standpipes with a booster pumping station.

Figure 5.1 Potential Water Storage Facility Site

Elevated Tanks provide water storage in a steel vessel mounted on a support system, typically a concrete pedestal. This type of facility has the significant advantage of being able to store the entire contents of the structure at an elevation where it is available by gravity. Ideally, elevated tanks are located at a highpoint in the community to shorten the support system and reduce costs. If located in a prominent location, elevated tanks can be a focal point for the community.

Reservoirs store water at or near grade. They may be fully exposed, sitting on a concrete pad, or fully or partially buried. Unless a significant topographic highpoint is available, reservoirs utilize booster pumps to maintain pressures in the system. Booster pumps must operate continuously to maintain pressure. Typically, reservoirs are constructed with a minimum of two cells. Multiple pumps, some with variable capacity, are usually provided in an adjacent pumphouse.

Standpipes are cylindrical and usually contain water from the base to the top. Typically, only the water in the top few metres of the structure is available by gravity. Booster pumping stations are frequently provided at the base of standpipes to make most of the volume useable during emergency conditions. Subject to the need and cost of pumping stations, a standpipe can sometimes be a less costly alternative to an elevated tank, while providing energy saving opportunities and advantages over a reservoir. Following the advent of concrete pedestals for elevated tanks, few new standpipes have been constructed within this general area of southwestern Ontario.

A summary of the types of storage facilities considered is provided in Table 5.3.

Table 5.3 Summary of Storage Facility Types

Type of Facility	Advantages	Disadvantages
Reservoir	• Can be expanded if site has sufficient footprint • Minimal visual impact	• Higher energy and annual maintenance costs • Require pumps to maintain pressure • Requires standby power • Have larger footprint
Elevated Tank	• Gravity storage • Energy efficient • Can be a focal point in the community • Small footprint • Lower operational costs relative to a reservoir and booster pumping station • Relatively simple mechanical and control equipment	• Not expandable • Shadowing and visual impacts • Recoating maintenance costs
Standpipe & Booster Pumping Station	• Energy efficient • Small footprint	• Not expandable • Shadowing and visual impacts • Not as cost efficient and mechanically complex relative to an elevated tank

5.4.4 Selection of Storage Type

Given the above summarized advantages and disadvantages, the preferred storage type for Teeswater is an elevated tank. It will provide the amount of storage required with a minimal footprint, with low operation costs and is familiar in terms of equipment and maintenance to local operators.

5.4.5 Cost Analysis

A probable cost estimate for Alternative 1B is provided in Table 5.4. The cost summary includes the estimated cost of constructing a standby well, elevated storage tank, watermain connections, and associated engineering, hydrogeological and geotechnical fees. The costs presented below are in 2025 dollars and does not include HST.

Table 5.4 Summary of Capital Costs for Alternative 1B

Item	Alternative 1B – Construction of Standby Well and Water Storage Facility
Elevated Tank	$ 6,271,000
Standby Well and Connections	$ 292,165
Watermain Connections	$ 320,000
Engineering, hydrogeological, geotechnical fees	$ 364,500
Total ($2025)	**$7,247,665 + HST**

5.5 Environmental Impacts Evaluation of Alternatives

Following the identification of practical and feasible alternative solutions, the environmental impacts alternatives are evaluated. The purposes of this is to examine the potential environmental impacts associated with the proposed works and to examine potential mitigation measures for any identified impacts. The evaluation stage generally involved the following activities:

- Evaluation of environmental impacts
- Preliminary selection of a preferred alternative
- Consultation with the general public and review agencies
- Final selection of the preferred alternative.

5.5.1 Environmental Evaluation Methodology and Procedure

The evaluation of alternatives was carried out using a comparative assessment methodology, designed to predict the nature and magnitude of environmental impacts resulting from each defined option and to assess the relative merits of the alternative solutions. The evaluation methodology involved the following principal tasks:

- Identification of existing environmental conditions (baseline conditions, inventories)
- Assessment of existing land use activities, infrastructure, natural features, and socioeconomic characteristics.
- Review of proposed alternatives and related works.
- Determination of the level of complexity required to complete the impact assessment.
- Identification of environmental components and subcomponents that mya be affected by the defined alternative (i.e., define evaluation criteria).

- Prediction of the environmental impacts (positive, negative) resulting from the construction and operation of the defined options.
- Identification and evaluation of measures to mitigate adverse effects.
- Selection of a preferred alternative following a comparative analysis of the relative merits of each option.

The second phase of the MCEA process includes the evaluation of impacts associated with the alternative solutions. During the evaluation process, it is necessary to determine what effect or impact the practical alternatives will have on the environment and what measures can be taken to mitigate the impact. The intent of this exercise is to:

- Minimize or avoid adverse environmental effects associated with the project.
- Incorporate environmental factors into the decisions-making process.

Under the terms of the EA Act, the environment is divided into five general components:

- Natural environment
- Social environment
- Cultural environment
- Economic environment
- Technical environment

Each environmental component can be further subdivided into specific elements that have the potential to be affected by the implementation of a solution. Table 5.5 provides an overview of the environmental components being considered as part of this investigation.

The environmental effects of each alternative on the specific components are generally determined through an assessment of various impact predictors (i.e. impact criteria). Given the works associated with the alternative solutions, the following key impact criteria were examined during the assessment:

- Nature (direct, indirect or cumulative)
- Magnitude (including the scale, intensity, geographic scope, frequency and duration of potential impacts)
- Technical complexity
- Mitigation potential (which considers avoidance, compensation, and degree of reversibility)
- Public perception
- Scarcity and uniqueness of affected components
- Compliance with the applicable regulations and public policy objectives.

Table 5.5 Environmental Components Evaluation

Environmental Component	Sub-Component
Natural Environment	• Significant natural features • Species at Risk • Wildlife • Vegetation • Surface water quality and quantity • Groundwater resources • Erosion and slope stability • Climate change • Excess soil • Air quality, dust, noise
Social	• Source Water Protection • Local disruptions • Health and safety • Recreation activities • Construction impacts • Shading • Noise
Cultural	• Historical and cultural resources
Economic	• Capital • Operating and maintenance costs
Technical	• Impacts to existing infrastructure • Utilities • Increase water storage

Using the above criteria, the potential impacts of each practical alternative were systematically evaluated. The significance of the potential impacts posed by each alternative were evaluated, considering the anticipated severity of the following:

- Direct changes occurring at the time of the project completion.
- Indirect effects following project completion.
- Induced changes resulting from the project.

For the purposes of this MCEA, impact determination criteria developed by Natural Resources Canada have been applied to predict the magnitude of environmental effects from resulting from the implementation of the project. Table 5.6 summarizes the impact criteria.

Table 5.6 Level of Impact Effects and Criteria

Level of Effect	General Criteria
High	Implementation of the project could threaten sustainability of the feature and should be considered a management concern. Additional remediation, monitoring and research may be required to reduce impact potential.
Moderate	Implementation of the project could result in a resource decline below baseline, but impact levels should stabilize following project completion and into the foreseeable future. Additional management actions may be required for mitigation purposes.

Level of Effect	General Criteria
Low	Implementation of the project could have a limited impact upon the resource during the lifespan of the project. Research, monitoring and/or recovery initiatives may be required for mitigation purposes.
Minimal	Implementation of the project could impact upon the resources during the construction phase of the project but would have negligible impacts on the resource during the operation phase.

Given the criteria defined above, the significance of adverse effects is predicted on the following assumptions:

- Impacts from a proposed alternative assessed as having a moderate or high level of effect on a given feature would be considered significant and;
- Impacts from a proposed alternative assessed as having a minimal to low level of effect on a given feature would not be considered significant.

5.5.2 Environmental Evaluation

The potential interactions between the identified practical alternatives and environmental features are examined as part of the second phase of the MCEA process. The purpose of this analysis is to determine, in relative terms, the environmental effects of constructing and operating each identified option on the defined environmental component and subcomponents. Table 5.7 summarizes the preliminary evaluation of alternatives. Given the preliminary evaluations completed, the environmental evaluation only considers Alternative 1B – Construct a standby well at the existing municipal well site and a water storage facility at a new site in the community of Teeswater and Alternative 4 – Do Nothing.

The following symbols are used in Table 5.7 to indicate the levels of impacts:

○ Minimal Impact

◔ Low Impact

◑ Moderate Impact

● High Impact

Table 5.7 Evaluation of Alternative Solutions

Component	Alternative 1B – Construct a Standby Well and Water Storage Facility	Alternative 4 – Do Nothing
Natural – significant natural features	Teeswater River is located 80 m north of the site. A geotechnical analysis has been completed and sediment and erosion control measures will mitigate impacts during construction. An armour stone wall is proposed along the top of the riverbank. ◔ Low level of impact	No impacts expected. ○ Minimal level of impact
Natural – species at risk	Limited habitat opportunities as the site is used for parkland and regularly mowed. No species at risk observed during site visit. NHIC records indicate one species at risk in the area – Fawnsfoot mussel. Construction and operation of the facility is not expected to impact the aquatic habitat of the mussel. ◔ Low level of impact	No impacts expected. ○Minimal level of impact
Natural – wildlife	Limited habitat opportunities as the site is used for parkland and regularly mowed. ◔ Low level of impact	No impacts expected. ○ Minimal level of impact
Natural – vegetation	Site characterized by mowed grass, apple and willow trees. Trees believed to be planted as part of landscaping efforts. Small trees will be removed and surface vegetation (grass) stripped during construction. ◔ Moderate level of impact	No impacts expected. ○ Minimal level of impact
Natural – surface water quality and quantity	Construction activities (excavation, material storage) have the potential to impact the adjacent Teeswater River. Impacts will be mitigated through sediment and erosion control and storage of materials to the south of the track. An emergency overflow pipe will be directed towards the river. The overflow pipe will outlet to a riprap area at the bottom of the bank. ◑ Moderate level of impact	No impacts expected. ○ Minimal level of impact
Natural – groundwater resources	Excavation is not expected to be deep enough to impact local aquifers. ○ Minimal level of impact	No impacts expected. ○ Minimal level of impact

Component	Alternative 1B – Construct a Standby Well and Water Storage Facility	Alternative 4 – Do Nothing
Natural – erosion and slope stability	Site is adjacent to slope for Teeswater River valley. Potential for impacts to slope during construction. ◑ Moderate level of impact	No impacts expected. ○ Minimal level of impact
Natural – climate change	Construction will require heavy equipment that will release greenhouse gases as emissions. Impacts related to construction may be reduced through equipment and materials selection. Back up diesel generator will be utilized during emergency power outages. Will provide storage of treated water (improve redundancy for emergency outages) ◔ Low level of impact	System will lack storage in event of emergency outages, which may be more frequent with an increased frequency of extreme events. ● High impact
Natural – excess soils	Expected that construction will generate excess soils. Contractor will be required to handle excess soils in accordance with O. Reg. 406/19. ◔ Low level of impact	No impacts expected. ○ Minimal level of impact
Natural – air quality, dust and noise	Construction of facility will result in localized impacts related to air quality and noise during duration of construction activities. Residences located approximately 75 m to the west of the site. During operation, minimal noise, dust or air quality impacts are expected. ◑ Moderate level of impact	No impacts expected. ○ Minimal level of impact
Social – source water protection	Proposed site is located within WHPA B with a vulnerability score of 10. The water storage facility is not a significant drinking water threat, however construction activities ○ Minimal Level of Impact	No impacts expected. ○ Minimal level of impact
Social – local disruptions	During construction water supply may be temporarily interrupted to install watermain connections to the site. These are expected to be short in duration. Access to the complex via James St. East may also be interrupted during construction of watermain connections. Notice will be provided to impacted adjacent properties as soon as possible. ◔ Low level of impact	Residents may experience interruptions in water service if the well is taken offline for maintenance or in an emergency. ● High impact

Component	Alternative 1B – Construct a Standby Well and Water Storage Facility	Alternative 4 – Do Nothing
Social – health and safety	Construction will involve heavy equipment. The construction area will be fenced to prevent public access. Following construction, the site will be fenced and gated to prevent unauthorized access. The operation of the water storage facility will provide treated water storage in the event of an emergency outage at the wells and pressure during fire flow conditions. ◔ Low level of impact	Residents may experience interruptions in water service if the well is taken offline for maintenance or in an emergency. ● High impact
Social – recreation activities	Construction activities will result in a small portion of the park being inaccessible to the public. This may include a portion of the ring road. Construction will not impact access to any of the buildings at the complex. Operation of the water storage facility will not have any impacts on recreation use or activities at the complex site. ◔ Low level of impact	No impacts expected. ○ Minimal level of impact
Social – construction activities	Construction activities will result in additional noise and disturbances in the immediate vicinity of the site. The construction activities will include construction of the storage facility and watermain connections at the north end of Elizabeth Street and east end of James Street East. ◑ Moderate level of impact	No impacts expected. ○ Minimal level of impact
Social – shading	The tower may be a visual intrusion for adjacent property owners and they may experience shading from the facility. Impacts related to shading are expected to be limited to the morning hours (i.e. before 11 AM). ◔ Low level of impact	No impacts expected. ○ Minimal level of impact
Social – noise	Construction of the facility will result in locally increased noise levels during the duration of construction. During operation, it is expected that noise levels will be minimal. ◔ Low level of impact	No impacts expected. ○ Minimal level of impact

Component	Alternative 1B – Construct a Standby Well and Water Storage Facility	Alternative 4 – Do Nothing
Cultural – historical and cultural resources	A Stage 1-2 Archaeological Assessment was completed, and no archaeological resources were identified. The checklist for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes identified low potential for built heritage resources and cultural heritage landscapes. ○ Minimal level of impact	No impacts expected. ○ Minimal level of impact
Economic – capital costs	Estimated cost of the facility and watermain connections is $7,247,665. A grant has been received for $3,413,580, resulting in a net cost of $3,834,085. The costs attributable to future growth may be recovered through development charges. ◑ Moderate level of impact	No impacts expected. ○ Minimal level of impact
Economic – operating and maintenance costs	Will result in additional operational costs for the drinking water system. The preferred storage type (elevated water storage facility) has lower operational costs than other types of facilities. ◔ Low level of impact	In event of an emergency, if there is no redundancy in the drinking water system the Municipality may be required to pay a premium for emergency repairs and/or trucked water. ● High impact
Technical – impacts to existing infrastructure	Existing electrical lines along north side of ring road may be relocated. ◔ Low level of impact	Existing water distribution system will continue to be deficient in terms of MECP guidelines related to water storage. ● High impact
Technical – utilities	Electrical services are available at the site. Will require construction of a connection to the existing drinking water distribution system at east end of James St. East. ◔ Low level of impact	No impacts expected. ○ Minimal level of impact
Technical – increase water storage	Will provide sufficient treated water storage for existing and 25-year future population. Will provide storage for emergency needs, fire protection and equalization pressure. ○ Minimal level of impact	Does not increase water storage, per MECP guidelines. System will continue to be deficient in terms of recommended storage. ● High impact

The impacts identified to have moderate or high levels of impact are further discussed in Section 7.0 (Identification of Potential Impacts and Mitigation Measures).

5.6 Evaluation Summary

A total of five alternative solutions were identified and evaluated. These were:

- Alternative 1A – Construct a new well and storage facility at the same site in Teeswater.
- Alternative 1B – Construct a standby well at the existing well site and a storage facility at an alternative site in Teeswater.
- Alternative 2 – Obtain water from an alternative source.
- Alternative 3 – Limit community growth.
- Alternative 4 – Do nothing.

Alternative 3 – Obtain water from an alternative source, was considered not to be a viable alternative as it would be contradictory to provincial and municipal policies to use a private well and would be too costly and/or unattainable to supply surface water from Lake Huron or the Teeswater River. Alternative 3 – Limit community growth was also considered not to be a viable alternative as it directly contradicts provincial and municipal planning policies directing growth to urban settlement areas, like Teeswater.

Alternative 1A includes the construction of a new municipal well and water storage facility. The evaluation of Alternative 1A consisted of a desktop evaluation of potential sites for a new well. The intent of this evaluation was to identify a potential site, if possible, for test well. The evaluation of sites considered the hydrogeological potential, overburden thickness, potential for interference with existing wells, Source Water Protection policies and sufficient space for construction and operation. The evaluation considered sites throughout Teeswater, however there was no suitable site identified with enough potential to support constructing a test well. Given this, Alternative 1A was not considered further.

Alternative 1B involves the construction of a standby well at the existing municipal well storage and a water storage facility at a different location. Similar to Alternative 1A, a number of sites were considered for the water storage facility. A preferred site was identified at the fairgrounds, north of the Teeswater-Culross Community Centre. This site was preferred given the availability of sufficient space to support operation and construction of a storage facility; the land is municipally owned and land acquisition is not required; and proximity to major components of the community and the existing distribution system.

Three types of water storage facilities were also considered with Alternative 1B: elevated tanks, reservoirs, and standpipes with booster pumping station. The advantages of an elevated tank include gravity storage, energy efficiency, and a smaller footprint. Disadvantages include visual intrusion and shading impacts, as well as an inability to expand the storage in the future. Reservoirs, unlike elevated tanks, require booster pumps to maintain pressure and tend to have higher operating and maintenance costs. Relative to elevated tanks, reservoirs require more space, but can be expanded in the future. Standpipes have some similar advantages to elevated towers, but the water stored is not readily available by gravity and they are more mechanically and operationally complex. Due to the lower operating and maintenance costs and operator preference, an elevated tank is considered the preferred type of storage facility for Teeswater.

5.7 Identification of a Preferred Solution

Based on the results of the assessments undertaken above, and a review of the technical components associated with the project, the preferred solution is Alternative 1B – Construction a standby well at the current well site and a new well storage facility at a new site. There are several attributes associated with Alternative 1B that justify its consideration as the preferred option for addressing the deficiencies with system redundancy and fire flows and emergency storage capacity:

- It provides Teeswater with water supply redundancy in the event of well maintenance activities and emergencies.
- It provides Teeswater with adequate supply and storage capacity to service the existing population as well as future development.
- The lifecycle cost of an elevated tank would likely be similar to a reservoir and booster pumping station, but an elevated tank has several advantages including the use of gravity to achieve system pressures and reduced mechanical complexity.
- Elevated tanks are generally easier to operate and maintain.
- Although costs associated with drilling a well into an artesian aquifer are high, these costs are offset by the low costs associated with connecting to existing treatment and distribution infrastructure.

6.0 CONSULTATION

6.1 General

Public consultation is an integral component of the MCEA process. Public consultation allows for an exchange of information which assists the proponent in making informed decisions during the evaluation of alternative solutions. During Phases 1 and 2 of the study process, consultation was undertaken to obtain input from the general public, stakeholders, and review agencies that might have an interest in the project.

The components of the public consultation program employed during the MCEA study process are summarized in this Section of the Project File Report and documented in Appendix C.

6.2 Initial Public Notice

Contents: General study description, summary of proposed work

Issued: April 10, 2024

Placed In: Mildmay Town Crier, Wingham Advanced Times (April 17 and 24th editions)

Circulated To: 44 adjacent property owners within the study area, 8 review agencies and 7 indigenous communities

No comments were received from members of the public as a result of the Notice. A copy of the Notice is included in Appendix C.

6.3 Government Review Agencies

Input into the MCEA process was solicited from government review agencies by way of email correspondence. Agencies that might have an interest in the project were initially sent a letter describing the nature of the project and a copy of the Notice of Study Commencement. Appendix C contains a copy of the information circulated to the review agencies and a list of the agencies requested to comment on the project. Formal written correspondence from the agencies is also provided. A summary of the comments received is included in Table 6.1.

A copy of the draft Project File Report was submitted to the MECP for comments on April 30, 2025. The comments received from the MECP are summarized in Table 6.1.

Table 6.1 Summary of Review Agency Comments

Review Agency	Comments	Action Taken
Monica Walker Bolton, Bruce County Planning Department Received: April 12, 2024 via email	The Bruce County Planning Department has received a copy of the Notice and has no comments or concerns at this time.	Response noted and filed.

Review Agency	Comments	Action Taken
Carl Seider, Grey Sauble Conservation Authority Received: April 19, 2024 Via Email	The policies and activities identified within the application fall within Saugeen, Grey Sauble, North Bruce Peninsula Source Protection Region Neither Section 57 (Prohibited Activities) nor Section 58 (Regulated Activities) applies to the study area. Notes that the study area falls within a Wellhead Protection Area B (Score of 10)	Information Noted and Filed
Monika Macki Ministry of Environment Conservation and Parks Received May 7, 2024 Via Email	Acknowledged that South Bruce is following the approved environmental planning process for a Schedule B project under the MCEA. Attached an “Area of Interest” guidance document for areas of interest to be addressed during the process. Consultation with Indigenous communities is required during the MCEA process and provided a list of communities that must be consulted. Draft report must be sent to MECP 30 days prior to issuing Notice of Completion for review.	Information Noted and Filed
Liam Smythe On behalf of Joseph Harvey Ministry of Citizenship and Multiculturalism (MCM) Received May 10, 2024 Via Email	Stated their interest in archaeological resources, built heritage, and cultural heritage landscapes. Indicated that the study area will be evaluated using the MCM checklists for Evaluating Archaeological Potential and *Evaluating the Potential for Built Heritage Resources and Cultural Heritage.* The Environmental Assessment reporting shall advise MCM if any or all cultural heritage studies were completed for the EA before issuing the Notice of Completion.	Information Noted and Filed

Review Agency	Comments	Action Taken
Michael Oberle, Saugeen Valley Conservation Authority (SVCA) Received May 23, 2024	SVCA has had previous communication with South Bruce regarding potential locations for the water tower. For the current property of the community center/arena ground, SVCA would require that the tower and related infrastructure be set back beyond/outside of the Teeswater River valley slope.	Information Noted and Filed. A geotechnical report was sent in November 2024.
Monika Macki Ministry of Environment Conservation and Parks Received May 9, 2025 Via Email	Provided comments on draft MCEA Project File. Comments included: • Revise report to include discussion of PPS • Consider including a project schedule • Continue to engage with indigenous communities and include all copies of correspondence • Recommend non-chloride dust suppressants be applied during construction • If there is evidence of species at risk or habitat on or around the location of the activity, MECP recommends an Information Gathering Form be submitted. • Report should be referred to as a Project File Report. • Document these comments in final report.	Report revised to address comments from MECP.

6.4 Indigenous Consultation

6.4.1 Indigenous Consultation Process

The Crown has a duty to consult with First Nation and Metis communities if there is a potential to impact on treaty rights. This requirement is delegated to project proponents as part of the MCEA process, therefore, the project proponent has a responsibility to conduct adequate and thorough consultation with indigenous communities as part of the MCEA consultation process.

6.4.2 Background Review

To identify First Nation and Métis communities that may have an interest in the proposed project, federal and provincial agencies were consulted, as was the Aboriginal and Treaty Rights Information System (ATRIS) on the Crown-Indigenous Relations and Northern Affairs Canada website. The following communities were emailed a letter outlining the project (included in Appendix C) on April 10, 2024

- Chippewas of Nawash Unceded First Nation;
- Chippewas of Saugeen First Nation;
- Great Lakes Métis Council (formerly Grey-Owen Sound Métis Council);
- Historic Saugeen Métis (HSM);
- Métis Nation of Ontario;
- Saugeen Ojibway Nation (SON) Environment Office and
- Huron-Wendat Nation

The letter included information regarding the project, map, and copy of the Notice of Commencement. A log of correspondence with First Nation and Métis communities is provided in Table 6.2. Copies of all correspondence sent are included in Appendix C.

The identified communities were sent a copy of the Stage 1-2 Archaeological Assessment on November 12, 2024.

6.4.3 Consultation Log

No responses were received to the initial letter from any of the First Nation or Metis communities. A log of the consultation efforts is provided in Table 6.2.

Table 6.2 Summary of First Nation and Metis Community Comments

To	From	Comments	Actions Taken/Response
Metis Nation of Ontario (via email) - consultation email, April 10th, 2024	BMROSS	• Provided letter outlining project scope and map of the project area.	No response
Chippewas of Nawash (via email)- Chief Conrad Ritchie April 10th, 2024,	BMROSS	• Provided letter outlining project scope and map of the project area.	No response
Great Lakes Metis Council (via email), Peter Coture April 10th, 2024	BMROSS	• Provided letter outlining project scope and map of the project area.	No response
HSM (via email), consultation email, April 10th, 2024	BMROSS	• Provided letter outlining project scope and map of the project area.	No response

To	From	Comments	Actions Taken/Response
SON Environmental Office, (via email) Charlene Leonard & Amber Debassige April 10th, 2024	BMROSS	• Provided letter outlining project scope and map of the project area.	No response
Chippewas of Kettle and Stony Point First Nation (via email) Kimberly Bressette, April 10th, 2024	BMROSS	• Provided letter outlining project scope and map of the project area.	No response
Metis Nation of Ontario (via email) - consultation email, November 15th, 2024,	BMROSS	• Provided presentation material distributed in the October 30th Public Information Center.	No response
Chippewas of Nawash (via email)- Chief Conrad Ritchie November 15th, 2024	BMROSS	• Provided presentation material distributed in the October 30th Public Information Center.	No response
Great Lakes Metis Council (via email), Peter Coture November 15th, 2024	BMROSS	• Provided presentation material distributed in the October 30th Public Information Center.	No response
HSM (via email), consultation email, November 15th, 2024	BMROSS	• Provided presentation material distributed in the October 30th Public Information Center.	Response Received Via Email – November 20th, 2024
SON Environmental Office, (via email) Charlene Leonard & Amber Debassige, November 15th, 2024	BMROSS	• Provided presentation material distributed in the October 30th Public Information Center.	No response

To	From	Comments	Actions Taken/Response
Chippewas of Kettle and Stony Point First Nation (via email) Kimberly Bressette November 15th, 2024	BMROSS	• Provided presentation material distributed in the October 30th Public Information Center.	No response
BMROSS (via email)- November 20th, 2024,	Historic Saugeen Metis (HSM)	• Indicted that the presentation material from the October 30th Public Information Center was received and reviewed. • The HSM expressed no concerns regarding any of the alternatives proposed. • The primary concerns of the HSM are environmental impacts and preservation and identification of archeological artifacts. The HSM would like to continue to be informed in the future about the project.	Filed and noted
SON (via email), Kove Sartor – November 29, 2024	Timmins Martelle Heritage Consultants	• Provided copy of Stage 1-2 Archaeological Assessment	No response
HSM (via email), December 13, 2024	BMROSS	• Provided copy of Stage 1-2 Archaeological Assessment	No response

6.5 Public Information Centre

A Public Information Centre (PIC) was held on September 4, 2024, at 5:00 PM, at the Teeswater-Culross Community Centre in Teeswater. A notice announcing the meeting was placed in the August 21 and 28, 2024 editions of the Mildmay Town Crier and on the Municipality's website. A copy is included in Appendix C. The notice was also circulated to 44 property owners within the study area. The notice was hand delivered to the residents of Parkview Lodge. The meeting included an open house component and a formal presentation of the alternatives and their evaluation, followed by a question-and-answer session.

The general purpose of the meeting was to provide audience members with the following:

- A review of the Teeswater DWS and identified issues
- An overview of the MCEA process
- The identified problem
- The alternative solutions identified and their evaluation from a feasibility perspective
- The preliminary preferred solution (Alternative 1B)
- An opportunity to provide feedback and ask questions.

There were five residents in attendance. A copy of the presentation materials is included in Appendix C. The questions and comments received during the PIC are summarized in Table 6.3. There were no comments received from the public following the meeting.

Table 6.3 Comments and Questions from the PIC

Question/Comment	Response
Why is the 'Do Nothing' alternative an option if the Ministry was telling the Municipality to do something about the water system?	The Do Nothing is always considered as part of the MCEA process in the event the other alternatives cannot be implemented. It also serves as a comparison for the baseline conditions.
What would happen if there was an emergency at the well right now with no water storage	Water may need to be trucked in.
Concern over the type of contaminate found in some of the potential well locations.	The boreholes done at the fairgrounds indicated the area had been used for landfilling of construction materials in the past.
A resident expressed concern over the preferred location of the storage facility, related to elevation.	Elevation is one consideration with respect to siting the facility. A model of the distribution system indicated the proposed site is suitable for providing fire protection and equalization pressure.
Why was the current well drilled in its location?	There is little information available as to why the well was drilled in its location, due to its age.
How were the potential well sites test for contaminates?	Boreholes were collected from the potential well site at the fairgrounds and the soil samples were sent for chemical analysis. The other sites did not warrant testing as they were ruled out for other reasons.
How tall will the tower be?	40 to 45 m.
If a standpipe was chosen would it need to be taller to store the same amount of water and why is that not preferred?	An elevated tower will provide a few days of storage available by gravity, compared to a standpipe which would provide much less storage by gravity. The standpipe would require a booster pumping station, resulting in higher energy, operating and maintenance costs over the long term.
How many sites were considered for the elevated tower?	Six in total, in conjunction with the sites looked at for a new well.
Will the elevated tower accommodate the needs of the entire town?	It will service the existing population and future growth.

The meeting adjourned at 7:00 PM. No comment sheets were completed or returned following the meeting.

6.6 Consultation Summary

The public consultation program developed for this project was directed toward property owners located near the study area, First Nation and Métis communities, and provincial review agencies. Agency consultation entailed the standard feedback from provincial review agencies. There was little interest in the project from the general public. Appendix C contains all consultation correspondence about this project.

7.0 IDENTIFICATION OF POTENTIAL IMPACTS AND MITIGATION MEASURES

7.1 Framework of Analysis

Following the section of Alternative 1B as the preliminary preferred solution, a study framework was developed to further evaluate the potential impacts of implementing this project. For reference, Figure 7.1 illustrates the preferred solution. The purposes of this review was to assess the environmental interactions resulting from the construction and operation of the proposed works, and to determine the identified interactions that would generate potential environmental impacts.

The assessment of the preferred alternative incorporated these activities:

- Preliminary assessment of the construction and operational requirements of the proposed works
- Consultation with the public, stakeholder groups and government agencies.
- Reviewing engineering methodologies associated with the construction of a new elevated storage facility.
- Prediction of the environmental interactions between the proposed works and the identified environmental components.
- Evaluation of potential impacts of the project on the environmental features, including residual effects following mitigation.

7.2 General Project Scope

The works summarized below and illustrated conceptually in Figure 7.1 represent the scope of construction planned for this project. The water storage facility component of this project is expected to involve the following general components:

- Contractor mobilization to the site
- Site clearing
- Excavation for foundation
- Dewatering
- Construction of the elevated storage tank
- Connection to the existing distribution system
- Construction of emergency overflow outlet
- Grading
- Commissioning of new tower
- Site restoration

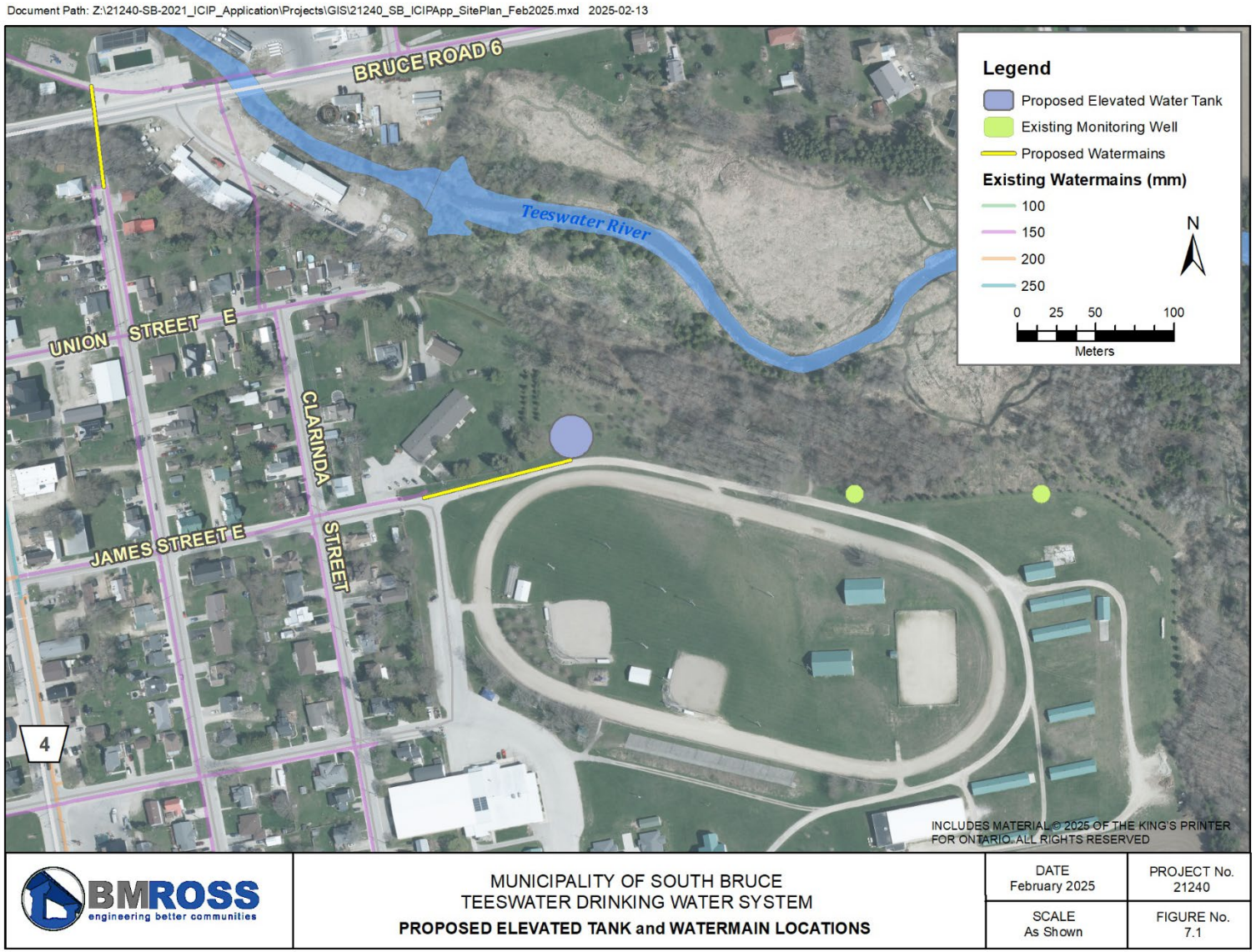
7.3 Impact Assessment and Mitigation Measures

7.3.1 Assessment of Impacts

In reviewing the various criteria identified in Section 5.4 of this report and additional comments received

An assessment was conducted to identify and evaluate the environmental interactions that could arise from project implementation. The assessment examined the potential impacts of constructing and operating the proposed works on the defined environmental sub-components. Table 5.1 summarizes the findings of the assessment of the interaction.

Figure 7.1 Proposed Elevated Tank Location



7.4 Assessment of Impacts

In reviewing the various criteria identified in Section 5.4 of this report, and additional comments received during the consultation, a number of specific environmental elements were identified which could be adversely affected by the implementation of the preferred alternative. The potential impacts are associated with the following environmental or project components:

- Natural Environment
    - Vegetation
    - Surface water – water quality
    - Erosion and slope stability
    - Air, dust and noise
- Social Environment
    - Construction Activities
- Economic Environment
    - Project cost

This section of the report summarizes the above-noted matters and outlines the measures proposed to mitigate potential environmental effects. The selection of mitigation measures incorporated an evaluation of alternative forms of mitigation and a consideration of three broad approaches to mitigation: avoidance, minimization of adverse effects, and compensation.

7.5 Discussion of Potential Impacts

7.5.1 Vegetation

Construction of the water storage facility will require removal of approximately 20 trees at the proposed site. The majority of the trees that will be removed are small apple, willow and oak. A number of the trees have signs of decay (dying limbs). To mitigate potential impacts, vegetation removal will be limited to only the extent required, with efforts to preserve the larger trees to the east of the site as well as along the top of the riverbank. Any trees identified for removal will be cut outside of the active nesting period, i.e. between September 1 to March 1, to minimize impacts on breeding and migratory birds.

The Municipality may also consider planting replacement trees elsewhere within the fairgrounds lands or the community.

7.5.2 Surface Water Impacts

Construction of the preferred alternative may impact surface water quality, given the proximity of the site to the top of the valley containing the Teeswater River. The river is located approximately 50 m from the toe of the slope. The slope is well vegetated with mature trees.

To minimize impacts to the water course, sediment and erosion control measures will be implemented and maintained along the top of the bank throughout construction.

An emergency overflow pipe from the water storage facility to the base of the valley slope is proposed. The overflow pipe will be drilled into place, to minimize disturbing the slope. Rip rap (100 mm to 305 mm in diameter), with a filter stone and geotextile underlay will be installed at the outlet. The outlet will include a duckbill check valve to prevent any backflows, as well as animal intrusions into the overflow pipe.

7.5.3 Erosion and Slope Stability Impacts

A geotechnical investigation was completed for the proposed site was undertaken by Englobe in January 2024 to assess the subsurface soil, groundwater conditions and slope stability.

The slope adjacent to the site is approximately 8.6 m in height from the toe to the top, with a 3:1 gradient. The slope was noted to be well vegetated with grass and mature trees. No active erosion was observed at the toe of the slope or on the slope face. The slope, based on the geotechnical observations, was given a low potential for slope instability.

The geotechnical investigation identified low groundwater level in the soils, compact to very dense native sand/silt below the proposed footing level. From the information obtained from the boreholes, the foundation of the facility will be supported within the native subsoil.

A copy of the geotechnical report is located in Appendix B.

7.5.4 Air, Dust and Noise

See Section 7.5.5 for mitigation measures related to air, dust and noise as the impacts are expected to be related to the construction activities. During the operation phase, the facility is not expected to have noticeable impacts on air quality, dust or noise.

7.5.5 Construction Related Impacts

Construction-related activities associated with project implementation have the potential to impact existing environmental features, the general public, and construction workers. The Contractor will therefore be responsible for carrying out these activities by industry safety standards and all applicable legislation and contract specifications. Mitigation measures will also be incorporated into the construction specifications to ensure that operations are conducted in a manner that limits detrimental effects to the environment.

Table 7.1 outlines a series of mitigation measures that are typically incorporated into construction specifications. For this project, contract specifications will need to be written such that all regulatory agency requirements are included and imposed on the Contractor.

Table 7.1 Summary of Mitigation Measures for Construction Activities

Construction Activity	Planned Mitigation
Refueling and Maintenance	- -Identify suitable locations for designated refueling and maintenance areas outside of WHPA B. - -Restrict refueling or maintenance if equipment is near watercourses or the top of the river valley bank. - -Avoid cleaning equipment in watercourses and in locations where debris can gain access to sewers or watercourses. - -Prepare to intercept, clean up, and dispose of any spillage that may occur (whether on land or water).

Construction Activity	Planned Mitigation
Traffic Control	- As applicable, the Contractor shall prepare and submit a traffic plan to the Project Engineer for review and acceptance. If it is necessary to detour traffic, the Contractor will co-ordinate the routing and provide adequate signage and barricades. - Traffic flow for private access should generally be maintained during construction. If access to a private driveway has to be restricted for a period of time, the property owner will be notified and access would be restored by the end of each working day. - Access to the community centre will be directed to the Marcy and Gordon Street entrances, rather than the one from James Street. - At the end of each working day, a minimum of one lane of traffic, controlled by barricades, delineators, etc. shall be maintained for emergency vehicles.
Disposal	- Dispose of all construction debris in approved locations. - Avoid emptying fuel, lubricants, or pesticides into sewers or watercourses.
Work in Sensitive Areas	- Work will occur in dry conditions, whenever possible. - Slopes disturbed by the construction will be stabilized upon completion of the work.
Drainage and Water Control	- All portions of the work should be properly and efficiently drained during construction. - Provide temporary drainage and pumping to keep excavation and site free from water. - Control disposal or runoff of water containing suspended materials or other harmful substances by approval agency requirements. - Provide settling ponds and sediment basins as required. - Do not direct water flow over payments, except through approved pipes/troughs
Dust Control	- Cover or wet down dry materials and rubbish to prevent blowing dust or debris. - The ring road and/or track (if utilized for construction) should be regularly wetted to prevent dust. - Avoid the use of chemical dust control products.
Site Clearing	- Protective measures shall be taken to safeguard trees from construction operations. - Equipment or vehicles shall not be parked, repaired, or refueled near the dripline area of any tree not designated for removal. - Restrict tree removal to areas designated by the Contract Administrator. - Minimize stripping of topsoil and vegetation. - Revegetate as soon possible. - Soils excavated from the site are to be re-used on site is possible or disposed of in accordance with Excess Soil Regulations.
Sedimentation and Erosion Control	- Minimize the removal of vegetation from slopes. - Silt fences shall be installed and maintained down slope from any stockpile locations. - Complete restoration works following construction.
Noise Control	- Site procedures should be established to minimize noise levels by local bylaws (e.g. no work on Saturdays or Sundays). - Employ devices to minimize noise levels in the construction area (as practical) - Night time or Sunday work shall not be permitted, except in emergencies.

7.5.6 Economic Impacts

The estimated cost of the project is $7,247,665 + HST. The Municipality has received provincial grant funding in the amount of $3,413,580, bringing the net cost to $3,834,085. This is a

significant capital cost to the municipality. Capital costs associated with the construction of major facilities should be collected form those properties directly benefitting from the works, either immediately or through a deferred benefit.

To mitigate potential economic impacts, project costs associated with future growth could be collected for through development charges, to offset the costs paid by existing taxpayers. It is expected that project costs not funded through the grant or development charges will be funded through borrowing, reserve funds, and user rates.

7.6 Operational Phase

Upon completion of the planned construction, the water storage facility will be operated and maintained by the Municipality of South Bruce or their agent, in accordance with MECP guidelines and current provincial water regulations.

7.7 Health and Safety

The planned works involve construction work that has the potential to adversely impact the health and safety of the works and the general public. A series of measures will be set out in the construction contract documentation to minimize the risk posed by construction in a manner consistent with health and safety regulations. These specifications may need to be altered depending upon the nature of the construction activity and the requirements of regulatory agencies.

8.0 APPROVALS

8.1 General

Implementation of the recommended solution is subject to the receipt of all necessary approvals. Following a review of the existing framework of legislation, it was determined that two formal approvals may be required to permit the construction of the proposed works. This section of the report identifies the applicable legislation and summarizes the intent of the associated approvals process.

8.2 Environmental Assessment Act

The recommended solution is considered a Schedule B project under the terms of the MCEA document, as the project involves the construction of a new water storage facility. The project is approved following the completion of the first two phases of the MCEA process.

The following activities are required to complete the formal MCEA process:

- Complete the 30-day review period, defined in the Notice of Completion;
- Address any outstanding issues;
- Finalize the Project File Report;
- Advise the Municipality and the MECP when the MCEA study process is complete; and
- Obtain necessary approvals.

8.3 Safe Drinking Water Act

The works associated with the preferred alternative are subject to the Safe Drinking Water Act. Accordingly, the project cannot proceed until the Municipality has received the necessary amendments to its DWWP from the MECP. The existing Municipal Drinking Water License defines how these works must be designed, constructed, operated and maintained in order to ensure compliance with accepted engineering standards.

8.4 Saugeen Valley Conservation Authority – Permit under O. Reg 169/06 Development, interference with Wetland and Alterations to Shorelines and Watercourses

Implementation of some components of the preferred alternative solution will involve construction on lands regulated by the SVCA. In accordance with the Conservation Authorities Act, an application for a permit under O.Reg 169/06 *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* will be submitted to SVCA before construction. The application will define measures to protect sensitive lands during construction to minimize the negative impacts of the project on the natural features of the areas. Site restoration and post-construction enhancements to disturbed areas will also be presented.

8.5 Ontario Heritage Act

If archaeological resources are impacted by the project work, the MCM will be notified. Activities impacting archaeological resources must cease immediately and a licensed archaeologist will carry out an archaeological assessment in accordance with the Ontario Heritage Act and Standards and Guidelines for Consultant Archaeologists.

If human remains are encountered, all activities must cease immediately and the local police and coroner notified. In situations where human remains are associated with archaeological resources, MCM should also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act.

8.6 Ontario Water Resources Act

The Ontario Water Resources Act and Environmental Protection Act require a PTTW prior to any water extractions over 50,000 L/day. Should dewatering over the 50,000 L be required for construction, a PTTW will be required.

9.0 CONCLUSION AND PROJECT IMPLEMENTATION

9.1 Selection of a Preferred Alternative

Given the foregoing, Alternative 1B – Construction of a standby well at the existing well site and an elevated tank at an alternative site in Teeswater is identified as the preferred solution to the identified problem. A recommendation to this effect was presented to and supported by the Council of the Municipality of South Bruce.

9.2 Project Timing and Timeline

Following the completion of the MCEA investigation, the Municipality intends to proceed with the final design and construction of the works associated with this project. It is anticipated that the Municipality will include this project in their budget for 2025.

The anticipated timeline for this project is as follows:

- Obtain approvals, permits — May-June 2025
- Contractor mobilization — June 2025
- Construction of elevated storage facility — June 2025 to May 2026
- Commission of elevated storage facility — May 2026

9.3 Impact Mitigation

Based upon a review of the current environmental setting, there were no impacts associated wit the implementation of the preferred alternative that could not be mitigated. Therefore, the implementation of the proposed preferred alternative is appropriate for the identified problem and is not expected to result in any significant impacts to the natural, social, economic, cultural or technical environment. The merits of this option were also seen to substantially outweigh those identified for the other alternative solution considered in this process.

9.4 Final Public Consultation

A Notice of Completion will be circulated to local residents, stakeholders, government review agencies and Indigenous communities. The Notice will identify the preferred alternative and provide the process for providing comments and submitting a Section 16 Order request to the Minister of Environment, Conservation and Parks.

9.5 Environmental Commitments

As an outcome of the MCEA process, the Township is committed to carrying out the following measures to mitigate potential environmental impacts related to project implementation:

- Implementation of standard construction mitigation measures (e.g. sediment and erosion control, site restoration) as presented in Table 7.1, where appropriate, during the construction phase of the project to minimize constructed-related impacts to the natural and social environment.
- Any activities occurring a result of the construction that result in the management of excess soil will be complete in accordance with Ontario Regulation 406/19, On-Site and Excess Soil Management, and current guidance documents entitled Management of Excess Soil – A Guide for Best Management Practices.
- Submission of relevant applications for required approvals, as well as implementation of all conditions issued in association with the subsequent approvals.
- Adjacent property owners will be advised in advance of the construction.

- Removal of trees will occur between September 1 and April 1 to mitigate potential impacts to breeding and nesting birds.

10.0 SUMMARY

This report documents the MCEA process conducted to address the deficiencies with water supply and storage capacity in the community of Teeswater. Currently, there is only one well supplying drinking water to the community. As such, the system lacks redundancy. As well, there is a lack of storage capacity within the Teeswater Drinking Water System. As a result, the Municipality of South Bruce initiated a Schedule B MCEA to investigate additional water supply and storage facilities for the community.

Based on the review of existing conditions as discussed previously, the following problem was identified:

The existing water supply for the community of Teeswater is a single well with no standby source. The system contains no treated water storage infrastructure. A standby well supply and addition of a storage facility are recommended to satisfy MECP Design Guidelines for Drinking Water Systems, and to service the existing population as well as future growth.

To address the problem, five alternatives were identified:

- Alternative 1A: Construct a new well and storage facility at the same site.
- Alternative 1B: Construct a standby well at the existing well site and a storage facility at an alternative site.
- Alternative 2: Obtain water from an alternative source.
- Alternative 3: Limit water usage and community growth.
- Alternative 4: Do nothing.

Alternatives 2 and 3 were not considered viable approaches to resolving the existing problem and were not evaluated further. A number of alternative sites for a potential new well were investigated; however, from the initial hydrogeological review a site with enough potential to warrant further investigation (i.e. drilling a test well) was not identified. Given the absence of a suitable new site for a well, Alternative 1A was not considered further.

Related to Alternatives 1B, there were a number of sites that were evaluated as potential locations for a new water storage facility. The availability of sufficient space, municipally-owned property and proximity to the water distribution system led to a location at the fairgrounds identified as the preferred site for a new water storage facility.

Three types of water storage facilities were considered. The advantages of an elevated tank include gravity storage, energy efficiency, and a smaller footprint. Disadvantages include visual intrusion and shading impacts, as well as an inability to expand the storage in the future. Reservoirs require booster pumps to maintain pressure and tend to have higher operating and maintenance costs as a result. Reservoirs require more space, but they can be expanded. Standpipes have similar advantages to elevated tanks; however, they require a booster pumping station which means they are more mechanically complex to maintain and operate. Given the advantages and disadvantages of each type of facility, as well as operator preference, an elevated tank is considered the preferred type of storage facility for Teeswater.

Based on the assessments undertaken and a review of technical components associated with the project, Alternative 1B was identified as the preferred solution. A new well located at the existing site, and an elevated storage tank located at the Teeswater-Culross Community Centre, were identified as the preferred site(s) and type of storage facility. There are several attributes associated with Alternative 1B which justified its consideration as the preferred option to address the identified deficiencies in the Teeswater water system:

- It provides Teeswater with water supply redundancy in the event of well maintenance activities and emergencies.
- It provides Teeswater with adequate supply and storage capacity to service the existing population as well as future development.
- The lifecycle cost of an elevated tank would likely be similar to a reservoir and booster pumping station, but an elevated tank has several advantages including the use of gravity to achieve system pressures and reduced mechanical complexity.
- Elevated tanks are generally easier to operate and maintain.

Although costs associated with drilling a well into an artesian aquifer are high, these costs are offset by the low costs associated with connecting to existing treatment and distribution infrastructure. Given the findings of the evaluation of alternatives and environmental effects analysis, the project has the potential to have a number of impacts related to construction and operation, the natural habitat, and community. The impacts were assessed and appropriate mitigation measures to avoid, minimize, or compensate for the impacts were identified.

The proposed project is a Schedule B activity under the terms of the MCEA and is approved subject to the completion of a screening process. The Municipality of South Bruce intends to proceed with the implementation of this project upon completion of the MCEA investigation and after the receipt of all necessary approvals and funding is in place.

All of which is respectfully submitted.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____

Lisa J. Courtney, MCIP, RPP
Environmental Planner

Per _____

Andrew Garland, P. Eng
Project Engineer

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Appendix A

Cultural and Archaeological Resource Checklists and Stage 1-2 Archaeological Assessment

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area:
    - is a recognized heritage property
    - may be of cultural heritage value
- it includes all areas that may be impacted by project activities, including – but not limited to:
    - the main project area
    - temporary storage
    - staging and working areas
    - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Cultural Heritage Evaluation Report (CHER)

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a qualified person(s) (see page 5 for definitions) to undertake a cultural heritage evaluation report (CHER).

The CHER will help you:

- identify, evaluate and protect cultural heritage resources on your property or project area
- reduce potential delays and risks to a project

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages for more detailed information and when completing this form.

Project or Property Name

Municipality of South Bruce MCEA For a New Water Storage Facility (Teeswater)

Project or Property Location (upper and lower or single tier municipality)

Community of Teeswater

Proponent Name

Municipality of South Bruce

Proponent Contact Information

Stu Moffat , Manager of Operations - smoffat@southbruce.ca

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

Part A: Screening for known (or recognized) Cultural Heritage Value

	Yes	No
2. Has the property (or project area) been evaluated before and found **not** to be of cultural heritage value?	☐	☑

If Yes, do **not** complete the rest of the checklist.

The proponent, property owner and/or approval authority will:

- summarize the previous evaluation and
- add this checklist to the project file, with the appropriate documents that demonstrate a cultural heritage evaluation was undertaken

The summary and appropriate documentation may be:

- submitted as part of a report requirement
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Is the property (or project area):		
a. identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value?	☐	☑
b. a National Historic Site (or part of)?	☐	☑
c. designated under the *Heritage Railway Stations Protection Act*?	☐	☑
d. designated under the *Heritage Lighthouse Protection Act*?	☐	☑
e. identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office (FHBRO)?	☐	☑
f. located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?	☐	☑

If Yes to any of the above questions, you need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report, if a Statement of Cultural Heritage Value has not previously been prepared or the statement needs to be updated

If a Statement of Cultural Heritage Value has been prepared previously and if alterations or development are proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No, continue to Question 4.

Part B: Screening for Potential Cultural Heritage Value

	Yes	No
4. Does the property (or project area) contain a parcel of land that:		
a. is the subject of a municipal, provincial or federal commemorative or interpretive plaque?	☐	☑
b. has or is adjacent to a known burial site and/or cemetery?	☐	☑
c. is in a Canadian Heritage River watershed?	☐	☑
d. contains buildings or structures that are 40 or more years old?	☐	☑

Part C: Other Considerations

	Yes	No
5. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area):		
a. is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area?	☐	☑
b. has a special association with a community, person or historical event?	☐	☑
c. contains or is part of a cultural heritage landscape?	☐	☑

If Yes to one or more of the above questions (Part B and C), there is potential for cultural heritage resources on the property or within the project area.

You need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report (CHER)

If the property is determined to be of cultural heritage value and alterations or development is proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No to all of the above questions, there is low potential for built heritage or cultural heritage landscape on the property.

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g. under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
    - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

For more information, see the Ministry of Tourism, Culture and Sport's Ontario Heritage Toolkit or Standards and Guidelines for Conservation of Provincial Heritage Properties.

In this context, the following definitions apply:

- **qualified person(s)** means individuals – professional engineers, architects, archaeologists, etc. – having relevant, recent experience in the conservation of cultural heritage resources.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may already be in place for identifying potential cultural heritage resources, including:

- one endorsed by a municipality
- an environmental assessment process e.g. screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport (MTCS) under the Ontario government's Standards & Guidelines for Conservation of Provincial Heritage Properties [s.B.2.]

Part A: Screening for known (or recognized) Cultural Heritage Value

2. Has the property (or project area) been evaluated before and found not to be of cultural heritage value?

Respond 'yes' to this question, if all of the following are true:

A property can be considered not to be of cultural heritage value if:

- a Cultural Heritage Evaluation Report (CHER) - or equivalent - has been prepared for the property with the advice of a qualified person and it has been determined not to be of cultural heritage value and/or
- the municipal heritage committee has evaluated the property for its cultural heritage value or interest and determined that the property is not of cultural heritage value or interest

A property may need to be re-evaluated, if:

- there is evidence that its heritage attributes may have changed
- new information is available
- the existing Statement of Cultural Heritage Value does not provide the information necessary to manage the property
- the evaluation took place after 2005 and did not use the criteria in Regulations 9/06 and 10/06

Note: Ontario government ministries and public bodies [prescribed under Regulation 157/10] may continue to use their existing evaluation processes, until the evaluation process required under section B.2 of the Standards & Guidelines for Conservation of Provincial Heritage Properties has been developed and approved by MTCS.

To determine if your property or project area has been evaluated, contact:

- the approval authority
- the proponent
- the Ministry of Tourism, Culture and Sport

3a. Is the property (or project area) identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value e.g.:

i. designated under the *Ontario Heritage Act*

- individual designation (Part IV)
- part of a heritage conservation district (Part V)

Individual Designation – Part IV

A property that is designated:

- by a municipal by-law as being of cultural heritage value or interest [s.29 of the *Ontario Heritage Act*]
- by order of the Minister of Tourism, Culture and Sport as being of cultural heritage value or interest of provincial significance [s.34.5]. **Note**: To date, no properties have been designated by the Minister.

Heritage Conservation District – Part V

A property or project area that is located within an area designated by a municipal by-law as a heritage conservation district [s. 41 of the *Ontario Heritage Act*].

For more information on Parts IV and V, contact:

- municipal clerk
- Ontario Heritage Trust
- local land registry office (for a title search)

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ii. subject of an agreement, covenant or easement entered into under Parts II or IV of the *Ontario Heritage Act*

An agreement, covenant or easement is usually between the owner of a property and a conservation body or level of government. It is usually registered on title.

The primary purpose of the agreement is to:

- preserve, conserve, and maintain a cultural heritage resource
- prevent its destruction, demolition or loss

For more information, contact:

- Ontario Heritage Trust - for an agreement, covenant or easement [clause 10 (1) (c) of the *Ontario Heritage Act*]
- municipal clerk – for a property that is the subject of an easement or a covenant [s.37 of the *Ontario Heritage Act*]
- local land registry office (for a title search)

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iii. listed on a register of heritage properties maintained by the municipality

Municipal registers are the official lists - or record - of cultural heritage properties identified as being important to the community.

Registers include:

- all properties that are designated under the *Ontario Heritage Act* (Part IV or V)
- properties that have not been formally designated, but have been identified as having cultural heritage value or interest to the community

For more information, contact:

- municipal clerk
- municipal heritage planning staff
- municipal heritage committee

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iv. subject to a notice of:

- intention to designate (under Part IV of the *Ontario Heritage Act*)
- a Heritage Conservation District study area bylaw (under Part V of the *Ontario Heritage Act*)

A property that is subject to a **notice of intention to designate** as a property of cultural heritage value or interest and the notice is in accordance with:

- section 29 of the *Ontario Heritage Act*
- section 34.6 of the *Ontario Heritage Act.* **Note**: To date, the only applicable property is Meldrum Bay Inn, Manitoulin Island. [s.34.6]

An area designated by a municipal by-law made under section 40.1 of the *Ontario Heritage Act* as a **heritage conservation district study area**.

For more information, contact:

- municipal clerk – for a property that is the subject of notice of intention [s. 29 and s. 40.1]
- Ontario Heritage Trust

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v. included in the Ministry of Tourism, Culture and Sport's list of provincial heritage properties

Provincial heritage properties are properties the Government of Ontario owns or controls that have cultural heritage value or interest.

The Ministry of Tourism, Culture and Sport (MTCS) maintains a list of all provincial heritage properties based on information provided by ministries and prescribed public bodies. As they are identified, MTCS adds properties to the list of provincial heritage properties.

For more information, contact the MTCS Registrar at registrar@ontario.ca.

3b. Is the property (or project area) a National Historic Site (or part of)?

National Historic Sites are properties or districts of national historic significance that are designated by the Federal Minister of the Environment, under the *Canada National Parks Act*, based on the advice of the Historic Sites and Monuments Board of Canada.

For more information, see the National Historic Sites website.

3c. Is the property (or project area) designated under the *Heritage Railway Stations Protection Act*?

The *Heritage Railway Stations Protection Act* protects heritage railway stations that are owned by a railway company under federal jurisdiction. Designated railway stations that pass from federal ownership may continue to have cultural heritage value.

For more information, see the Directory of Designated Heritage Railway Stations.

3d. Is the property (or project area) designated under the *Heritage Lighthouse Protection Act*?

The *Heritage Lighthouse Protection Act* helps preserve historically significant Canadian lighthouses. The Act sets up a public nomination process and includes heritage building conservation standards for lighthouses which are officially designated.

For more information, see the Heritage Lighthouses of Canada website.

3e. Is the property (or project area) identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office?

The role of the Federal Heritage Buildings Review Office (FHBRO) is to help the federal government protect the heritage buildings it owns. The policy applies to all federal government departments that administer real property, but not to federal Crown Corporations.

For more information, contact the Federal Heritage Buildings Review Office.

See a directory of all federal heritage designations.

3f. Is the property (or project area) located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?

A UNESCO World Heritage Site is a place listed by UNESCO as having outstanding universal value to humanity under the Convention Concerning the Protection of the World Cultural and Natural Heritage. In order to retain the status of a World Heritage Site, each site must maintain its character defining features.

Currently, the Rideau Canal is the only World Heritage Site in Ontario.

For more information, see Parks Canada – World Heritage Site website.

Part B: Screening for potential Cultural Heritage Value

4a. Does the property (or project area) contain a parcel of land that has a municipal, provincial or federal commemorative or interpretive plaque?

Heritage resources are often recognized with formal plaques or markers.

Plaques are prepared by:

- municipalities
- provincial ministries or agencies
- federal ministries or agencies
- local non-government or non-profit organizations

For more information, contact:

- municipal heritage committees or local heritage organizations – for information on the location of plaques in their community
- Ontario Historical Society's Heritage directory – for a list of historical societies and heritage organizations
- Ontario Heritage Trust – for a list of plaques commemorating Ontario's history
- Historic Sites and Monuments Board of Canada – for a list of plaques commemorating Canada's history

4b. Does the property (or project area) contain a parcel of land that has or is adjacent to a known burial site and/or cemetery?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulations, Ontario Ministry of Consumer Services – for a database of registered cemeteries
- Ontario Genealogical Society (OGS) – to locate records of Ontario cemeteries, both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to locate early cemeteries

In this context, adjacent means contiguous or as otherwise defined in a municipal official plan.

4c. Does the property (or project area) contain a parcel of land that is in a Canadian Heritage River watershed?

The Canadian Heritage River System is a national river conservation program that promotes, protects and enhances the best examples of Canada's river heritage.

Canadian Heritage Rivers must have, and maintain, outstanding natural, cultural and/or recreational values, and a high level of public support.

For more information, contact the Canadian Heritage River System.

If you have questions regarding the boundaries of a watershed, please contact:

- your conservation authority
- municipal staff

4d. Does the property (or project area) contain a parcel of land that contains buildings or structures that are 40 or more years old?

A 40 year 'rule of thumb' is typically used to indicate the potential of a site to be of cultural heritage value. The approximate age of buildings and/or structures may be estimated based on:

- history of the development of the area
- fire insurance maps
- architectural style
- building methods

Property owners may have information on the age of any buildings or structures on their property. The municipality, local land registry office or library may also have background information on the property.

Note: 40+ year old buildings or structure do not necessarily hold cultural heritage value or interest; their age simply indicates a higher potential.

A building or structure can include:

- residential structure
- farm building or outbuilding
- industrial, commercial, or institutional building
- remnant or ruin
- engineering work such as a bridge, canal, dams, etc.

For more information on researching the age of buildings or properties, see the Ontario Heritage Tool Kit Guide Heritage Property Evaluation.

Part C: Other Considerations

5a. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) is considered a landmark in the local community or contains any structures or sites that are important to defining the character of the area?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has potential landmarks or defining structures and sites, for instance:

- buildings or landscape features accessible to the public or readily noticeable and widely known
- complexes of buildings
- monuments
- ruins

5b. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) has a special association with a community, person or historical event?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has a special association with a community, person or event of historic interest, for instance:

- Aboriginal sacred site
- traditional-use area
- battlefield
- birthplace of an individual of importance to the community

5c. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) contains or is part of a cultural heritage landscape?

Landscapes (which may include a combination of archaeological resources, built heritage resources and landscape elements) may be of cultural heritage value or interest to a community.

For example, an Aboriginal trail, historic road or rail corridor may have been established as a key transportation or trade route and may have been important to the early settlement of an area. Parks, designed gardens or unique landforms such as waterfalls, rock faces, caverns, or mounds are areas that may have connections to a particular event, group or belief.

For more information on Questions 5.a., 5.b. and 5.c., contact:

- Elders in Aboriginal Communities or community researchers who may have information on potential cultural heritage resources. Please note that Aboriginal traditional knowledge may be considered sensitive.
- municipal heritage committees or local heritage organizations
- Ontario Historical Society's "Heritage Directory" - for a list of historical societies and heritage organizations in the province

An internet search may find helpful resources, including:

- historical maps
- historical walking tours
- municipal heritage management plans
- cultural heritage landscape studies
- municipal cultural plans

Information specific to trails may be obtained through Ontario Trails.

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Criteria for Evaluating Archaeological Potential

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area may contain archaeological resources i.e., have archaeological potential
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Archaeological assessment

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a licensed consultant archaeologist (see page 4 for definitions) to undertake an archaeological assessment.

The assessment will help you:

- identify, evaluate and protect archaeological resources on your property or project area
- reduce potential delays and risks to your project

Note: By law, archaeological assessments **must** be done by a licensed consultant archaeologist. Only a licensed archaeologist can assess – or alter – an archaeological site.

What to do if you:

- **find an archaeological resource**

  If you find something you think may be of archaeological value during project work, you must – by law – stop all activities immediately and contact a licensed consultant archaeologist

  The archaeologist will carry out the fieldwork in compliance with the *Ontario Heritage Act* [s.48(1)].

- **unearth a burial site**

  If you find a burial site containing human remains, you must immediately notify the appropriate authorities (i.e., police, coroner's office, and/or Registrar of Cemeteries) and comply with the *Funeral, Burial and Cremation Services Act*.

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages when completing this form.

Project or Property Name

Municipality of South Bruce MCEA For a New Water Storage Facility (Teeswater)

Project or Property Location (upper and lower or single tier municipality)

Community of Teeswater

Proponent Name

Municipality of South Bruce

Proponent Contact Information

Stu Moffat , Manager of Operations - smoffat@southbruce.ca

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

	Yes	No
2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?	☐	☑

If Yes, do **not** complete the rest of the checklist. You are expected to follow the recommendations in the archaeological assessment report(s).

The proponent, property owner and/or approval authority will:

- summarize the previous assessment
- add this checklist to the project file, with the appropriate documents that demonstrate an archaeological assessment was undertaken e.g., MTCS letter stating acceptance of archaeological assessment report

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., environmental assessment document
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Are there known archaeological sites on or within 300 metres of the property (or the project area)?	☐	☑
4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property (or project area)?	☐	☑
5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or project area)?	☐	☑
6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?	☐	☑
7. Has the property (or project area) been recognized for its cultural heritage value?	☐	☑

If Yes to any of the above questions (3 to 7), do **not** complete the checklist. Instead, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment of your property or project area.

If No, continue to question 8.

	Yes	No
8. Has the entire property (or project area) been subjected to recent, extensive and intensive disturbance?	☐	☑

If Yes to the preceding question, do **not** complete the checklist. Instead, please keep and maintain a summary of documentation that provides evidence of the recent disturbance.

An archaeological assessment is not required.

If No, continue to question 9.

	Yes	No
9. Are there present or past water sources within 300 metres of the property (or project area)?	☑	☐

If Yes, an archaeological assessment is required.

If No, continue to question 10.

	Yes	No
10. Is there evidence of two or more of the following on the property (or project area)?	☐	☑

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

If Yes, an archaeological assessment is required.

If No, there is low potential for archaeological resources at the property (or project area).

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
  - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

In this context, the following definitions apply:

- **consultant archaeologist** means, as defined in Ontario regulation as an archaeologist who enters into an agreement with a client to carry out or supervise archaeological fieldwork on behalf of the client, produce reports for or on behalf of the client and provide technical advice to the client. In Ontario, these people also are required to hold a valid professional archaeological licence issued by the Ministry of Tourism, Culture and Sport.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may be already in place for identifying archaeological potential, including:

- one prepared and adopted by the municipality e.g., archaeological management plan
- an environmental assessment process e.g., screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport under the Ontario government's Standards & Guidelines for Conservation of Provincial Heritage Properties [s. B.2.]

2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?

Respond 'yes' to this question, if all of the following are true:

- an archaeological assessment report has been prepared and is in compliance with MTCS requirements
  - a letter has been sent by MTCS to the licensed archaeologist confirming that MTCS has added the report to the Ontario Public Register of Archaeological Reports (Register)
- the report states that there are no concerns regarding impacts to archaeological sites

Otherwise, if an assessment has been completed and deemed compliant by the MTCS, and the ministry recommends further archaeological assessment work, this work will need to be completed.

For more information about archaeological assessments, contact:

- approval authority
- proponent
- consultant archaeologist
- Ministry of Tourism, Culture and Sport at archaeology@ontario.ca

3. Are there known archaeological sites on or within 300 metres of the property (or project area)?

MTCS maintains a database of archaeological sites reported to the ministry.

For more information, contact MTCS Archaeological Data Coordinator at archaeology@ontario.ca.

4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property?

Check with:

- Aboriginal communities in your area
- local municipal staff

They may have information about archaeological sites that are not included in MTCS' database.

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or property area)?

Check with:

- Aboriginal communities in your area
- local municipal staff

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulation Unit, Ontario Ministry of Consumer Services – for database of registered cemeteries
- Ontario Genealogical Society (OGS) – to locate records of Ontario cemeteries, both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to locate early cemeteries

In this context, 'adjacent' means 'contiguous', or as otherwise defined in a municipal official plan.

7. Has the property (or project area) been recognized for its cultural heritage value?

There is a strong chance there may be archaeological resources on your property (or immediate area) if it has been listed, designated or otherwise identified as being of cultural heritage value by:

- your municipality
- Ontario government
- Canadian government

This includes a property that is:

- designated under *Ontario Heritage Act* (the OHA), including:
  - individual designation (Part IV)
  - part of a heritage conservation district (Part V)
  - an archaeological site (Part VI)
- subject to:
  - an agreement, covenant or easement entered into under the OHA (Parts II or IV)
  - a notice of intention to designate (Part IV)
  - a heritage conservation district study area by-law (Part V) of the OHA
- listed on:
  - a municipal register or inventory of heritage properties
  - Ontario government's list of provincial heritage properties
  - Federal government's list of federal heritage buildings
- part of a:
  - National Historic Site
  - UNESCO World Heritage Site
- designated under:
  - *Heritage Railway Station Protection Act*
  - *Heritage Lighthouse Protection Act*
- subject of a municipal, provincial or federal commemorative or interpretive plaque.

To determine if your property or project area is covered by any of the above, see:

- Part A of the MTCS Criteria for Evaluating Potential for Built Heritage and Cultural Heritage Landscapes

Part VI – Archaeological Sites

Includes five sites designated by the Minister under Regulation 875 of the Revised Regulation of Ontario, 1990 (Archaeological Sites) and 3 marine archaeological sites prescribed under Ontario Regulation 11/06.

For more information, check Regulation 875 and Ontario Regulation 11/06.

8. Has the entire property (or project area) been subjected to recent extensive and intensive ground disturbance?

Recent: after-1960

Extensive: over all or most of the area

Intensive: thorough or complete disturbance

Examples of ground disturbance include:

- quarrying
- major landscaping – involving grading below topsoil
- building footprints and associated construction area
  - where the building has deep foundations or a basement
- infrastructure development such as:
  - sewer lines
  - gas lines
  - underground hydro lines
  - roads
  - any associated trenches, ditches, interchanges. **Note**: this applies only to the excavated part of the right-of-way; the remainder of the right-of-way or corridor may not have been impacted.

A ground disturbance does **not** include:

- agricultural cultivation
- gardening
- landscaping

Site visits

You can typically get this information from a site visit. In that case, please document your visit in the process (e.g., report) with:

- photographs
- maps
- detailed descriptions

If a disturbance isn't clear from a site visit or other research, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment.

9. Are there present or past water bodies within 300 metres of the property (or project area)?

Water bodies are associated with past human occupations and use of the land. About 80-90% of archaeological sites are found within 300 metres of water bodies.

Present

- Water bodies:
  - primary - lakes, rivers, streams, creeks
  - secondary - springs, marshes, swamps and intermittent streams and creeks
- accessible or inaccessible shoreline, for example:
  - high bluffs
  - swamps
  - marsh fields by the edge of a lake
  - sandbars stretching into marsh

Water bodies not included:

- man-made water bodies, for example:
  - temporary channels for surface drainage
  - rock chutes and spillways
  - temporarily ponded areas that are normally farmed
  - dugout ponds
- artificial bodies of water intended for storage, treatment or recirculation of:
  - runoff from farm animal yards
  - manure storage facilities
  - sites and outdoor confinement areas

Past

Features indicating past water bodies:

- raised sand or gravel beach ridges – can indicate glacial lake shorelines
- clear dip in the land – can indicate an old river or stream
- shorelines of drained lakes or marshes
- cobble beaches

You can get information about water bodies through:

- a site visit
- aerial photographs
- 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

10. Is there evidence of two or more of the following on the property (or project area)?

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

- **Elevated topography**

  Higher ground and elevated positions - surrounded by low or level topography - often indicate past settlement and land use.

  Features such as eskers, drumlins, sizeable knolls, plateaus next to lowlands, or other such features are a strong indication of archaeological potential.

  Find out if your property or project area has elevated topography, through:

  - site inspection
  - aerial photographs
  - topographical maps

- **Pockets of well-drained sandy soil, especially within areas of heavy soil or rocky ground**

  Sandy, well-drained soil - in areas characterized by heavy soil or rocky ground - may indicate archaeological potential

  Find out if your property or project area has sandy soil through:

  - site inspection
  - soil survey reports

- **Distinctive land formations**

  Distinctive land formations include – but are not limited to:

  - waterfalls
  - rock outcrops
  - rock faces
  - caverns
  - mounds, etc.

  They were often important to past inhabitants as special or sacred places. The following sites may be present – or close to – these formations:

  - burials
  - structures
  - offerings
  - rock paintings or carvings

  Find out if your property or project areas has a distinctive land formation through:

  - a site visit
  - aerial photographs
  - 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

- **Resource extraction areas**

  The following resources were collected in these extraction areas:

  - food or medicinal plants e.g., migratory routes, spawning areas, prairie
  - scarce raw materials e.g., quartz, copper, ochre or outcrops of chert
  - resources associated with early historic industry e.g., fur trade, logging, prospecting, mining

  Aboriginal communities may hold traditional knowledge about their past use or resources in the area.

- **Early historic settlement**

  Early Euro-Canadian settlement include – but are not limited to:

  - early military or pioneer settlement e.g., pioneer homesteads, isolated cabins, farmstead complexes
  - early wharf or dock complexes
  - pioneers churches and early cemeteries

  For more information, see below – under the early historic transportation routes.

- **Early historic transportation routes** - such as trails, passes, roads, railways, portage routes, canals.

  For more information, see:

  - historical maps and/or historical atlases
    - for information on early settlement patterns such as trails (including Aboriginal trails), monuments, structures, fences, mills, historic roads, rail corridors, canals, etc.
    - Archives of Ontario holds a large collection of historical maps and historical atlases
    - digital versions of historic atlases are available on the Canadian County Atlas Digital Project
  - commemorative markers or plaques such as local, provincial or federal agencies
  - municipal heritage committee or other local heritage organizations
    - for information on early historic settlements or landscape features (e.g., fences, mill races, etc.)
    - for information on commemorative markers or plaques

Ontario

Ministry of Tourism, Culture and Sport

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Criteria for Evaluating Archaeological Potential

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area may contain archaeological resources i.e., have archaeological potential
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  - the main project area
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Processes covered under this checklist, such as:

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- *Aggregates Resources Act*
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Archaeological assessment

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a licensed consultant archaeologist (see page 4 for definitions) to undertake an archaeological assessment.

The assessment will help you:

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Note: By law, archaeological assessments **must** be done by a licensed consultant archaeologist. Only a licensed archaeologist can assess – or alter – an archaeological site.

What to do if you:

- **find an archaeological resource**

  If you find something you think may be of archaeological value during project work, you must – by law – stop all activities immediately and contact a licensed consultant archaeologist

  The archaeologist will carry out the fieldwork in compliance with the *Ontario Heritage Act* [s.48(1)].

- **unearth a burial site**

  If you find a burial site containing human remains, you must immediately notify the appropriate authorities (i.e., police, coroner's office, and/or Registrar of Cemeteries) and comply with the *Funeral, Burial and Cremation Services Act*.

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages when completing this form.

Project or Property Name

Municipality of South Bruce - Additional Well

Project or Property Location (upper and lower or single tier municipality)

Community of Teeswater

Proponent Name

Municipality of South Bruce

Proponent Contact Information

Stu Moffat , Manager of Operations - smoffat@southbruce.ca

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

	Yes	No
2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?	☐	☑

If Yes, do **not** complete the rest of the checklist. You are expected to follow the recommendations in the archaeological assessment report(s).

The proponent, property owner and/or approval authority will:

- summarize the previous assessment
- add this checklist to the project file, with the appropriate documents that demonstrate an archaeological assessment was undertaken e.g., MTCS letter stating acceptance of archaeological assessment report

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., environmental assessment document
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If No, continue to Question 3.

	Yes	No
3. Are there known archaeological sites on or within 300 metres of the property (or the project area)?	☐	☑
4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property (or project area)?	☐	☑
5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or project area)?	☐	☑
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7. Has the property (or project area) been recognized for its cultural heritage value?	☐	☑

If Yes to any of the above questions (3 to 7), do **not** complete the checklist. Instead, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment of your property or project area.

If No, continue to question 8.

	Yes	No
8. Has the entire property (or project area) been subjected to recent, extensive and intensive disturbance?	☑	☐

If Yes to the preceding question, do **not** complete the checklist. Instead, please keep and maintain a summary of documentation that provides evidence of the recent disturbance.

An archaeological assessment is not required.

If No, continue to question 9.

	Yes	No
9. Are there present or past water sources within 300 metres of the property (or project area)?	☐	☐

If Yes, an archaeological assessment is required.

If No, continue to question 10.

	Yes	No
10. Is there evidence of two or more of the following on the property (or project area)?	☐	☐

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- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

If Yes, an archaeological assessment is required.

If No, there is low potential for archaeological resources at the property (or project area).

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

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Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
  - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

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1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may be already in place for identifying archaeological potential, including:

- one prepared and adopted by the municipality e.g., archaeological management plan
- an environmental assessment process e.g., screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport under the Ontario government's Standards & Guidelines for Conservation of Provincial Heritage Properties [s. B.2.]

2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?

Respond 'yes' to this question, if all of the following are true:

- an archaeological assessment report has been prepared and is in compliance with MTCS requirements
  - a letter has been sent by MTCS to the licensed archaeologist confirming that MTCS has added the report to the Ontario Public Register of Archaeological Reports (Register)
- the report states that there are no concerns regarding impacts to archaeological sites

Otherwise, if an assessment has been completed and deemed compliant by the MTCS, and the ministry recommends further archaeological assessment work, this work will need to be completed.

For more information about archaeological assessments, contact:

- approval authority
- proponent
- consultant archaeologist
- Ministry of Tourism, Culture and Sport at archaeology@ontario.ca

3. Are there known archaeological sites on or within 300 metres of the property (or project area)?

MTCS maintains a database of archaeological sites reported to the ministry.

For more information, contact MTCS Archaeological Data Coordinator at archaeology@ontario.ca.

4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property?

Check with:

- Aboriginal communities in your area
- local municipal staff

They may have information about archaeological sites that are not included in MTCS' database.

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or property area)?

Check with:

- Aboriginal communities in your area
- local municipal staff

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulation Unit, Ontario Ministry of Consumer Services – for database of registered cemeteries
- Ontario Genealogical Society (OGS) – to locate records of Ontario cemeteries, both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to locate early cemeteries

In this context, 'adjacent' means 'contiguous', or as otherwise defined in a municipal official plan.

7. Has the property (or project area) been recognized for its cultural heritage value?

There is a strong chance there may be archaeological resources on your property (or immediate area) if it has been listed, designated or otherwise identified as being of cultural heritage value by:

- your municipality
- Ontario government
- Canadian government

This includes a property that is:

- designated under *Ontario Heritage Act* (the OHA), including:
  - individual designation (Part IV)
  - part of a heritage conservation district (Part V)
  - an archaeological site (Part VI)
- subject to:
  - an agreement, covenant or easement entered into under the OHA (Parts II or IV)
  - a notice of intention to designate (Part IV)
  - a heritage conservation district study area by-law (Part V) of the OHA
- listed on:
  - a municipal register or inventory of heritage properties
  - Ontario government's list of provincial heritage properties
  - Federal government's list of federal heritage buildings
- part of a:
  - National Historic Site
  - UNESCO World Heritage Site
- designated under:
  - *Heritage Railway Station Protection Act*
  - *Heritage Lighthouse Protection Act*
- subject of a municipal, provincial or federal commemorative or interpretive plaque.

To determine if your property or project area is covered by any of the above, see:

- Part A of the MTCS Criteria for Evaluating Potential for Built Heritage and Cultural Heritage Landscapes

Part VI – Archaeological Sites

Includes five sites designated by the Minister under Regulation 875 of the Revised Regulation of Ontario, 1990 (Archaeological Sites) and 3 marine archaeological sites prescribed under Ontario Regulation 11/06.

For more information, check Regulation 875 and Ontario Regulation 11/06.

8. Has the entire property (or project area) been subjected to recent extensive and intensive ground disturbance?

Recent: after-1960

Extensive: over all or most of the area

Intensive: thorough or complete disturbance

Examples of ground disturbance include:

- quarrying
- major landscaping – involving grading below topsoil
- building footprints and associated construction area
  - where the building has deep foundations or a basement
- infrastructure development such as:
  - sewer lines
  - gas lines
  - underground hydro lines
  - roads
  - any associated trenches, ditches, interchanges. **Note**: this applies only to the excavated part of the right-of-way; the remainder of the right-of-way or corridor may not have been impacted.

A ground disturbance does **not** include:

- agricultural cultivation
- gardening
- landscaping

Site visits

You can typically get this information from a site visit. In that case, please document your visit in the process (e.g., report) with:

- photographs
- maps
- detailed descriptions

If a disturbance isn't clear from a site visit or other research, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment.

9. Are there present or past water bodies within 300 metres of the property (or project area)?

Water bodies are associated with past human occupations and use of the land. About 80-90% of archaeological sites are found within 300 metres of water bodies.

Present

- Water bodies:
  - primary - lakes, rivers, streams, creeks
  - secondary - springs, marshes, swamps and intermittent streams and creeks
- accessible or inaccessible shoreline, for example:
  - high bluffs
  - swamps
  - marsh fields by the edge of a lake
  - sandbars stretching into marsh

Water bodies not included:

- man-made water bodies, for example:
  - temporary channels for surface drainage
  - rock chutes and spillways
  - temporarily ponded areas that are normally farmed
  - dugout ponds
- artificial bodies of water intended for storage, treatment or recirculation of:
  - runoff from farm animal yards
  - manure storage facilities
  - sites and outdoor confinement areas

Past

Features indicating past water bodies:

- raised sand or gravel beach ridges – can indicate glacial lake shorelines
- clear dip in the land – can indicate an old river or stream
- shorelines of drained lakes or marshes
- cobble beaches

You can get information about water bodies through:

- a site visit
- aerial photographs
- 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

10. Is there evidence of two or more of the following on the property (or project area)?

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

- **Elevated topography**

  Higher ground and elevated positions - surrounded by low or level topography - often indicate past settlement and land use.

  Features such as eskers, drumlins, sizeable knolls, plateaus next to lowlands, or other such features are a strong indication of archaeological potential.

  Find out if your property or project area has elevated topography, through:

  - site inspection
  - aerial photographs
  - topographical maps

- **Pockets of well-drained sandy soil, especially within areas of heavy soil or rocky ground**

  Sandy, well-drained soil - in areas characterized by heavy soil or rocky ground - may indicate archaeological potential

  Find out if your property or project area has sandy soil through:

  - site inspection
  - soil survey reports

- **Distinctive land formations**

  Distinctive land formations include – but are not limited to:

  - waterfalls
  - rock outcrops
  - rock faces
  - caverns
  - mounds, etc.

  They were often important to past inhabitants as special or sacred places. The following sites may be present – or close to – these formations:

  - burials
  - structures
  - offerings
  - rock paintings or carvings

  Find out if your property or project areas has a distinctive land formation through:

  - a site visit
  - aerial photographs
  - 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

- **Resource extraction areas**

  The following resources were collected in these extraction areas:

  - food or medicinal plants e.g., migratory routes, spawning areas, prairie
  - scarce raw materials e.g., quartz, copper, ochre or outcrops of chert
  - resources associated with early historic industry e.g., fur trade, logging, prospecting, mining

  Aboriginal communities may hold traditional knowledge about their past use or resources in the area.

- **Early historic settlement**

  Early Euro-Canadian settlement include – but are not limited to:

  - early military or pioneer settlement e.g., pioneer homesteads, isolated cabins, farmstead complexes
  - early wharf or dock complexes
  - pioneers churches and early cemeteries

  For more information, see below – under the early historic transportation routes.

- **Early historic transportation routes** - such as trails, passes, roads, railways, portage routes, canals.

  For more information, see:

  - historical maps and/or historical atlases
    - for information on early settlement patterns such as trails (including Aboriginal trails), monuments, structures, fences, mills, historic roads, rail corridors, canals, etc.
    - Archives of Ontario holds a large collection of historical maps and historical atlases
    - digital versions of historic atlases are available on the Canadian County Atlas Digital Project
  - commemorative markers or plaques such as local, provincial or federal agencies
  - municipal heritage committee or other local heritage organizations
    - for information on early historic settlements or landscape features (e.g., fences, mill races, etc.)
    - for information on commemorative markers or plaques

NOTES
N.O. – NORMALLY OPEN
N.C. – NORMALLY CLOSED

CLINTON STREET (HIGHWAY #4)

STEEL GUIDERAIL

TEESWATER RIVER

WATER LEVEL 288.506

TEESWATER RIVER

100mmø WTM TO DISTRIBUTION SYSTEM (APPROX. LOCATION)

50mmø C.S. FOR BLOWOFF AT NORTH END OF CONTACT CHAMBER

21m

2m Typ.

450x450x150 TEE WITH 450mmø PLUG

150mmø PVC

90° BEND WITH THRUST RESTRAINT (Typ.)

450mmø CONTACT CHAMBER

GAS METER LOACTION

CONC PAD

WATER TREATMENT PLANT BUILDING F.F. 291.37

STEPS

CONC PAD

C.S. 19mmø COPPER SAMPLE LINE

CONC PAD

WATER FOUNTAIN

WV

STEPS

150mmø WV (N.C. AND LOCKED SHUT)

100mmø WV (N.O.)

250mmø

450x250 REDUCER

250mmø WV (N.O.)

50mmø C.S. FOR BLOWOFF AT SOUTH END OF CONTACT CHAMBER

ASPHALT PAD

SECURITY FENCE

200mmø ARTESIAN WELL

Ex. 250mmø PVC

Ex. 150mmø

250mmø WTM TO DISTRIBUTION SYSTEM (APPROX. LOCATION)

150mmø WTM TO DISTRIBUTION SYSTEM (APPROX. LOCATION)

APPROX. LOCATION OF TILE BED

PROPERTY LINE

U/G BELL LINE

TIMBER PLAY CENTER

PARTIAL GRAVEL

HPLS

ROOF OVERHANG

ROCKING HORSES

CONCRETE PAD FOR PICNIC SHELTER

SLIDE

BOTTOM OF BANK

SENIORS RESIDENCE

HPLS

TOP OF BANK

CONCRETE SIDEWALK

ASPHALT BOULEVARD

HILLCREST STREET
(FORMERLY ELORA STREET)

RECORD DRAWINGS
The revisions to these contract documents reflecting the significant change in the Work made during construction are based on data furnished by the Contractor to the Architect. The Architect shall not be held responsible for the accuracy of the information provided by the Contractor.

SITE BENCH MARK ELEV = 291.37
FINISH FLOOR ELEVATION OF WATER TREATMENT BUILDING

DATE	DESCRIPTION
FEB 2008	AS BUILT

REVISION / ISSUE

Seal not valid unless signed and dated

LICENSED PROFESSIONAL ENGINEERS
J.T. GRAHAM
PROVINCE OF ONTARIO

HENDERSON PADDON
& ASSOCIATES LIMITED
CIVIL & ENVIRONMENTAL ENGINEERING CONSULTANTS
OWEN SOUND ◆ THE BLUE MOUNTAINS ◆ GRIMSBY ◆ HANOVER
PHONE (519) 376-7612 SINCE 1972

Title:
SITE PLAN
TEESWATER WATER TREATMENT PLANT

Client:
MUNICIPALITY OF SOUTH BRUCE

Design:	Scale: 1:200
Drawn: C A H	Approved:
Checked: J T G	
Date: DEC. 06	Design Engineer

DRAWING No. 106071-02

C:\2006\100\106071\Draw\106071-02-0.dwg Feb 22, 2008 - 4:18pm

Stage 1-2 Archaeological Assessment
New Water Storage Facility
Community of Teeswater, Municipality of South Bruce
Part of Lots 14 and 15, Concession 6, and Lot 15, Concession 7
Geographic Township of Culross
Bruce County, Ontario

Original Report

Submitted to:
Ministry of Citizenship and Multiculturalism

Prepared for:
B.M. Ross and Associates Ltd.
62 North Street
Goderich, ON N7A 2T4
lcourtney@bmross.net

Prepared by:
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Licensee:	Amanda Parks, MA (P450)
PIF No:	P450-0141-2024
Project No:	2024-414
Dated:	February 27, 2025

EXECUTIVE SUMMARY

A Stage 1 and 2 archaeological assessment was conducted for the New Water Storage Facility (Teeswater) Municipal Class Environmental Assessment (MCEA), in the community of Teeswater, Municipality of South Bruce, Ontario. The project will involve the construction of a new elevated water storage facility and two proposed watermain connections. The project area is separated into two distinct areas: the North Parcel, which is located north of Elizabeth Street South and is bisected by Hillcrest Street West; and the South Parcel, which is located east of James Street East. In total, the project area is roughly 1.18 ha (2.92 ac) in size and is located within Lots 14 and 15, Concession 6, and Lot 15, Concession 7, in the Geographic Township of Culross, Bruce County. In 2024, TMHC Inc. (TMHC) was contracted by B.M. Ross and Associates Ltd. to undertake the assessment, which was conducted in accordance with the provisions of the *Environmental Assessment Act*. The purpose of the assessment was to determine whether there were archaeological resources present within the project area.

The Stage 1 background study included a review of current land use, historic and modern maps, past settlement history for the area and a consideration of topographic and physiographic features, soils and drainage. It also involved a review of previously registered archaeological resources within 1 km of the project area and previous archaeological assessments within 50 m. The background study indicated that the project area had potential for the recovery of archaeological resources due the proximity (i.e., within 300 m) of features that signal archaeological potential, namely:

- a water source (Teeswater River);
- mapped 19th-century thoroughfares (Elizabeth, James, Hillcrest, Clinton, Marcy, Gordon, Union, Clarinda, Brownlee, and Janet Streets);
- an area of mapped 19th-century settlement (Teeswater) – multiple structures present within the village plot;
- known heritage properties (2 Clinton Street South and 3 Clinton Street South); and,
- a provincial plaque (The Founding of Teeswater).

The project area consists of non-ploughable lands; these were subject to Stage 2 assessment via standard test pit survey at a 5 m transect interval (0.8%; 0.01 ha), in keeping with provincial standards. Areas where disturbed soils were identified were subject to a judgmental test pit survey at a 10 m interval to determine the extent of disturbance (64.4%; 0.76 ha). The remainder of the project area consists of built features that were previously disturbed (30.5%; 0.36 ha) and a steeply sloped area (4.2%; 0.05 ha), which were deemed of low archaeological potential and were photo-documented.

All work met provincial standards, and no archaeological material was documented during the assessment. As such, no further archaeological assessment is recommended.

Should proposed impacts extend beyond the lands assessed for this project, then additional assessment may be required.

These recommendations are subject to the conditions laid out in Section 5.0 of this report, and to the Ministry of Citizenship and Multiculturalism's (MCM's) review and acceptance of this report into the provincial register of archaeological reports.

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PROJECT PERSONNEL

Project Manager	Amanda Parks, MA (P450)
Project Administrators	Kellie Theaker, CHRP
	Victoria Scott, MA, MLis
	Sara Harvey
Health and Safety Coordinator	Wendi Jakob, C.Tech, CAPM
Fieldwork Coordinators	Katherine Bishop, PhD (P407)
	Valerie Wolfkamp, MA
	David Gostick, BA
Field Director	Arwen Johns, MA (R1330)
Field Technicians	Gloria Schidowka, MSc
	Ashley Ward, MA
	Tristan Cook, BA
	Brandon Thompson, BA
GIS Technician	David Gostick, BA
Report Writer	Casey Lun, MSc
Senior Reviewer	Matthew Beaudoin, PhD (P324)

ACKNOWLEDGEMENTS

B.M. Ross and Associates Ltd.	Lisa Courtney

TERRITORIAL ACKNOWLEDGEMENT

The project area is within the traditional territory of Chippewas of Nawash Unceded First Nation and Saugeen First Nation, collectively Saugeen Ojibway Nation (SON). SON's Traditional Territory is bounded on the south by the Maitland River system from Goderich to past Arthur, on the west by the Canada/USA border in the middle of Lake Huron, on the north by a line along the midpoint of the channel between the Saugeen (Bruce) Peninsula and Manitoulin Island, and on the east by a line down the middle of Georgian Bay. The SON also asserts Aboriginal title over that portion of Lake Huron and Georgian Bay within their Territory.

The people of the Chippewas of Nawash and Saugeen First Nations have lived, fished, hunted, and traded throughout these lands for generations and continue to do so today. They have a deep connection to the lands within their traditional territory. This includes cultural heritage: spiritual and sacred sites, artifacts and archaeological sites, built heritage, and cultural heritage landscapes. It also includes care and protection for the Ancestors and their resting places.

The project area is also within the settlement, resource gathering, and historic trading areas of the Historic Saugeen Métis. The Historic Saugeen Métis are descended from unions between European traders and First Nations women. The Historic Saugeen Métis hunt, fish, trap, and harvest the lands and waters of the Bruce Peninsula and Lake Huron. Today, they trace their roots through Grey, Bruce, the western part of Huron, the northern part of Lambton, and parts of Wellington, Dufferin, and Waterloo Counties.

This land continues to be home to diverse Indigenous peoples (e.g., First Nations, Métis and Inuit) who are contemporary stewards of the land.

INDIGENOUS PARTICIPANTS

Saugeen Ojibway Nation

SON Archaeology Department Kove Sartor

ABOUT TMHC

Established in 2003 with a head office in London, Ontario, TMHC Inc. (TMHC) provides a broad range of archaeological assessment, heritage planning and interpretation, cemetery, and community consultation services throughout the Province of Ontario. We specialize in providing heritage solutions that suit the past and present for a range of clients and intended audiences, while meeting the demands of the regulatory environment. Over the past two decades, TMHC has grown to become one of the largest privately-owned heritage consulting firms in Ontario and is today the largest predominately woman-owned CRM business in Canada.

Since 2004, TMHC has held retainers with Infrastructure Ontario, Hydro One, the Ministry of Transportation, Metrolinx, the City of Hamilton, and Niagara Parks Commission. In 2013, TMHC earned the Ontario Archaeological Society's award for Excellence in Cultural Resource Management. Our seasoned expertise and practical approach have allowed us to manage a wide variety of large, complex, and highly sensitive projects to successful completion. Through this work, we have gained corporate experience in helping our clients work through difficult issues to achieve resolution.

TMHC is skilled at meeting established deadlines and budgets, maintaining a healthy and safe work environment, and carrying out quality heritage activities to ensure that all projects are completed diligently and safely. Additionally, we have developed long-standing relationships of trust with Indigenous and descendent communities across Ontario and a good understanding of community interests and concerns in heritage matters, which assists in successful project completion.

TMHC is a Living Wage certified employer with the Ontario Living Wage Network and a member of the Canadian Federation for Independent Business.

KEY STAFF BIOS

Matthew Beaudoin, PhD – Principal

Matthew received a PhD in Anthropology from Western University in 2013 and has a professional archaeological license with the Province of Ontario (P324). During his archaeological career, Matthew has conducted extensive field research and artifact analysis in Labrador and Ontario, and has taught the Field Methods Course and Principals of archaeology courses as a part-time faculty member at Western University. Matthew has also conducted ethnographic projects in Labrador, and has volunteered with the OAS to provide archaeological training to several Indigenous communities throughout the province.

Over the course of his career, Matthew has supervised over 800 archaeological assessments in Ontario, including Stages 1-4, under a variety of regulatory triggers including provincial and municipal Environmental Assessments, Green Energy projects, development projects under the *Planning Act*, and as due diligence process. Matthew has extensive experience managing large and complex archaeological projects in conjunction with other disciplines, specialists, and Indigenous communities including Enbridge Line 10 Westover Segment, Imperial Oil from Waterdown to Finch, and Highway 3 Widening in Kingsville. Since joining TMHC in 2008, Matthew has also been involved with several notable projects, such as the archaeological assessment of Stoney Point/Camp Ipperwash. For these and other projects, Matthew works closely with heritage staff at TMHC and with heritage staff employed by clients and stakeholder communities.

Matthew is an active member of the Canadian Archaeological Association, the Ontario Archaeological Society, the Society for American Archaeology, and the Society for Historical Archaeology.

Amanda Parks, MA – Manager – Environmental Assessments Project Division

Amanda began her career in archaeology in 2004 and has dedicated her work to the conservation of cultural heritage resources in Ontario. Amanda has worked on numerous Stage 1-4 archaeological assessments in a multitude of roles: project manager, field director, report writer, artifact analyst, and engagement specialist. Regarding the latter, Amanda has worked regularly with Indigenous communities throughout Ontario, engaging communities for archaeological projects, environmental assessments, and property management plans. She has established good working relationships with communities by focusing on a collaborative approach to the protection and documentation of archaeological sites.

Amanda earned a BA in Archaeological Science from the University of Toronto in 2012 and completed her MA in Applied Archaeology at Western in 2018. Her masters research focused on the sweat baths at the Redeemer site, a Middle Ontario Iroquoian site located in the City of Hamilton.

STATEMENT OF QUALIFICATIONS AND LIMITATIONS

The attached Report (the "Report") has been prepared by TMHC Inc. (TMHC) for the benefit of the Client (the "Client") in accordance with the agreement between TMHC and the Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations");
- represents TMHC's professional judgment in light of the Limitation and industry standards for the preparation of similar reports;
- may be based on information provided to TMHC which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context; and
- was prepared for the specific purposes described in the Report and the Agreement.

TMHC shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. TMHC accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

TMHC agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but TMHC makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Except (1) as agreed to in writing by TMHC and Client; (2) as required by-law; or (3) to the extent used by governmental reviewing agencies for the purpose of obtaining permits or approvals, the Report and the Information may be used and relied upon only by Client.

TMHC accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information ("improper use of the Report"), except to the extent those parties have obtained the prior written consent of TMHC to use and rely upon the Report and the Information. Any injury, loss or damages arising from improper use of the Report shall be borne by the party making such use.

This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

QUALITY INFORMATION

Report prepared by: _____

Casey Lun, MSc

Report Writer

Project managed by: _____

Amanda Parks, MA (P450)

Manager – Environmental Assessments Project Division

Report reviewed by: _____

Matthew Beaudoin, PhD (P324)

Principal/Manager of Archaeological Assessment

1 PROJECT CONTEXT

1.1 Development Context

1.1.1 Introduction

A Stage 1 and 2 archaeological assessment was conducted for the New Water Storage Facility (Teeswater) Municipal Class Environmental Assessment (MCEA), in the community of Teeswater, Municipality of South Bruce, Ontario. The project will involve the construction of a new elevated water storage facility and two proposed watermain connections. The project area is separated into two distinct areas: the North Parcel, which is located north of Elizabeth Street South and is bisected by Hillcrest Street West; and the South Parcel, which is located east of James Street East. In total, the project area is roughly 1.18 ha (2.92 ac) in size and is located within Lots 14 and 15, Concession 6, and Lot 15, Concession 7, in the Geographic Township of Culross, Bruce County. The North Parcel contains paved roads and manicured grass. The South Parcel contains a grassed sports field, a gravel track, a park with manicured grass that is lightly treed, and paved paths. In 2024, TMHC was contracted by B.M. Ross and Associates Ltd. to undertake the assessment, which was conducted in accordance with the provisions of the *Environmental Assessment Act*. The purpose of the assessment was to determine whether there were archaeological resources present within the project area.

All archaeological assessment activities were performed under the professional archaeological license of Amanda Parks, MA (P450) and in accordance with the *Standards and Guidelines for Consultant Archaeologists* (MTC 2011, "Standards and Guidelines"). Permission to enter the project area and carry out all required archaeological activities, including collecting artifacts when found, was given by B.M. Ross and Associates Ltd.

1.1.2 Purpose and Legislative Context

The *Ontario Heritage Act* (R.S.O. 1990) (OHA) provides legislative oversight for the conservation, protection, and preservation of heritage resources in the Province of Ontario, including archaeological resources. The *OHA* assigns responsibility for doing so to a provincial ministry, now the Ministry of Citizenship and Multiculturalism (MCM). The MCM regulates how archaeological sites are dealt with by:

- Establishing a system to license individuals permitted to identify and investigate archaeological sites;
- Creating technical standards and guidelines for archaeological fieldwork and reporting;
- Maintaining a list of registered archaeological sites; and
- Overseeing transfers of archaeological collections.

The *OHA* does not speak to the need for undertaking archaeological assessments prior to land development. Instead, it regulates how such work must be undertaken and how archaeological sites are dealt with when the need for an archaeological assessment is prompted by other pieces of legislation.

The *Environmental Assessment Act* (R.S.O. 1990)(EAA) was developed to provide for the protection, conservation and wise management of the environment in Ontario. It applies to projects carried out by a provincial ministry, municipality or designated public body, and which can be made to apply to private sector proponents through a designation regulation. Section 1 of the *EAA* has broadly defined "environment" to cover "cultural heritage" resources. As per policy guidelines, the *EAA* provides for two types of environmental assessment planning and approval processes for undertakings subject to the act: environmental assessments (EAs) and class environmental assessments (Class EAs).

The current project follows an approved Class Environmental Assessment (EA) developed by the Municipal Engineers Association on behalf of Ontario municipalities, as documented in *Municipal Class Environmental Assessments* (Municipal Engineers Association 2023). The document enables the planning and implementation of municipal infrastructure (including the road, water, wastewater, and transit undertakings set out in Appendix 1 of the document) to be undertaken in accordance with an approved procedure designed to protect the environment (Municipal Engineers Association 2023). Since the undertakings carried out by municipalities can vary in their potential environmental impact, undertakings have been classified as exempt, eligible for screening, B, and C with each classification having different requirements. Projects that are eligible for exemption must still be subject to an archaeological screening process to determine whether the project is exempt from the requirements of the EAA.

2 STAGE 1 BACKGROUND REVIEW

2.1 Research Methods and Sources

A Stage 1 overview and background study was conducted to gather information about known and potential cultural heritage resources within the project area. According to the *Standards and Guidelines*, a Stage 1 background study must include a review of:

- an up-to-date listing of sites from the MCM's PastPortal for 1 km around the project area;
- reports of previous archaeological fieldwork within a radius of 50 m around the project area;
- topographic maps at 1:10,000 (recent and historical) or the most detailed scale available;
- historical settlement maps (e.g., historical atlas, survey);
- archaeological management plans or other archaeological potential mapping when available; and,
- commemorative plaques or monuments on or near the project area.

For this project, the following activities were carried out to satisfy or exceed the above requirements:

- a database search was completed through MCM's PastPortal system that compiled a list of registered archaeological sites within 1 km of the project area (completed September 25, 2024);
- a review of known prior archaeological reports for the project area and adjacent lands;
- Ontario Base Mapping (1:10,000) was reviewed through ArcGIS and mapping layers under the Open Government Licence – Canada and the Open Government Licence- Ontario;
- detailed mapping provided by the client was reviewed; and,
- a series of historic maps and photographs was reviewed related to the post-1800 land settlement.

Additional sources of information were also consulted, including modern aerial photographs, local history accounts, soils data provided by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), physiographic data provided by the Ontario Ministry of Northern Development and Mines, and detailed topographic data provided by Land Information Ontario.

When compiled, background information was used to create a summary of the characteristics of the project area, in an effort to evaluate its archaeological potential. The Province of Ontario (MTC 2011; Section 1.3.1) has defined the criteria that identify archaeological potential as:

- previously identified archaeological sites;
- water sources;
    - primary water sources (e.g., lakes, rivers, streams, creeks);
    - secondary water sources (e.g., intermittent streams and creeks, springs, marshes, swamps);
    - features indicating past water sources (e.g., glacial lake shorelines, relic river or stream channels, shorelines of drained lakes or marshes, cobble beaches);
    - accessible or inaccessible shorelines (e.g., high bluffs, sandbars stretching into a marsh);
- elevated topography (e.g., eskers, drumlins, large knolls, plateau);
- pockets of well-drained sandy soils;
- distinctive land formations that might have been special or spiritual places (e.g., waterfalls, rock outcrops, caverns, mounds, promontories and their bases);
- resource areas, including:

  - food or medicinal plants (e.g., migratory routes, spawning areas, prairies);
  - scarce raw materials (e.g., quartz, copper, ochre, or chert outcrops);
  - early industry (e.g., fur trade, logging, prospecting, mining);
- areas of early 19th-century settlement, including:
  - early military locations;
  - pioneer settlement (e.g., homesteads, isolated cabins, farmstead complexes);
  - wharf or dock complexes;
  - pioneer churches;
  - early cemeteries;
- early transportation routes (e.g., trails, passes, roads, railways, portage routes);
- a property listed on a municipal register, designated under the *Ontario Heritage Act*, or that is a federal, provincial, or municipal historic landmark or site; and,
- a property that local histories or informants have identified with possible archaeological sites, historical event, activities, or occupations.

In Southern Ontario (south of the Canadian Shield), any lands within 300 m of any of the features listed above are considered to have potential for the discovery of archaeological resources.

Typically, a Stage 1 assessment will determine potential for Indigenous and 19th-century period sites independently. This is due to the fact that lifeways varied considerably during these eras, so the criteria used to evaluate potential for each type of site also varies.

It should be noted that some factors can also negate the potential for discovery of intact archaeological deposits. The *Standards and Guidelines* (MTC 2011; Section 1.3.2) indicates that archaeological potential can be removed in instances where land has been subject to extensive and deep land alterations that have severely damaged the integrity of any archaeological resources. Major disturbances indicating removal of archaeological potential include, but are not limited to:

- quarrying;
- major landscaping involving grading below topsoil;
- building footprints; and,
- sewage and infrastructure development.

Some activities (agricultural cultivation, surface landscaping, installation of gravel trails, etc.) may result in minor alterations to the surface topsoil but do not necessarily affect or remove archaeological potential. It is not uncommon for archaeological sites, including structural foundations, subsurface features and burials, to be found intact beneath major surface features like roadways and parking lots. Archaeological potential is, therefore, not removed in cases where there is a chance of deeply buried deposits, as in a developed or urban context or floodplain where modern features or alluvial soils can effectively cap and preserve archaeological resources.

2.2 Project Context: Archaeological Context

2.2.1 Project Area: Overview and Physical Setting

The project area is located in the community of Teeswater in the Municipality of South Bruce, and is separated into two distinct areas: the North Parcel, which is located north of Elizabeth Street South and is bisected by Hillcrest Street West; and the South Parcel, which is located east of James Street East. A new watermain connection is being proposed within the North Parcel and a New Water Storage Facility and watermain connection are being proposed within the South Parcel. In total, the project area is roughly 1.18 ha (2.92 ac) in size and is located within Lots 14 and 15, Concession 6, and Lot 15, Concession 7, in the Geographic Township of Culross, Bruce County. The North Parcel contains paved roads and manicured grass; it is bound to the north by a playground, to the east and west by residential properties and a public swimming pool, and to the south by Elizabeth Street South. The South Parcel contains a grassed sports field, a gravel track, a park with manicured grass that is lightly treed, and paved paths, all located within the Teeswater-Culross Community Centre property; it is bound to the north by a bank overlooking the Teeswater River, to the east by woodlot and paved paths, to the south by the sports field, and to the west by residential properties.

The project area falls within the Horseshoe Moraines physiographic region (Map 3), as defined by Chapman and Putnam (1984:127). The region is essentially a horseshoe-shaped area consisting of two major landform components, one being irregular, stony knobs and ridges composed of till and kame deposits and the other being areas of horizontally bedded sand and gravel terraces and swampy valley floors (Chapman and Putnam 1984:127). The southern portion of the region, closer to Lake Huron, consists of two (and sometimes three) morainic ridges of pale brown, hard, calcareous fine-textured till with some stoniness (Chapman and Putnam 1984:127). The project area is situated on a spillway associated with the Teeswater River.

Formal soil surveys for Bruce County do not map the soils in portions of the project area as they are defined as “urban” (Map 4). The portions of the project area where the soils are mapped contain Teeswater silt loam. Teeswater silt loam is a soil with good drainage that develops on silty alluvial deposits over gravel (Hoffman and Richards 1954).

The project area lies within the Greenock Creek-Teeswater River drainage. Teeswater River borders the project area to the north (Map 1).

2.2.2 Summary of Registered or Known Archaeological Sites

According to PastPortal (accessed September 25, 2024) there is one registered archaeological site within 1 km of the project area (Table 1). AlHh-4 (the Gibson site) is roughly 530 m to the west and was discovered during a Stage 1 and 2 archaeological assessment conducted by Scarlett Janusas Archaeology Inc (SJA) in advance of proposed subdivision development. Pedestrian and test pit surveys yielded over 400 19th-century artifacts, including ceramics, glass, and metals. A further Stage 3 assessment involving controlled surface pick-up and test unit excavation likewise yielded over 400 artifacts. The materials are said to relate to a mid 19th-century to early 20th-century refuse scatter associated with the Gibson Farmstead.

Table 1: Registered Archaeological Sites within 1 km of the Project Area

Borden Number	Site Name	Time Period	Affinity	Site Type	Status
AlHh-4	Gibson	Post-Contact		Rural Historical Farmstead, scatter	No Further CHVI

2.2.3 Summary of Past Archaeological Investigations within 50 m

During the course of this study no record was found of any archaeological investigations within 50 m of the project area. However, it should be noted that the MCM currently does not provide an inventory of archaeological assessments to assist in this determination.

2.2.4 Dates of Archaeological Fieldwork

The Stage 2 fieldwork was conducted on October 15 and 16, 2024, under the direction of Arwen Johns, MA (R1330). Table 2 lists the dates of fieldwork, along with the weather conditions associated with each day.

Table 2: Dates of Fieldwork, Weather Conditions and Field Director

Dates of Fieldwork	Weather Conditions	Field Director
October 15, 2024	Mix of sun and clouds, and sporadic rain	A. Johns, MA (R1330)
October 16, 2024	Sunny, clear, and cool with sporadic rain	A. Johns, MA (R1330)

2.3 Project Context: Historical Context

2.3.1 Indigenous Settlement in Bruce County

Our archaeological knowledge of past Indigenous occupation and land use in this portion of Bruce County is limited, largely due to a paucity of cultural resource management and research based archaeological assessments. Using existing data and regional syntheses, it is possible to propose a generalized model of Indigenous settlement in Bruce County. The general themes, time periods and cultural traditions of Indigenous settlement, based on archaeological evidence, are provided below and in Table 3.

Table 3: Chronology of Indigenous Settlement in Bruce County

Period	Time Range	Diagnostic Features	Archaeological Complexes
Early Paleo	9000-8400 BCE	fluted projectile points	Gainey, Barnes, Crowfield
Late Pale	8400-8000 BCE	non-fluted and lanceolate points	Holcombe, Hi-Lo, Lanceolate
Early Archaic	8000-6000 BCE	serrated, notched, bifurcate base points	Nettling, Bifurcate Base Horizon
Middle Archaic	6000-2500 BCE	stemmed, side & corner notched points	Brewerton, Otter Creek, Stanly/Neville
Late Archaic	2000-1800 BCE	narrow points	Lamoka
Late Archaic	1800-1500 BCE	broad points	Genesee, Adder Orchard, Perkiomen
Late Archaic	1500-1100 BCE	small points	Crawford Knoll
Terminal Archaic	1100-950 BCE	first true cemeteries	Hind
Early Woodland	950-400 BCE	expanding stemmed points, Vinette pottery	Meadowood
Middle Woodland	400 BCE-500 CE	dentate, pseudo-scallop pottery	Saugeen
Transitional Woodland	500-900 CE	first corn, cord-wrapped stick pottery	Princess Point
Late Woodland	900-1300 CE	first villages, corn horticulture, longhouses	Glen Meyer
Late Woodland	1300-1400 CE	large villages and houses	Uren, Middleport
Late Woodland	1400-1650 CE	tribal emergence, territoriality	
Contact Period - Indigenous	1650 CE-present	treaties, mixture of Indigenous & European items	
Contact Period - Settler	1796 CE-present	industrial goods, homesteads	

2.3.1.1 Paleo Period

The first inhabitants of Bruce County lived in small, mobile bands that moved across the landscape in pursuit of the large migratory game, particularly caribou that were the staple of their subsistence. Ontario at the time still experienced a cold and harsh climate, with open spruce woodland dominating between 10,500 and 8,000 BCE and tundra conditions between 9,200 – 8,300 BCE. Between 9,000-8,400 BCE, with the exception of the Niagara Escarpment, all of the Bruce Peninsula was submerged beneath pro-glacial Lake Algonquin (Cowan and Sharpe 2007:20).

The Paleo period is divided into two basic timeframes, distinguished by styles of chipped stone arrowheads or projectile points. The Early Paleo period (9,000 – 8,400 BCE) is associated archaeologically with carefully crafted leaf-shaped points or spear heads, donned with long narrow channels or flutes along the central axis of the point perpendicular to the base. These large points are better known further south in Ontario, although finds have also been made in neighbouring Grey County and many occur on Fossil Hill chert which outcrops on the Escarpment near Blue Mountain. The archaeological hallmark of the Late Paleo period (8,400 – 7,500 BCE) are smaller lanceolate spear points that, while still finely made, do not exhibit the characteristic flutes of earlier times and often occur on different raw materials, including quartzite from Sheguiandah on Manitoulin Island.

In general, documented Paleo sites in Ontario are rare, small and ephemeral. Given their considerable age, organic materials rarely survive and hence, archaeologically, they are known primarily from stone tools, including the spear tips identified above, alongside scraping, cutting, splitting and crushing tools used to manipulate plant and animal raw materials used for food, clothing, shelter and other necessities of life. Quite often they are associated with former glacial shorelines, which were the focus of caribou migratory routes.

To date, no Paleo period sites have been identified in Bruce County. This is partly due to the fact that some areas were submerged beneath glacial lakes for part of the period, although many of the locales where Paleo sites are likely to exist have not been subject to a significant amount of archaeological study. Two Early Paleo sites, AlHj-57 and AlHj-50, were discovered to the southeast of the Alpena-Amberley Ridge further south in Huron County during an archaeological assessment for the K2 wind energy project (TMHC 2012a, 2012b). BbHi-32, discovered during the assessment of SP Ontario Armow Wind energy project (Golder 2012a, 2016), is a potential Paleo site based on the presence of Fossil Hill chert tool manufacturing waste although further testing was not undertaken to confirm this.

2.3.1.2 Archaic Period

The Archaic period is a long, broadly defined period that encompasses long trajectories of subsistence and technological changes, in part as a continuing adaptation to climate and vegetation changes. The period essentially spans a long period of time between the post-glacial Paleo Period characterized primarily by big game hunters and the Woodland Period, associated with emergent horticulture, the introduction of longer-term settlements and pottery technology. Archaeologists generally recognize three major temporal divisions within the Archaic Period – Early (ca. 8,000 – 6,000 BCE), Middle (6,000 – 2,500 BCE) and Late (2,800 to 800 BCE) – generally defined by distinctive projectile point styles and other unique stone tool categories.

The Early Archaic period witnessed warming temperatures and fluctuating lake levels. By about 7,500 BCE there was a shift from the primarily coniferous forests of early times to mixed forest conditions that were favourable for deer, elk and moose. Early Archaic populations continued the mobile lifestyle of their predecessors and had a more varied diet exploiting a larger range of plant, bird, mammal and fish species. A

seasonal pattern of warm-season riverine or lakeshore settlements and interior cold-weather occupations has been documented in the archaeological record. Early Archaic sites are also quite rare on the landscape, with many potentially submerged as water levels rose to those of modern-day Lake Huron. As groups continued to live a mobile lifestyle, Early Archaic sites are often small and consist largely of stone tools and stone manufacturing waste. Three distinctive projectile point styles are associated with the Early Archaic: Side-Notched (8,000-7,700 BCE), Kirk/Nettling Corner-Notched (7,800-6,900 BCE), and LeCroy Bifurcate-Based (6,900-6000 BCE). These can be associated with heavy, roughly-flaked woodworking chopper/scrapers, ground axe-like celts and ground and polished slate tubes that may have served as atlatl (dart/spear-thrower) weights.

Three confirmed or suspected Early Archaic sites have been reported in Bruce County. BbHi-31 is a corner-notched projectile point identified near the Glammis Bog on Willow Creek and was discovered during the archaeological assessment for the SP Ontario Armow Wind project (Golder 2012a); however, the attribution of this discovery has been put into question (Fitzgerald 2016). The West Site (BfHh-2), discovered by William Fox as part of a long-term survey project undertaken by what is now the MCM, is a scatter of stone tool manufacturing debris made on Bar River Formation quartzite from Sheguiandah; it is described as a camp site related to butchering activities (Fox 1998). A side-notched projectile point made from quartzite was also recovered from Jones bluff at Cape Croker (Fitzgerald 2016).

Throughout Ontario, sites generally dating to the Middle Archaic are more commonly encountered, partially a reflection of great population density during this time as well as patterns of more regular and intensive utilization and occupation of resource-rich zones, albeit still on a seasonal basis. In Bruce County, Middle Archaic sites are still relatively rare, partially due to the limited archaeological investigation that has occurred within its bounds, but also due to the fact that continued fluctuating lake levels contributed to many sites being inundated.

By 5,000-4,000 BCE, mixed coniferous-deciduous forests were prevalent and bore significant nut-producing species (oak, walnut, butternut, hickory and beech) that attracted wapiti (elk) and white-tailed deer populations. Archaeological evidence also suggests that Middle Archaic populations were both hunters and fishers, indicated by the recovery of fishing apparatus, such as cobble netsinkers, and the regular occurrence of sites along waterways, especially adjacent to rapids, many of which are still popular fishing spots today.

The artifacts relating to or diagnostic of the Middle Archaic are more diverse than those from earlier times, with significant variability over the period's lengthy duration. Many of the earliest Middle Archaic projectile points are side-notched pieces or stemmed variations of earlier bifurcate base points with serrated edges from extensive resharpening. Corner- and side-notched spear points continued in use through the Middle Archaic period. Formal ground and polished stone tools are more common by this time, including axes, "bannerstones" (possibly weights for atlatls or spear-throwers, or for use as ornamental or ceremonial objects). In general, the diversity of artifacts reflects a wider range of activities, subsistence and otherwise, including hunting, fishing, wood and bone working, hide processing and so on. While it is not immediately evident archaeologically that watercraft were made and used during this time, it is none the less possible.

In the western Great Lakes, some Middle Archaic sites have produced items of local source copper or "native copper," as described by archaeologists to distinguish Canadian Shield derived material from that brought to North America by European explorers thousands of years later. Indigenous populations modified naturally occurring or mined copper nuggets through cold hammering and annealing into a variety of tools – projectile points, hooks, adzes and ornamental items. These, alongside copper raw materials, were traded throughout the Upper Great Lakes. Occasionally native copper artifacts are found at significant distances from sources

around Lake Superior, suggesting an extensive and wide-reaching trading network existed by this time that encompassed lands within what is now Bruce County. A tanged projectile point was recovered from the east side of the Bruce Peninsula in Eastnor Township to the south of Barrow Bay and a 5.5 kg (12 pound) native copper nugget was found along the Lake Huron shore near the mouth of the Saugeen River (Fitzgerald 2016). While most intensively practiced during the Middle Archaic period, native copper working continued into the Late Archaic and Woodland periods, although the objects from more recent times were generally ornamental or ritual in nature and often occur in mortuary contexts.

Only three sites in the PastPortal inventory for Bruce County are clearly identified as dating to the Middle Archaic period. These are the Gingrich Site (BcHh-3), a camp site four miles southeast of the mouth of Saugeen River, dating to ca. 3,000 – 2,500 BCE based on the presence of a corner/side notched projectile point type known as "Brewerton." It was identified by researchers from the National Museum in the 1950s. BaHg-5 is an isolated find of the same type of point, discovered during a recent archaeological assessment for a land development project north of Poplar Beach (Detritus Consulting 2019). The third site is BbHi-35, Armow Location 37, comprised of a ca. 3,500 – 2,000 BCE Otter Creek style projectile point recovered near Greenock Swamp and the headwaters of the North Penetangore River (Golder 2012b). Nonetheless, numerous other registered and known sites have generated confirmed or likely Middle Archaic artifacts:

- the Inverhuron-Lucas site (BbHj-3);
- Rocky Ridge (BbHj-16);
- Knetchel (BbHj-2); and
- BbHi-31.

These sites occur largely in lakeshore contexts, although BbHi-31 is on Willow Creek near the Glammis Bog.

Late Archaic period sites are far more plentiful in Bruce County, partially a reflection of the fact that these sites were never inundated as essentially modern lake levels were achieved by that time. In addition, climate and environmental conditions mimicked those of modern day. The Late Archaic period is once again defined based on the occurrence of distinctive projectile point styles that are divided into three overarching time periods or complexes: Narrow Point (ca. 2,500-1,800 BCE); Broad Point (ca. 2,000-1,400 BCE); and Small Point or Terminal Archaic (ca. 1,500-800 BCE). Two notable developments occur during this period. The first is the invention of the bow and arrow, thought to be reflected in the manufacture of much smaller projectile points for arrow tips. The second is the elaboration of mortuary traditions, as reflected in the documentation of Indigenous burials with highly elaborate grave goods that include ritual, ornamental and utilitarian items of local and non-local origin (e.g., native copper items, marine shell, unworked galena cubes and powdered red ochre). While archaeologists interpret these highly elaborate burials (referred to as "Glacial Kame" for their occurrence in glacial landforms of the same name) as the first formal Indigenous cemeteries, it should be noted that evidence from earlier burials is absent largely due to environmental conditions that inhibited preservation over longer time periods.

PastPortal identifies 11 Late Archaic Period sites or multiple occupation sites that include Late Archaic artifacts. Several of these sites, most interpreted as small, seasonal camps, were identified by annual research surveys completed by what is now the MCM during the late 1970s and 1980s and were not subject to extensive study. One of these is the Mason site (BeHh-6), a multiple occupation site located on the Wiarton-Oliphant portage route. Late Archaic artifacts have also been documented on the Project R/Rocky Ridge (BbHj-16) and Knechtel I (BbHj-2) sites in the Kincardine area along Lake Huron and the IF9 site along the North Penetangore River (Fisher 1994:43).

Numerous other sites within Bruce County, particularly within the Bruce Peninsula National Park, are possible Archaic habitation/lithic workshop sites although these cannot be assigned as such since investigations have not yet produced diagnostic artifacts that would confirm this. Burial sites at Sauble Beach (MHC 1999), Southampton (Fitzgerald 2002), and Inverhuron (Fitzgerald 2001; Lee 1960) contain native copper awls, marine shell beads and pendants, as well as red ochre and could be attributable to the Late Archaic Glacial Kame mortuary complex, as described above, although they may also be associated with similar mortuary traditions known for the Early Woodland period.

2.3.1.3 Early, Middle and Transitional Woodland Periods

Three hallmarks characterize the Woodland period: the appearance of earthenware pottery in the Great Lakes area around 800 BCE, the development of the practice of agriculture and the emergence of populations subsiding primarily on crop staples corn, beans and squash, and the appearance of major longer-term settlements. Whereas earlier populations practiced a settlement system comprised of seasonal movements to camps, activity areas and resource zones on a seasonal and semi-seasonal basis (a cycle that continued into modern times for some Indigenous groups), some Woodland period peoples lived in larger villages that were moved only when local resources were depleted. Archaeologists recognize three very wide-sweeping time divisions in the Woodland period reflecting considerable change in tools, technology and settlement-subsistence practices: Early (ca. 800-400 BCE), Middle (ca. 400 BCE – 700 CE), and Late (ca. 900-1650+ CE).

The Early Woodland is defined in Bruce County by sites attributed to what archaeologists call the Meadowood cultural complex (800-400 CE), associated with the oldest style of pottery known in Ontario - Vinette 1, thick- and straight-sided pots with tapering bottoms and cord- or fabric-roughened surfaces and lacking formal decoration. This pottery is similar to that manufactured around the same time by populations in Michigan and Ohio. Triangular preforms or tool blanks are also characteristic of Meadowood and exhibit considerable technical skill and craftsmanship. That these are found in large caches in proximity to primary chert outcrops suggests they were potentially mass produced, utilized in systems of widespread exchange throughout the Great Lakes and transformed into various tool forms like projectile points, hide scrapers and drills. Other Early Woodland projectile point types, like Turkey-tail and Adena Stemmed, show equal technical prowess in their execution and tie into widespread trade networks extending into Ohio. The Early Woodland archaeological cultures of Ontario continue the mortuary traditions of Late Archaic times and show connections to the elaborate ceremonial traditions of the Adena mortuary complex of the central Ohio Valley that included geometric and animal-form earthworks and burial mounds. The first evidence of domesticated plants (gourds, pumpkins, squash and sunflowers) also occurs in the Early Woodland.

Early Woodland sites in the greater Bruce Peninsula area are sporadic but generally widespread in the lower Saugeen River watershed (Donaldson – BdHi-1and Location 8 sites), along earlier incarnations of the Lake Huron shore (Project R/Rocky Ridge - BbHj-16 and Ferris – BbHj-21 sites), along the Penetangore and North Penetangore rivers (Penetangore – BaHj-4, IF16, and IF18 sites) and adjacent Silver Lake/Greenock Swamp (Fighting Pigeon site – BaHi-4) (Fitzgerald 2016). Not all of these are clearly defined in PastPortal as Early Woodland sites, with the inventory also including occupations at the Inverhuron-Lucas (BbHj-3) and Hunter (BdHh-5) sites.

The Middle Woodland period is associated with pottery vessels with more outflaring rims and exterior surfaces decorated with bands of stamped motifs made by impressing the edge of a scallop shell (or similar looking tool) (i.e., pseudo-scallop shell) or toothed comb (dentate stamp), with the former more common in the later part of the period. Regional differences are notable across Ontario during the Middle Woodland,

with the manifestation between the Bruce Peninsula and the Niagara Peninsula identified as "Saugeen," named for signature sites identified in Bruce County along the Saugeen River, some of which are burials. The latter suggest an association with the ca. 200 BCE to 500 CE Hopewell culture in southern and central Ohio associated with impressive burial mounds and earthworks, highly elaborate stone tool technologies and extensive, almost pan-American exchange networks indicated by the occurrence of non-local objects from thousands of miles distant. At the Donaldson site (BdHi-1) along the lower Saugeen River, exotic trade goods diagnostic of Hopewell traditions was identified in burial contexts - two sheet copper panpipe covers, three cut mica sheets, a copper-patched stone earspool, and a matched pair of cut and ground wolf maxillae.

Middle Woodland sites are larger and more frequent than Early Woodland sites in Ontario, likely due to population growth resulting from more intensive exploitation of fish. The distribution of Middle Woodland sites across Ontario suggests a shift from the Late Archaic-Early Woodland settlement pattern of larger band sizes in winter combined with summer dispersal into smaller groups to one of summer aggregations of large groups of people in highly accessible riverine areas with resource abundance (e.g., river rapids, river/stream mouths where spear fishing produced a rich subsistence base) and winter dispersal to smaller nuclear and extending family or small band camps. During the late summer and fall, extended families dispersed to shallow bays to net fall-spawning fish (i.e., whitefish, lake herring/cisco, and lake trout) and into the interior to harvest wild rice. Dispersal into small, mobile extended-family groups during periods of reduced food availability continued during the late fall and winter with the trapping and hunting of fur-bearing mammals being pursued from small, sheltered camps scattered throughout the interior.

In the greater Bruce Peninsula area, Saugeen "complex" Middle Woodland archaeological sites have been located near river mouths adjacent to the Lake Huron shore (Knechtel 2 – BbHj-2, Inverhuron- Lucas – BbHj-3, and Evans sites), alongside rapids of the lower Saugeen River (Donaldson – BdHi-1 and Thede- BcHi-7 sites), and around the shore of the inland Arran Lake (Krug site – BcHh-5), likely representing various components of the seasonal subsistence rounds and that individual watersheds (e.g., Saugeen, Sauble, and Penetangore) or other landscapes with clustered, reliable food and non-food resources may represent separate band territories (Fitzgerald 2016). In total 15 sites in the PastPortal inventory are recorded as consisting entirely of or incorporating a Middle Woodland occupation, including the more recently investigated Ne'bwaakah giizwed ziibi (BdHi-2) at the mouth of the Saugeen River and the Nochemowenaing (BfHg-4) site.

By the end of the late Middle Woodland period and into the early part of the Late Woodland pottery vessels emerged with more globular forms with rounded bases and heavily cord- or fabric-roughened exteriors with decoration created through impressing the ends of small circular tools (punctates) along the neck and twisted cords, cord-wrapped sticks and other cord-wrapped implements along the rim. Projectile points fashioned from pentagonal blanks as well as triangular forms also define this transition between Middle and Late Woodland. These transitional points and ceramics have been recovered in Bruce County at river mouth, sandy bay, and riverine locations – the Chief's Point – BeHh-2, multiple occupation Hunter - BdHh-5 and Donaldson – BdHi-1 sites as well as the IF10 site along the North Penetangore River (Fitzgerald 2016).

2.3.1.4 Late Woodland Period

During the Late Woodland period a warming trend between ca. 900 to 1250 CE, allowed for a more intensive pursuit of corn agriculture and its expansion to even marginal locales. Although intensive agricultural was not possible in the upper Bruce Peninsula which is characterized by poor soil development, conditions were conducive to it in the narrow Huron Fringe, the Lake Huron shore between Red Bay and Point Clark, and at the mouths of the Beaver and Bighead valleys at the head of Georgian Bay. At the tip of the Bruce Peninsula an anomalous pocket of sandy loam and loam soils surrounded by water on three sides could have supported the cultivation of domesticated plants if the growing season was suitable (Fitzgerald 2016). By providing a plentiful and storable, year-round food source, corn agriculture permitted the long-term settlement of locales, resulting in the creation of large village sites comprised of multiple extended families. While certain Great Lakes Indigenous populations practiced an agricultural lifestyle from this point on, Bruce Peninsula Algonquin groups practiced agriculture more intermittently and continued their diverse hunter-fisher-gatherer subsistence strategy. In fact, a cooling trend between ca. 1430 and 1850 encouraged a shorter growing season and full-scale adoption of agriculture by Bruce County Indigenous populations during this period.

The Late Woodland period is Bruce County is still poorly understood, primarily because the archaeological record has been traditionally interpreted using biases from other parts of Ontario where it is both better known from a larger sample of archaeological sites and associated with historically documented Iroquoian groups like the Tionnontate (or Petun) near Blue Mountain, Huron-Wendat in primarily Simcoe County and Attawandaron or Neutral in southwestern Ontario, and their ancestral populations. The Late Woodland 14th century Nodwell site is one of the only of its kind to be identified in Bruce County and its interpretation is subsequently the subject of much disagreement. Traditionally, many archaeologists have interpreted Nodwell as an Iroquoian village, due to the fact that it bears hallmarks of the typical "Iroquoian" pattern identified elsewhere in Ontario – large multi-family dwellings referred to as longhouses, a palisade around the perimeter, and complex ceramic traditions for pottery manufacture and pipe making. However, a more recent interpretation of the site is that it was occupied by local Bruce Peninsula Algonquian-speaking groups who practiced an agricultural lifestyle until the cooling period of the Little Ice Age prohibited the successful cultivation of corn over the long term (Fitzgerald 2016). Accounts in the 17th century by European explorers and missionaries speak to corn cultivation by local Algonquian-speaking groups.

Although there is regional diversity and significant variability in settlement patterns and both tool and pottery technologies throughout the Late Woodland period that are too numerous to describe here, Late Woodland archaeological sites are identified by the presence of high quality, thin-walled pottery with intricate impressed and incised decoration, small triangular or side-notched triangular projectile points, animal bone tools and ornaments, clay and stone smoking pipes, polished and ground stone implements, extensive assemblages of animal and fish bone and occasionally preserved botanical remains such as seeds or kernels of corn, beans, squash, tobacco and medicinal plants. Late Woodland site types include palisaded villages (which grow from early settlements of one or two houses to assemblies of twenty or more), cabin and special-purpose sites, camps, burials and ossuaries (i.e., large multiple burial pits), although the latter have not yet been documented in Bruce County.

Late Woodland period habitation, resource-procurement, ritual, and burial sites are noticeably more frequent and widespread across the Bruce Peninsula and adjacent areas. As they can often reflect larger and longer-occupied sites, they tend to be more visible archaeologically. In addition to Nodwell, one other 14th century palisaded longhouse village is known in Port Elgin and is a recent discovery (Fitzgerald 2016). Known Late Woodland sites occur most frequently in close proximity to the Lake Huron and Georgian Bay shorelines,

especially near mouths of watercourses and in sandy bays (e.g., Potawatomi and Sydenham rivers, Eddy's/Little Port Elgin Creek [Sandy Beach Bay], Dunks Bay, Black Creek [Myles Bay], Red Bay, Sauble River, French Bay, Stoney Creek, Saugeen River, Little Sauble River [Inverhuron Bay], Andrews Creek). Other nearshore site localities on the Georgian Bay side of the peninsula – many that would appear less inviting, include relict cobble strandlines, exposed bedrock, and in or under shallow escarpment caves and overhangs (e.g., Flowerpot Island, Little Cove, Cave Point, Hunter's Point, White Cloud Island, Colpoys Bay). Instances of interior sites, while few, occur in a variety of settings that each would have served a specific purpose – along portage routes (e.g., Boat Lake), adjacent to rivers and lakes/swamps (e.g., Saugeen River, Otter Lake/Greenock Swamp), and in areas of sandy and sandy loam soils associated with pro-glacial Main Lake Algonquin features – i.e., lake beds and barrier bars (e.g., Port Elgin and the valley mouths of the Bighead and Beaver rivers) (Fitzgerald 2016).

Twenty sites in the Bruce County inventory in PastPortal are attributed to the Late Woodland period. Notable examples include the Hunter's Point site (BfHg-3), which dates between 1300 and 1500 CE, the Cripps site (BhHj-17) located in the Dunk's Bay area and Hunter site (BdHh-5), situated on the Saugeen Reserve. A notable recent discovery is the Ne'bwaakaah giizwed ziibi site (BdHi-2) at the mouth of the Saugeen River in Southampton that yielded Late Woodland cultural features containing pottery, dog, bird and beaver burials along with potential ceremonial fish features (FAC 2013).

Beginning in the late-16th century, Late Woodland sites are also characterized by the occurrence of items of European manufacture or fashioned from them. These include various varieties of glass beads, whole copper/brass kettles and fragments thereof, glass and ceramic containers and iron tools, namely axes, awls, knives and other implements. While the earliest items were likely brought into the Bruce by individuals who had encountered or were accompanied by European explorers and missionaries, later items are a product of a systematic trade network that developed in response to French, English and Dutch interests in beaver pelts. Extensive written documents exist for the arrival of Europeans to North America, including some that speak specifically about Indigenous populations who inhabited Bruce County in the Late Woodland. However, these records were made by explorers and missionaries with a purpose of reporting back to their superiors in Europe and are both incomplete and culturally biased. Nonetheless they provide useful baseline information for understanding Indigenous life in the late-16th through mid-to-late 17th centuries that can be combined with archaeological evidence and oral histories to generate a much rich and more fulsome picture of the period.

2.3.2 Treaty History

The project area is encompassed by Saugeen Tract Purchase, or Treaty 45 ½ that was signed between the Crown and Anishinaabe peoples on August 9, 1836 in Manitowaning (Ministry of Indigenous Affairs 2022). The treaty was negotiated between the SON and the Crown to open 1.5 million acres for settlement, in return for assistance and the protection of the Indigenous Peoples who continued to live on the Saugeen Peninsula (Duern 2017; SON 2021). These lands became known as the "Queens Bush".

The conditions of Treaty 45 ½ were not upheld by the British Crown, who claimed that the Saugeen (Bruce) Peninsula could not be protected without the negotiation of a second treaty. Settlers were moving farther north into the Peninsula, and it was the aim of the Canadian Government to settle the opposing side of Lake Huron to match the settlement of those in the United States (Surtees 1984:101-102). The terms of the new treaty were negotiated with each sitting Chief separately, and pressure was exerted on all signatories to cede more territory under the promise of protection of territory, and financial benefits (Surtees 1984:104-105). This became Treaty 72, which was signed on October 13, 1854, and ceded approximately 500,000 acres of the Saugeen (Bruce) Peninsula to the British Crown (Duern 2017; Ministry of Indigenous Affairs 2022).

In 2019, the SON filed claims with the Canadian and Ontario government regarding the waters in Lake Huron and Georgian Bay, and a claim seeking redress from Treaty 72 in which the SON was forced to cede lands to the British Crown, after being assured under Treaty 45 ½ that their lands on the Saugeen (Bruce) Peninsula would be protected from settler encroachment (OKT 2021). Phase 1 of the claim has concluded, with the Ontario Superior Court denying Aboriginal Title to the claimed waters in Lake Huron and Georgian Bay but did agree that the Crown broke its treaty promise as outlined in Treaty 45 ½. Phase II of the trial is still ongoing (OKT 2021).

2.3.3 Nineteenth-Century and Municipal Settlement

Historically the project area falls within Lots 14 and 15, Concession 6, and Lot 15, Concession 7, in the Geographic Township of Culross, Bruce County, Ontario. A brief discussion of 19th-century settlement and land use in the township is provided below in an effort to identify features signaling archaeological potential.

2.3.3.1 Bruce County

Municipal settlement in Bruce County was facilitated by the signing of various treaties between the Crown and local Indigenous communities. The lands within Bruce County were acquired under two major treaties. Treaty No. 45 ½, also referred to as the Saugeen Tract Purchase, was signed by representatives of the Saugeen Nation and Lieutenant-Governor Francis Bond Head on August 9, 1836 (Department of Indian Affairs 1891). The treaty established a line between the villages of Saugeen and Nawash near the base of the Saugeen Peninsula at Owen Sound. South of that line, Brant, Carrick, Elderslie, Greenock, Huron, Kincardine, Kinloss, and Saugeen Townships were considered ceded territory. The townships to the north of the line–Amabel, Albemarle, Eastnor, Lindsay, and St. Edmonds–became the Saugeen and Owen Sound Reserve. Treaty 72, signed on October 13, 1854 by the Crown and Saugeen and Chippewa peoples living in the Saugeen and Owen Sound Reserve, released the majority of the reserve lands on the Peninsula but established formal reservations - Saugeen First Nation Reserve #29 north of the Saugeen River, Chief's Point Reserve No. 28, the Nawash - Owen Sound First Nation Reserve (subsequently surrendered in 1857 under Treaty No. 82), the Cape Crocker or Neyaashiinigmiing Reserve No. 27 and a reserve around the Colpoy's Bay (subsequently surrendered in 1861 under Treaty No. 82) (Department of Indian Affairs 1891). Additional and smaller Bruce County parcels were surrendered in 1885 and 1899.

In 1849 when the lands north of Huron District known as the "Queen's Bush" were surveyed, the new area was named after the Governor General of Canada at the time, James Bruce (Robertson 1906). This new county was created by an Act of Parliament in 1849, dividing the district of Huron into three counties: Huron, Perth and Bruce (Robertson 1906). Bruce County included 12 townships, and the Peninsula (which was still under control of the Saugeen at the time). It is reported that the first European settlers to establish homes in Bruce County were William Withers and Allan Cameron who settled at the mouth of Penetangore River in present day Kincardine during the spring of 1848 (H. Belden & Co 1880). Withers is credited with building the community's first saw mill. Penetangore is believed to be a corruption of the Algonquin word "Na-Benem-tan-gaugh," meaning "the river with sand on one side," which reflected the fact that the river mouth was marked by a clay bluff on one side and a sand dune on the other (Robertson 1906).

The earliest surveys in Bruce County (e.g., the first concession in Huron and Kinloss) were those created to provide access to the Queen's Bush (Robertson 1906). These were followed by those to establish colonization roads, lots adjacent to these, and along the shore in the Lake Huron townships of Huron, Kincardine, Bruce and Saugeen. One of the earliest "Free Grant" or colonization roads was the Durham Road, cut through the southern Bruce townships in 1848-49, the majority of which were surveyed ca. 1851-1852 (Bruce County Historical Society 2024). The northern townships were surveyed only after the signing of Treaty 72 in 1854.

The earliest European settlers arrived via river routes and from the lake, or along the colonization roads (Robertson 1906). Prior to the cutting of substantial thoroughfares, access to the Bruce was otherwise via Indigenous land trails or waterways. The latter were dotted with small taverns and inns, strategic stopping points for families heading north and westward from earlier settled counties to the south. The earliest foci for settlement were the Lake Huron shores, settlement roads, river mouths and riverside locales that made effective mill sites and strategic cross roads (Robertson 1906). Saw and grist mills were the focal points for

some of the earliest communities in Bruce County that by the mid-19th century also included taverns, churches, schools, stores and post offices.

The census of 1851 (Library and Archives Canada 2018) reported that there were no more than 499 recent settler families living in Bruce County, many of whom lived in shanties, small, rough built early pioneer dwellings that were erected to create temporary shelter and meet the Crown requirements for a land grant. The County's population grew quickly into the 1860s, hastened by the construction of a series of stone roads that provided access between the County's various settlements and much improved land travel.

While settlement progressed relatively steadily across Bruce County from the south and lakeward to the north into the interior lands, it was very much prohibited in some locales by significant swampy zones, including Greenock Swamp (Robertson 1906), as well as a lack of access. Settlements emerged later within the Bruce Peninsula proper, following the release of reserve lands. Whereby many of the townships in southern Bruce County witnessed community development by the mid-1850s, many of the original municipal settlements in Amabel, Albermarle, Eastnor, Lindsay and St. Edmunds were founded in the 1870s and 1880s. Apart from the Indigenous and Métis populations, the earliest settlers of Bruce County were primarily of German, Scottish, Irish and French heritage (Robertson 1906).

Several of the earliest communities in Bruce County townships were unsuccessful, some for a lack of resources and many others for the fact that railroads established in the 1870s bypassed them entirely (e.g., Balaclava) (Robertson 1906:339). Early railways in the Bruce included those built by the Toronto, Grey and Bruce Company in the 1870s (later purchased and upgraded by the Canadian Pacific Railway), the Stratford & Lake Huron Railway, and the Wellington, Grey and Bruce Railway which opened in 1876 (Robertson 1906). Many new centres emerged along the rail routes as station sites, while existing communities that were serviced by the rail thrived with the establishment of new business and industries and arrival of a wave of new settlers.

The early settlement of Bruce County followed several themes: the clearing of fertile agricultural lands in areas where suitable soils were present, a shoreline focus that encouraged the development of harbours, ports and shipping locales as well as recreational areas and a focus on plentiful local resources, including fish, timber and minerals (Robertson 1906). Thriving agricultural communities developed, for example in Huron and Culross townships. Active shipping ports emerged in both southern Bruce, at the mouth of the Penetangore River and Inverhuron Bay, and in the north, the latter at Lion's Head. Bruce's earliest major settlement – Penetangore, now Kincardine – at the mouth of the Penetangore River grew around its water access, with the construction of a significant complex of wharves and warehouses. Bruce County waterfront ports became a strategic connection point between trading and manufacturing centres in the Upper Great Lakes and markets in the central interior of Upper Canada and Canada West. Commercial fisheries were established on the Fishing Islands; today, the presence of stone ruins on Main Station Island is a reminder of this early industry to Bruce County's development (Robertson 1906).

2.3.3.2 Culross Township

Originally surveyed in 1852 by G. McPhilips, Culross Township was the last to be opened to settlement in the original Saugeen Tract lands, as there was no road to the township until after the township's land sale in 1854 (Robertson 1906). The earliest recorded European settlers arrived shortly before the September sale.

Although noted for its quality soils and growing capacities, the township was slow to develop. The first post office was established at what is now Teeswater in the mid-1850s where a dam and sawmill had been newly constructed in 1855 by P.B. Brown (Robertson 1906:348). A grist mill followed in 1856. A narrow-gauge railway was built in the 1870s by the Toronto, Grey and Bruce Company; however, its low tolerance of snow made it a mostly seasonal line until it was acquired and upgraded by the Canada Pacific Railway Company (Robertson 1906).

In 1854, Culross and Greenock formed a single municipality. This union lasted until 1856 when it was dissolved. The Village of Teeswater became its own municipality in 1875. In 1999, the Townships of Culross and Carrick, and the Villages of Teeswater and Mildmay amalgamated into the Municipality of South Bruce.

Teeswater remained the centre of the township and the primary community, though attempts were made to form other villages. Belmore and Formosa on the periphery of the township were two examples, but the importance of these to Culross have been minimized due to their border nature (Robertson 1906). The village of Moscow also known as the Cheviot post office receives more attention from historians for its importance to Culross (Robertson 1906). Paul Ross surveyed village lots in 1856, the same year Teeswater was surveyed. A sawmill, grist mill, and tannery operated in Moscow until they burned down in 1880, resulting in a collapse of the town's prospects (Robertson 1906:352).

2.3.3.3 Teeswater

The village of Teeswater was founded in 1856, when the owners of farm Lots 15 and 16, Concession 6 and 7 (P.B. Brown, Alexander Gibson, Ira Fulford, and Matthew Hadwin), surveyed and subdivided portions of their farm into village lots (Robertson 1906:354). By this time a mill dam, a saw mill, and a post office had already been constructed. Despite its centralized location within the township of Culross, the village, the only one of its kind in the township, developed slowly. In 1861 there were only two stores, two taverns, a grist and sawmill, and a weekly mail service (Robertson 1906). 1866 saw the addition of a foundry, a tannery, and a pearl ash factory. The 1869 contest for a railway was the impetus for the village's growth, as the residents of Teeswater and Culross Township fought for the Toronto, Grey and Bruce Railway (Robertson 1906). The township offered $43,000 to the railway company, and eventually Teeswater became the western terminus for the Toronto, Grey and Bruce Railway. The first passenger train reached Teeswater on November 16, 1874, carrying with it a large number of visitors. Teeswater was officially incorporated into a village on June 1, 1875 (Bruce County Museum and Cultural Centre 2023).

2.3.4 Review of Historic Maps

The project area falls within Lots 14 and 15, Concession 6, and Lot 15, Concession 7, in the Geographic Township of Culross, Bruce County, Ontario. On the 1852 *Plan of the Township of Culross*, the area is depicted as surveyed and divided into lots and concessions (Map 5). Road allowances for Clinton and Hillcrest Streets are depicted on the plan but do not necessarily represent what was constructed at the time. The North Parcel is within a marshy area situated near river terraces that border the Teeswater River. The river cuts through the South Parcel, which is situated on the cutbanks of the Teeswater River. Although no structures are shown, names are listed on the lots on the 1854 *Plan of the Township of Culross* (Map 6). Joseph (or Jesse) Fulford is listed on Lot 15, Concession 7, and Peter B. Brown is listed on the northern half of Lots 14 and 15, Concession 6. By 1880, the *Historical Atlas* shows Teeswater as a settled community, indicated by subdivided lots and town limits (Map 7). James, Elizabeth, Clinton, Hillcrest, and many other streets are depicted as open by this time.

Topographic maps from the 20th century are available for review in this area. A combined 1937/1946 map depicts the sports field / race track, and numerous structures along the surrounding streets (Map 8). Elizabeth Street is shown connected to Hillcrest Street. North of the South Parcel, Teeswater River widens significantly from a narrow river channel, before constricting into a narrow stream once again, likely as a result of damming. A dam was noted on a 1904 fire insurance plan for Teeswater (Goad 1904). Although there is little information concerning this dam, a Teeswater Co-op Dam is noted by Saugeen Conservation (2021), which may have been located near the Teeswater Creamery. Lands within the project area slope down (northward) toward the river valley.

A review of a 1954 aerial photograph shows that the North Parcel is within the residential boundaries of Teeswater and the South Parcel lies east of a residential area as of this date (Map 9). The Teeswater Ball Park has been constructed within the sports track. Most of the lands within the South Parcel appear to be undergoing landscaping.

By 1976, Elizabeth Street no longer reaches Hillcrest Street, and the area between the two streets is now wooded (Map 10). A playground and swimming pool north of the North Parcel are now present. To the east of the North Parcel, the lands appear to be gravelled or paved, and a small area extends into the project area. Within the South Parcel, a small path is shown south of Teeswater River, leading from the sports field up to Brown Street and cutting through the northern edge of the South Parcel. A structure and parking lot was now present north of the sports field. Additionally, to the north of South Parcel, the dam across the Teeswater River was removed, the mill pond drained, and the course of the river has been allowed to flow naturally.

In 1987, a structure appears northwest of the North Parcel, near the playground (Map 11). The small path running through the north edge of the South Parcel has been removed. Teeswater River narrows by 1995, likely as a result of the removal of the Teeswater Co-op Dam due to its poor structural state (Saugeen Conservation 2021), and the river is now shown to have a much thinner meander (Map 12).

By 2006, a path has been constructed within part of the North Parcel, leading west from the swimming pool (Map 13). Near the South Parcel, new trees have been planted in the grassed area north of the sports field, surrounding a small path. A path branches off northward and leads down to the banks of the river. Additional rows of trees appear by 2015, north of the South Parcel (Map 14). A more substantial path has been constructed through the northern edge of the North Parcel.

2.3.5 Review of Heritage Properties

There are two heritage properties withing the vicinity of the project area. The properties are located 150 m southwest of the North Parcel, at 2 and 3 Clinton Street, are considered historic properties (South Bruce Tourism 2019). County of Bruce Carnegie Library was built circa 1914 at 2 Clinton Street South. The Teeswater Town Hall Theatre is located at 3 Clinton Street South and was built in 1869.

The nearest plaque commemorating Teeswater is approximately 115 m southwest of the North Parcel, at 3 Clinton Street. It reads:

> By 1855, the first permanent settlers on the site of Teeswater, the families of Matthew Hadwen and Peter Brown, had located here on the Teeswater River. In that year, Brown erected a sawmill and later added a grist-mill. In 1856, a post office was established with Hadwen as first postmaster. Although the settlement's early growth was slow, a tannery, a foundry, two taverns and a pearl-ash factory were in operation by 1867 when the population numbered some 400. The development of the community was spurred by the completion of a branch line of the Toronto, Grey and Bruce Railway in 1874 from a point near Orangeville. Teeswater was incorporated as a village on January 1, 1875 with a population of about 700 (Ontario Heritage Trust [OHT] n.d.).

2.4 Analysis and Conclusions

As noted in Section 2.1, the Province of Ontario has identified numerous factors that signal the potential of the project area to contain archaeological resources. Based on the archaeological and historical context reviewed above, the project area is in proximity (i.e., within 300 m) to features that signal archaeological potential, namely:

- a water source (Teeswater River);
- mapped 19th-century thoroughfares (Elizabeth, James, Hillcrest, Clinton, Marcy, Gordon, Union, Clarinda, Brownlee, and Janet Street);
- an area of mapped 19th-century settlement (Teeswater) – multiple structures present within the village plot;
- known heritage properties (2 Clinton Street South and 3 Clinton Street South); and,
- a provincial plaque (The Founding of Teeswater).

2.5 Recommendations

Given that the project area demonstrated potential for the discovery of archaeological resources, a Stage 2 archaeological assessment was recommended. In keeping with provincial standards, the areas within the project area that consist of grassed or treed areas are recommended for assessment by a test pit survey at a 5 m transect interval to achieve the provincial standard. As the project area is considered to have archaeological potential pending Stage 2 field inspection, a separate map detailing zones of archaeological potential is not provided herein (MTC 2011; Section 7.7.4, Standard 1 and Section 7.7.6, Standards 1 and 2).

3 STAGE 2 ARCHAEOLOGICAL ASSESSMENT

3.1 Field Methods

The Stage 2 lands required for the New Water Storage Facility project encompass two separate areas: the North Parcel and the South Parcel. All fieldwork was undertaken in good weather and lighting conditions. No conditions were encountered that would hinder the identification or recovery of artifacts. The project area boundaries were determined in the field based on proponent mapping and landscape features.

The project area is comprised of non-ploughable lands (manicured grass). As such, the project area was subject to a standard test pit assessment. Test pits measuring at least 30 cm (shovel-width) were excavated through the first 5 cm of subsoil with all fill screened through 6 mm hardware cloth. Once screening was finished, the stratigraphy in the test pits was examined and then the pits were backfilled as best as possible, tamped down by foot and shovel and re-capped with sod. Test pitting extended up to 1 m from all standing features, including trees and buildings, when present.

It was anticipated that when cultural material was found, the test pit survey would be intensified (reduced to 2.5 m) to determine the size of the site. If not enough archaeological materials were recovered from the intensification test pits, a 1 m^2 test unit would be excavated atop of one of the positive test pits to gather additional information.

The following presents the field methods within the North Parcel and the South Parcel.

3.1.1 North Parcel – North of Elizabeth Street South (Map 15)

The North Parcel east of Elizabeth Street South consisted of a manicured grass lawn (Image 1). Test pits contained three layers: Layer 1 (0 – 10 cm) was brown sandy loam imported topsoil; Layer 2 (10 – 20 cm) was dark brown sandy loam with large gravel intrusions (imported fill); and Layer 3 (20 – 30 cm) was sandy loam imported fill with pea gravel intrusions (Image 2). Although the observed soil profiles indicated disturbance, the test pit survey within this portion of the North Parcel was undertaken at a 5 m interval due to the small size of the area. The disturbance likely relates to the construction of Elizabeth Street South or grading activities for the construction of the nearby house.

The section of the North Parcel north of Hillcrest Street East consisted of manicured grass. While the project area was initially subject to Stage 2 assessment via standard test pit survey at a 5 m transect interval, immediately upon commencing the test pit survey it was determined that the lands within this portion of the project area had been subject to deep and extensive land alterations, as disturbed test pit profiles were identified. Consequently, a judgmental test pit survey was undertaken for the project area at a 10 m interval to confirm the spatial extent and depth of disturbance (Image 3). No intact soil profiles were observed.

Test pits north of Hillcrest Street East contained three layers: Layer 1 (0 – 5 cm) was brown silty loam imported topsoil; Layer 2 (5 – 10 cm) was brown silty sandy loam imported fill with large gravel intrusions; and Layer 3 (10 – 20 cm) was brown silty loam imported fill with pea gravel intrusions (Image 4). The disturbance was likely the result of grading for the adjacent path and paved parking lot and the installation of subsurface utilities in the area.

As per Section 2.1, Standard 2 of the *Standards and Guidelines* (MTC 2011:28-29), certain physical features and deep land alterations are considered as having low archaeological potential and are thus exempt from the standard test pit survey. Disturbances within the North Parcel included paved roadways and gravel paths (Images 5-7), subsurface utilities (Images 5-9), and steep road embankments (Image 9). The woodlot north of Elizabeth Street was determined to be steeply sloped (Image 10). These areas were photo-documented.

3.1.2 South Parcel – East of James Street East, Sports Field (Map 16)

The South Parcel consisted of non-ploughable lands east of James Street East, including manicured grass and lightly treed areas. Initial test pits revealed obviously disturbed soils. Consequently, a judgmental test pit survey was undertaken for the project area at a 10 m interval to confirm the spatial extent and depth of disturbance (Images 11 and 12). No intact soil profiles were observed.

Test pits contained roughly 5 cm of brown silty loam imported topsoil over 35-60 cm of brown silty sandy loam imported fill, with significant inclusions of rocks, pea gravel, and modern plastic debris (Image 13). The disturbance is likely the result of extensive land alterations during the 20 and 21st centuries including construction of the sports field, race track and road, which would have involved significant grading and leveling. Disturbance may also have been the result of the installation of utilities, as evidenced by a fire hydrant and water line in the vicinity of the sports field.

As per Section 2.1, Standard 2 of the *Standards and Guidelines* (MTC 2011:28-29), certain physical features and deep land alterations are considered as having low archaeological potential and are thus exempt from the standard test pit survey. Disturbances within the South Parcel included the existing paved road and gravel track (Images 14 and 15). These areas were photo-documented.

3.1.3 Summary

In summary, test pit survey employing a 5 m transect interval was conducted for approximately 0.8% (0.01 ha) of the project area. Test pit survey employing a 10 m transect interval was conducted for approximately 64.4% (0.76 ha) of the project area to confirm the depth and extent of disturbance. Disturbances, consisting of graded, paved, and gravel paths and roads, embankments, as well as areas containing subsurface utilities, accounts for roughly 30.5% (0.36 ha) of the project area, while steeply sloped areas account for 4.2% (0.05 ha).

Maps 15 and 16 illustrate the Stage 2 field conditions and assessment methods; the location and orientation of all photographs appearing in this report are also shown on these maps. Due to the fact that the proponent map was supplied in a GIS data format, no separate map of Stage 2 assessment methods overlaid on the proponent map is provided. Map 2 can be viewed as the layout that was provided.

3.2 Record of Finds

No archaeological materials or sites were identified during the Stage 2 archaeological assessment of the project area. Table 4 provides an inventory of the documentary records generated during this project.

All files are currently being stored at the TMHC corporate office located at 1108 Dundas Street, Unit 105, London, ON, N5W 3A7.

Table 4: Documentary Records

Date	Field Notes	Field Maps	Digital Images
October 15, 2024	Digital and hard copies	Digital and hard copies	30 Images
October 16, 2024	Digital and hard copies	Digital and hard copies	32 Images

3.3 Analysis and Conclusions

A Stage 2 field assessment was conducted in keeping with the MCM's *Standards and Guidelines* (MTC 2011). The test pit survey did not result in the documentation of archaeological resources.

3.4 Recommendations

All work met provincial standards, and no archaeological material was documented during the assessment. As such, no further archaeological assessment is recommended.

Should proposed impacts extend beyond the lands assessed for this project, then additional assessment may be required.

These recommendations are subject to the conditions laid out in Section 5.0 of this report and to the MCM's review and acceptance of this report into the provincial register.

4 SUMMARY

A Stage 1 and 2 archaeological assessment was conducted for the New Water Storage Facility (Teeswater) Municipal Class Environmental Assessment (MCEA), in Teeswater, Municipality of South Bruce, Ontario. The project area is roughly 1.18 ha (2.92 ac) in size and is located within Lots 14 and 15, Concession 6, and Lot 15, Concession 7, in the Geographic Township of Culross, Bruce County. The Stage 1 assessment revealed that the project area had potential for the discovery of archaeological resources and a Stage 2 survey was recommended and carried out. The Stage 2 assessment (test pit assessment at a 5 m and 10 m interval) did not result in the documentation of archaeological resources. As such, no further archaeological assessment is recommended.

5 ADVICE ON COMPLIANCE WITH LEGISLATION

This report is submitted to the MCM as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the MCM, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

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

The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must notify the police or coroner and Registrar of Burial Sites, Ontario Ministry of Government and Consumer Services at 416-212-7499 and FBCSARegistrar@ontario.ca.

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7 IMAGES

Image 1: North Parcel - Test Pit Survey at 5 m Interval on East Side of Elizabeth Street

Looking Northwest

Image 2: North Parcel - Disturbed Test Pit East of Elizabeth Street

Image 3: North Parcel - Test Pit Survey at 10 m Interval on North Side of Hilcrest Street East

Looking South

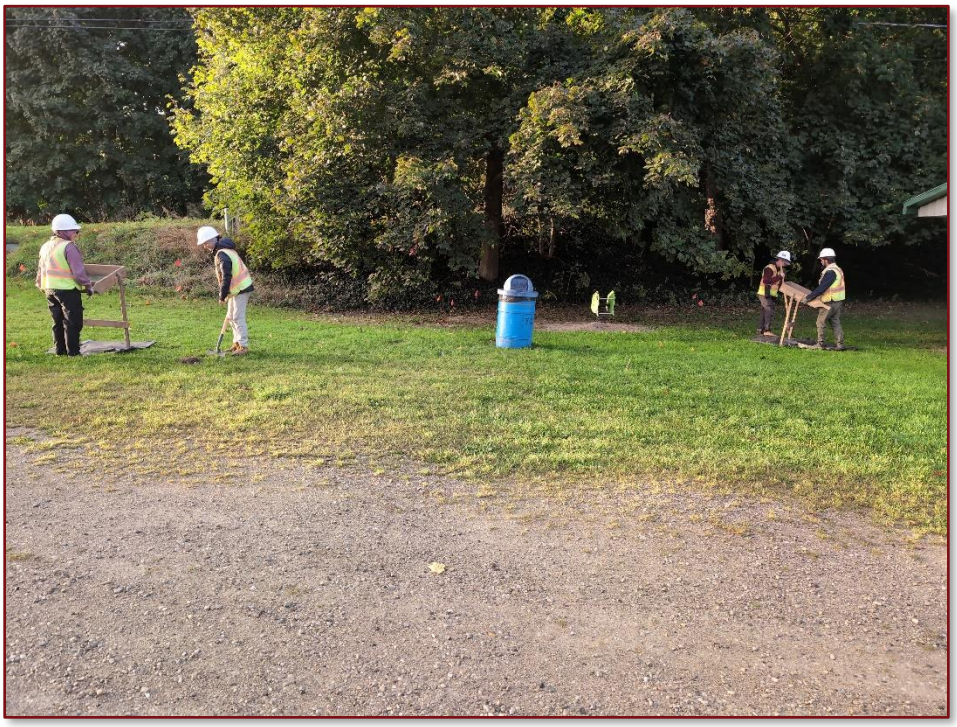


Image 4: North Parcel - Disturbed Test Pit North of Hillcrest Street East

Image 5: North Parcel - Hillcrest Street, Note Buried Utilities Beside Road and Sidewalk

Looking East

Image 6: North Parcel - Gravel Path on North Side of Hilcrest Street East

Looking Southeast

Image 7: North Parcel - Elizabeth Street Termination, Note Slope at Rear of Image

Looking North

Image 8: North Parcel - Elizabeth Street – West Side, Note Flags Indicating Subsurface Utilities

Looking West

Image 9: North Parcel - Road Embankment and Buried Utilities North of Hillcrest Street

Looking South

Image 10: North Parcel - Steep Slope and Buried Utilities North of Elizabeth Street

Looking South

Image 11: South Parcel - Test Pit Survey at 10 m Interval in Lightly Treed Area

Looking North

Image 12: South Parcel - Test Pit Survey at 10 m Interval in Manicured Grass Sports Field

Looking Northwest

Image 13: South Parcel - Example of a Disturbed Test Pit

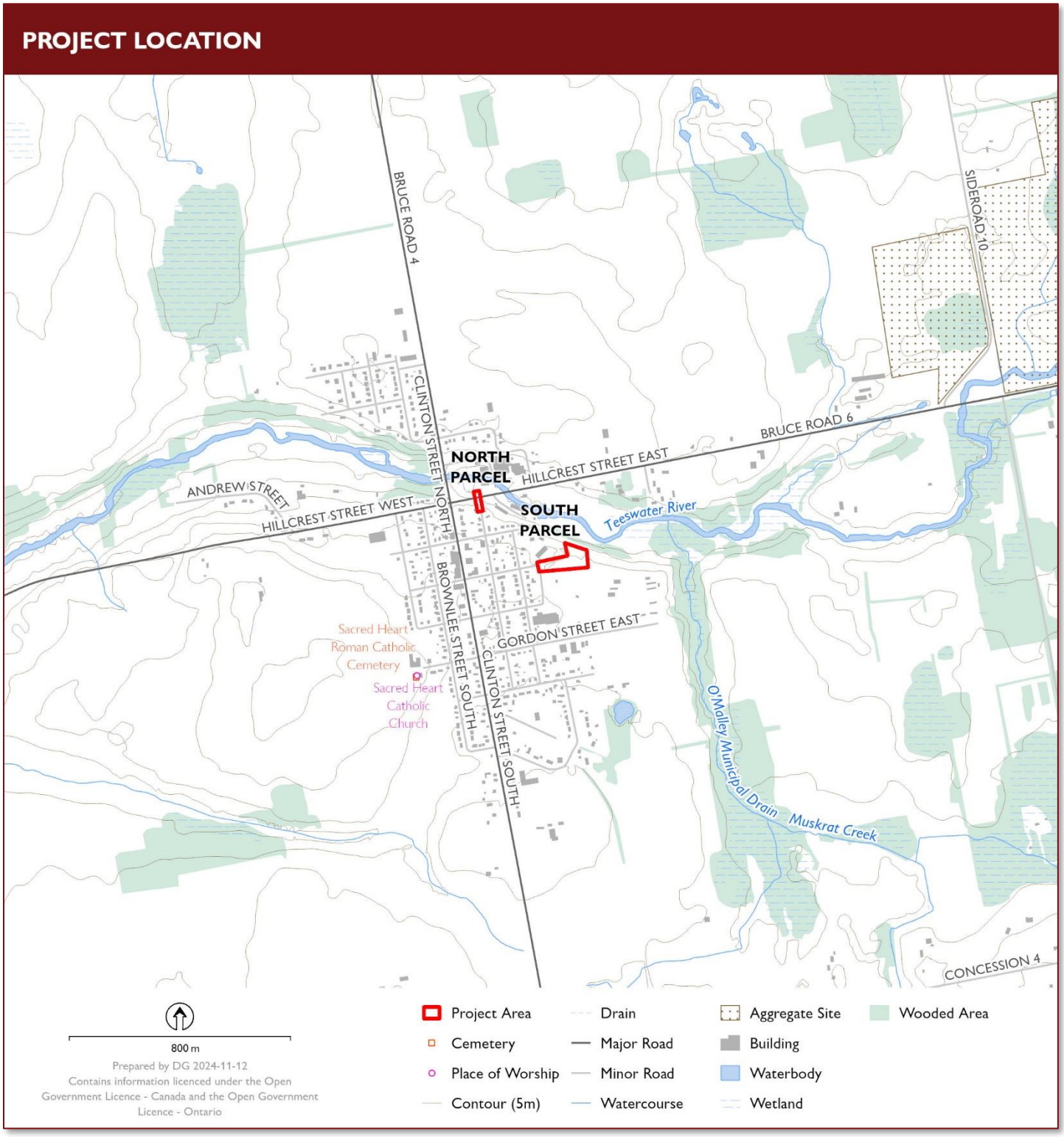
Image 14: South Parcel - Paved Road to Community Centre

Looking North

Image 15: South Parcel - Gravel Track within Community Centre Property

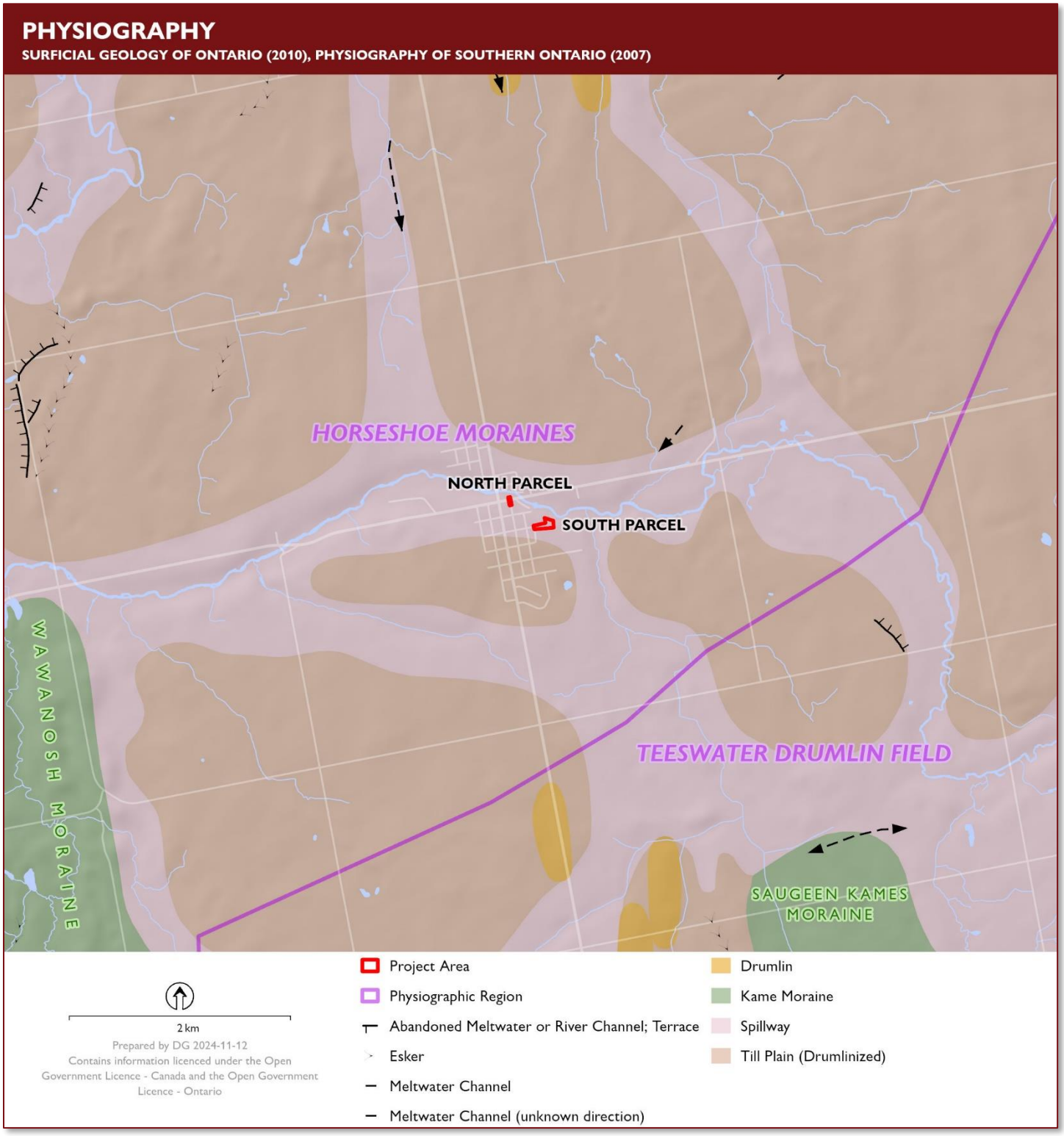
Looking East

8 MAPS



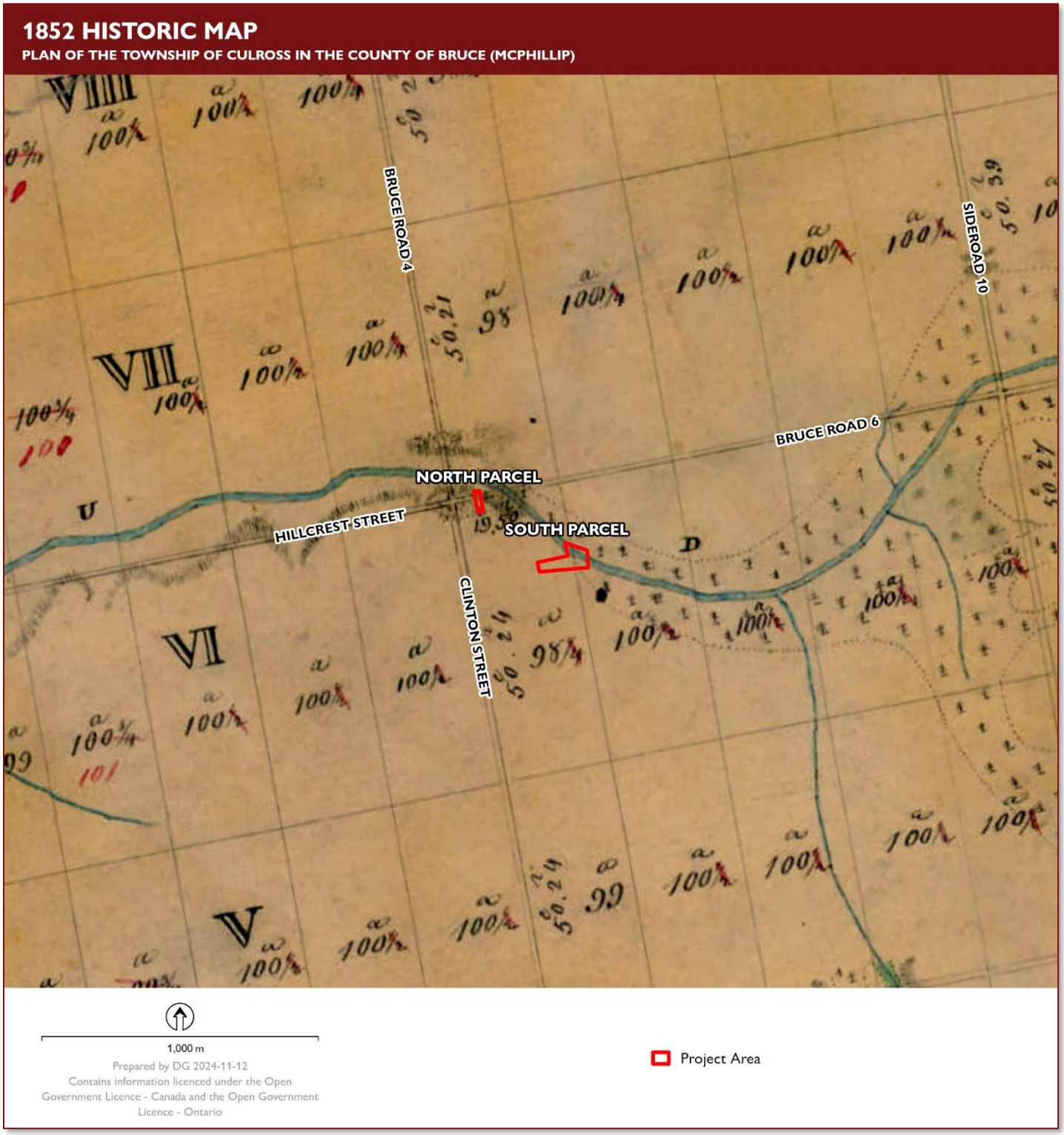
Map 1: Location of the Project Area in Bruce County, ON

Map 2: Aerial Photograph Showing the Location of the Project Area

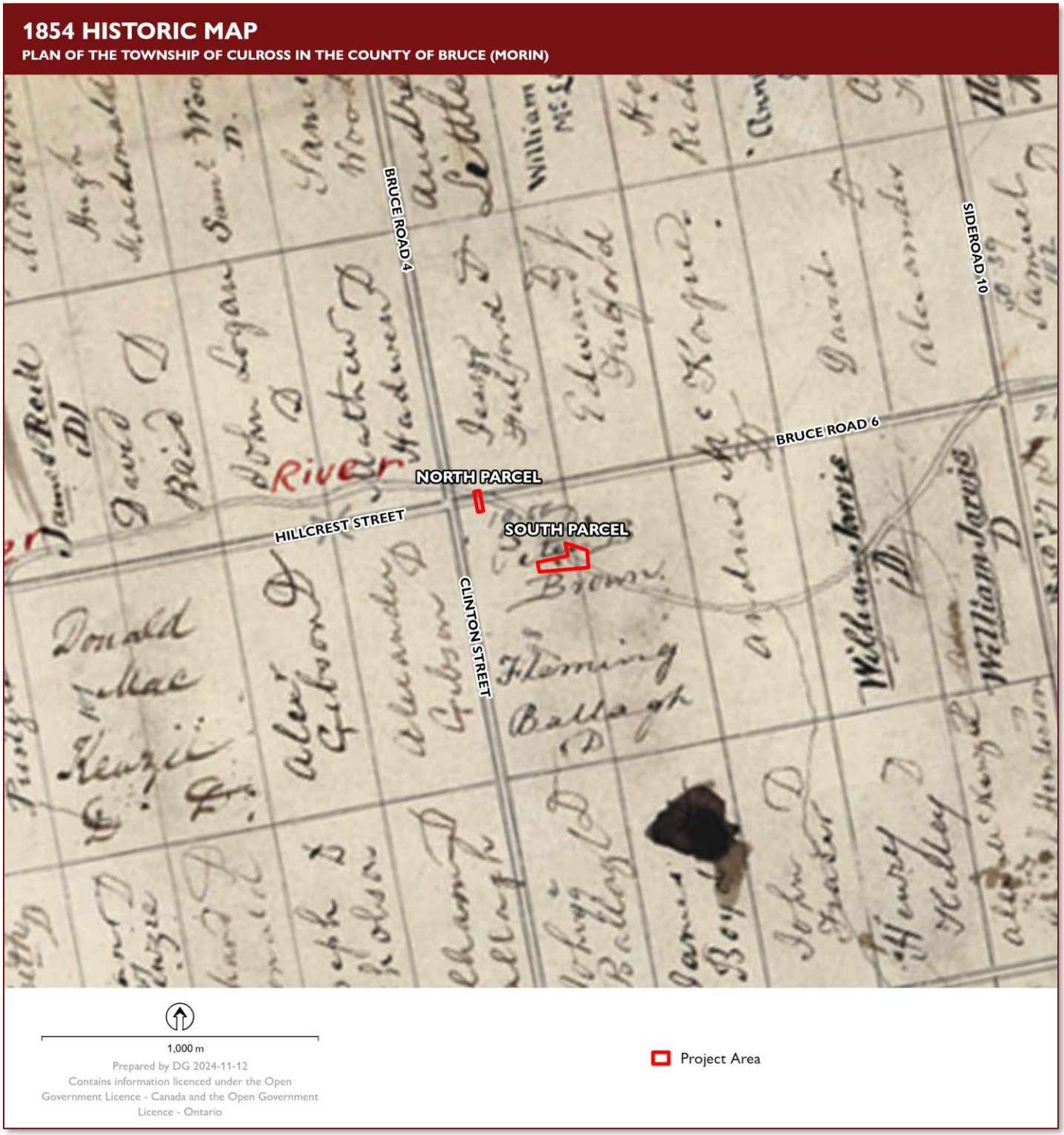


Map 3: Physiography Within the Vicinity of the Project Area

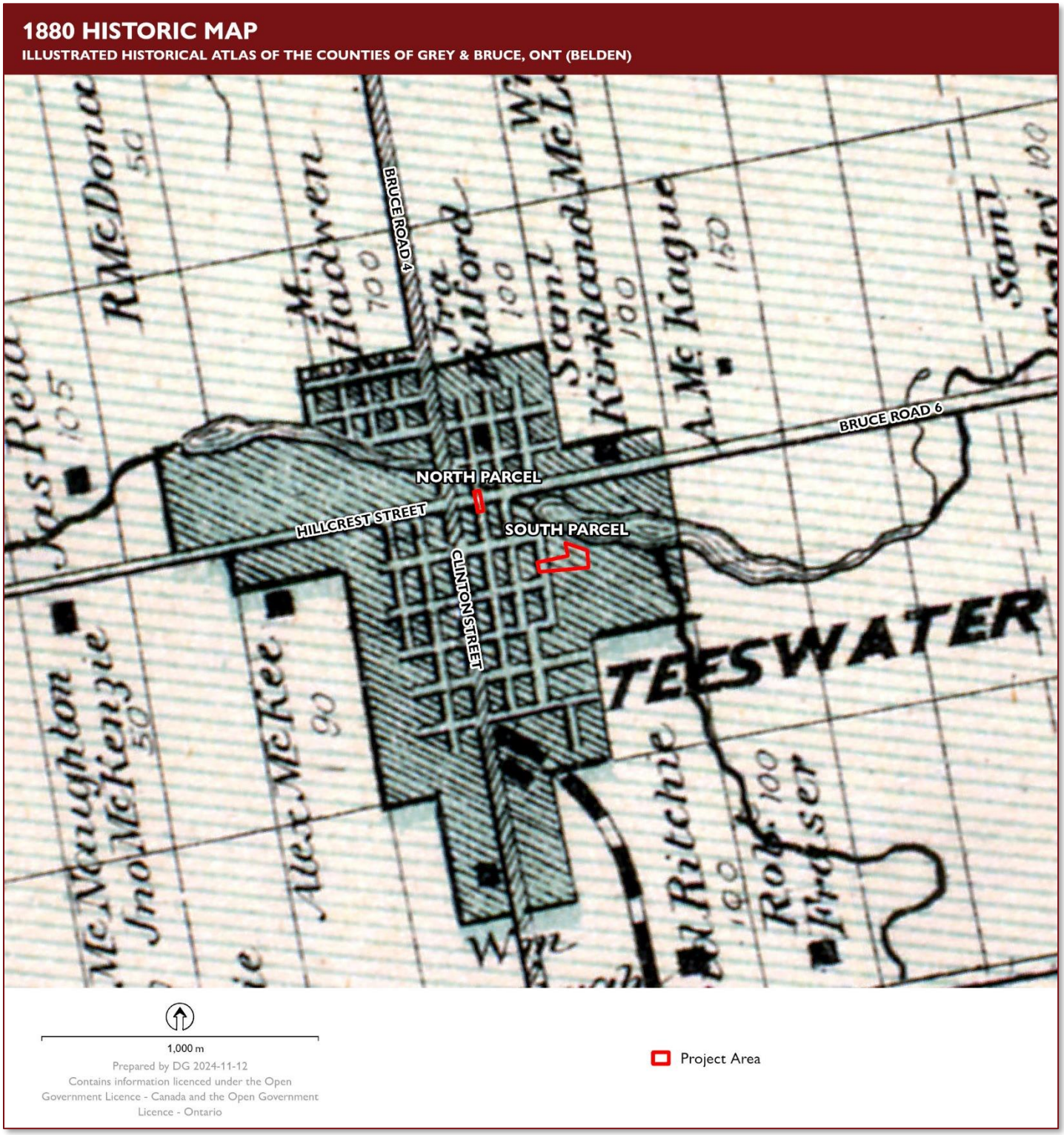
Map 4: Soils Within the Vicinity of the Project Area



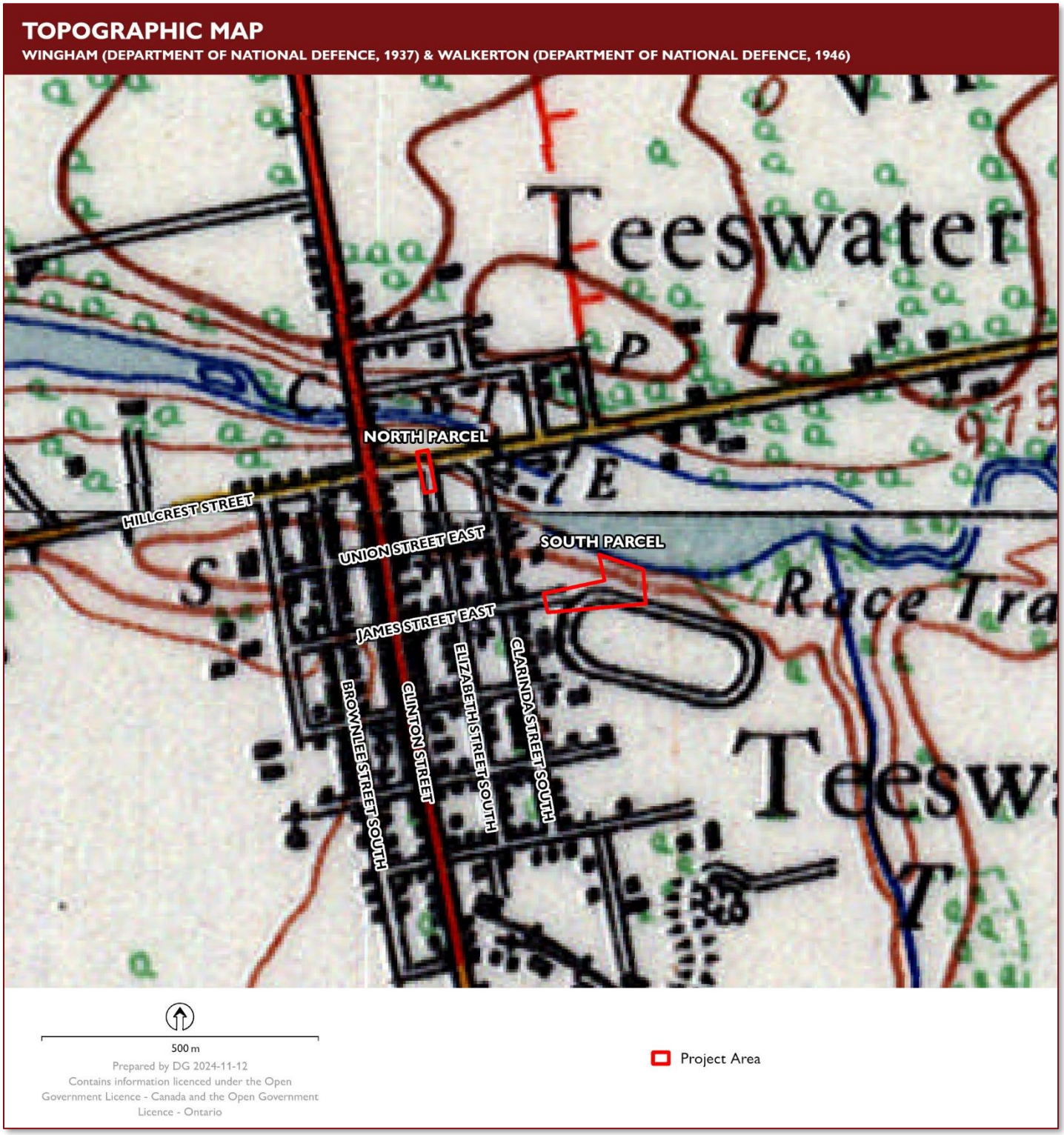
Map 5: Location of the Project Area Shown on the 1852 Plan of the Township of Culross



Map 6: Location of the Project Area Shown on the 1854 Plan of the Township of Culross



Map 7: Location of the Project Area Shown on the 1880 Map of Bruce County



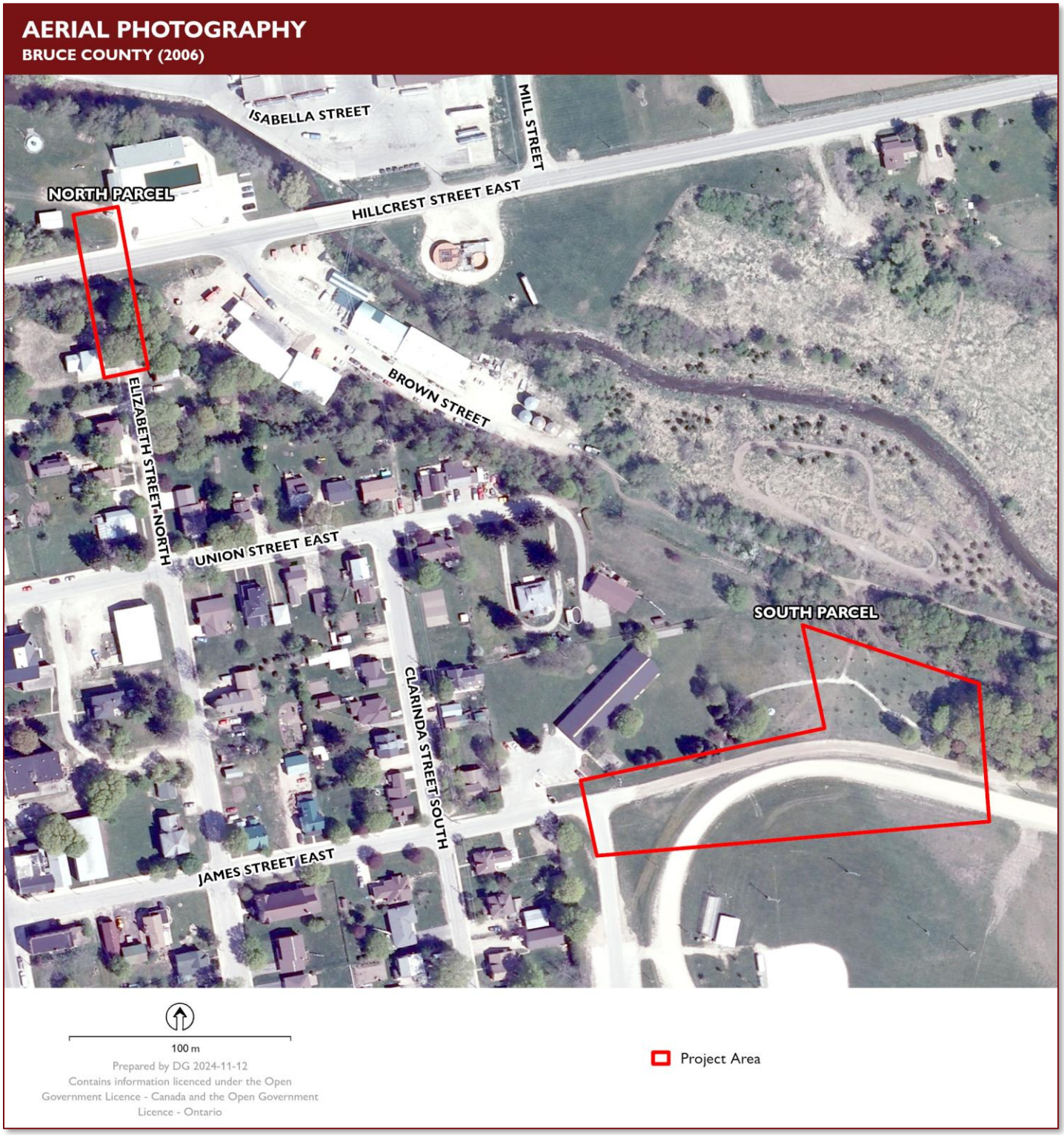
Map 8: Location of the Project Area Shown on 1937/1946 Topographic Mapping

Map 9: Location of the Project Area Shown on 1954 Aerial Imagery

Map 10: Location of the Project Area Shown on 1976 Aerial Imagery

Map 11: Location of the Project Area Shown on 1987 Aerial Imagery

Map 12: Location of the Project Area Shown on 1995 Aerial Imagery



Map 13: Location of the Project Area Shown on 2006 Aerial Imagery

Map 14: Location of the Project Area Shown on 2015 Aerial Imagery

Map 15: North Parcel - Stage 2 Field Conditions and Assessment Methods

STAGE 2 METHODS
SOUTH PARCEL

Project Area
Report Photo

STAGE 2 ASSESSMENT METHODS

Areas of Archaeological Potential
Confirmed Disturbance (Test Pit Survey, 10m Interval)
Areas of Low Archaeological Potential
Not Surveyed, Photo Documented
Disturbed (Gravel, Roads, Utilities)

20 m

Prepared by DG 2024-11-12

Map 16: South Parcel - Stage 2 Field Conditions and Assessment Methods

Stage 1-2 Archaeological Assessment
New Water Storage Facility
Community of Teeswater, Municipality of South Bruce
Part of Lots 14 and 15, Concession 6, and Lot 15, Concession 7
Geographic Township of Culross
Bruce County, Ontario

SUPPLEMENTARY DOCUMENTATION

NOT FOR PUBLIC CIRCULATION

Licensee: Amanda Parks, MA (P450)

PIF No: P450-0141-2024

Project No: 2024-414

Dated: February 27, 2025

Summary of Indigenous Engagement

Saugeen Ojibway Nation (SON) was engaged as part of this project. Communications regarding fieldwork were directed through email by Amadna Parks of TMHC. Son confirmed their interest in participating in the project. While a representative from SON was ultimately unable to attend the Stage 2 fieldwork, a summary of results was provided to the community for review and input. No response was received. A copy of the report was provided to SON for review and comment prior to the submission of this report to the MCM.

Amanda Parks

From: Amanda Parks
Sent: November 29, 2024 11:38 AM
To: SON Archaeology
Cc: Lisa Courtney
Subject: RE: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment
Attachments: 2024-414 BM Ross Proposed Elevated Tank, South Bruce St 1-2 Draft Report.pdf

Hi Kove,

I hope you are doing well! Please find attached the draft Stage 1-2 archaeological assessment report for the proposed Teeswater Elevated Water Storage project. We are hoping you can please provide comments by **Thursday December 19th**, so that we are able to submit the report to the MCM this year and meet funding requirements for the project.

Thank you, and please let me know if you have any questions.

Amanda

Amanda Parks, MA, P450 (she/her)
Manager - Environmental Assessments
aparks@tmhc.ca
(519) 671-8698

TMHC Inc.
1108 Dundas Street, Unit 105
London, ON | N5W 3A7
www.tmhc.ca
519-641-7222

From: Amanda Parks
Sent: October 21, 2024 10:22 AM
To: SON Archaeology <archaeology@saugeenojibwaynation.ca>
Cc: Lisa Courtney <lcourtney@bmross.net>
Subject: RE: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment

Hi Kove,

Since SON wasn't able to send a monitor out on this project last week, and as we couldn't delay due to project funding restrictions, I wanted to circulate a summary of the field work we completed to keep you appraised and to see if you had any questions or concerns.

As shown on the attached maps, there were two main project components: a) a south component, which is the proposed location of elevated water storage tank and a watermain connection, b) a north component, which is the proposed location of a watermain connection north of Elizabeth Street. I have attached a map of our field results along with some photos showing the field conditions. Essentially, both areas showed extensive and deep disturbance related to grading and filling of the lands, with soil profiles generally consisting of a thin layer of topsoil over a layer of dense brown silty loam with rocks, pea gravel, and modern plastic debris.

a) South Component: Proposed location of elevated water storage tank and one watermain connection
   - The initial test pit survey of this component demonstrated deep and extensive disturbance, likely related to significant grading and filling of the property for the use of the community centre. This component was subject to a test pit survey at 10 m intervals to confirm disturbance. Across the entire component, soils consisted of 5 cm of topsoil over 40-60+ cm of brown silty sandy loam with rocks, pea gravel, and modern plastic debris. Images 1-6 on the attached PDF show the field conditions and the disturbed soils. I have also attached an aerial image from 1954 which shows some of that disturbance, as well as the mill pond to the north, which once filled the river floodplain.

b) North Component: Proposed location of second watermain connection north of Elizabeth Street
   - The test pit survey in this component likewise demonstrated deep and extensive disturbance, associated with the installation of buried utilities as well as road construction. This area was largely subject to a test pit survey at 10 m intervals to confirm disturbance, though one small area was tested at 5 m intervals and was also confirmed to be disturbed. Soils consisted of 5 cm of topsoil (likely imported) over 5 cm of silty sandy loam with large gravel inclusions over 35 cm of silty loam with pea gravel. Steeply sloping lands were found centrally within the project area. Images 7-12 on the attached PDF show the field conditions and the disturbed soils.

No archaeological resources were encountered. Based on the above, we are recommending no further assessment of the property is required. Please let me know if you have any questions or concerns regarding the above.

We are currently working on the report and will circulate it to you for review and comment prior to circulating to the MCM.

Thank you!
Amanda

Amanda Parks, MA, P450 (she/her)
Manager - Environmental Assessments
aparks@tmhc.ca
(519) 671-8698

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1108 Dundas Street, Unit 105
London, ON | N5W 3A7
www.tmhc.ca
519-641-7222

From: Amanda Parks <aparks@tmhc.ca>
Sent: October 14, 2024 4:59 PM
To: SON Archaeology <archaeology@saugeenojibwaynation.ca>
Cc: Lisa Courtney <lcourtney@bmross.net>
Subject: Re: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment

Hi Kove!

Just realized I provided you with the wrong phone number for Arwen for tomorrow's project in Teeswater. She can be reached at 226-377-7566.

Thanks!
Amanda

Get Outlook for Android

From: Amanda Parks
Sent: Friday, October 11, 2024 8:31:04 AM
To: SON Archaeology <archaeology@saugeenojibwaynation.ca>
Cc: Lisa Courtney <lcourtney@bmross.net>
Subject: RE: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment

That is great, thanks Kove!

Yes, I have attached maps of the meeting location and the project area to this email. We intend to complete a test pit survey across the project area. We are estimating the work will take two days with a crew of 5. Additional deployment details follow, including start time, field director contact, and parking PIN:

Start Date: Tuesday October 15
# of days anticipated for fieldwork: 2 days
Start time: 9:30 am on Tuesday, 8:00am on Wednesday
Consultant Company: TMHC
Field Director(s) and Cell Phone(s): Sean Graziano (519-282-0541)
Fieldwork Coordinator: Valerie Wolfkamp (519-282-9025)
Stage of Fieldwork: Stage 1-2
Required PPE: Work boots, gloves, and high vis gear. Please also bring eye protection.
Meeting Location Address: Teeswater Community Centre - 21 Marcy St E, Teeswater, ON N0G 2S0; Parking PIN: https://maps.app.goo.gl/5noMf3q3rs6V7MAo9 (see attached map)
Size of Field Crew: 5

If you have any other questions please let me know.

Thanks!
Amanda

Amanda Parks, MA, P450 (she/her)
Manager - Environmental Assessments
aparks@tmhc.ca
(519) 671-8698

TMHC Inc.
1108 Dundas Street, Unit 105
London, ON | N5W 3A7
www.tmhc.ca
519-641-7222

From: SON Archaeology <archaeology@saugeenojibwaynation.ca>
Sent: October 10, 2024 11:28 AM
To: Amanda Parks <aparks@tmhc.ca>
Subject: Re: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment

Good morning Amanda,

I will look into sending a monitor, in the meantime could you provide me with the work plan and maps please?

Miigwech,

Kove Sartor
SON Archaeology Department
Resource & Infrastructure Department

10129 Hwy 6
Georgian Bluffs, ON
N0H 2T0
saugeenojibwaynation.ca

On Thu, Oct 10, 2024 at 10:30 AM Amanda Parks <aparks@tmhc.ca> wrote:

> Hi Kove,
>
> We have confirmed that we will be deploying on Tuesday August 15th and Wednesday August 16th for this project (pending weather). The municipality is moving forward with this project as part of a grant program and so we need to keep to some pretty tight timelines.
>
> Project details are as follows:
>
> Start Date: Tuesday October 15
> # of days anticipated for fieldwork: 2 days
> Start time: 9:30 am on Tuesday, 8:00am on Wednesday
> Consultant Company: TMHC
> Field Director(s) and Cell Phone(s): Sean Graziano (519-282-0541)
> Fieldwork Coordinator: Jonathan Freeman (519-282-9025)
> Stage of Fieldwork: Stage 1-2
> Required PPE: Work boots, gloves, and high vis gear. Please also bring eye protection.
> Meeting Location Address: Teeswater Community Centre - 21 Marcy St E, Teeswater, ON N0G 2S0; Parking PIN: https://maps.app.goo.gl/5noMf3q3rs6V7MAo9 (see attached map)
> Size of Field Crew: 5
>
> If you could please let me know if you have someone available to attend it would be most appreciated!
>
> Amanda

Amanda Parks, MA, P450 (she/her)
Manager - Environmental Assessments
aparks@tmhc.ca
(519) 671-8698

TMHC Inc.
1108 Dundas Street, Unit 105
London, ON | N5W 3A7
www.tmhc.ca
519-641-7222

From: Amanda Parks
Sent: October 7, 2024 3:12 PM
To: SON Archaeology <archaeology@saugeenojibwaynation.ca>
Cc: Lisa Courtney <lcourtney@bmross.net>
Subject: RE: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment

Hi Kove,

I hope you had a nice weekend! I just wanted to touch base with you about this project. We are planning on being out next week, likely October 15th and 16th. Will SON be able to send a representative to participate?

Thanks!
Amanda

Amanda Parks, MA, P450 (she/her)
Manager - Environmental Assessments
aparks@tmhc.ca
(519) 671-8698

TMHC Inc.
1108 Dundas Street, Unit 105
London, ON | N5W 3A7
www.tmhc.ca
519-641-7222

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From: Amanda Parks
Sent: September 25, 2024 9:40 AM
To: SON Archaeology <archaeology@saugeenojibwaynation.ca>
Cc: Lisa Courtney <lcourtney@bmross.net>
Subject: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment

Hi Kove,

I hope you are doing well!

We have recently been contracted by BM Ross on behalf of the Municipality of South Bruce to conduct a Stage 1-2 archaeological assessment for proposed new Elevated Water Storage and watermain connections in Teeswater in the Municipality of South Bruce.

I believe the municipality has reached out about this project.

We have recently submitted for locates and are tentatively looking at scheduling the fieldwork the week of October 15th. Is SON interested in participating?

Thanks!
Amanda

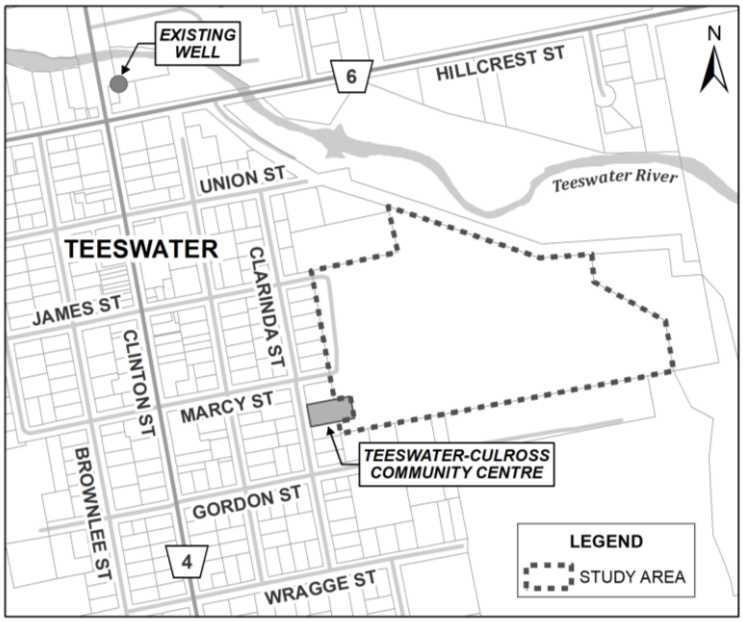
Get Outlook for Android

Appendix B

Hydrogeological & Geotechnical Investigations

MUNICIPALITY OF SOUTH BRUCE
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT FOR A NEW WATER STORAGE FACILITY (COMMUNITY OF TEESWATER)

NOTICE OF STUDY COMMENCEMENT



THE PROJECT: The Municipality of South Bruce is initiating a Municipal Class Environmental Assessment (MCEA) to investigate options for creating water storage in the community of Teeswater. Currently, the Teeswater water system has no water storage capacity. Adding water storage will minimize the potential for service disruptions and provide storage for the existing and future water system users. The area being considered as a potential site for the new water storage facility is the municipally owned land adjacent to the Teeswater-Culross Community Centre and is shown in the attached figure.

THE ENVIRONMENTAL SCREENING PROCESS: The planning for this project is following the environmental screening process set out for Schedule B activities under the MCEA process. The purpose of the screening process is to identify potential environmental impacts associated with the project and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders, First Nation and Métis communities, and government review agencies.

PUBLIC INVOLVEMENT: Public input and comments are invited for incorporation into the planning and design of this project. Initial comments are welcomed and will be received until **May 10th, 2024** at the address listed below. Any comments collected in conjunction with the study will be maintained on file for use during the project and may be included in project documentation. With the exception of personal information, all comments will become part of the public record. It is expected a public information meeting will be held at a future date regarding this project.

For further information on this project, or to review the Municipal Class EA process, please contact the consulting engineers: B.M. Ross and Associates: 62 North Street, Goderich, Ontario, N7A 2T4. Telephone (519) 524-2641. Lisa Courtney, Environmental Planner (e-mail: lcourtney@bmross.net).

Stu Moffat, Manager of Operations
Municipality of South Bruce

This Notice issued: April 10th, 2024.

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 **www.bmross.net**

File No. 21240

VIA EMAIL ONLY

April 10, 2024

Review Agency
(see attached list)

Re: Municipality of South Bruce
Municipal Class EA for a Water Storage Facility
(Community of Teeswater)

The Municipality of South Bruce is initiating a Municipal Class Environmental Assessment (MCEA) to investigate options for creating water storage in the community of Teeswater. Currently, the Teeswater water system has no water storage capacity. Adding water storage will minimize the potential for service disruptions and provide storage for the existing and future water system users. The area being considered as a potential site for the new water storage facility is the municipally owned land adjacent to the Teeswater-Culross Community Centre and is shown in the attached figure.

The planning for this project is following the environmental screening process established for Schedule 'B' activities under the MCEA document. Schedule B projects are approved subject to the completion of a screening process. The purpose of the Environmental Assessment process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders, Aboriginal communities, and review agencies.

Your organization has been identified as possibly having an interest in this project and we are soliciting your input. Please forward your response to our office by **May 10th, 2024.** If you have any questions or require further information, please contact the undersigned at lcourtney@bmross.net or by phone at 1-888-524-2641.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Lisa Courtney, MCIP, RPP
Environmental Planner

LJC:hv
c.c.: Stu Moffat, Municipality of South Bruce

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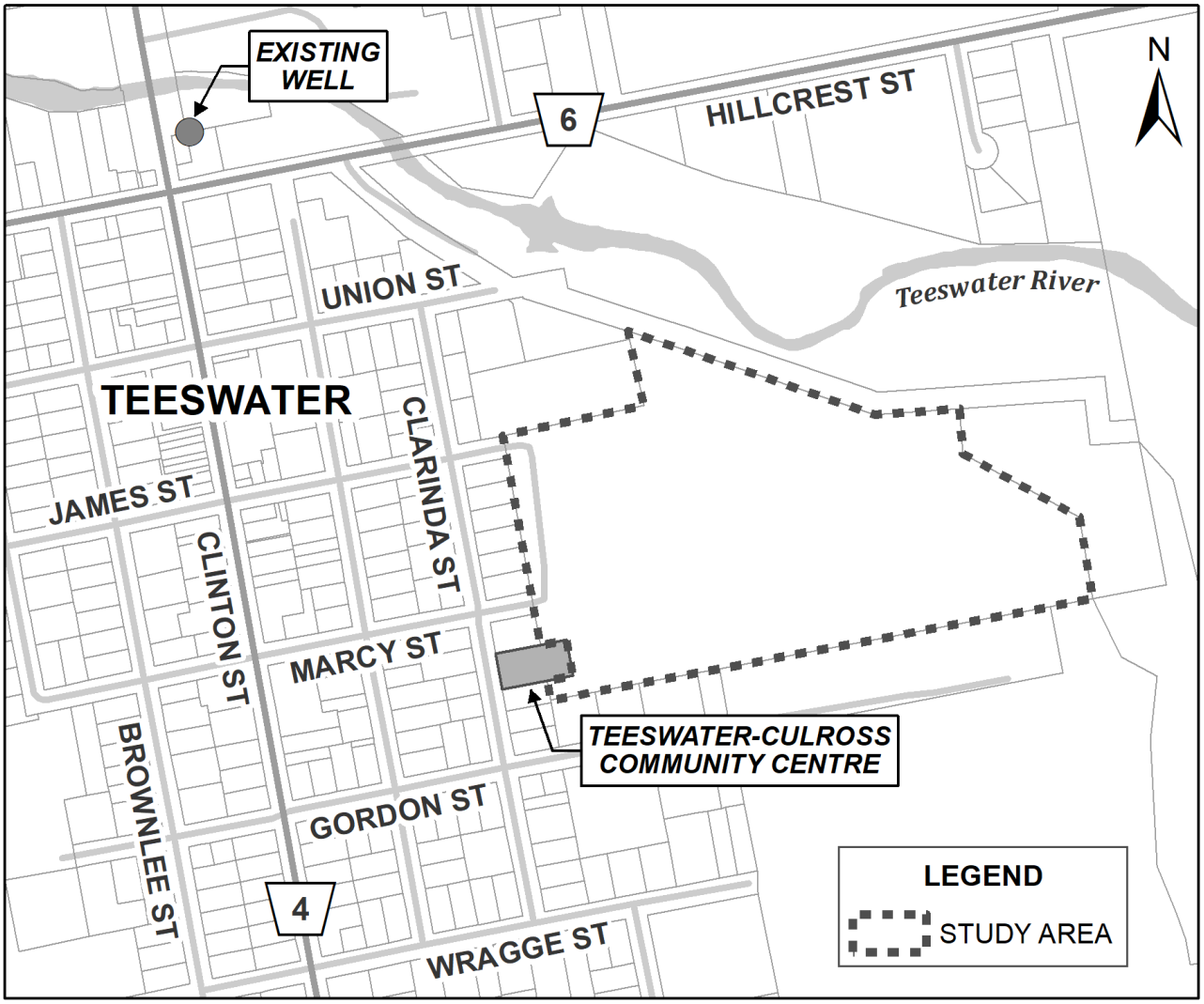
Figure 1: Teeswater Drinking Water System, Municipality of South Bruce



MUNICIPALITY OF SOUTH BRUCE
MCEA FOR NEW WELL AND WATER STORAGE FACILITY
(COMMUNITY OF TEESWATER)
BMROSS FILE 21240

REVIEW AGENCY CIRCULATION LIST – 2024

Agency	Contact Method	Address	Involvement
Ministry of Environment, Conservation and Parks (London)	Email agency letter, preliminary site map, and Project Information File	Southwest Region Ministry Regional Office Email: eanotification.swregion@ontario.ca	Mandatory Contact
Ministry of Natural Resources and Forestry	Email agency letter and preliminary site map	Owen Sound Work Centre Email: midhurstinfo@ontario.ca	Potential Impacts on Natural Features
Ministry of Citizenship and Multiculturalism	Email agency letter and preliminary site map	Ms. Karla Barboza, Team Lead (A), Heritage Heritage Program Unit Programs and Services Branch 401 Bay Street, Suite 1700 Toronto ON M7A 0A7 Email: karla.barboza@ontario.ca	Potential impacts on cultural and archaeological resources
County of Bruce-Planning & Development Department	Email agency letter and preliminary site map	Planning & Development Office Email: bcplpe@brucecounty.on.ca Christine MacDonald – CAO Email: Cmacdonald@brucecounty.on.ca	- General Information - Implications for Long-Term Development
Saugeen Valley Conservation Authority	Email agency letter and preliminary site map	Jason Dodds- Environmental Planning Technician Email: jdodds@svca.on.ca	Potential Impact on Natural Features
Saugeen, Grey Sauble, and Northern Bruce Peninsula Source Protection Region	Email agency letter and preliminary site map	Carl Seider c/o Grey Sauble Conservation Authority 237897 Inglis Falls Road, RR4 Owen Sound, ON N4K 5N6 (Canada) Email: c.seider@greysauble.on.ca	Impacts related to Source Water Protection.

Agency	Contact Method	Address	Involvement
Municipality of South Bruce	Email agency letter and preliminary site map	Stu Moffat, Operations Manager Email: smoffat@southbruce.ca	Proponent (copy)
Municipality of South Bruce Fire Chief	Email agency letter and preliminary site map	Guy Gallant, Fire Chief Email: ggallant@southbruce.ca	Impacts related to fire protection
Veolia	Email agency letter and preliminary site map	Scott Gowan Email: scott.gowan@veolia.com	Impacts on water system operation

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 **www.bmross.net**

File No. 21240

VIA EMAIL ONLY

April 10, 2024

Aboriginal Community
(see attached list)

Re: Municipality of South Bruce
MCEA for a New Water Storage Facility
(Community of Teeswater)

The Municipality of South Bruce is initiating a Municipal Class Environmental Assessment (MCEA) to investigate options for creating water storage in the community of Teeswater. Currently, the Teeswater water system has no water storage capacity. Adding water storage will minimize the potential for service disruptions and provide storage for the existing and future water system users. The area being considered as a potential site for the new water storage facility is the municipally owned land adjacent to the Teeswater-Culross Community Centre and is shown in the attached figure.

The planning for this project is following the environmental screening process established for Schedule 'B' activities under the Municipal Class EA document. Schedule B projects are approved subject to the completion of a screening process. The purpose of the Environmental Assessment process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders, Aboriginal communities, and review agencies.

Your community has been identified as possibly having an interest in this project and we are soliciting your input. Please forward your response to our office by **May 25th, 2024.** If you have any questions or require further information, please contact the undersigned at lcourtney@bmross.net or by phone at 1-888-524-2641.

Yours very truly

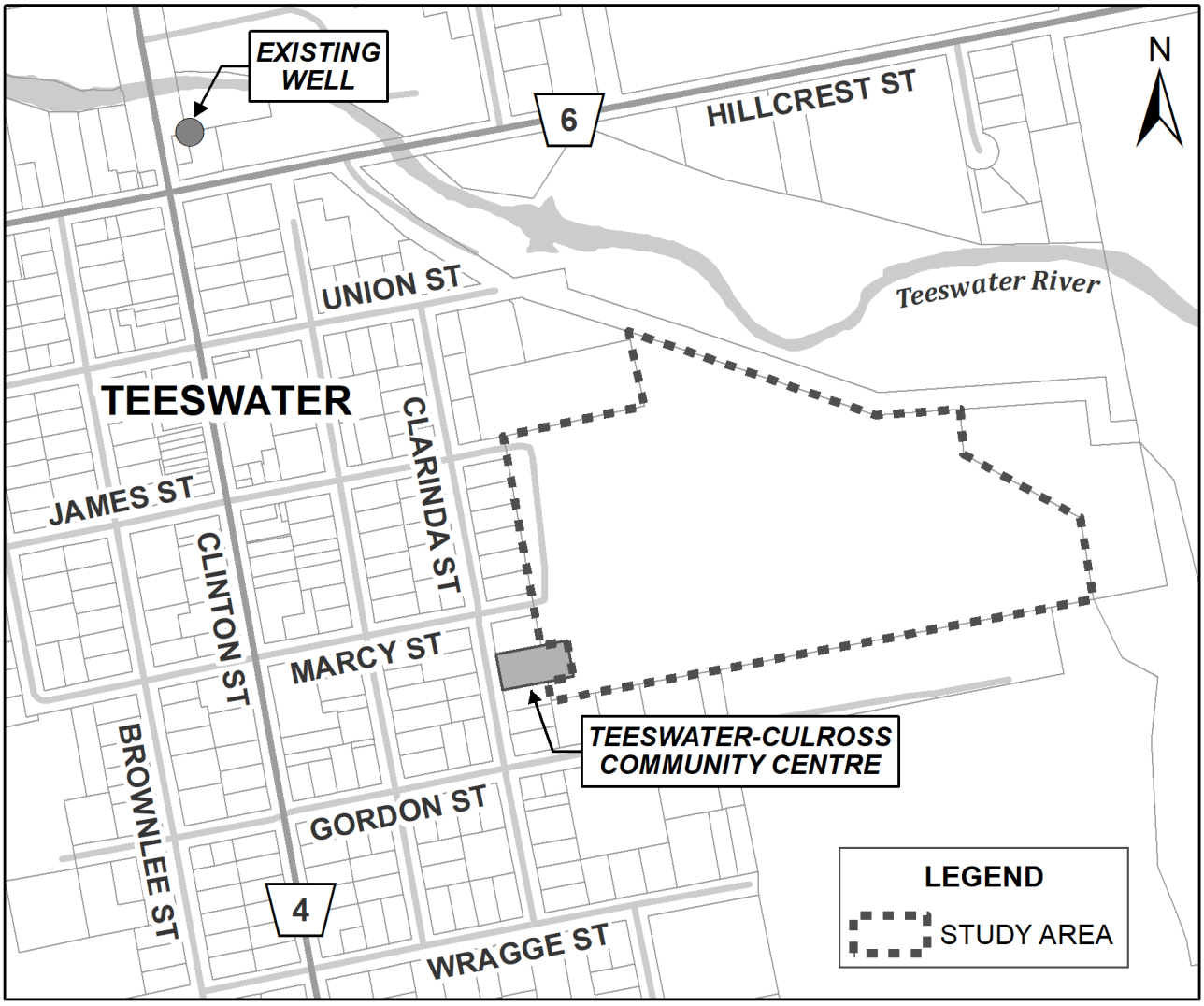
B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Lisa Courtney, MCIP, RPP
Environmental Planner

LJC:hv
Encl.
c.c.: Stu Moffat, Municipality of South Bruce

Z:\21240-SB-2021_ICIP_Application\WP\Class EA\Aboriginal\21240-2024-04-10-Aboriginal letter.docx

Figure 1: Teeswater Drinking Water System, Municipality of South Bruce



Response Form

Project Name: Class EA for Teeswater Drinking Water System Expansion

Project Description: Class EA (Schedule B) for the addition of a new well and/or new water storage facility.

Project Location: Teeswater, Municipality of South Bruce

(Key Plan of Project Location attached)

Please Detach and Return in Envelope Provided

Name of Aboriginal Community: _____

Please check appropriate box

☐ **Please send additional information on this project**

☐ **We would like to meet with representatives of this project.**

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MUNICIPALITY OF SOUTH BRUCE
MCEA FOR NEW WELL AND WATER STORAGE FACILITY
BMROSS FILE 21240

ABORIGINAL COMMUNITIES' CIRCULATION LIST – 2024

Aboriginal Community	Contact Method
Métis Nation of Ontario	Email: consultations@metisnation.org,
Chippewas of Saugeen	Chief Conrad Ritchie Chippewas of Saugeen 6 Cameron Drive Southampton, ON N0H 2L0 Email: critchie@saugeenfirstnation.ca
Chippewas of Nawash	Ogimaa: Gregory Nadjiwon Chippewas of Nawash 135 Lakeshore Blvd. Neyaashiinigmiing, ON N0H 2T0 Email: Chief@nawash.ca
Great Lakes Metis Council	Peter Coture – President Great Lakes Metis Council 380 9th Street East Owen Sound, ON N4K 1P1 Email: peterc1908@hotmail.com GreatLakesMetis@gmail.com
Historic Saugeen Métis	Historic Saugeen Métis 204 High Street, Box 1492 Southampton, ON N0H 2L0 Email: hsmlrcc@bmts.com
Saugeen Ojibway Nation Environment Office Charlene Leonard (Infrastructure and Resource Manager) & Amber Debassige (Executive Assistant)	Email: manager.ri@saugeenojibwaynation.ca, cc: execassist.ri@saugeenojibwaynation.ca
Chippewas of Kettle and Stony Point First Nation	Kimberly Bressette Chippewas of Kettle and Stony Point First Nation 6247 Indian Lane Lambton Shores, ON N0N 1J2 Email: Kimberly.Bressette@kettlepoint.org

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 **www.bmross.net**

File No. 21240

VIA EMAIL ONLY

April 10, 2024

Kimberly Bressette
Chippewas of Kettle and Stony Point First Nation
6247 Indian Lane
Lambton Shores, ON N0N 1J2

Re: Municipality of South Bruce
MCEA for a New Water Storage Facility
(Community of Teeswater)

The Municipality of South Bruce is initiating a Municipal Class Environmental Assessment (MCEA) to investigate options for creating water storage in the community of Teeswater. Currently, the Teeswater water system has no water storage capacity. Adding water storage will minimize the potential for service disruptions and provide storage for the existing and future water system users. The area being considered as a potential site for the new water storage facility is the municipally owned land adjacent to the Teeswater-Culross Community Centre and is shown in the attached figure.

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Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Lisa Courtney, MCIP, RPP
Environmental Planner

LJC:hv
Encl.
c.c.: Stu Moffat, Municipality of South Bruce

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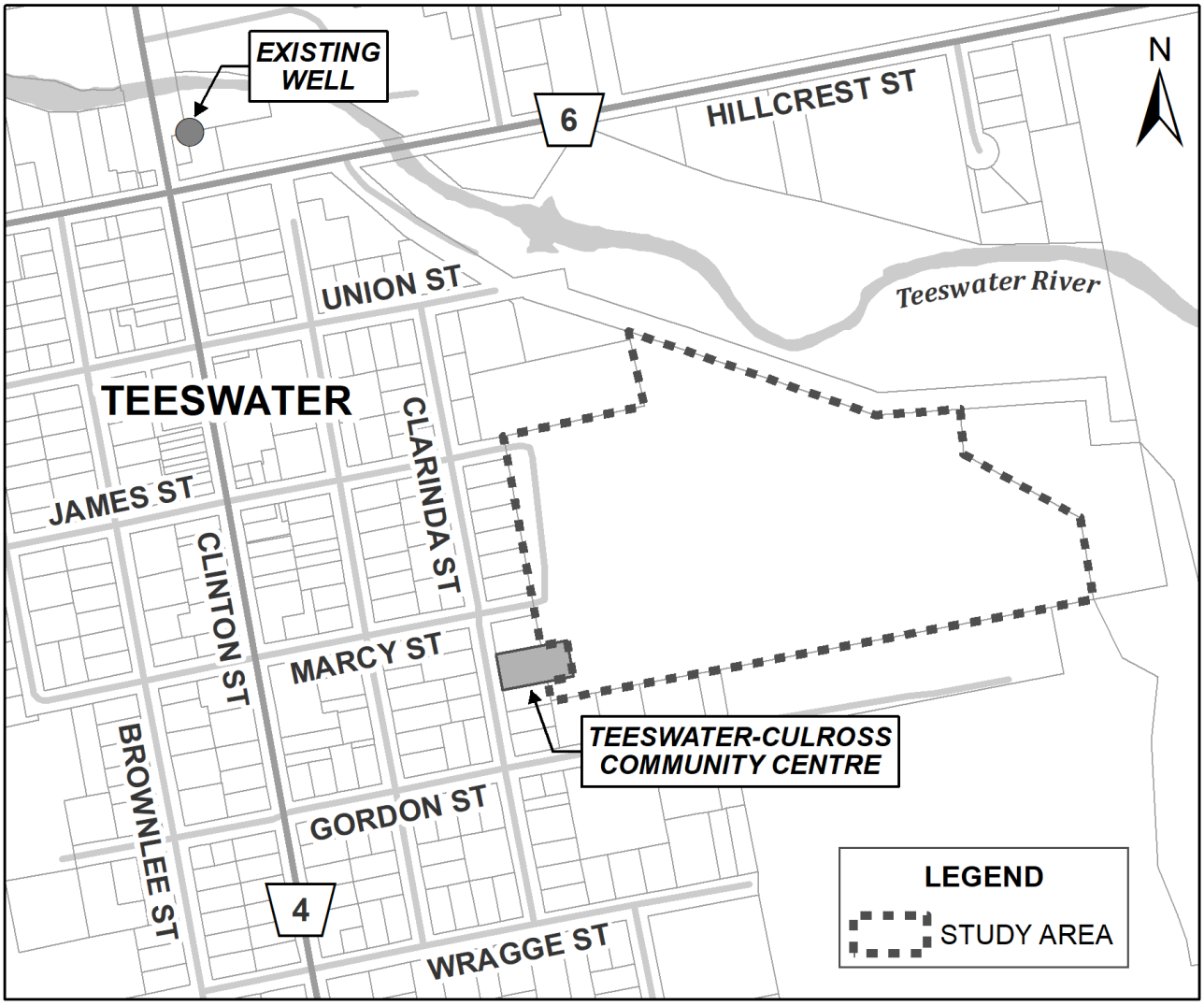

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File No. 21240

VIA EMAIL ONLY

April 10, 2024

Saugeen Ojibway Nation Environment Office
Charlene Leonard (Infrastructure and Resource Manager)

Re: Municipality of South Bruce
MCEA for a New Water Storage Facility
(Community of Teeswater)

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Amber Debassige (Executive Assistant)

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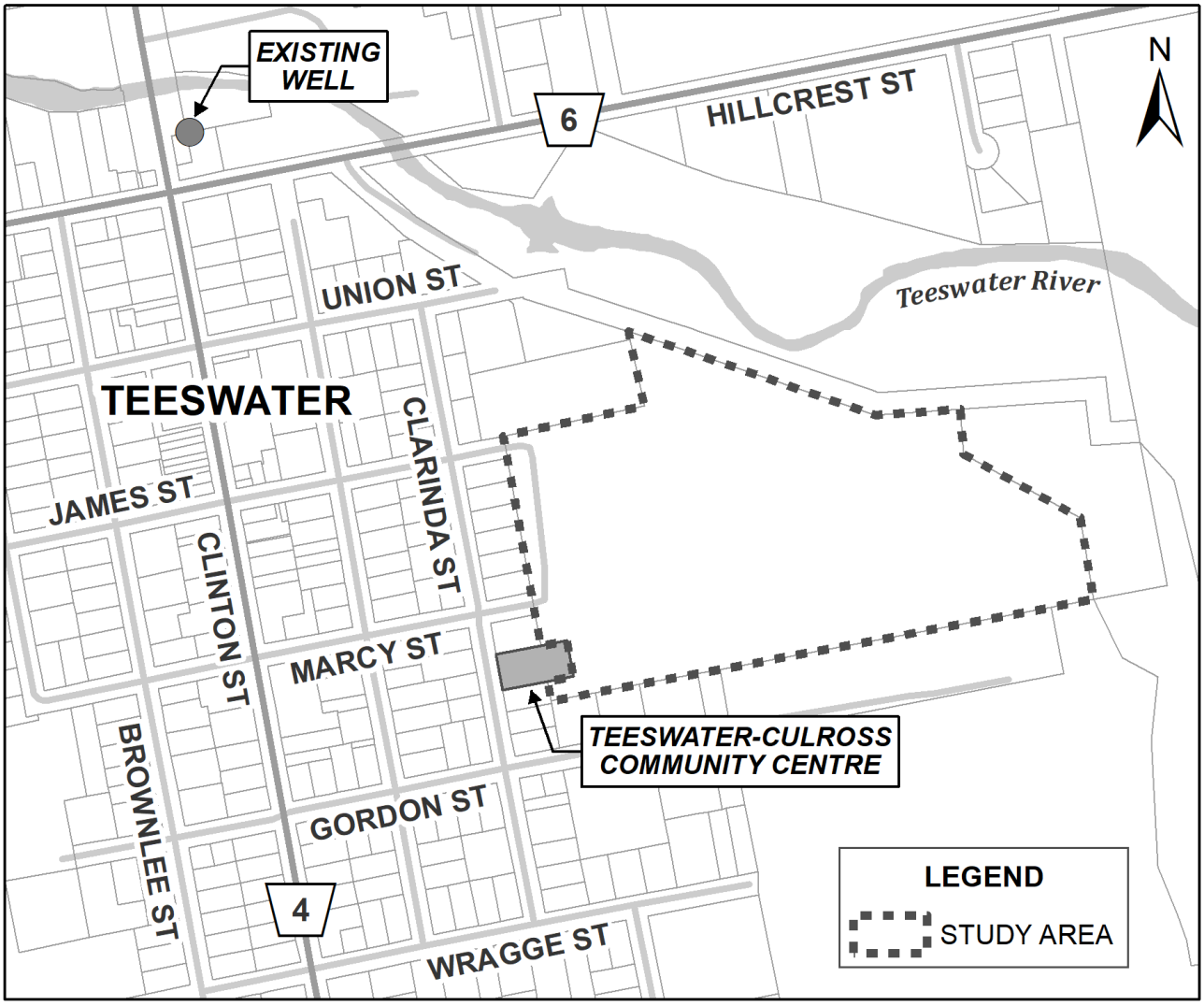

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File No. 21240

VIA EMAIL ONLY

April 10, 2024

Ogimaa: Gregory Nadjiwon
Chippewas of Nawash
135 Lakeshore Blvd.
Neyaashiinigmiing, ON N0H 2T0

Re: Municipality of South Bruce
MCEA for a New Water Storage Facility
(Community of Teeswater)

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Lisa Courtney, MCIP, RPP
Environmental Planner

LJC:hv
Encl.
c.c.: Stu Moffat, Municipality of South Bruce

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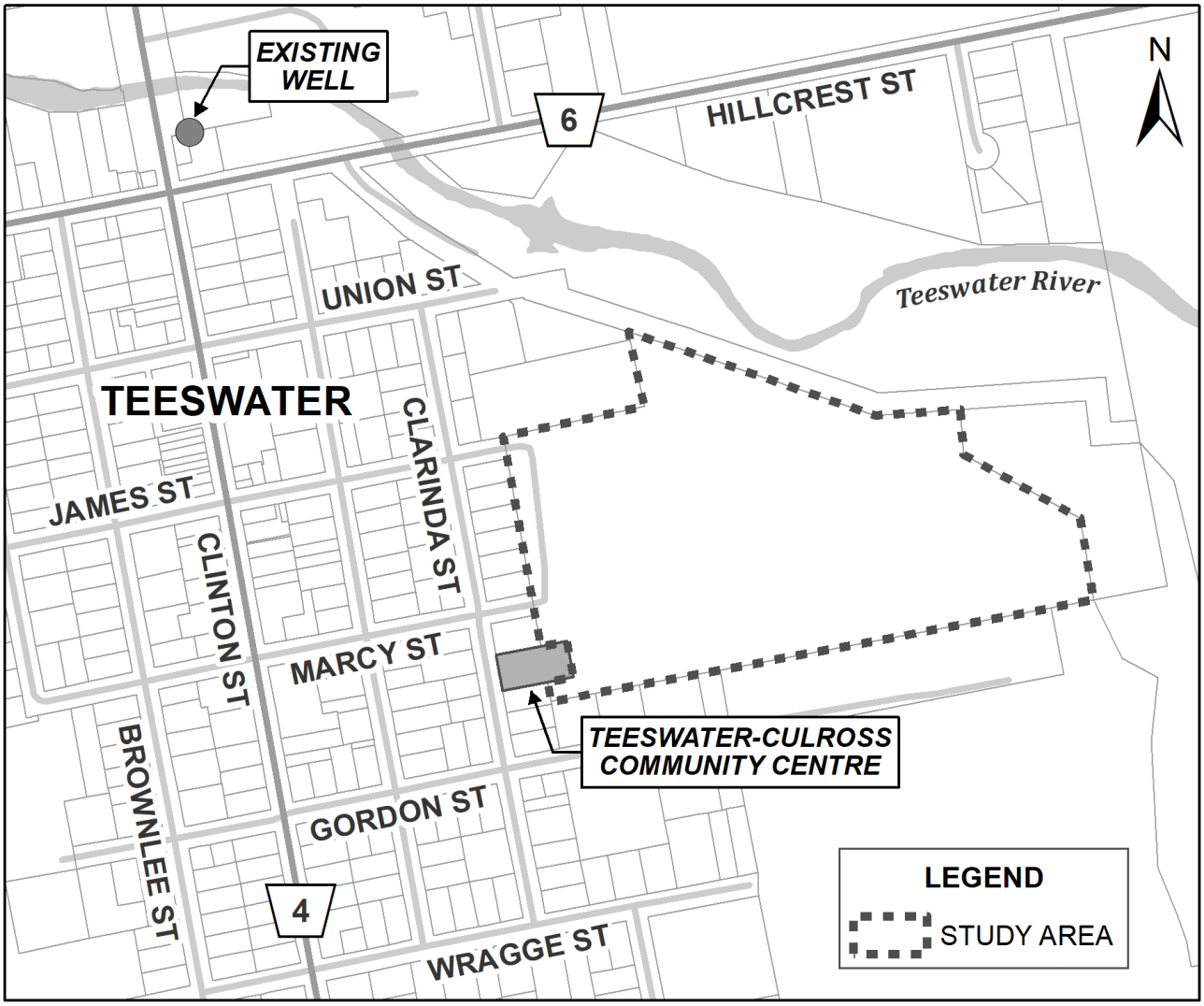

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Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 **www.bmross.net**

File No. 21240

VIA EMAIL ONLY

April 10, 2024

Chief Conrad Ritchie
Chippewas of Saugeen
6 Cameron Drive
Southampton, ON N0H 2L0

Re: Municipality of South Bruce
MCEA for a New Water Storage Facility
(Community of Teeswater)

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Per _____
Lisa Courtney, MCIP, RPP
Environmental Planner

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c.c.: Stu Moffat, Municipality of South Bruce

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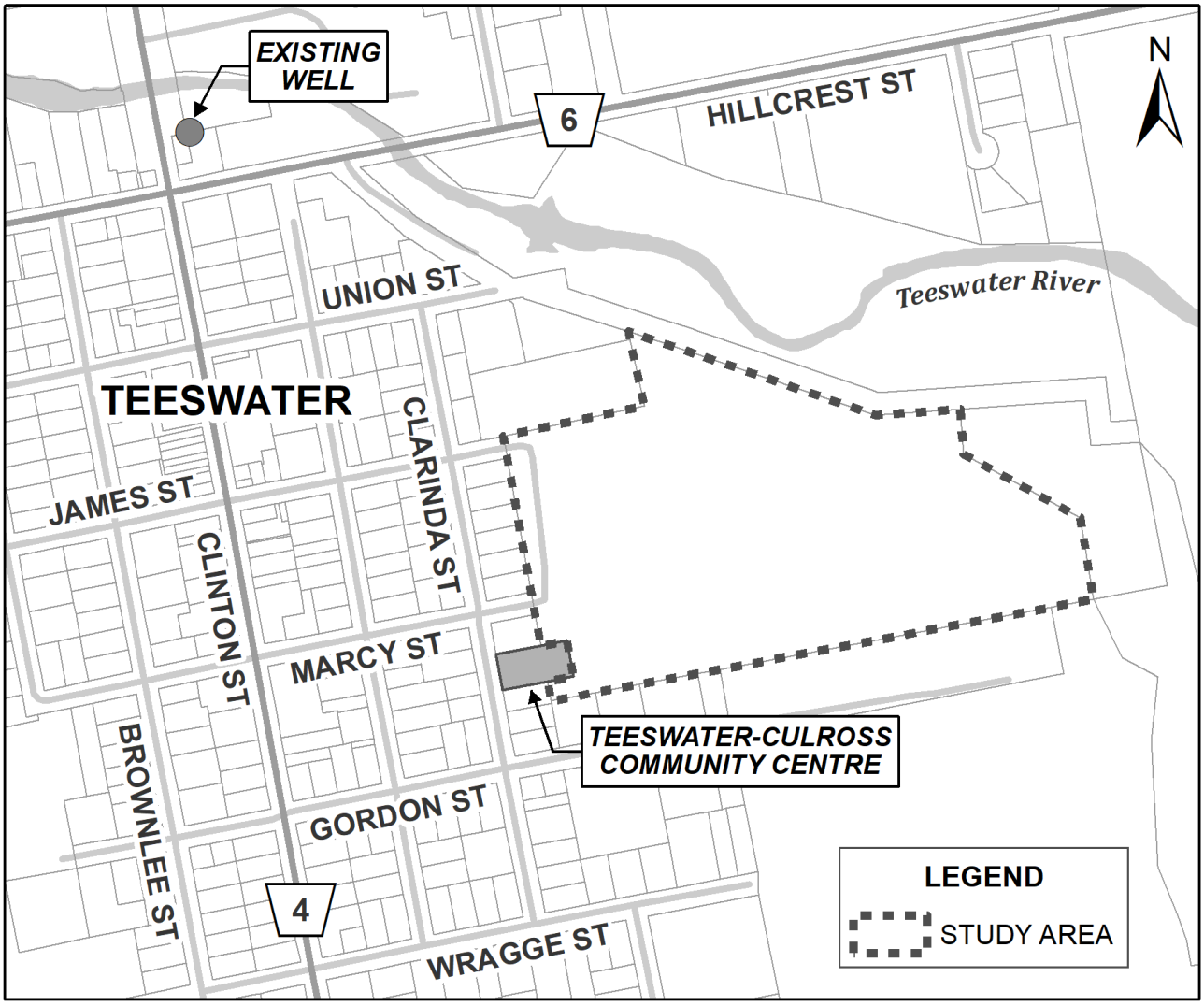

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File No. 21240

VIA EMAIL ONLY

April 10, 2024

Peter Coture – President
Great Lakes Metis Council
380 9th Street East
Owen Sound, ON N4K 1P1

Re: Municipality of South Bruce
MCEA for a New Water Storage Facility
(Community of Teeswater)

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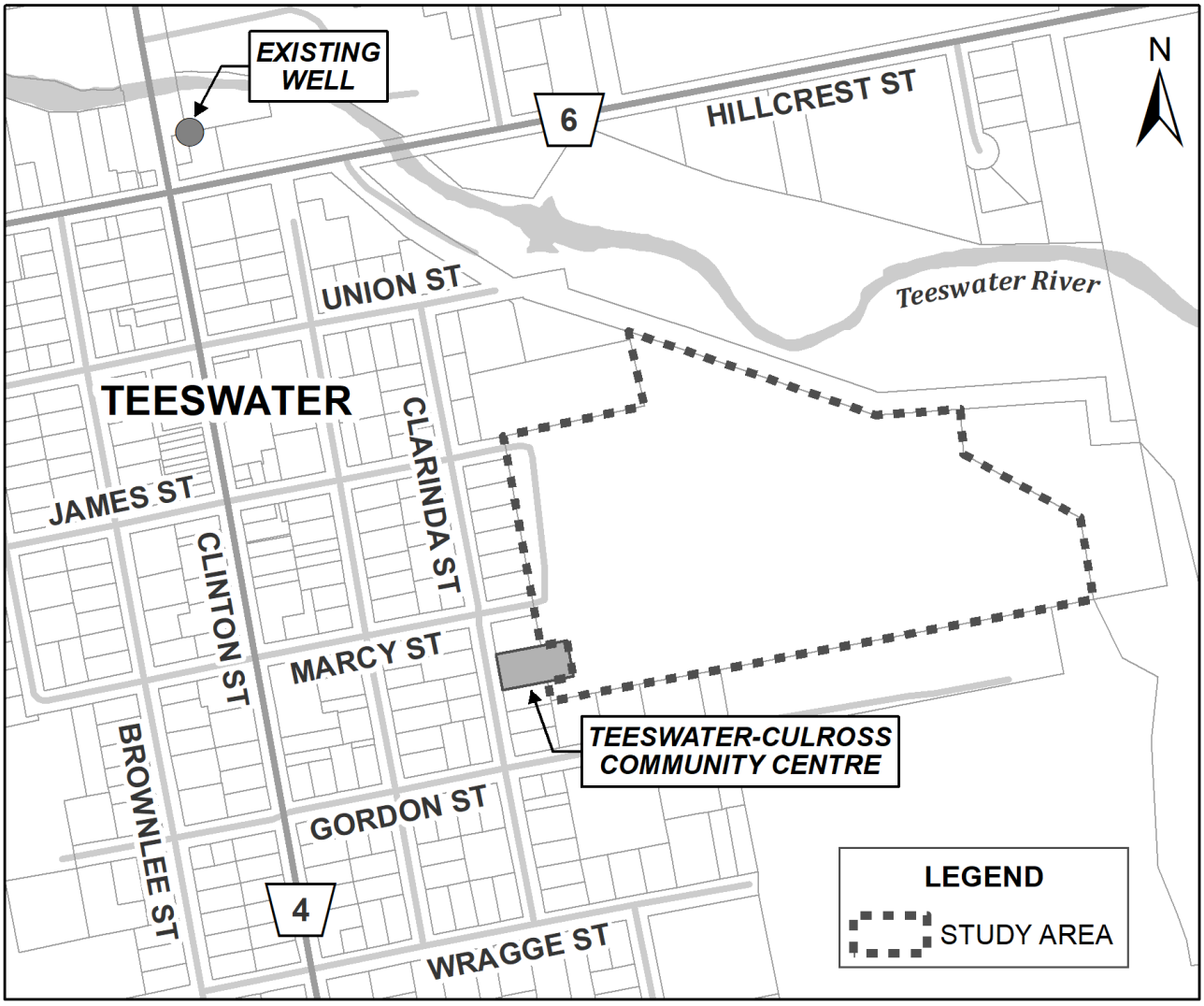

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File No. 21240

VIA EMAIL ONLY

April 10, 2024

Historic Saugeen Métis
204 High Street, Box 1492
Southampton, ON N0H 2L0

Re: Municipality of South Bruce
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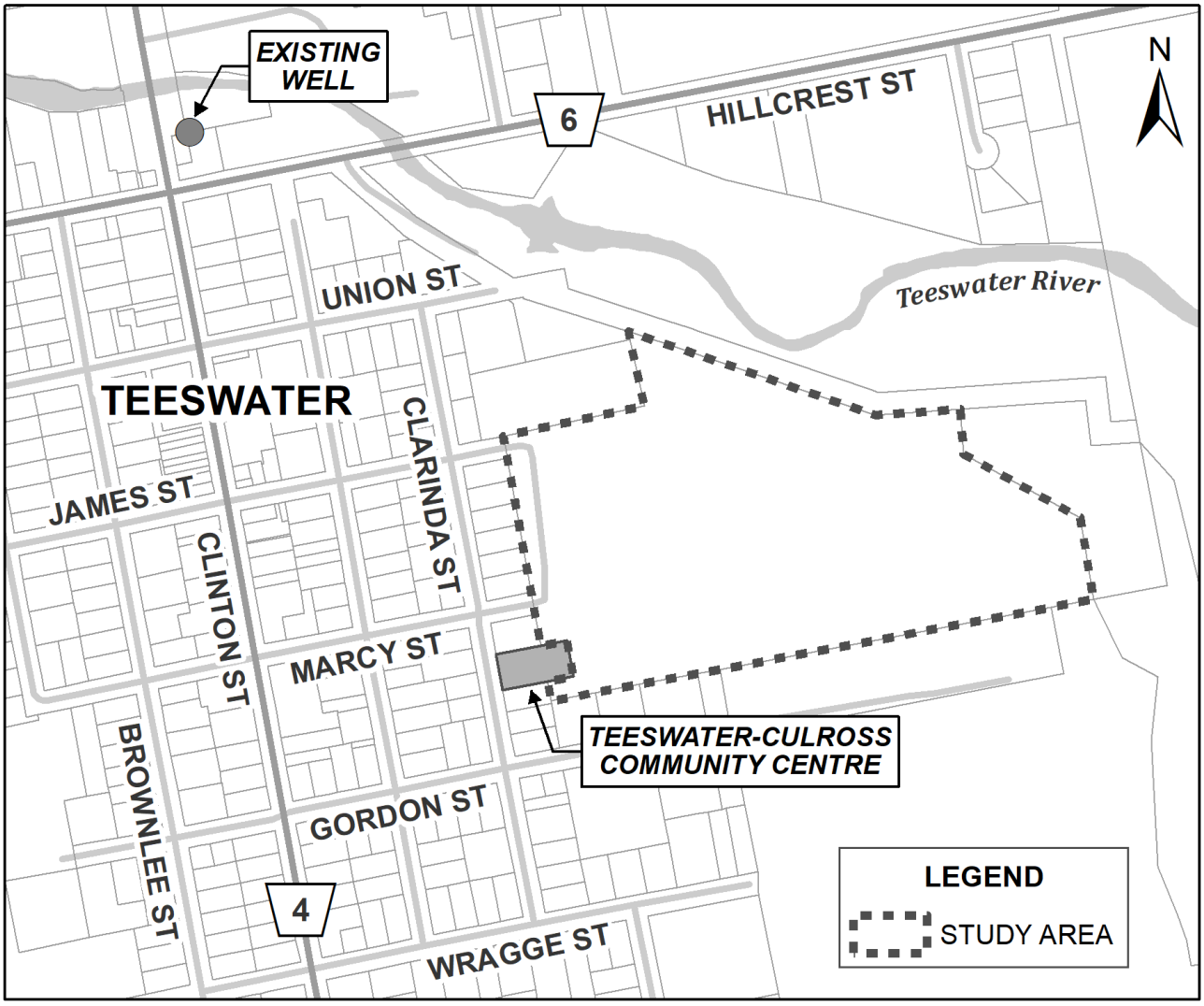

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VIA EMAIL ONLY

April 10, 2024

Métis Nation of Ontario
consultations@metisnation.org,

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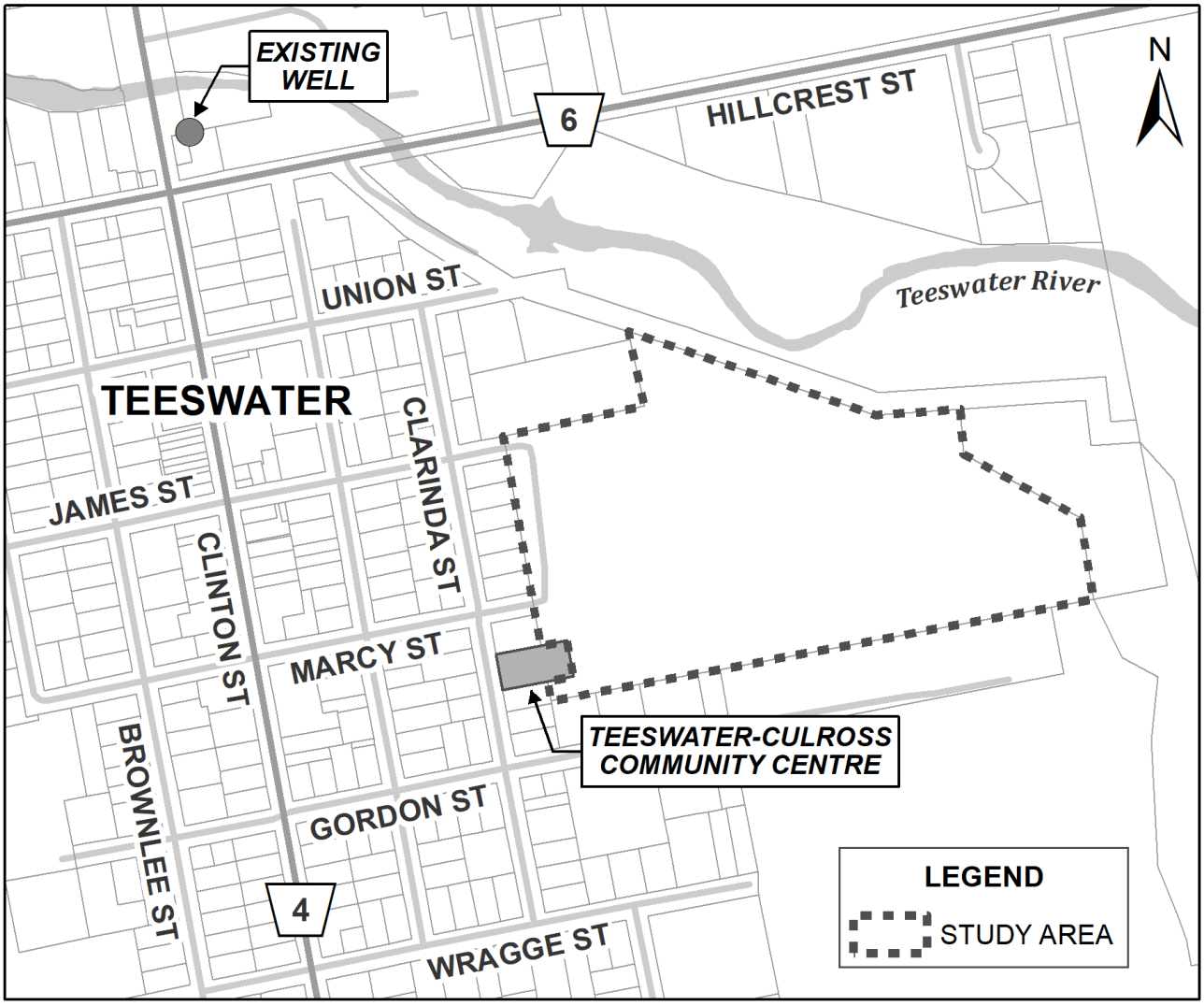

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April 10, 2024

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Charlene Leonard (Infrastructure and Resource Manager)

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Amber Debassige (Executive Assistant)

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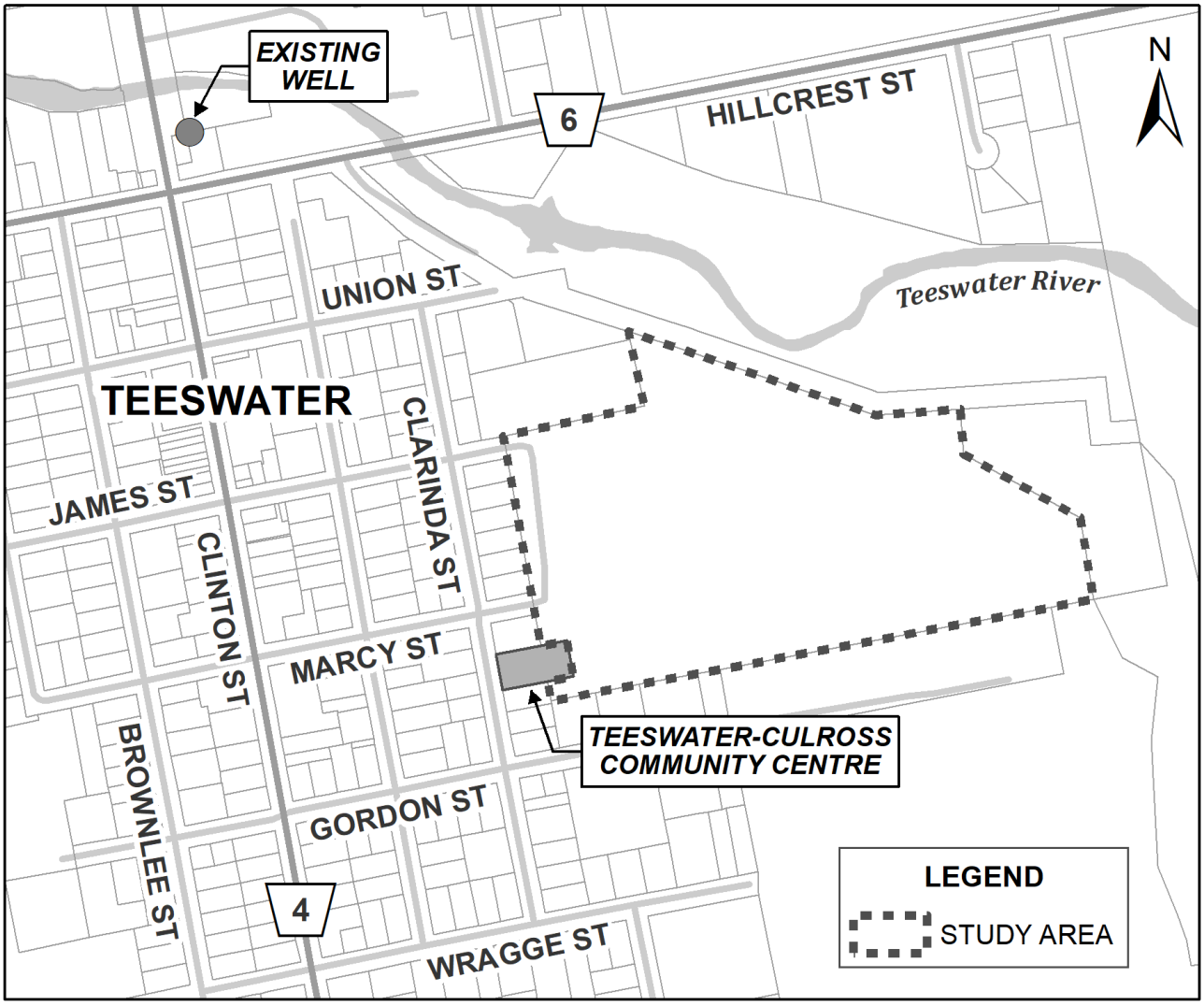

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p. (519) 524-2641 **www.bmross.net**

File No. 21240

VIA EMAIL ONLY
Dominic.Sainte-Marie@wendake.ca

April 17, 2024

Huron-Wendat Nation
Dominic Saint-Marie

Re: Municipality of South Bruce
MCEA for a New Water Storage Facility
(Community of Teeswater)

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B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Lisa Courtney, MCIP, RPP
Environmental Planner

LJC:hv
Encl.
c.c.: Stu Moffat, Municipality of South Bruce
Chief Remy Vincent bureaupolitique@wendake.ca

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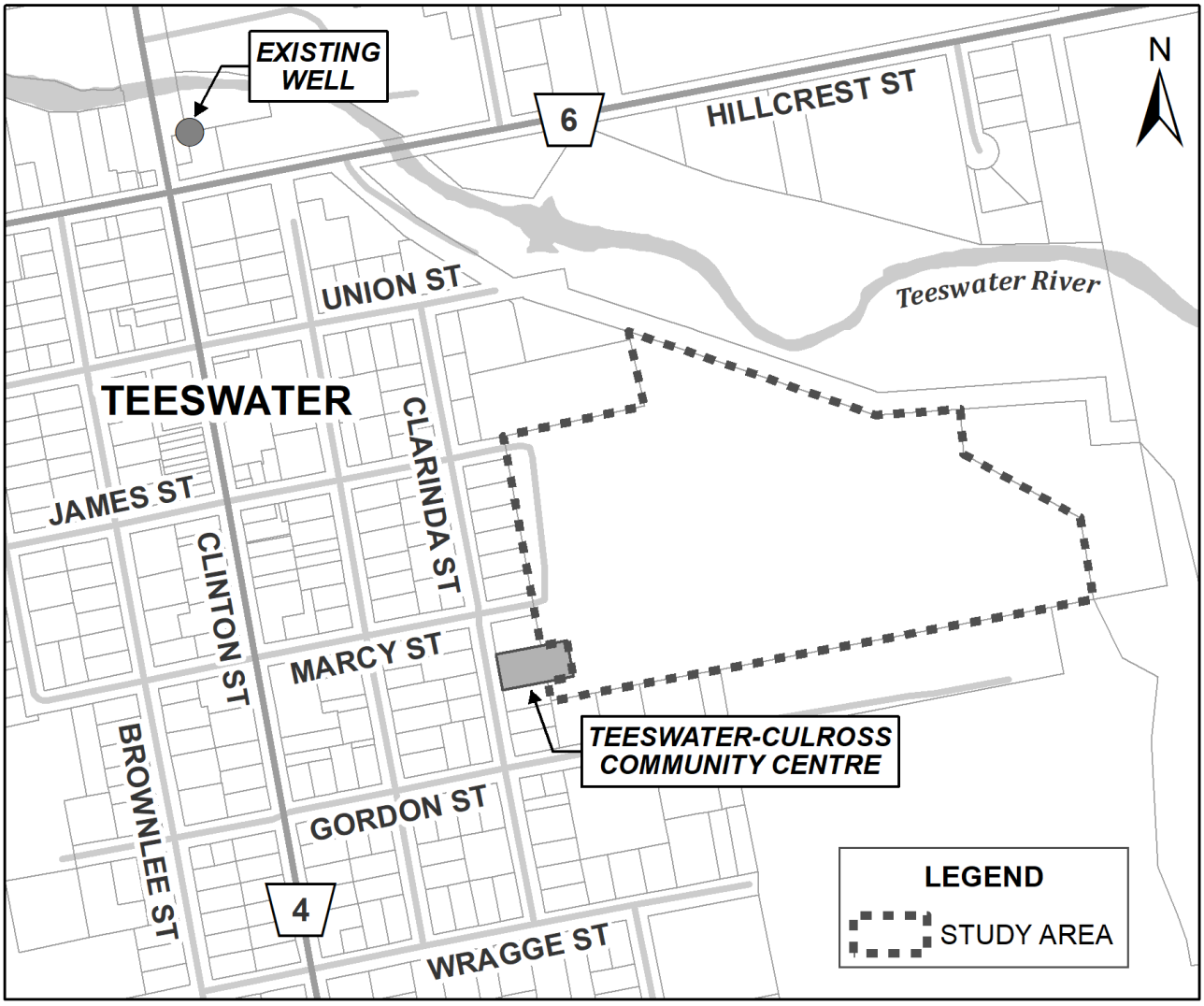


Ministry of Natural Resources and Forestry

Land Use Planning and Strategic Issues Section
Southern Region

Regional Operations Division
300 Water Street
Peterborough, ON K9J 3C7

Ministère des Richesses naturelleset des Forêts

Section de l'aménagement du territoire et des questions stratégiques
Région du Sud

Division des opérations régionales
300, rue Water
Peterborough (ON) K9J 3C7

Ontario

April 22, 2024

Stu Moffat, Operations Manager
Municipality of South Bruce
21 Gordon Street East
Teeswater, Ontario N0G 2S0

SUBJECT: **Municipality of South Bruce**
Municipal Class EA for a Water Storage Facility (Community of Teeswater)

The Ministry of Natural Resources and Forestry (MNRF) received the above noted letter on April 10, 2024. Thank you for circulating this to our office. Please note that we have not completed a screening of natural heritage or other resource values for the project at this time. This response, however, does provide information to guide you in identifying and assessing natural features and resources as required by applicable policies and legislation, as well as engaging with the Ministry for advice as needed.

Please also note that it is the proponent's responsibility to be aware of, and comply with, all relevant federal or provincial legislation, municipal by-laws or other agency approvals.

Natural Heritage

MNRF's natural heritage and natural resources GIS data layers can be obtained through the Ministry's Land Information Ontario (LIO) website. You may also view natural heritage information online (e.g., Provincially Significant Wetlands, ANSI's, woodlands, etc.) using the Make a Map: Natural Heritage Areas tool.

We recommend that you use the above-noted sources of information during the review of your project proposal.

Natural Hazards

A series of natural hazard technical guides developed by MNRF are available to support municipalities and conservation authorities implement the natural hazard policies in the Provincial Policy Statement (PPS). For example, standards to address flood risks and the potential impacts and costs from riverine flooding are addressed in the *Technical Guide River and Stream Systems: Flooding Hazard Limit (2002)*. We recommend that you consider these technical guides as you assess specific improvement projects that can be undertaken to reduce the risk of flooding.

Petroleum Wells & Oil, Gas and Salt Resources Act

There may be petroleum wells within the proposed project area. Please consult the Ontario Oil, Gas and Salt Resources Library website (www.ogsrlibrary.com) for the best-known data on any wells recorded by MNRF. Please reference the 'Definitions and Terminology Guide' listed in the

publications on the library website to better understand the well information available. Any oil and gas wells in your project area are regulated by the *Oil, Has and Salt Resource Act*, and the supporting regulations and operating standards. If any unanticipated wells are encountered during development of the project, or if the proponent has questions regarding petroleum operations, the proponent should contact the Petroleum Operations Section at POSRecords@ontario.ca or 519-873-4634.

Fish and Wildlife Conservation Act

Please note, that should the project require:

- The relocation of fish outside of the work area, a Licence to Collect Fish for Scientific Purposes under the *Fish and Wildlife Conservation Act* will be required.
- The relocation of wildlife outside of the work area (including amphibians, reptiles, and small mammals), a Wildlife Collector's Authorization under the *Fish and Wildlife Conservation Act* will be required.

Public Lands Act & Lakes and Rivers Improvement Act

Some Project may be subject to the provisions of the *Public Lands Act* or *Lakes and River Improvement Act*. Please review the information on MNRF's web pages provided below regarding when an approval is, or is not, required. Please note, *Lakes and Rivers Improvement Act* approval from the Ministry is not required for certain activities within the area of jurisdiction of a Conservation Authority. Please see the *Lakes and Rivers Improvement Act* administrative guide for more information and contact your local Conservation Authority where unsure if work is subject to regulation under the *Conservation Authorities Act*.

- For more information about the *Public Lands Act*: https://www.ontario.ca/page/crown-land-work-permits
- For more information about the *Lakes and Rivers Improvement Act*: https://www.ontario.ca/page/lakes-and-rivers-improvement-act-administrative-guide

After reviewing the information provided, if you have not identified any of MNRF's interests stated above, there is no need to circulate any subsequent notices to our office. If you have identified any of MNRF's interests and/or may require permit(s) or further technical advice, please direct your specific questions to the undersigned.

If you have any questions or concerns, please feel free to contact me.

Best Regards,

Jody Marks
Regional Planner
Land Use Planning and Strategic Issues Section – Southern Region
Ministry of Natural Resources and Forestry

Risk Management Office
237897 Inglis Falls Road
RR4 Owen Sound, ON N4K 5N6
Phone: 519-470-3000 Toll Free: 877-470-3001
rmo@greysauble.on.ca

Notice of Restricted Land Use
Clean Water Act – ss. 59(2)(a)

TO/ATTN: Lisa Courtney

Location Address: 21 MARCY ST. E.,TEESWATER

Assessment Roll #: 410506000613300000000

Property Owner Name MUNICIPALITY OF SOUTH BRUCE and/or

Person engaged in Activity (where applicable) _____

Notice File No. RLU-4105-2024-001 RMP File No. n/a

From the information noted in the letter initiating the Municipal Class EA process regarding plans to create a water storage facility on the subject property, at this stage it has been determined that **neither section 57 (Prohibited Activities) or section 58 (Regulated Activities)** applies on the above-noted property, pursuant to the *Clean Water Act, 2006*. However, it is should be noted that this property falls within the Wellhead Protection Area B (Score of 10) for the Teeswater Drinking Water System. The storage of fuel greater than 2,500 litres and certain chemicals (greater than 25 litres) associated with wood working and metal degreasers are prohibited. Furthermore fuel storage greater then 250 litres would require development of a Risk Management Plan.

The policies that would apply to the activities identified in the application, fall under the approved Source Protection Plan for the Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Region (effective July 1, 2016).

If any activities or operations on this property change, please contact this office. If you have any questions, please contact this office (519-470-3000 or toll-free 1-877-470-3001) or via email at c.seider@greysauble.on.ca.

Signature of RMO: _____ Date: April 19, 2024

Ministry of the Environment, Conservation and Parks

Environmental Assessment Branch

7th Floor
135 St. Clair Avenue W
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax.: 416 314-8452

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Direction des évaluations environnementales

7ème étage
135, avenue St. Clair Ouest
Toronto ON M4V 1P5
Tél. : 416 314-8001
Téléc. : 416 314-8452

May 7, 2024

Lisa Courtney
BM Ross
lcourtney@bmross.net

BY EMAIL ONLY

Re: **Municipal Class Environmental Assessment for New Water Storage Facility (Teeswater)**
Municipality of South Bruce
Municipal Class Environmental Assessment, Schedule B
Acknowledgement of Notice of Commencement

Dear Lisa,

This letter is in response to the Notice of Commencement for the above noted project. The Ministry of the Environment, Conservation and Parks (MECP) acknowledges that the Municipality of South Bruce (proponent) has indicated that the study is following the approved environmental planning process for a Schedule B project under the Municipal Class Environmental Assessment (Class EA).

The **updated (August 2022)** attached "Areas of Interest" document provides guidance regarding the ministry's interests with respect to the Class EA process. Please address all areas of interest in the EA documentation at an appropriate level for the EA study. Proponents who address all the applicable areas of interest can minimize potential delays to the project schedule. Information is provided at the end of the Areas of Interest document relating to the Notice of Completion**.**

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

The proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to the proposed project**, the MECP is delegating the procedural aspects of rights-based consultation to the proponent through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information provided to date and the Crown`s preliminary assessment the proponent is required to consult with the following communities who have been identified as potentially affected by the proposed project:

- Saugeen First Nation and the Chippewas of Nawash Unceded First Nation - these communities work together on consultation issues and are known collectively as the Saugeen Ojibway Nation. They have requested notices be sent to the Saugeen Ojibway Nation Environment Office with a copy to the Chief and Council of Saugeen First Nation and Chippewas of Nawash Unceded First Nation.

- Métis Nation of Ontario- Lands and Resources Dept, Region 7
    - MNO Georgian Bay Métis Council (please cc Métis Nation of Ontario (MNO) Lands, Resources and Consultations Branch)

- Huron-Wendat- if the proponent is contemplating construction that may require an archaeological assessment, then the Huron-Wendat should be notified

Steps that the proponent may need to take in relation to Aboriginal consultation for the proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process". Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments.

Please also refer to the attached document "A Proponent's Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities" for further information, including the MECP's expectations for EA report documentation related to consultation with communities.

The proponent must contact the Director of Environmental Assessment Branch (EABDirector@ontario.ca) under the following circumstances after initial discussions with the communities identified by the MECP:

- Aboriginal or treaty rights impacts are identified to you by the communities;
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right;
- Consultation with Indigenous communities or other stakeholders has reached an impasse; or
- A Section 16 Order request is expected based on impacts to Aboriginal or treaty rights

The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play should additional steps and activities be required.

A draft of the report should be sent directly to me prior to the release of the final report through the issuance of the Notice of Completion, allowing a minimum of 30 days for the ministry's technical reviewers to provide comments on the draft report.

Please also ensure a copy of the Notice of Completion is sent to the ministry's Southwest Region EA notification email account (eanotification.swregion@ontario.ca) after the draft report and Notice of Completion is reviewed and finalized.

Should you or any members of your project team have any questions regarding the material above, please contact me at monika.macki@ontario.ca.

Sincerely,

Monika Macki

Monika Macki
Regional Environmental Planner – Southwest Region
Project Review Unit, Environmental Assessment Branch

Enclosed: Areas of Interest

Attached: Client's Guide to Preliminary Screening for Species at Risk

A Proponent's Introduction to the Delegation of Procedural Aspects of Consultation with Aboriginal Communities

AREAS OF INTEREST (v. August 2022)

It is suggested that you check off each section after you have considered / addressed it.

Planning and Policy

- Applicable plans and policies should be identified in the report, and the proponent should describe how the proposed project adheres to the relevant policies in these plans.
    - Projects located in MECP Central, Eastern or West Central Region may be subject to **A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020)**.
    - Projects located in MECP Central or Eastern Region may be subject to the **Oak Ridges Moraine Conservation Plan (2017)** or the **Lake Simcoe Protection Plan (2014)**.
    - Projects located in MECP Central, Southwest or West Central Region may be subject to the **Niagara Escarpment Plan (2017)**.
    - Projects located in MECP Central, Eastern, Southwest or West Central Region may be subject to the **Greenbelt Plan (2017)**.
    - Projects located in MECP Northern Region may be subject to the **Growth Plan for Northern Ontario (2011).**

- The **Provincial Policy Statement (2020)** contains policies that protect Ontario's natural heritage and water resources. Applicable policies should be referenced in the report, and the proponent should describe how the proposed project is consistent with these policies.

- In addition to the provincial planning and policy level, the report should also discuss the planning context at the municipal and federal levels, as appropriate.

Source Water Protection

The *Clean Water Act*, 2006 (CWA) aims to protect existing and future sources of drinking water. To achieve this, several types of vulnerable areas have been delineated around surface water intakes and wellheads for every municipal residential drinking water system that is located in a source protection area. These vulnerable areas are known as a Wellhead Protection Areas (WHPAs) and surface water Intake Protection Zones (IPZs). Other vulnerable areas that have been delineated under the CWA include Highly Vulnerable Aquifers (HVAs), Significant Groundwater Recharge Areas (SGRAs), Event-based modelling areas (EBAs), and Issues Contributing Areas (ICAs). Source protection plans have been developed that include policies to address existing and future risks to sources of municipal drinking water within these vulnerable areas.

Projects that are subject to the Environmental Assessment Act that fall under a Class EA, or one of the Regulations, have the potential to impact sources of drinking water if they occur in designated vulnerable areas or in the vicinity of other at-risk drinking water systems (i.e. systems that are not municipal residential systems). MEA Class EA projects may include

activities that, if located in a vulnerable area, could be a threat to sources of drinking water (i.e. have the potential to adversely affect the quality or quantity of drinking water sources) and the activity could therefore be subject to policies in a source protection plan. Where an activity poses a risk to drinking water, policies in the local source protection plan may impact how or where that activity is undertaken. Policies may prohibit certain activities, or they may require risk management measures for these activities. Municipal Official Plans, planning decisions, Class EA projects (where the project includes an activity that is a threat to drinking water) and prescribed instruments must conform with policies that address significant risks to drinking water and must have regard for policies that address moderate or low risks.

- In October 2015, the MEA Parent Class EA document was amended to include reference to the Clean Water Act (Section A.2.10.6) and indicates that proponents undertaking a Municipal Class EA project must identify early in their process whether a project is or could potentially be occurring with a vulnerable area. **Given this requirement, please include a section in the report on source water protection.**

    - The proponent should identify the source protection area and should clearly document how the proximity of the project to sources of drinking water (municipal or other) and any delineated vulnerable areas was considered and assessed. Specifically, the report should discuss whether or not the project is located in a vulnerable area and provide applicable details about the area.

    - If located in a vulnerable area, proponents should document whether any project activities are prescribed drinking water threats and thus pose a risk to drinking water (this should be consulted on with the appropriate Source Protection Authority). Where an activity poses a risk to drinking water, the proponent must document and discuss in the report how the project adheres to or has regard to applicable policies in the local source protection plan. This section should then be used to inform and be reflected in other sections of the report, such as the identification of net positive/negative effects of alternatives, mitigation measures, evaluation of alternatives etc.

- While most source protection plans focused on including policies for significant drinking water threats in the WHPAs and IPZs it should be noted that even though source protection plan policies may not apply in HVAs, these are areas where aquifers are sensitive and at risk to impacts and within these areas, activities may impact the quality of sources of drinking water for systems other than municipal residential systems.

- In order to determine if this project is occurring within a vulnerable area, proponents can use Source Protection Information Atlas, which is an online mapping tool available to the public. Note that various layers (including WHPAs, WHPA-Q1 and WHPA-Q2, IPZs, HVAs, SGRAs, EBAs, ICAs) can be turned on through the “Map Legend” bar on the left. The mapping tool will also provide a link to the appropriate source protection plan in order to identify what policies may be applicable in the vulnerable area.

- For further information on the maps or source protection plan policies which may relate to their project, proponents must contact the appropriate source protection authority. **Please consult with the local source protection authority to discuss potential impacts on drinking water. Please document the results of that consultation within the report and include all communication documents/correspondence.**

More Information

For more information on the *Clean Water Act*, source protection areas and plans, including specific information on the vulnerable areas and drinking water threats, please refer to Conservation Ontario's website where you will also find links to the local source protection plan/assessment report.

A list of the prescribed drinking water threats can be found in section 1.1 of Ontario Regulation 287/07 made under the *Clean Water Act*. In addition to prescribed drinking water threats, some source protection plans may include policies to address additional "local" threat activities, as approved by the MECP.

Climate Change

The document "Considering Climate Change in the Environmental Assessment Process" (Guide) is part of the Environmental Assessment program's Guides and Codes of Practice. The Guide sets out the MECP's expectation for considering climate change in the preparation, execution and documentation of environmental assessment studies and processes. The guide provides examples, approaches, resources, and references to assist proponents with consideration of climate change in EA. Proponents should review this Guide in detail.

- **The MECP expects proponents of Class EA projects to:**

    1. Consider during the assessment of alternative solutions and alternative designs, the following:
        a. the project's expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation); and
        b. resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation).
    2. Include a discrete section in the report detailing how climate change was considered in the EA.

How climate change is considered can be qualitative or quantitative in nature and should be scaled to the project's level of environmental effect. In all instances, both a project's impacts on climate change (mitigation) and impacts of climate change on a project (adaptation) should be considered.

- The MECP has also prepared another guide to support provincial land use planning direction related to the completion of energy and emission plans. The "Community Emissions Reduction Planning: A Guide for Municipalities" document is designed to educate stakeholders on the municipal opportunities to reduce energy and greenhouse gas emissions, and to provide guidance on methods and techniques to incorporate consideration of energy and greenhouse gas emissions into municipal activities of all types. We encourage you to review the Guide for information.

Air Quality, Dust and Noise

- If there are sensitive receptors in the surrounding area of this project, a quantitative air quality/odour impact assessment will be useful to evaluate alternatives, determine impacts and identify appropriate mitigation measures. The scope of the assessment can be determined based on the potential effects of the proposed alternatives, and typically includes source and receptor characterization and a quantification of local air quality impacts on the sensitive receptors and the environment in the study area. The assessment will compare to all applicable standards or guidelines for all contaminants of concern. **Please contact this office for further consultation on the level of Air Quality Impact Assessment required for this project if not already advised.**

- If a quantitative Air Quality Impact Assessment is not required for the project, the MECP expects that the report contain a qualitative assessment which includes:

    - A discussion of local air quality including existing activities/sources that significantly impact local air quality and how the project may impact existing conditions;
    - A discussion of the nearby sensitive receptors and the project's potential air quality impacts on present and future sensitive receptors;
    - A discussion of local air quality impacts that could arise from this project during both construction and operation; and
    - A discussion of potential mitigation measures.

- As a common practice, "air quality" should be used an evaluation criterion for all road projects.

- Dust and noise control measures should be addressed and included in the construction plans to ensure that nearby residential and other sensitive land uses within the study area are not adversely affected during construction activities.

- The MECP recommends that non-chloride dust-suppressants be applied. For a comprehensive list of fugitive dust prevention and control measures that could be applied, refer to *Cheminfo Services Inc. Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities* report prepared for Environment Canada. March 2005.

- The report should consider the potential impacts of increased noise levels during the operation of the completed project. The proponent should explore all potential measures to mitigate significant noise impacts during the assessment of alternatives.

Ecosystem Protection and Restoration

- Any impacts to ecosystem form and function must be avoided where possible. The report should describe any proposed mitigation measures and how project planning will protect and enhance the local ecosystem.

- Natural heritage and hydrologic features should be identified and described in detail to assess potential impacts and to develop appropriate mitigation measures. The following sensitive environmental features may be located within or adjacent to the study area:
    - Key Natural Heritage Features: Habitat of endangered species and threatened species, fish habitat, wetlands, areas of natural and scientific interest (ANSIs), significant valleylands, significant woodlands; significant wildlife habitat (including habitat of special concern species); sand barrens, savannahs, and tallgrass prairies; and alvars.
    - Key Hydrologic Features: Permanent streams, intermittent streams, inland lakes and their littoral zones, seepage areas and springs, and wetlands.
    - Other natural heritage features and areas such as: vegetation communities, rare species of flora or fauna, Environmentally Sensitive Areas, Environmentally Sensitive Policy Areas, federal and provincial parks and conservation reserves, Greenland systems etc.

We recommend consulting with the Ministry of Natural Resources and Forestry (MNRF), Fisheries and Oceans Canada (DFO) and your local conservation authority to determine if special measures or additional studies will be necessary to preserve and protect these sensitive features. In addition, for projects located in Central Region you may consider the provisions of the Rouge Park Management Plan if applicable.

Species at Risk

- The Ministry of the Environment, Conservation and Parks has now assumed responsibility of Ontario's Species at Risk program. Information, standards, guidelines, reference materials and technical resources to assist you are found at https://www.ontario.ca/page/species-risk.

- The Client's Guide to Preliminary Screening for Species at Risk (Draft May 2019) has been attached to the covering email for your reference and use. Please review this document for next steps.

- For any questions related to subsequent permit requirements, please contact SAROntario@ontario.ca.

Surface Water

- The report must include enough information to demonstrate that there will be no negative impacts on the natural features or ecological functions of any watercourses within the study area. Measures should be included in the planning and design process to ensure that any impacts to watercourses from construction or operational activities (e.g. spills, erosion, pollution) are mitigated as part of the proposed undertaking.

- Additional stormwater runoff from new pavement can impact receiving watercourses and flood conditions. Quality and quantity control measures to treat stormwater runoff should be considered for all new impervious areas and, where possible, existing surfaces. The ministry's Stormwater Management Planning and Design Manual (2003) should be referenced in the report and utilized when designing stormwater control methods. **A Stormwater Management Plan should be prepared as part of the Class EA process** that includes:

    - Strategies to address potential water quantity and erosion impacts related to stormwater draining into streams or other sensitive environmental features, and to ensure that adequate (enhanced) water quality is maintained
    - Watershed information, drainage conditions, and other relevant background information
    - Future drainage conditions, stormwater management options, information on erosion and sediment control during construction, and other details of the proposed works
    - Information on maintenance and monitoring commitments.

- Ontario Regulation 60/08 under the *Ontario Water Resources Act* (OWRA) applies to the Lake Simcoe Basin, which encompasses Lake Simcoe and the lands from which surface water drains into Lake Simcoe. If a proposed sewage treatment plant is listed in Table 1 of the regulation, the report should describe how the proposed project and its mitigation measures are consistent with the requirements of this regulation and the OWRA.

- Any potential approval requirements for surface water taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, except for certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the Water Taking User Guide for EASR for more information. Additionally, an

Environmental Compliance Approval under the OWRA is required for municipal stormwater management works.

Groundwater

- The status of, and potential impacts to any well water supplies should be addressed. If the project involves groundwater takings or changes to drainage patterns, the quantity and quality of groundwater may be affected due to drawdown effects or the redirection of existing contamination flows. In addition, project activities may infringe on existing wells such that they must be reconstructed or sealed and abandoned. Appropriate information to define existing groundwater conditions should be included in the report.

- If the potential construction or decommissioning of water wells is identified as an issue, the report should refer to Ontario Regulation 903, Wells, under the OWRA.

- Potential impacts to groundwater-dependent natural features should be addressed. Any changes to groundwater flow or quality from groundwater taking may interfere with the ecological processes of streams, wetlands or other surficial features. In addition, discharging contaminated or high volumes of groundwater to these features may have direct impacts on their function. Any potential effects should be identified, and appropriate mitigation measures should be recommended. The level of detail required will be dependent on the significance of the potential impacts.

- Any potential approval requirements for groundwater taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, with the exception of certain water taking activities that have been prescribed by the Water Taking EASR Regulation – *O. Reg. 63/16*. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the Water Taking User Guide for EASR for more information.

- Consultation with the railroad authorities is necessary wherever there is a plan to use construction dewatering in the vicinity of railroad lines or where the zone of influence of the construction dewatering potentially intercepts railroad lines.

Excess Materials Management

- In December 2019, MECP released a new regulation under the Environmental Protection Act, titled "On-Site and Excess Soil Management" (O. Reg. 406/19) to support improved management of excess construction soil. This regulation is a key step to support proper management of excess soils, ensuring valuable resources don't go to waste and to provide clear rules on managing and reusing excess soil. New risk-based standards referenced by

this regulation help to facilitate local beneficial reuse which in turn will reduce greenhouse gas emissions from soil transportation, while ensuring strong protection of human health and the environment. The new regulation is being phased in over time, with the first phase in effect on January 1, 2021. For more information, please visit https://www.ontario.ca/page/handling-excess-soil.

- The report should reference that activities involving the management of excess soil should be completed in accordance with O. Reg. 406/19 and the MECP's current guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2014).

- All waste generated during construction must be disposed of in accordance with ministry requirements.

Contaminated Sites

- Any current or historical waste disposal sites should be identified in the report. The status of these sites should be determined to confirm whether approval pursuant to Section 46 of the EPA may be required for land uses on former disposal sites. We recommend referring to the MECP's D-4 guideline for land use considerations near landfills and dumps.
    - Resources available may include regional/local municipal official plans and data; provincial data on large landfill sites and small landfill sites; Environmental Compliance Approval information for waste disposal sites on Access Environment.

- Other known contaminated sites (local, provincial, federal) in the study area should also be identified in the report (Note – information on federal contaminated sites is found on the Government of Canada's website).

- The location of any underground storage tanks should be investigated in the report. Measures should be identified to ensure the integrity of these tanks and to ensure an appropriate response in the event of a spill. The ministry's Spills Action Centre must be contacted in such an event.

- Since the removal or movement of soils may be required, appropriate tests to determine contaminant levels from previous land uses or dumping should be undertaken. If the soils are contaminated, you must determine how and where they are to be disposed of, consistent with *Part XV.1 of the Environmental Protection Act* (EPA) and Ontario Regulation 153/04, Records of Site Condition, which details the new requirements related to site assessment and clean up. Please contact the appropriate MECP District Office for further consultation if contaminated sites are present.

Servicing, Utilities and Facilities

- The report should identify any above or underground utilities in the study area such as transmission lines, telephone/internet, oil/gas etc. The owners should be consulted to discuss impacts to this infrastructure, including potential spills.

- The report should identify any servicing infrastructure in the study area such as wastewater, water, stormwater that may potentially be impacted by the project.

- Any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste must have an Environmental Compliance Approval (ECA) before it can operate lawfully. Please consult with MECP's Environmental Permissions Branch to determine whether a new or amended ECA will be required for any proposed infrastructure.

- We recommend referring to the ministry's environmental land use planning guides to ensure that any potential land use conflicts are considered when planning for any infrastructure or facilities related to wastewater, pipelines, landfills or industrial uses.

Mitigation and Monitoring

- Contractors must be made aware of all environmental considerations so that all environmental standards and commitments for both construction and operation are met. Mitigation measures should be clearly referenced in the report and regularly monitored during the construction stage of the project. In addition, we encourage proponents to conduct post-construction monitoring to ensure all mitigation measures have been effective and are functioning properly.

- Design and construction reports and plans should be based on a best management approach that centres on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of any impacted areas.

- The proponent's construction and post-construction monitoring plans must be documented in the report, as outlined in Section A.2.5 and A.4.1 of the MEA Class EA parent document.

Consultation

- The report must demonstrate how the consultation provisions of the Class EA have been fulfilled, including documentation of all stakeholder consultation efforts undertaken during the planning process. This includes a discussion in the report that identifies concerns that were raised and **describes how they have been addressed by the proponent** throughout

the planning process. The report should also include copies of comments submitted on the project by interested stakeholders, and the proponent's responses to these comments (as directed by the Class EA to include full documentation).

- Please include the full stakeholder distribution/consultation list in the documentation.

Class EA Process

- If this project is a Master Plan: there are several different approaches that can be used to conduct a Master Plan, examples of which are outlined in Appendix 4 of the Class EA. **The Master Plan should clearly indicate the selected approach for conducting the plan**, by identifying whether the levels of assessment, consultation and documentation are sufficient to fulfill the requirements for Schedule B or C projects. Please note that any Schedule B or C projects identified in the plan would be subject to Section 16 Order Requests under the Environmental Assessment Act, although the plan itself would not be. **Please include a description of the approach being undertaken (use Appendix 4 as a reference).**

- If this project is a Master Plan: Any identified projects should also include information on the MCEA schedule associated with the project.

- The report should provide clear and complete documentation of the planning process in order to allow for transparency in decision-making.

- The Class EA requires the consideration of the effects of each alternative on all aspects of the environment (including planning, natural, social, cultural, economic, technical). The report should include a level of detail (e.g. hydrogeological investigations, terrestrial and aquatic assessments, cultural heritage assessments) such that all potential impacts can be identified, and appropriate mitigation measures can be developed. Any supporting studies conducted during the Class EA process should be referenced and included as part of the report.

- Please include in the report a list of all subsequent permits or approvals that may be required for the implementation of the preferred alternative, including but not limited to, MECP's PTTW, EASR Registrations and ECAs, conservation authority permits, species at risk permits, MTO permits and approvals under the *Impact Assessment Act*, 2019.

- Ministry guidelines and other information related to the issues above are available at http://www.ontario.ca/environment-and-energy/environment-and-energy. We encourage you to review all the available guides and to reference any relevant information in the report.

Notice of Completion
Once the EA Report is finalized, the proponent must issue a Notice of Completion providing a minimum 30-day period during which documentation may be reviewed and comment and input can be submitted to the proponent. The Notice of Completion must be sent to the appropriate MECP Regional Office email address.

The public can request a higher level of assessment on a project if they are concerned about potential adverse impacts to constitutionally protected Aboriginal and treaty rights. In addition, the Minister may issue an order on his or her own initiative within a specified time period. The Director (of the Environmental Assessment Branch) will issue a Notice of Proposed Order to the proponent if the Minister is considering an order for the project within 30 days after the conclusion of the comment period on the Notice of Completion. At this time, the Director may request additional information from the proponent. Once the requested information has been received, the Minister will have 30 days within which to make a decision or impose conditions on your project.

Therefore, the proponent cannot proceed with the project until at least 30 days after the end of the comment period provided for in the Notice of Completion. Further, the proponent may not proceed after this time if:

- a Section 16 Order request has been submitted to the ministry regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, or
- the Director has issued a Notice of Proposed order regarding the project.

Please ensure that the Notice of Completion advises that outstanding concerns are to be directed to the proponent for a response, and that in the event there are outstanding concerns regarding potential adverse impacts to constitutionally protected Aboriginal and treaty rights, Section 16 Order requests on those matters should be addressed in writing to:

Minister of the Environment, Conservation and Parks

777 Bay Street, 5th Floor
Toronto ON M7A 2J3
minister.mecp@ontario.ca

and

Director, Environmental Assessment Branch
Ministry of the Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5
EABDirector@ontario.ca

Ministry of Citizenship and Multiculturalism

Heritage Planning Unit
Heritage Branch
Citizenship, Inclusion and Heritage Division
5th Flr, 400 University Ave
Tel.: 613-242-3743

Ministère des Affaires civiques et du Multiculturalisme

Unité de la planification relative au patrimoine
Direction du patrimoine
Division des affaires civiques, de l'inclusion et du patrimoine
Tél.: 613-242-3743

May 10, 2024 EMAIL ONLY

Lisa Courtney
Environmental Planner
B.M. Ross and Associates, Ltd.
62 North Street
Goderich, ON N7A 2T4
lcourtney@bmross.net

MCM File	**:**	**0021385**
Proponent	**:**	**Municipality of South Bruce**
Subject	**:**	**Municipal Class Environmental Assessment – Schedule B – Notice of Commencement**
Project	**:**	**Water Storage Facility (Community of Teeswater)**
Location	**:**	**Municipality of South Bruce, Bruce County, Ontario**

Dear Lisa Courtney:

Thank you for providing the Ministry of Citizenship and Multiculturalism (MCM) with the Notice of Commencement for the above-referenced project.

MCM's interest in this project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- archaeological resources, including land and marine;
- built heritage resources, including bridges and monuments; and
- cultural heritage landscapes.

Under the EA process, the proponent is required to determine a project's potential impact on known (previously recognized) and potential cultural heritage resources.

Project Summary
The Municipality of South Bruce is initiating a Municipal Class Environmental Assessment (MCEA) to investigate options for creating water storage in the community of Teeswater. Currently, the Teeswater water system has no water storage capacity. Adding water storage will minimize the potential for service disruptions and provide storage for the existing and future water system users. The area being considered as a potential site for the new water storage facility is the municipally owned land adjacent to the Teeswater-Culross Community Centre.

This project is following the requirements of a Schedule B Municipal Class Environmental Assessment.

Identifying Cultural Heritage Resources
While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation.

Archaeological Resources
This EA project may impact archaeological resources and should be screened using the Ministry's *Criteria for Evaluating Archaeological Potential* to determine if an archaeological assessment is needed. MCM archaeological sites data are available at *archaeology@ontario.ca*.

If the EA project area exhibits archaeological potential, then an archaeological assessment (AA) shall be undertaken by an archaeologist licenced under the *Ontario Heritage Act (OHA)*, who is responsible for submitting the report directly to MCM for review.

Please note that archaeological concerns have not been fully addressed until reports have been entered into the Ontario Public Register of Archaeological Reports where those reports recommend that:

1. the archaeological assessment of the project area is complete and
2. all archaeological sites identified by the assessment are either of no further cultural heritage value or interest (as per Section 48(3) of the Ontario Heritage Act) or that mitigation of impacts has been accomplished through excavation or an avoidance and protection strategy.

Proponents should wait to receive the MCM's review letter indicating that the report(s) has been entered into the Register before issuing a decision or proceeding with any ground disturbing activities.

Proponents must follow the recommendations of the archaeological assessment report(s). MCM recommends that further stages of archaeological assessment (if recommended) be undertaken as early as possible during detailed design and prior to any ground disturbing activities.

Built Heritage Resources and Cultural Heritage Landscapes
The Ministry's *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* should be completed to help determine whether this EA project may impact known or potential built heritage resources and/or cultural heritage landscapes.

If there is potential for built heritage resources and/or cultural heritage landscapes within the project area, a Cultural Heritage Evaluation Report (CHER) should be undertaken by a qualified person to determine the cultural heritage value or interest of the project area. If the project area is determined to be of cultural heritage value or interest and alterations or development is proposed, MCM recommends that a Heritage Impact Assessment (HIA), prepared by a qualified consultant, be completed to assess potential project impacts. Please send the HIA to MCM, and heritage planning staff at the Municipality of South Bruce for review and comment, and make it available to local organizations or individuals who have expressed interest in review.

Community input should be sought to identify locally recognized and potential cultural heritage resources. Sources include, but are not limited to, municipal heritage committees, historical societies and other local heritage organizations.

Cultural heritage resources are often of critical importance to Indigenous communities. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage

resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to them.

Environmental Assessment Reporting
All technical cultural heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MCM whether any technical cultural heritage studies will be completed for this EA project and provide them to MCM before issuing a Notice of Completion or commencing any work on the site. If screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

Please note that the responsibility for administration of the *Ontario Heritage Act* and matters related to cultural heritage have been transferred from the Ministry of Tourism, Culture and Sport (MTCS) to the Ministry of Citizenship and Multiculturalism (MCM). Individual staff roles and contact information remain unchanged. Please continue to send any notices, report and/or documentation **via email only** to both Karla Barboza and myself.

- Karla Barboza, Team Lead - Heritage | Heritage Planning Unit (Citizenship and Multiculturalism) | 416-660-1027 | karla.barboza@ontario.ca
- Joseph Harvey, Heritage Planner | Heritage Planning Unit (Citizenship and Multiculturalism) | 613-242-3743 | joseph.harvey@ontario.ca

Thank you for consulting MCM on this project and please continue to do so throughout the EA process. If you have any questions or require clarification, please do not hesitate to contact me.

Sincerely,

Liam Smythe
On behalf of

Joseph Harvey
Heritage Planner
Joseph.Harvey@ontario.ca

Copied to: Alex Jackman, B.M. Ross & Associates
Karla Barboza, MCM

It is the sole responsibility of proponents to ensure that any information and documentation submitted as part of their EA report or file is accurate. The Ministry of Citizenship and Multiculturalism (MCM) makes no representation or warranty as to the completeness, accuracy or quality of the any checklists, reports or supporting documentation submitted as part of the EA process, and in no way shall MCM be liable for any harm, damages, costs, expenses, losses, claims or actions that may result if any checklists, reports or supporting documents are discovered to be inaccurate, incomplete, misleading or fraudulent.

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

The *Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33* requires that any person discovering human remains must cease all activities immediately and notify the police or coroner. If the coroner does not suspect foul play in the disposition of the remains, in accordance with *Ontario Regulation 30/11* the coroner shall notify the Registrar, Ontario Ministry of Public and Business Service Delivery, which administers provisions of that Act related to burial sites. In situations where human remains are associated with archaeological resources, the Ministry of Citizenship and Multiculturalism should also be notified (at archaeology@ontario.ca) to ensure that the archaeological site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*.

From:	Michael Oberle
To:	lcourtney@bmross.net
Subject:	SVCA comments - Municipality of South Bruce Municipal Class EA for a Water Storage Facility (Community of Teeswater)
Date:	May 23, 2024 1:04:41 AM
Attachments:	01a. 21240-2022-08-12-SVCA Let.pdf

Good day Lisa Courtney,

This email is further to the email of below and the attached letter dated April 10, 2024 regarding the above referenced file.
SVCA apologize that we did not provide comments to you by your requested date of May 10, 2024, however, we trust that these comments will be accepted.

In July 2023, I had communication with Bill Hayes, then the Mun. of South Bruce Acting Operations Manager, regarding locations for future water tower and SVCA concerns.

For the current property of the community centre/arena grounds, SVCA would require that the tower and related infrastructure be set back beyond/outside of the Teeswater River valley slope.
If work is proposed within the SVCA Regulated Area of the property, then further SVCA review and permit would be required.

The SVCA thanks you for the attached letter and the SVCA looks forward to working together with our municipal partners, where required, as this proposal progresses.

I trust that the above is helpful at this time. Any questions, please do not hesitate to ask.

Kind regards,
Mike
Michael Oberle
Environmental Planning Coordinator
Cell: 519-373-4175
1078 Bruce Road 12, PO Box 150, Formosa, ON N0G 1W0
m.oberle@svca.on.ca
https://link.edgepilot.com/s/02c244e7/39ogL9XMwk2Q6jJsUMGZuA?u=http://www.saugeenconservation.ca/

From: Alex Jackman <ajackman@bmross.net>
Sent: Wednesday, April 10, 2024 11:52 AM
To: Jason Dodds <j.dodds@svca.on.ca>
Subject: Municipality of South Bruce Municipal Class EA for a Water Storage Facility (Community of

Teeswater)

**[CAUTION]: This email originated from outside of the organization. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Good morning/afternoon.
Please find attached a letter and Notice of Commencement for the Municipality of South Bruce, Municipal Class Environmental Assessment for new water storage (Community of Teeswater).
A copy of the Initial Notice can also be found on the Municipal website at Notice of Study Commencement - New Water Storage Facility - Municipality of South Bruce.

Please submit any initial questions and comments prior to **May 10th, 2024,** to Lisa Courtney (lcourtney@bmross.net) at B.M. Ross and Associates Limited, 62 North Street, Goderich ON N7A 2T4, (519)-524-2641.

Thanks, and cheers,

Alex Jackman, H.BEDP
B. M. Ross and Associates Limited
Engineers and Planners

62 North Street
Goderich, ON N7A 2T4

Phone: (519) 524-2641
ajackman@bmross.net
https://link.edgepilot.com/s/11f33b65/gH3Odb299EGq0zElkrSlNQ?u=http://www.bmross.net/

From: Monica Walker Bolton
To: lcourtney@bmross.net
Subject: FW: Municipality of South Bruce Municipal Class EA for a Water Storage Facility (Community of Teeswater)
Date: April 12, 2024 9:23:27 AM
Attachments: 21240-2022-08-12-BC-Plan_Dev Let.pdf

Dear Lisa,
This is to acknowledge that Bruce County Planning and Development has received the above noted notice. We have no comments or concerns to note at this time.
-Monica

From: Jack Van Dorp <JVanDorp@brucecounty.on.ca>
Sent: Wednesday, April 10, 2024 4:20 PM
To: Monica Walker Bolton <MWalkerBolton@brucecounty.on.ca>
Subject: Fwd: Municipality of South Bruce Municipal Class EA for a Water Storage Facility (Community of Teeswater)

FYI

From: Christine MacDonald [redacted]>
Sent: Wednesday, April 10, 2024 3:08:56 PM
To: Linda White [redacted] Jack Van Dorp [redacted];
Adam Stanley [redacted]
Cc: Claire Dodds [redacted]>
Subject: Fwd: Municipality of South Bruce Municipal Class EA for a Water Storage Facility (Community of Teeswater)

See below.

From: Alex Jackman <ajackman@bmross.net>
Sent: Wednesday, April 10, 2024 11:30 AM
To: Bruce County Planning - Lakeshore Hub <bcplpe@brucecounty.on.ca>
Cc: Christine MacDonald [redacted]>
Subject: Municipality of South Bruce Municipal Class EA for a Water Storage Facility (Community of Teeswater)

Good morning/afternoon.
Please find attached a letter and Notice of Commencement for the Municipality of South Bruce, Municipal Class Environmental Assessment for new water storage (Community of Teeswater).

A copy of the Initial Notice can also be found on the Municipal website at Notice of Study Commencement - New Water Storage Facility - Municipality of South Bruce.

Please submit any initial questions and comments prior to **May 10th, 2024,** to Lisa Courtney (lcourtney@bmross.net) at B.M. Ross and Associates Limited, 62 North Street, Goderich ON N7A 2T4, (519)-524-2641.

Thanks, and cheers,

Alex Jackman, H.BEDP
B. M. Ross and Associates Limited
Engineers and Planners

62 North Street
Goderich, ON N7A 2T4

Phone: (519) 524-2641
ajackman@bmross.net
https://link.edgepilot.com/s/685cee71/3kvDY1yDWU6Lbfw6deQVQA?u=http://www.bmross.net/

Christine MacDonald
Chief Administrative Officer
Corporation of the County of Bruce

[redacted]

https://link.edgepilot.com/s/91baaabd/6xfrtc94dESfRcgoP1e18Q?u=http://www.brucecounty.on.ca/

COB_Logo.png

Christine MacDonald
Chief Administrative Officer
Office of the CAO
Corporation of the County of Bruce

[redacted]

https://link.edgepilot.com/s/91baaabd/6xfrtc94dESfRcgoP1e18Q?u=http://www.brucecounty.on.ca/

Jack Van Dorp
Director
Planning and Development
Corporation of the County of Bruce

Office: 519-534-2092
[redacted]
https://link.edgepilot.com/s/91baaabd/6xfrtc94dESfRcgoP1e18Q?u=http://www.brucecounty.on.ca/

Individuals who submit letters and other information to Council and its Committees should be aware that any personal information contained within their communications may become part of the public record and may be made available through the agenda process which includes publication on the County's

website.

If you have received this communication in error, please notify the sender immediately and delete all copies (electronic or otherwise). Thank you for your cooperation.

If you feel that this email was commercial in nature and you do not wish to receive further electronic messages from the County of Bruce, please click on the following link to unsubscribe: Unsubscribe. Please be advised that this may restrict our ability to send messages to you in the future.

Monica Walker Bolton
Land Use Planning Manager
Planning and Development
Corporation of the County of Bruce

Office: 519-881-1782
[redacted]
https://link.edgepilot.com/s/91baaabd/6xfrtc94dESfRcgoP1e18Q?u=http://www.brucecounty.on.ca/

Individuals who submit letters and other information to Council and its Committees should be aware that any personal information contained within their communications may become part of the public record and may be made available through the agenda process which includes publication on the County's website.

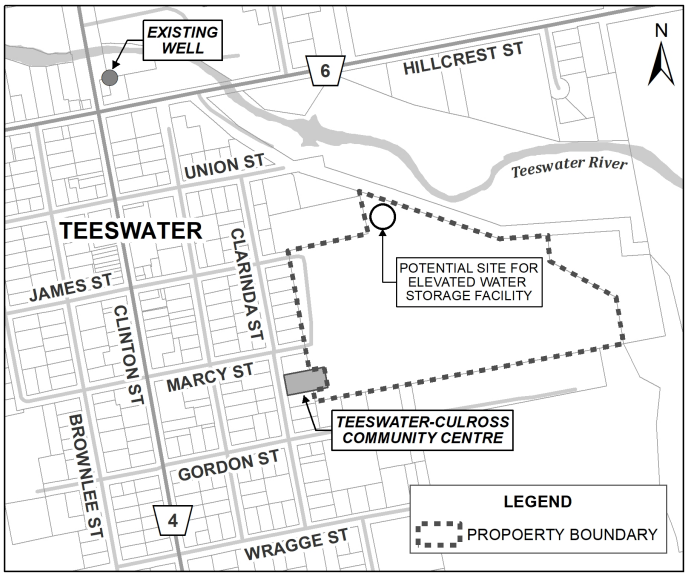
If you have received this communication in error, please notify the sender immediately and delete all copies (electronic or otherwise). Thank you for your cooperation.

If you feel that this email was commercial in nature and you do not wish to receive further electronic messages from the County of Bruce, please click on the following link to unsubscribe: Unsubscribe. Please be advised that this may restrict our ability to send messages to you in the future.

Municipality of South Bruce Municipal Class Environmental Assessment for a New Water Storage Facility (Community of Teeswater)

Notice of Public Information Centre

The Project: The Municipality of South Bruce has initiated a Municipal Class Environmental Assessment (MCEA) to investigate options for a new water storage facility in the community of Teeswater. Currently, the Teeswater water system has no water storage capacity. Adding water storage will minimize the potential for service disruptions and provide storage for the existing and future water system users. The site being considered for a new water storage facility is at the Teeswater Culross Community Centre (21 Marcy St. East), north of the track. See the included figure for the approximate location.



The Environmental Assessment Process: The project is being investigated following the MCEA process set out for Schedule 'B' activities. The purpose of the MCEA is to evaluate solutions related to infrastructure needs and projects following a logical and defined decision-making process. The process incorporates the evaluation of alternative solutions, potential environmental impacts, consultation, and identifies how impacts may be mitigated.

Public Involvement: Public consultation is a key component of this study, and an in-person Public Information Centre has been scheduled. This meeting will provide details on the alternative solutions investigated and preliminary evaluations regarding a new water storage facility. This meeting will also provide an opportunity for members of the public to ask questions and provide comments on the project. Details of the meeting are as follows:

Date: Wednesday, September 4, 2024
Place: Teeswater-Culross Community Center (21 Marcy Street, East, Teeswater, ON)
Time: 5:00 to 7:00 p.m. (Presentation at 5:30 p.m.)

This meeting will be held in person at the Teeswater-Culross Community Center. The presentation materials will be posted on the Municipality of South Bruce website following the meeting, to allow residents to review the material. For further information regarding the MCEA or its processes, please contact Lisa Courtney, Environmental Planner (e-mail: lcourtney@bmross.net or 1-888-524-2641 x 238).

Any comments collected will be maintained on file for use during the project and may be included in project documentation. With the exception of personal information, all comments will become part of the public record.

Stu Moffat, Manager of Operations
This Notice issued: August 21st, 2024

Lisa Courtney

From: Alex Jackman <ajackman@bmross.net>
Sent: November 15, 2024 1:07 PM
To: undisclosed recipients:
Subject: Municipality of South Bruce MCEA Public Information Center for a New Water Storage Facility (Community of Teeswater)
Attachments: 21240-PIC-Presentation-Final.pdf

Good morning/afternoon,

Please see the attached presentation material from the Public Information Center held on October 30th, 2024, regarding the Municipality of South Bruce, Municipal Class Environmental Assessment for a new water storage facility in the Community of Teeswater.

Please submit any questions and comments to Lisa Courtney (lcourtney@bmross.net) at B.M. Ross and Associates Limited, 62 North Street, Goderich ON N7A 2T4, (519)-524-2641.

Thanks, and cheers,

Alex Jackman, H.BEDP
B. M. Ross and Associates Limited
Engineers and Planners

62 North Street
Goderich, ON N7A 2T4

Phone: (519) 524-2641
ajackman@bmross.net
www.bmross.net

Lisa Courtney

From: Coordinator LRC HSM <hsmlrcc@bmts.com>
Sent: November 20, 2024 8:52 AM
To: Lisa Courtney
Subject: Public Information Session for Proposed Teeswater Water Storage Facility Comments
Attachments: PastedGraphic-5.png

Categories: Archived

Municipality of South Bruce

RE: Municipality of South Bruce MCEA Public Information for New Water Storage Facility - Community of Teeswater

The Historic Saugeen Métis (HSM) Lands, Waters and Consultation Department has reviewed the Public Information PowerPoint presented for the Municipal Class EA for the proposed Water Storage Facility in Teeswater.

HSM has no concerns regarding any of the proposed alternatives at this time. The primary concerns of the HSM community is mitigation to prevent environmental impacts and preservation of identified archaeological artifacts.

HSM wishes to remain informed as the project continues, and would appreciate any updates as they become available.

Thank you for the opportunity to review this matter.

Regards,

Georgia Lumley

Coordinator, Lands, Waters & Consultation
Historic Saugeen Métis
204 High Street
Southampton, ON
saugeenmetis.com
519.483.4000

HISTORIC SAUGEEN MÉTIS

Lisa Courtney

From: Lisa Courtney <lcourtney@bmross.net>
Sent: December 13, 2024 10:09 AM
To: Coordinator LRC HSM
Subject: FW: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment
Attachments: 2024-414 BM Ross Proposed Elevated Tank, South Bruce St 1-2 Draft Report.pdf

Categories: Archived

Hello,
Please find attached the Stage 1-2 Archaeological Assessment completed for the proposed water storage facility in the community of Teeswater. Please let me know if there are any questions or comments.
Thanks and cheers,

Lisa J. Courtney, M.Sc. RPP, MCIP
B. M. Ross and Associates Limited
Engineers and Planners
62 North Street
Goderich, ON N7A 2T4

Office: (519) 524-2641
lcourtney@bmross.net
www.bmross.net

Lisa Courtney

From: Amanda Parks [redacted]
Sent: November 29, 2024 11:38 AM
To: SON Archaeology
Cc: Lisa Courtney
Subject: RE: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment
Attachments: image003.png; image006.jpg; image004.png; image001.png; image005.png; 2024-414 BM Ross Proposed Elevated Tank, South Bruce St 1-2 Draft Report.pdf

Categories: Archived

Hi Kove,

I hope you are doing well! Please find attached the draft Stage 1-2 archaeological assessment report for the proposed Teeswater Elevated Water Storage project. We are hoping you can please provide comments by **Thursday December 19th**, so that we are able to submit the report to the MCM this year and meet funding requirements for the project.

Thank you, and please let me know if you have any questions.

Amanda

Amanda Parks, MA, P450 (she/her)
Manager - Environmental Assessments
[redacted]

TMHC Inc.
1108 Dundas Street, Unit 105
London, ON | N5W 3A7
https://link.edgepilot.com/s/fbd348f0/k65ngytd-0e08No8IH9L-A?u=http://www.tmhc.ca/
519-641-7222

From: Amanda Parks
Sent: October 21, 2024 10:22 AM
To: SON Archaeology <archaeology@saugeenojibwaynation.ca>
Cc: Lisa Courtney <lcourtney@bmross.net>
Subject: RE: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment

Hi Kove,

Since SON wasn't able to send a monitor out on this project last week, and as we couldn't delay due to project funding restrictions, I wanted to circulate a summary of the field work we completed to keep you appraised and to see if you had any questions or concerns.

As shown on the attached maps, there were two main project components: a) a south component, which is the proposed location of elevated water storage tank and a watermain connection, b) a north component, which is the proposed location of a watermain connection north of Elizabeth Street. I have attached a map of our field results along with some photos showing the field conditions. Essentially, both areas showed extensive

and deep disturbance related to grading and filling of the lands, with soil profiles generally consisting of a thin layer of topsoil over a layer of dense brown silty loam with rocks, pea gravel, and modern plastic debris.

a) South Component: Proposed location of elevated water storage tank and one watermain connection
   - The initial test pit survey of this component demonstrated deep and extensive disturbance, likely related to significant grading and filling of the property for the use of the community centre. This component was subject to a test pit survey at 10 m intervals to confirm disturbance. Across the entire component, soils consisted of 5 cm of topsoil over 40-60+ cm of brown silty sandy loam with rocks, pea gravel, and modern plastic debris. Images 1-6 on the attached PDF show the field conditions and the disturbed soils. I have also attached an aerial image from 1954 which shows some of that disturbance, as well as the mill pond to the north, which once filled the river floodplain.

b) North Component: Proposed location of second watermain connection north of Elizabeth Street
   - The test pit survey in this component likewise demonstrated deep and extensive disturbance, associated with the installation of buried utilities as well as road construction. This area was largely subject to a test pit survey at 10 m intervals to confirm disturbance, though one small area was tested at 5 m intervals and was also confirmed to be disturbed. Soils consisted of 5 cm of topsoil (likely imported) over 5 cm of silty sandy loam with large gravel inclusions over 35 cm of silty loam with pea gravel. Steeply sloping lands were found centrally within the project area. Images 7-12 on the attached PDF show the field conditions and the disturbed soils.

No archaeological resources were encountered. Based on the above, we are recommending no further assessment of the property is required. Please let me know if you have any questions or concerns regarding the above.

We are currently working on the report and will circulate it to you for review and comment prior to circulating to the MCM.

Thank you!
Amanda

Amanda Parks, MA, P450 (she/her)
Manager - Environmental Assessments
[redacted]

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London, ON | N5W 3A7
https://link.edgepilot.com/s/fbd348f0/k65ngytd-0e08No8IH9L-A?u=http://www.tmhc.ca/
519-641-7222

From: Amanda Parks [redacted]
Sent: October 14, 2024 4:59 PM
To: SON Archaeology <archaeology@saugeenojibwaynation.ca>
Cc: Lisa Courtney <lcourtney@bmross.net>
Subject: Re: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment

Hi Kove!

Just realized I provided you with the wrong phone number for Arwen for tomorrow's project in Teeswater. She can be reached at 226-377-7566.

Thanks!
Amanda

Get Outlook for Android

From: Amanda Parks
Sent: Friday, October 11, 2024 8:31:04 AM
To: SON Archaeology <archaeology@saugeenojibwaynation.ca>
Cc: Lisa Courtney <lcourtney@bmross.net>
Subject: RE: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment

That is great, thanks Kove!

Yes, I have attached maps of the meeting location and the project area to this email. We intend to complete a test pit survey across the project area. We are estimating the work will take two days with a crew of 5. Additional deployment details follow, including start time, field director contact, and parking PIN:

Start Date: Tuesday October 15
# of days anticipated for fieldwork: 2 days
Start time: 9:30 am on Tuesday, 8:00am on Wednesday
Consultant Company: TMHC
Field Director(s) and Cell Phone(s): Sean Graziano [redacted]
Fieldwork Coordinator: Valerie Wolfkamp ([redacted]
Stage of Fieldwork: Stage 1-2
Required PPE: Work boots, gloves, and high vis gear. Please also bring eye protection.
Meeting Location Address: Teeswater Community Centre - 21 Marcy St E, Teeswater, ON N0G 2S0; Parking PIN: https://link.edgepilot.com/s/f57e689b/6u92Meb3HEeM4v7wVAzedg?u=https://maps.app.goo.gl/5noMf3q3rs6V7MAo9 (see attached map)
Size of Field Crew: 5

If you have any other questions please let me know.

Thanks!
Amanda

Amanda Parks, MA, P450 (she/her)
Manager - Environmental Assessments
aparks@tmhc.ca
(519) 671-8698

TMHC Inc.
1108 Dundas Street, Unit 105
London, ON | N5W 3A7
https://link.edgepilot.com/s/fbd348f0/k65ngytd-0e08No8IH9L-A?u=http://www.tmhc.ca/
519-641-7222

From: SON Archaeology <archaeology@saugeenojibwaynation.ca>
Sent: October 10, 2024 11:28 AM
To: Amanda Parks [redacted]
Subject: Re: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment

Good morning Amanda,

I will look into sending a monitor, in the meantime could you provide me with the work plan and maps please?

Miigwech,

Kove Sartor
SON Archaeology Department
Resource & Infrastructure Department

10129 Hwy 6
Georgian Bluffs, ON
N0H 2T0
saugeenojibwaynation.ca

On Thu, Oct 10, 2024 at 10:30 AM Amanda Parks [redacted] wrote:

> Hi Kove,
>
> We have confirmed that we will be deploying on Tuesday August 15th and Wednesday August 16th for this project (pending weather). The municipality is moving forward with this project as part of a grant program and so we need to keep to some pretty tight timelines.
>
> Project details are as follows:
>
> Start Date: Tuesday October 15
> # of days anticipated for fieldwork: 2 days
> Start time: 9:30 am on Tuesday, 8:00am on Wednesday
> Consultant Company: TMHC
> Field Director(s) and Cell Phone(s): Sean Graziano [redacted]
> Fieldwork Coordinator: Jonathan Freeman [redacted]
> Stage of Fieldwork: Stage 1-2
> Required PPE: Work boots, gloves, and high vis gear. Please also bring eye protection.
> Meeting Location Address: Teeswater Community Centre - 21 Marcy St E, Teeswater, ON N0G 2S0; Parking PIN: https://link.edgepilot.com/s/f57e689b/6u92Meb3HEeM4v7wVAzedg?u=https://maps.app.goo.gl/5noMf3q3rs6V7MAo9 (see attached map)
> Size of Field Crew: 5
>
> If you could please let me know if you have someone available to attend it would be most appreciated!
>
> Amanda

Amanda Parks, MA, P450 (she/her)
Manager - Environmental Assessments
[redacted]

TMHC Inc.
1108 Dundas Street, Unit 105
London, ON | N5W 3A7
https://link.edgepilot.com/s/fbd348f0/k65ngytd-0e08No8IH9L-A?u=http://www.tmhc.ca/
519-641-7222

From: Amanda Parks
Sent: October 7, 2024 3:12 PM
To: SON Archaeology <archaeology@saugeenojibwaynation.ca>
Cc: Lisa Courtney <lcourtney@bmross.net>
Subject: RE: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment

Hi Kove,

I hope you had a nice weekend! I just wanted to touch base with you about this project. We are planning on being out next week, likely October 15th and 16th. Will SON be able to send a representative to participate?

Thanks!
Amanda

Amanda Parks, MA, P450 (she/her)
Manager - Environmental Assessments
[redacted]

TMHC Inc.
1108 Dundas Street, Unit 105
London, ON | N5W 3A7
https://link.edgepilot.com/s/fbd348f0/k65ngytd-0e08No8IH9L-A?u=http://www.tmhc.ca/
519-641-7222

From: Amanda Parks
Sent: September 25, 2024 9:40 AM
To: SON Archaeology <archaeology@saugeenojibwaynation.ca>
Cc: Lisa Courtney <lcourtney@bmross.net>
Subject: TMHC - Teeswater Elevated Water Storage - Stage 1-2 Archaeological Assessment

Hi Kove,

I hope you are doing well!

We have recently been contracted by BM Ross on behalf of the Municipality of South Bruce to conduct a Stage 1-2 archaeological assessment for proposed new Elevated Water Storage and watermain connections in Teeswater in the Municipality of South Bruce.

I believe the municipality has reached out about this project.

We have recently submitted for locates and are tentatively looking at scheduling the fieldwork the week of October 15th. Is SON interested in participating?

Thanks!
Amanda

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MUNICIPALITY OF
South Bruce

BMROSS
engineering better communities

1

Municipal Class Environmental Assessment for a New Water Storage Facility (Teeswater)

PUBLIC INFORMATION CENTRE

SEPTEMBER 4, 2024

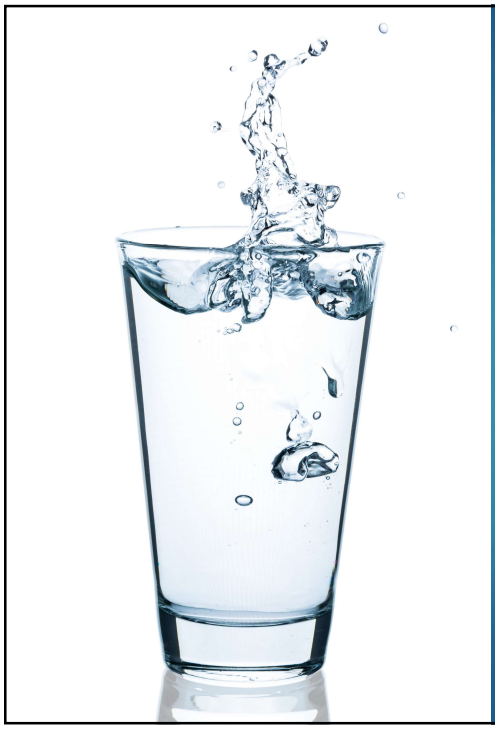
1

2

Agenda

1. Review of Teeswater Drinking Water System
2. Identified Issues
3. Municipal Class Environmental Assessment (MCEA) Process
4. Phase 1 – Identification of the Problem/Opportunity
5. Phase 2 – Identify Alternative Solutions
6. Phase 2 – Evaluate Alternative Solutions
7. Preliminary Preferred Solution
8. Questions and Comments

2



Teeswater Drinking Water System

3

- System operates under Drinking Water Works Permit (DWWP) No. 095-202, Municipal Drinking Water License (MDWL) No. 095-102, and Permit to Take Water (PTTW) No. 3848-9KCPAX.
- System supplied by one (1) groundwater well, drilled in 1996. It is an artesian well located north-east of the intersection of County Road 4 (Clinton St. North) and County Road 6 (Hillcrest St. East).
  - Pumphouse contains three high lift pumps, one emergency fire pump, and a sodium hypochlorite disinfection system.
- Approximately 11 km of watermain and approximately 500 connections servicing approximately 1,000 persons.

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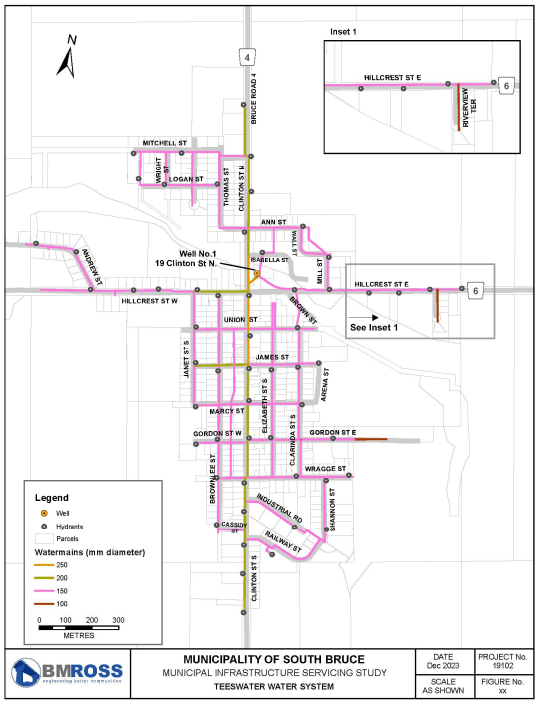

Teeswater Drinking Water System

4

4

Teeswater Drinking Water System Capacity

5

- Rated capacity of treatment and high-lift system is 2,160 m^3/day per MDWL, but PTTW limits takings to 1,600 m^3/day.
- Short-term supply capacity of well is greater (i.e., 3,900 L/min per PTTW).
- No redundancy or standby source of raw water.
- No water storage, so there is no redundancy for provision of treated water.
- Ministry of Environment, Conservation and Parks (MECP) Design Guidelines for Drinking Water Systems – 2008, recommend a standby well and storage facility to provide redundancy in drinking water systems.

5

Current and Future Demands

6

Year	Maximum Day Demand (m^3/day)
2021	742
2022	831
2023	637
Maximum	**831**

- Well supply and treatment sized for maximum day demand.
- Short-term peaks are even greater. Storage typically used to attenuate such peaks.

- 22 vacant serviced lots
- Approved development: 270 units, mix of single detached units, 45 semis, 112 townhouses
  - Equivalent to 219 single detached units (i.e., Equivalent Residential Units, ERUs)
- Proposed development: 60 ERUs
- Above represents an estimated additional demand of 551 m^3/day, for a total projected future committed demand of 831 + 551 = 1,382 m^3/day.

6

Storage Needs

7

- MECP Design Guidelines recommend storage for:
  - A: Peak flow equalization → 25% of maximum day demand
  - B: Fire flow protection → flow rate and duration are linked to population
  - C: Emergencies → 25% of (A + B)

Customer Scenario	Volume Recommended For: (m^3)			
	Equalization	Fire Protection	Emergency	**Total**
Existing	208	467	169	**844**
Existing + Commitments	318	610	232	**1,160**
Existing + Commitments + Proposals	345	647	248	**1,240**

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Current Issues

8

System lacks redundancy in terms of both supply of raw water and treated water.

Population growth will increase water needs.

To address these issues, the Municipality of South Bruce has initiated a Municipal Class Environmental Assessment.

8

Municipal Class Environmental Assessments (MCEA)

9

- The MCEA is the planning and approval process for municipal road, **water,** wastewater and stormwater projects.
- Municipalities must follow the MCEA process to meet the requirements of the Environmental Assessment Act.
- The MCEA process includes:
  - Consultation
  - Consideration of alternative solutions
  - Identifying impacts of the alternative solutions
  - Documenting the decision-making process.

9

MCEA Process

10

Schedule B EAs must complete Phase 1 and 2

1	2	3	4	5
Define the problem or opportunity	Evaluate alternative solutions and impacts. Select preferred solution.	Evaluate alternative design concepts and selection of preferred solution	Preparation Environmental Study Report for public and government agency review	Implementation of the solution and monitoring of impacts

Schedule C EAs must complete all the phases

10

MCEA Phase 1 – Define the Problem or Opportunity

11

The existing water supply for the community of Teeswater is a single well with no standby source. The system also does not contain any treated water storage infrastructure. Additional supply and storage capacity are needed to meet Ministry of Environment, Conservation and Parks design recommendations for the existing service population and future needs.

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Phase 2 – Identify Alternative Solutions

12

1. Construct a new well and storage facility at a new site.
2. Construct a standby well at the current well site and a water storage facility at a new site.
3. Obtain supplemental water from an alternative source.
4. Limit water usage and community growth.
5. Do nothing.

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Alternative 1: New well and storage facility at a new site

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- Requirements for a new well site include:
  - Availability of three phase power
  - Adequate property size (minimum of 60 m x 60 m)
  - Consideration of impacts related to Source Water Protection
  - Proximity to existing water infrastructure
  - Good access for operators
  - Minimal interference with existing wells (Municipal and private)
- Multiple sites (public and privately owned) investigated (on Clinton St., Janet St., at the community centre/fairgrounds).
  - Issues with thin overburden, potential site contamination, well impacts on adjacent properties
  - No suitable new well site could be identified
- **Given this, this alternative was not considered further.**

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Alternative 2: Use existing well site and new site for water storage facility

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This alternative involves:

Constructing a standby well at the existing well site	Constructing a water storage facility at a new site

Site identified for new storage facility is north of the track at the Teeswater-Culross Community Centre.

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Alternatives 3, 4 and 5

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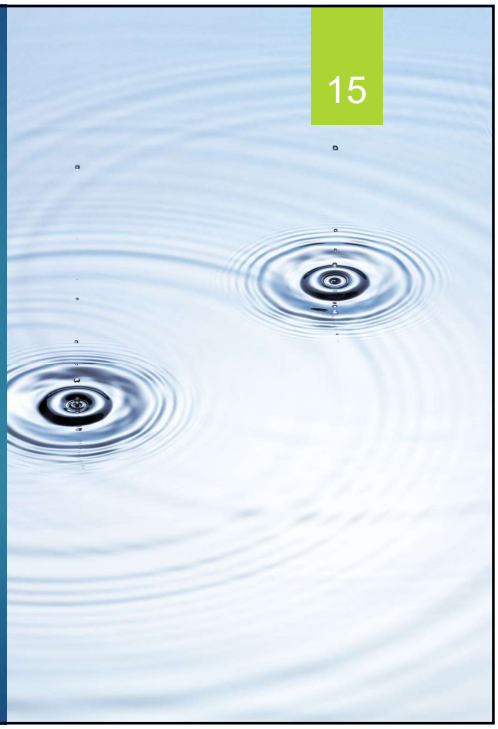
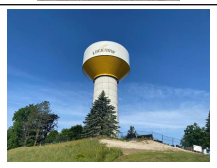
- 3. Obtain water from an alternatives source.
  - There is not a practical alternative source of water in close proximity that would be economically feasible to utilize.
  - Not considered practical or feasible.
- 4. Limit water usage and community growth.
  - Is contrary to provincial and local policies around growth and does not address the issue of a lack of redundancy for existing residents.
  - Not considered practical or feasible
- 5. Do Nothing.
  - Does not address the lack of redundancy for existing and future residents. However, this alternative is always considered through the EA process for comparison and in case the other alternatives cannot be implemented.



15

Evaluation of Alternative Storage Types

16

Type of Facility	Advantages	Disadvantages	Example
Reservoir	• Can be expanded • Minimal visual impact	• Higher energy and annual maintenance costs • Require pumps to maintain pressure • Requires standby power • Have larger footprint	
Elevated Tank (ET) Preferred Storage Type	• Gravity storage • Energy efficient • Can be a focal point in the community • Small footprint	• Not expandable • Shadowing and visual impacts • Recoating maintenance cost	
Standpipe & Booster Pumping Station	• Energy efficient • Small footprint	• Not expandable • Shadowing and visual impacts • Not as cost efficient, and mechanically more complex, relative to ET	

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Considerations for Site for New Elevated Storage Facility

- Need to purchase property
- Impact to adjacent properties
- Significant natural and/or cultural features present
- Disruption of natural features
- Impact on future development
- Visibility for economic development
- Connection to trunk water distribution mains
- Space for construction
- Geotechnical feasibility

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Potential Site for Elevated Water Storage Facility

18

Probable Project Costs

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- Probable costs:
  - Elevated tank: $6,900,000
  - Standby well + connections: $400,000
  - Watermain connection: $250,000
  - Engineering, hydrogeological, geotechnical fees: $900,000
  - Total: $8,450,000
- Grant received: $3,413,580
- Net cost: $5,036,420

- Portion of project costs attributable to future growth could be recovered through development charges.

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Preliminary Evaluation of Potential Impacts

20

Criteria	Potential Impact	Potential Mitigation Measures
Natural	• Construction related activities will result in removal of vegetation, including local removal of trees. • Deleterious materials could be released to Teeswater River during the construction phase. • Limited wildlife habitat present given surrounding urban uses.	• Implement sediment and erosion control measures to minimize potential impacts to the Teeswater River. • Remove trees outside of nesting periods.
Social	• Adjacent properties will be impacted by shading. • New facility will provide treated water storage. • New facility may be a visual intrusion for adjacent property owners. • Adjacent property owners may be impacted by increased noise and local traffic during construction.	• Localized construction-related impacts will be limited to the construction period. • Limited noise or traffic impacts when in operation.
Cultural	• Low potential for local heritage and archaeological resources.	
Economic	• High capital costs.	• Grant funding helps reduce costs. • Future growth could contribute through development charges.
Technical	• Will provide redundancy in the drinking water system. • Will provide capacity for next 50 years. • Will increase system resiliency for increased water use associated with climate change related drought conditions.	

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Next Steps

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- Review feedback and incorporate feedback received at PIC.
- Prepare Screening Report.
- Present draft Screening Report with preferred solution to Council.
- Finalize Screening Report and issue Notice of Completion.
- Design Phase
  - Confirm size
  - Select appearance (colour, logos)
- Apply for Approvals
- Construction

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Questions and Comments

Further questions or comments can be submitted to:
Lisa Courtney, B. M. Ross and Associates
lcourtney@bmross.net or 519-524-2641

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Ministry of the Environment, Conservation and Parks

Environmental Assessment Branch

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135 St. Clair Avenue W
Toronto ON M4V 1P5
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Ministère de l'Environnement, de la Protection de la nature et des Parcs

Direction des évaluations environnementales

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135, avenue St. Clair Ouest
Toronto ON M4V 1P5
Tél. : 416 314-8001
Téléc. : 416 314-8452

Via E-mail Only

May 9, 2025

Lisa Courtney
BM Ross on behalf of Municipality of South Bruce
lcourtney@bmross.net

Re: Municipal Class Environmental Assessment for New Water Storage Facility (Teeswater)
Municipality of South Bruce
Municipal Class Environmental Assessment – Schedule B
Project Review Unit Comments – Draft Project File Report

Dear Lisa,

Thank you for providing the ministry with an opportunity to comment on the draft Project File Report for the above noted Class Environmental Assessment (EA) project. The Ministry of the Environment, Conservation and Parks (ministry) provides the following comments for your consideration.

Planning and Policy

1) A discussion of the provincial planning and policy context, particularly of the Provincial Policy Statement (PPS), 2024, is missing from the Report. The **Provincial Policy Statement (2024)** contains policies that protect Ontario's natural heritage and water resources. As noted in the Municipal Class EA document, the PPS is a key consideration for identifying land-use planning objectives and evaluating alternative solutions in Phase of the 2 Class EA process. Applicable policies should be referenced in the report, and the proponent should describe how the proposed project is consistent with these policies. The ministry recommends revising the Report to include a discussion of the PPS.

Project Timeline

2) Consideration of a preliminary anticipated schedule for the project should be included in the report.

Indigenous Engagement

3) The proponent should continue to engage with all communities that have been engaged with to date as the Class EA process proceeds.

4) As per Section A.3.5 of the MCEA document, the report must include consultation records between the proponent and the consulted agencies. It is noted that Appendix C contains a template / copy of the notice email that was sent to the indigenous communities. However, copies of the actual correspondences should be included.

Air Quality and Odour

5) Please note that the ministry recommends that non-chloride dust suppressants be applied during construction.

Species at Risk

6) If there is evidence of species at risk and / or habitat on or around the location of your activity, MECP would suggest that the proponent complete an Information gathering Form (IGF) and appropriate survey efforts to fully asses impacts to species at risk before moving forward with the project. If after considering all the data and information in the IGF, the proponent has determined that the proposed activities COULD POTENTIALLY have adverse impacts prohibited by sections 9 and/or 10 of the ESA, an exemption or authorization may likely be required before the project proceeds. If there is no applicable exemption in regulations under the ESA, submit the IGF to the ministry at SAROntario@ontario.ca to seek a permit or agreement. Please visit How to get an Endangered Species Act permit or authorization | ontario.ca to obtain information on how to get an ESA permit or authorization.

General

7) As this is a Schedule B project, the report should be referred to a Project File Report. An Environmental Study Report is for Schedule C projects.

Thank you for circulating this draft Report for the ministry's consideration. Please document the provision of the draft Report to the ministry as well as this Project Review Unit Comments letter in the final report, and please provide an accompanying response letter to support our review of the final report. A copy of the final Notice should be sent to the ministry's Southwest Region EA notification email account (eanotification.swregion@ontario.ca).

Should you or any members of your project team have any questions regarding the material above, please contact me at monika.macki@ontario.ca.

Sincerely,

Monika Macki

Monika Macki
Environmental Resource Planner / EA Coordinator
Environmental Assessment Program Support, Environmental Assessment Branch
Ontario Ministry of the Environment, Conservation and Parks

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 **www.bmross.net**

File No. 21240

VIA EMAIL ONLY

May 13, 2025

Monika Macki
Environmental Resource Planner/EA Coordinator
Environmental Assessment Program Support, Environmental Assessment Branch
Ontario Ministry of Environment, Conservation and Parks

Dear Monika

Re: Municipal Class Environmental Assessment for New Water Storage Facility (Teeswater), Municipality of South Bruce – Project Review Unit Comments, Draft Project File Report

Thank you for your comments following your review of the draft Project File for the above noted Municipal Class Environmental Assessment (MCEA) project. The following letter summarizes our response to the comments received. For clarity, the numbering below corresponds with the numbering in your original letter.

Planning and Policy

1) A discussion of the PPS has been added to Section 2 (Background Review) of the Project File Report.

Project Timeline

2) A preliminary schedule for the project has been included in Section 9.2 (Project Timing and Timeline).

Indigenous Engagement

3) We will continue to engage with indigenous communities through the Class EA process.
4) The appendices have been updated to include each item of correspondence with each indigenous community.

Air Quality and Odour

5) Table 7.1 (Summary of Mitigation Measures for Construction Activities) also recommends avoiding the use of chemical dust control products.

Species at Risk

6) There is no evidence of species at risk and/or habitat at the proposed location of the elevated water storage facility. Should that change prior to implementation of the project, an Information Gathering Form and appropriate survey will be undertaken.

General

7) References to Environmental Study/Screening Report have been changed to Project File Report.

The comments received have been incorporated into the Project File Report and included with the consultation material. A copy of this letter will be provided with the final Project File Report and a copy of the Notice of Completion will be sent to the Southwest Region EA notification email account.

Thank you once again for the comments and should any other questions or comments arise, please do not hesitate to reach out.

Yours very truly
B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Lisa Courtney, MCIP, RPP
Environmental Planner

LC:es

Appendix C

Consultation

Geotechnical Investigation Report

New Elevated Water Storage Tower and Watermain
Teeswater, Ontario

Municipality of South Bruce
Final Report

July 22, 2024
04-02311345.000-0100-0101-GS-R-0001-00

ENGLOBE

Municipality of South Bruce

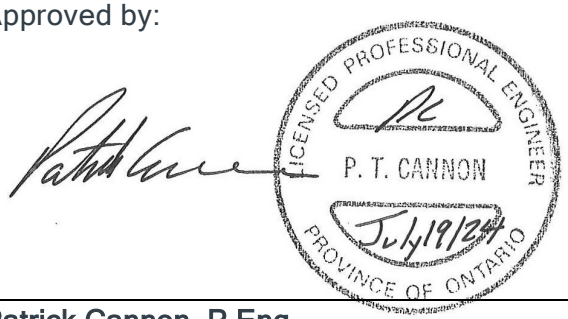
Prepared by:

Behnoush Honarvar Sedighian, M.Sc.
Geotechnical Professional

Reviewed by:

Zaheer Babar, MSc. PMP.
Project Manager

Approved by:



Patrick Cannon, P.Eng.
Project Director / Senior Geotechnical Engineer

Production team

Municipality of South Bruce

Manager of Operations	Mr. Stu Moffat

Englobe Corp.

Project Manager	Zaheer Babar, MSc. PMP.
Intermediate Geotechnical Professional	Behnoush Honarvar Sedighian, M.Sc.
Project Director / Senior Geotechnical Engineer	Patrick Cannon, P. Eng.

Revisions and publications log

REVISION No.	DATE	DESCRIPTION
00	July 22, 2024	Final Report Issued

Distribution

1 electronic PDF copy	B.M. Ross and Associates Limited Andrew Garland, P.Eng.

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If tests have been carried out, the results of these tests are valid only for the sample described in this report.

Englobe Corp.’s subcontractors who have carried out on-site or laboratory work are duly assessed according to the purchase procedure of our quality system. For further information, please contact your project manager.”

Table of Contents

TABLES

APPENDICES

1 Introduction

Englobe Corp. (Englobe) was retained by the Corporation of the Municipality of South Bruce (hereinafter referred to as the "Client") to undertake a geotechnical investigation in support of a proposal P2311345 for the New Elevated Water Storage Tower and Watermain at Teeswater, Ontario (herein after referred to as the 'Site'). A site location map is provided in Drawing 1 in Appendix A. Authorization to proceed with the work was provided by the Client on January 9, 2024.

The purpose of the work was to investigate and report on the subsurface soil and groundwater conditions in a series of boreholes drilled at the site. Based on this information, a slope stability assessment was completed to evaluate the long-term stability of the subject slopes. The geotechnical assessment was completed to satisfy the intents of the guidelines outlined in the document entitled *'Technical Guide – River and Stream Systems: Erosion Hazard Limits' (Ministry of Natural Resources, 2001)* and Saugeen Valley Conservation Authority document entitled *'Ontario Regulation 169/06: Development, Interference with Wetlands and Alterations to Shorelines and Water Courses'*.

Advice has also been provided with respect to the geotechnical design aspects of the proposed development, including recommendations for foundation design and floor slabs-on-grade. The anticipated construction conditions pertaining to excavation, backfill and temporary ground water control are discussed also, but only with regard to how these might influence the design.

Ongoing liaison with Englobe during the final design and construction phase of the project is recommended to ensure that the recommendations in this report are applicable and/or correctly interpreted and implemented.

The recommendations and opinions in this report are applicable only to the proposed development as described above and the Limitations of the Investigation found in Section 5 is an integral part of this report.

2 Site and Project Description

2.1 Existing Site Conditions

The site was examined by Englobe's senior geotechnical staff on January 9, 2024, in order to obtain general information regarding the existing slope features such as slope profile, slope drainage, watercourse features, vegetation cover and structures in the vicinity of the slopes. Photographs illustrating the various features of the study area are provided in Appendix B. The general arrangement of the site is shown in Appendix A, Drawing 2.

The proposed Elevated Water Storage is located at the top of the slope along James Street East in Teeswater, Municipality of South Bruce, Ontario, and the Teeswater River is 50 meters from the toe of the slope. Based on the elevation contours in the site plan drawing provided by the client, the slope is approximately 8.6 m in height and inclined at approximately 3 horizontal to 1 vertical.

During visual inspection, the slope was covered with vegetated grass, and the slope was well-vegetated, with mainly grass and mature trees. No scarps or erosion gullies were observed on the slope's face, and active erosion along the slope's toe was not observed.

2.2 Slope Stability Rating

The site inspection result and the site's general setting are described above. This information was used to complete the Slope Stability Rating Chart, as shown in Table 4.2 of the Technical Guide of the River and Stream Systems: Erosion and Hazard Limit by the Ontario Ministry of Natural Resources (MNR Guide). The rating result is shown in Appendix C and summarized in Table 1.

Table 1: Slope Stability Rating Chart Values as Observed in Section A-A'

Location	Slope Inclination (estimated)	Slope Height (estimated)	Slope Stability rating Chart Value
Section A-A'	3 to 1	8.6 m	12

In summary, a slope stability rating of about 12 has been indicated for slope Section A-A', which suggests a low potential for slope instability. The guideline indicates that slopes with this rating should be assessed with site inspection only, confirmation, and a report letter. This level of effort in this investigation is consistent with the approach outlined in the MNR guidelines.

2.3 Proposed Development

Based on the information provided by the Client, it is anticipated that the new water tower will be no more than 3 m deep and will have a raft foundation. For the Elizabeth Street North location, it is noted that the proposed watermain location is a narrow utility corridor that crosses a relatively steep embankment, therefore installation by directional drilling is the probable construction method. The proposed location of the water tower is shown on Drawing 3 in Appendix A, as derived by a preliminary site plan provided by the client.

2.4 Procedure

The fieldwork for this investigation was performed from February 22 to 23, 2024, and involved drilling six (6) boreholes extended to approximate depths ranging from 3.1 to 14.3 meters below ground surface (m BGS). Boreholes BH-01-24 to BH-03-24 can be used for the subsurface investigation of the proposed elevated water tower, boreholes BH-03-24 and BH-04-24 are located along the proposed watermain in James Street East, and boreholes BH-05-24 and BH-06-24 are located along the proposed watermain in Elizabeth Street North. The borehole locations are shown in Drawing 2 in Appendix A.

The field investigation was carried out in general conformance with the professional standards set out in the Canadian Foundation Engineering Manual (CFEM 2023, 5th Edition), applicable Ontario Regulations, and the ASTM International (ASTM) standards. The following is a summary of field investigation tasks:

- Local utility companies were contacted prior to the start of drilling activities to demarcate underground utilities on the site.
- The boreholes were advanced using a track-mounted drill rig equipped with continuous flight hollow stem augers supplied and operated by London Soil Test Inc. under the supervision of an Englobe drilling supervisor. The boreholes were logged by our geotechnical supervisor.
- The boreholes were surveyed for coordinates and geodetic elevation.

— Soil samples were recovered from the boreholes at regular depth intervals using a 50 mm outside diameter split spoon sampler in accordance with ASTM D1586 Standard Penetration Test (SPT). The recorded SPT N-values are provided on the borehole logs (Appendix D).

— Groundwater observations and measurements were carried out in the open boreholes and upon completion of drilling.

— Details of the groundwater observations and measurements are provided on the appended borehole logs (and summarized in Groundwater, Section 4.2 below).

— The boreholes were backfilled with bentonite in accordance with Ontario Regulation 903 as amended, under the Ontario Water Resources Act.

2.5 Laboratory Testing

All soil samples recovered during this investigation were returned to our laboratory for visual examination and moisture content testing. The moisture content values are shown on the appended borehole logs. Selected soil samples were submitted for Particle Size Analysis and Atterberg limits test. A list of laboratory tests completed are summarized in Table 1.

Table 2: List of Laboratory Tests Conducted as per ASTM Standards

Test	Standard	Number of Samples
Natural Moisture Content	ASTM D2216	37
Particle Size Analysis (Sieve Analysis)	ASTM D6913	1
Particle Size Analysis (Sieve and Hydrometer)	ASTM D7298	4

Detailed description and the results of the laboratory tests are provided on the appended boreholes log in Appendix E and Section 3 of this report.

It is important to note that as per the standard policy of Englobe, the soil samples will be stored for a period of three months from the date of sampling. These soil samples will be discarded after the three-month period unless prior arrangements have been made for longer storage.

3 Subsurface Conditions

The subsurface soil and groundwater conditions encountered in the boreholes, and the results of the field and laboratory testing, are shown on the Log of Borehole sheets in Appendix D. A list of abbreviations and symbols are provided to assist in the interpretation of the borehole logs. It should be noted that the boundaries between the strata have been inferred from drilling observations and non-continuous samples. They generally represent a transition from one soil type to another and should not be inferred to represent exact planes of geological change. Further, conditions will vary beyond the locations investigated.

3.1 Soil Conditions

The following discussion has been simplified in terms of the major soil strata for the purposes of geotechnical design. In general, the boreholes drilled at the site penetrated topsoil or fill overlying native deposits of sand and/or silt in all boreholes.

3.1.1 Topsoil

A surface layer of topsoil was encountered at the ground surface in BH-01-24 to BH-03-24, close to the proposed location of the water tower. The topsoil thickness ranged from 200 to 390 mm and mostly consisted of sand, gravel, and silt. A silty sandy topsoil layer was encountered beneath the pavement structure with a thickness of 170 mm in BH-04-24 which is located along the proposed watermain in James Street East. It is important to note that the topsoil thickness might differ beyond the areas where the boreholes were drilled.

3.1.2 Asphalt Pavements

A surface layer of pavement structure was encountered in BH-04-24 and BH-05-24. The thickness of the pavement structure ranged from 440 to 580 mm, underlain by silty sandy topsoil to gravelly sandy silt fill.

One (1) particle size distribution test (sieve testing) was conducted on the pavement structure material. The obtained results are reported in the respective borehole log and are also tabulated in the following Table 2 and also in Appendix C.

Table 3: Particle Size Distribution Analyses (Sieve Test)

Borehole and Sample Number	Sample Depth (m)	Gravel	Borehole and Sample Number	Sample Depth (m)	Gravel
BH-04-24 SS1	0 - 0.46	33	51	16	Yes (slightly out of range in 0.075 mm)

3.1.3 Fill

Fill was encountered in boreholes BH-05-24 and BH-06-24 to depths ranging from about 1.6 to 2.2 m BGS. The fill was variable in nature but generally consisted of gravelly sandy silt or sandy topsoil and gravel. The N values, as determined in the Standard Penetration testing carried out within the fill, ranged from 2 to 24 blows per 0.3 m, inferring a relatively very loose to compact state of packing. The in-situ water content of the samples of fill recovered from the standard penetration testing ranged from about 9 to 13 percent.

3.1.4 Sand / Silt

A layer of non-cohesive material consisting of silty sand, sand and gravel, silty gravelly sand to silt, and sandy silt with some sand, and some gravel was encountered beneath the topsoil in all boreholes, extending to the termination depth of all boreholes. The N-values, ranged from 9 to 50 blows per 0.3 m, inferring a loose to very dense relative density. The in-situ water content of the samples recovered from the standard penetration testing ranged from about 4 to 16 percent.

Four (4) grain size distribution tests (sieve and hydrometer testing) were conducted on the sand/silt deposit. The obtained results are reported in the respective borehole log and are also tabulated in the following Table 4 and in Appendix E.

Table 4: Particle Size Distribution Analyses (Sieve and Hydrometer)

Borehole and Sample Number	Sample Depth (m)	Soil Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
BH-01-24 SS4	2.29-2.74	Gravelly SILT, some Sand, trace Clay	25	19	51	5
BH-03-24 SS2	1.53 - 1.98	Sandy SILT, some Gravel, trace Clay	12	34	49	5
BH-05-24 SS4	2.29 - 2.74	Sandy SILT, traces of Gravel and Clay	2	22	75	2
BH-06-24 SS4	3.05 - 3.51	Silty Sandy GRAVEL, trace Clay	48	25	26	1

3.2 Groundwater

After completing the drilling operations, groundwater level observations were made in the open boreholes. In summary, groundwater was observed immediately after drilling in Borehole BH-01-24 at 11.4 m BGS, or at the elevation of about 292.8 m. Other boreholes were dry upon completion of drilling.

It should be noted that the conditions reported above may not necessarily represent stabilized conditions or the groundwater conditions which will be encountered during construction. The groundwater levels will vary due to seasonal effects and precipitation conditions. It should be noted that there was no provision for long-term groundwater monitoring at the site.

4 Discussion and Recommendations

The following discussion is based on our interpretation of the factual data obtained during this investigation and is intended for the use of the design engineer only. Comments made regarding the construction aspects are provided only in as much as they may impact on design considerations. Contractors bidding on or undertaking any work at the site should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction and make their own interpretation of the factual data as it affects their proposed construction techniques, schedule, equipment capabilities, costs, sequencing, and the like.

The discussion of the geotechnical aspects of the project is offered for preliminary design consideration. It is noted that only conceptual design information is presently available. Further geotechnical review will be required as the details of the design evolve.

The general arrangement of the proposed water tower is shown in Drawing 3 in Appendix A. In this design, it is proposed to construct a water tower, 50 m high with a 7.32 m diameter pedestal.

4.1 Site Preparation

It is expected that some grading of the property may be required to prepare the land for construction of the proposed Elevated Water Tower. The earthworks will likely include a general leveling of the site and removal of the topsoil.

In calculating the amount of topsoil to be removed, we recommend that the topsoil thicknesses provided on the individual test pit logs be increased by 400 mm to account for variations and some stripping of the mineral soil below. The topsoil can be used for landscaping fill.

Controlled fill required for raising grades beneath the pavements should consist of clean earth materials, free of topsoil, rubble, wood, plant materials etc. and at a suitable placement water content to consistently achieve the compaction requirements outlined below. Reuse of the native sand above the water table maybe feasible depending on the moisture content of the sand at the time of placement and weather conditions.

Imported earth for use as engineered fill will be subject to the requirements of Ontario Regulation (O. Reg.) 406/19 including the document 'Rules for Soil Management and Excess Soil Quality Standards' as adopted by reference in O. Reg. 406/19. Alternatively, consideration could be given to using OPSS Granular B Type II material imported from an MECP-licensed quarry. Source acceptance testing of materials imported for use as engineered fill must be carried out prior to the importation to the site.

Controlled fill should be placed in 300 mm thick lifts and compacted to 98 percent of standard Proctor maximum dry density. For optimal performance, the placement water content of the fill should be maintained within about 2 percent of the laboratory optimum water content for compaction.

Full-time testing by experienced geotechnical personnel should be carried out during fill placement and compaction to examine and approve potential sources of fill material and to carefully monitor the placement and verify the compaction by in-situ density testing using nuclear gauges.

4.2 Preliminary Foundation Design

Several factors exist within the study area that could impact the construction of the proposed elevated water tower, including:

- Compact to very dense native sand/silt layer underneath the footing level
- Relatively low groundwater level
- Typical dimensions of the elevated water tower structure
- The expected foundation loading.
- Susceptibility to excessive settlements, overturning, etc.

According to the abovementioned factors and the preliminary information provided by the Client, it is anticipated that the proposed reservoir (represented by borehole locations BH-01-24 to BH-03-24) will be no more than 3 m deep and will have a raft foundation. Based on the available borehole logs, the foundation will be supported within the native subsoil.

It is recommended that the project geotechnical information be provided to a specialized design/build contractor to confirm the feasibility of this foundation system. These contractors can provide further information on the methodology, detailed design, installation, and certification.

4.2.1 Raft Foundation

The raft foundation may be designed for the average values of Serviceability Limit State (SLS) bearing pressure and factored geotechnical resistance at Ultimate Limit State (ULS) presented in Table 5 below. The weight of the mat can be neglected for design purposes. The dimensions and depths of the proposed raft foundations are assumed based on the preliminary design provided by the Client, and the minimum frost protection depth of 1.4 m and the minimum depth of bearing stratum within the footing area have also been applied.

Table 5: Bearing Capacity for Raft Foundation

Boreholes	Unit	Foundation Depth (mbgs)	Bearing Stratum	Serviceability Limit States SLS (kPa)	Ultimate Limit States ULS (kPa)
BH-01-24 to BH-03-24	Elevated Water Tower	1.4	Sandy SILT to Gravelly SILT	200	300

The raft should be reinforced with top and bottom steel, as appropriate, to provide structural continuity and to permit spanning of local irregularities. It is essential that we observe the subgrade of the raft foundation prior to placement of reinforcing steel.

The width of raft foundations is larger than those of the isolated spread footing. Hence for a raft foundation, the depth of the zone of influence is likely to be much larger than that of a spread footing and consequently their settlement is larger. The maximum total settlement of the raft foundation with the above SLS pressure is expected to be about 50 mm with the differential settlement of approximately 19 mm.

4.3 Site Classification for Seismic Site Response

Seismic hazard is defined in the 2012 Ontario Building Code (OBC 2012) by uniform hazard spectra (UHS) at spectral coordinates of 0.2 s, 0.5 s, 1.0 s, and 2.0 s and a probability of exceedance of 2% in 50 years. The OBC method uses a site classification system defined by the average soil/bedrock properties (e.g., shear wave velocity (vs), Standard Penetration Test (SPT) resistance, and undrained shear strength (Su)) in the top 30 meters of the site stratigraphy below the foundation level, as set out in Table 4.1.8.4A of the Ontario Building Code (2012). There are 6 site classes from A to F, decreasing in ground stiffness from A, hard rock, to E, soft soil; with site class F used to denote problematic soils (e.g., sites underlain by thick peat deposits and/or liquefiable soils). The site class is then used to obtain peak ground acceleration (PGA), and peak ground velocity (PGV) site coefficients Fa and Fv, respectively, used to modify the UHS to account for the effects of site-specific soil conditions.

Based on the above-noted information, it is recommended that the site designation for seismic analysis be '**Site Class D**', as per Table 4.1.8.4.A of the Ontario Building Code (2012). The values of the site coefficient for design spectral acceleration at period T, F(T), and of similar coefficients F(PGA) and F(PGV) shall conform to Tables 4.1.8.4.B. to 4.1.8.4.I of the OBC 2012, as amended January 1, 2020, using linear interpolation for intermediate values of PGA.

4.4 Lateral Earth Pressures

The appropriate values for use in the design of structures subject to unbalanced earth pressures at this site are tabulated as follows:

Table 6: Coefficient of Lateral Earth Pressure

Stratum/Parameter	ϕ	γ	Ka	Ko	Kp
Loose Granular Fill	26	17.5	0.39	0.56	2.56
Compact Granular Fill Granular 'B' (OPSS 1010)	32	21.0	0.31	0.47	3.25
Sandy Gravelly Silt	30	19	0.33	0.50	3.00

Walls subject to unbalanced earth pressures must be designed to resist a pressure that can be calculated based on the following equation:

$$P = K[\gamma (h-h_w) + \gamma' h_w + q] + \gamma_w h_w$$

where,

- P = the horizontal pressure at depth, h (m)
- K = the earth pressure coefficient,
- h_w = the depth below the groundwater level (m)
- γ = the bulk unit weight of soil, (kN/m^3)
- γ' = the submerged unit weight of the exterior soil, (γ - 9.8 kN/m^3)
- q = the complete surcharge loading (kPa)

Where the wall backfill can be drained effectively to eliminate hydrostatic pressures on the wall, acting in conjunction with the earth pressure, this equation can be simplified to:

$$P = K[\gamma h + q]$$

The factored geotechnical resistance to sliding of earth retaining structures is developed by friction between the base of the footing and the soil. This friction (R) depends on the normal load on the soil contact (N) and the frictional resistance of the soil (tan ϕ) expressed as R = N tan ϕ. This is an unfactored resistance. The factored resistance at ULS is R_f = 0.8 N tan ϕ. The K value to be used for the design will depend on the rigidity of the wall.

4.5 Excavations

Excavations must be carried out in accordance with the Occupational Health and Safety Act, Ontario Regulation 213/91 (as amended), Construction Projects, Part III - Excavations, Sections 222 through 242. These regulations designate four (4) broad classifications of soils to stipulate appropriate measures for excavation safety. The existing fill and native sandy gravelly silt types are shown in the table below.

Table 7: Soil Classification for Excavations

Soil Type	Above Groundwater Level	Below Groundwater Level
Fill	Type 3	-
Sandy Gravelly Silt	Type 3	Type 3

Where workmen must enter a trench or excavation the soil must be suitably sloped and/or braced in accordance with the regulation requirements. The regulation stipulates safe excavation slopes by soil type as Table 8.

Table 8: Safe Excavation Slope Based on Soil Type (Ontario Regulation 213/91 Occupational Health and Safety Act (OHSA))

Soil Type	Base of Slope	Steepest Slope Inclination
1	Within 1.2 metres of bottom of trench	1 horizontal to 1 vertical
2	Within 1.2 metres of bottom of trench	1 horizontal to 1 vertical
3	From bottom of trench	1 horizontal to 1 vertical
4	From bottom of trench	3 horizontal to 1 vertical

Minimum support system requirements for steeper excavations are stipulated in Sections 235 through 238 and 241 of the Act and Regulations and include provisions for timbering, shoring, and moveable trench boxes.

Although significant groundwater was not encountered in the boreholes, depending on the actual groundwater conditions at the time of construction, seepage from surface drainage and seepage from any preferentially permeable features in the soil should be expected. For the range in excavation depths expected, the volume of water anticipated is such that temporary pumping from properly filtered sumps located as required in the excavations should suffice to control groundwater.

4.5.1 Removal of Site Excavated Material

All excess soil must be classified according to Ont. Reg. 406/19 as amended prior to off-site disposal. If excess soil is required to be removed from the site, it is recommended that material be classified during future test pit, borehole drilling, or Environmental Site Assessments.

4.6 Depth of Frost Penetration

The design frost penetration depth for the general area is 1.4 m. Therefore, a permanent soil cover of 1.4 m or its thermal equivalent insulation is required for frost protection of foundations. All exterior footings, footings beneath unheated areas, and foundations exposed to freezing temperatures should have at least such earth cover or equivalent synthetic insulation for frost protection. During winter construction exposed surfaces to support foundations must be protected against freezing by means of loose straw and tarpaulins, heating, etc.

For buried utility lines, variations from the above-noted depth of frost penetration might be considered, depending on various factors such as the type of backfilling materials or the temperature and moisture exposure of the area (prevailing winds, drifting snow, etc.). However, these variations do not generally represent a concern unless special equipment and/or buried utilities have specific requirements regarding the subsurface temperature and moisture regime (i.e., water lines or sensitive electrical utilities, etc.). In such special situations, further tests and analysis should be conducted on a case-by-case basis.

The depth of frost penetration is also defined as the zone of active weathering where sizeable variations in the moisture content accompany the yearly temperature fluctuations. Therefore, the foundation grades should be established at or below this depth. For the light poles and other light structures that are to be installed on a single footing, if some frost heave (25 mm to 50 mm) cannot be tolerated, the foundation elements should also be provided with the above-noted minimum depth of soil cover or equivalent exterior-grade insulation.

4.7 Site Servicing

The subgrade soils beneath the service pipes should comprise of native soils. Prior to installation of the services, the subgrade should be inspected by an experienced geotechnical engineer/technician. If any, very loose or soft areas are encountered during inspection they should be excavated and replaced with compacted granular material such as OPSS.MUNI 1010 Granular A.

The pipe bedding for the services should be conventional Class B pipe bedding comprising a minimum 150 mm thick layer of OPSS.MUNI 1010 Granular A aggregate below the pipe invert. The bedding course may be thickened if portions of the subgrade become wet during excavation. OPSS.MUNI 1010 Granular A type aggregate should be provided around the pipe to at least 300 mm above the top, and the bedding should be compacted to 98 percent of standard Proctor maximum dry density. Service lines installed outside of heated areas should be provided with a minimum 1.2 m of soil cover or equivalent insulation for frost protection.

4.8 Trench Backfill

The trenches above the specified pipe bedding should be backfilled with inorganic soils that are not excessively wet placed in 200 mm thick lifts and compacted to at least 98 percent of standard Proctor maximum dry density. Where the service trenches enter the tower, the trench backfill must be compacted as structural fill to a minimum of 100 percent of standard Proctor maximum dry density. Any trench backfill below a pavement structure should be compacted to 100 percent of standard Proctor maximum dry density within 1 m from the top of subgrade level. Based on the results of in-situ moisture content tests carried out on the native overburden deposits, the materials may be suitable for reuse as trench backfill. Any overly wet material may require drying prior to reusing as backfill. Organic material (topsoil) is not considered suitable for reuse as trench backfill and if encountered, shall be separated.

To minimize potential problems, backfilling operations should follow closely after excavation so that only a minimal length of trench is exposed. Care should be taken to direct surface runoff away from the excavations. Should construction extend into the winter season then backfilling operations should be planned to ensure that backfill material is kept to a minimum and ensured that frozen material is not used as backfill.

4.9 Quality Control

The foundation construction must be field reviewed by the geotechnical engineer to confirm that the founding soil exposed is consistent with the intended design bearing resistance. The on-site review of the condition of the foundation soil as the foundations are constructed is an integral part of the geotechnical design function and is required by Section 4.2.2.2 of the Ontario Building Code 2012.

The long-term performance of floor slabs is highly dependent upon the subgrade support conditions. Stringent construction control procedures should be maintained to ensure that uniform subgrade moisture and density conditions are achieved as much as practically possible. The design advice in this report is based on an assessment of the subgrade support capabilities as indicated by the boreholes.

The requirements for fill placement on this project have been stipulated relative to standard Proctor maximum dry density. In situ determinations of density during fill and asphaltic placement on site are required to demonstrate that the specified placement density is achieved.

During the placement of concrete at the construction site, testing should be performed to determine the slump and air content of the concrete, and concrete cylinders should be cast for every 100 m3 of concrete or daily, whichever is greater. Compressive strength to be tested in accordance with the requirements of CSA A23.1 and A23.2. Field sampling and testing of concrete shall be according to OPSS 1350 MUNI.

5 Statement of Limitations

The geotechnical recommendations provided in this report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report. Since all details of the design may not be known at the time of report preparation, we recommend that we be retained during the final design stage to verify that the geotechnical recommendations have been correctly interpreted in the design. Also, if any further clarification and/or elaboration are needed concerning the geotechnical aspects of the project, Englobe should be contacted. We recommend that we be retained during construction to confirm that the subsurface conditions do not deviate materially from those encountered in the test holes and to ensure that our recommendations are properly understood. Quality assurance testing and inspection services during construction are a necessary part of the evaluation of the subsurface conditions.

The geotechnical recommendations provided in this report are intended for the use of the Client or its agent and may not be used by a Third Party without the expressed written consent of Englobe and the Client. They are not intended as specifications or instructions to contractors. Any use which a contractor makes of this report, or decisions made based on it, are the responsibility of the contractor. The contractor must also accept the responsibility for means and methods of construction, seek additional information if required, and draw their own conclusions as to how the subsurface conditions may affect their work. Englobe accepts no responsibility and denies any liability whatsoever for any damages arising from improper or unauthorized use of the report or parts thereof.

It should be noted that the soil boundaries indicated on the borehole log are inferred from noncontinuous sampling and observations during drilling and should not be interpreted as exact planes of geological change. These boundaries are intended to reflect approximate transition zones for the purpose of geotechnical design. Also, the subsoil and groundwater conditions have been determined at the borehole locations only.

It is further noted that, depending on the time of year the fieldwork was completed, water levels should be expected to vary, perhaps significantly from those observed at the time of this investigation.

It is important to note that the geotechnical assessment involves a limited sampling of the site gathered at specific test hole locations and the conclusions in this report are based on this information gathered and in accordance with normally accepted practices. The subsurface geotechnical, hydrogeological, environmental, and geologic conditions between and beyond the test holes will differ from those encountered at the test holes. Also, such conditions are not uniform and can vary over time. Should subsurface conditions be encountered which differ materially from those indicated at the test holes, we request that we be notified in order to assess the additional information and determine whether or not changes should be made as a result of the conditions. Englobe will not be responsible to any party for damages incurred as a result of failing to notify Englobe that differing site or subsurface conditions are present upon becoming aware of such conditions.

The professional services provided for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise stated, specifically in the report. The recommendations and opinions given in this report are based on our professional judgment and are for the guidance of the Client or its Agent in the design of the specific project. No other warranties or guarantees, expressed or implied, are made. The Englobe recommendations are contingent upon provision of a consistently competent, stable subgrade, which is properly drained and free of soft spots and objectionable materials such as organics.

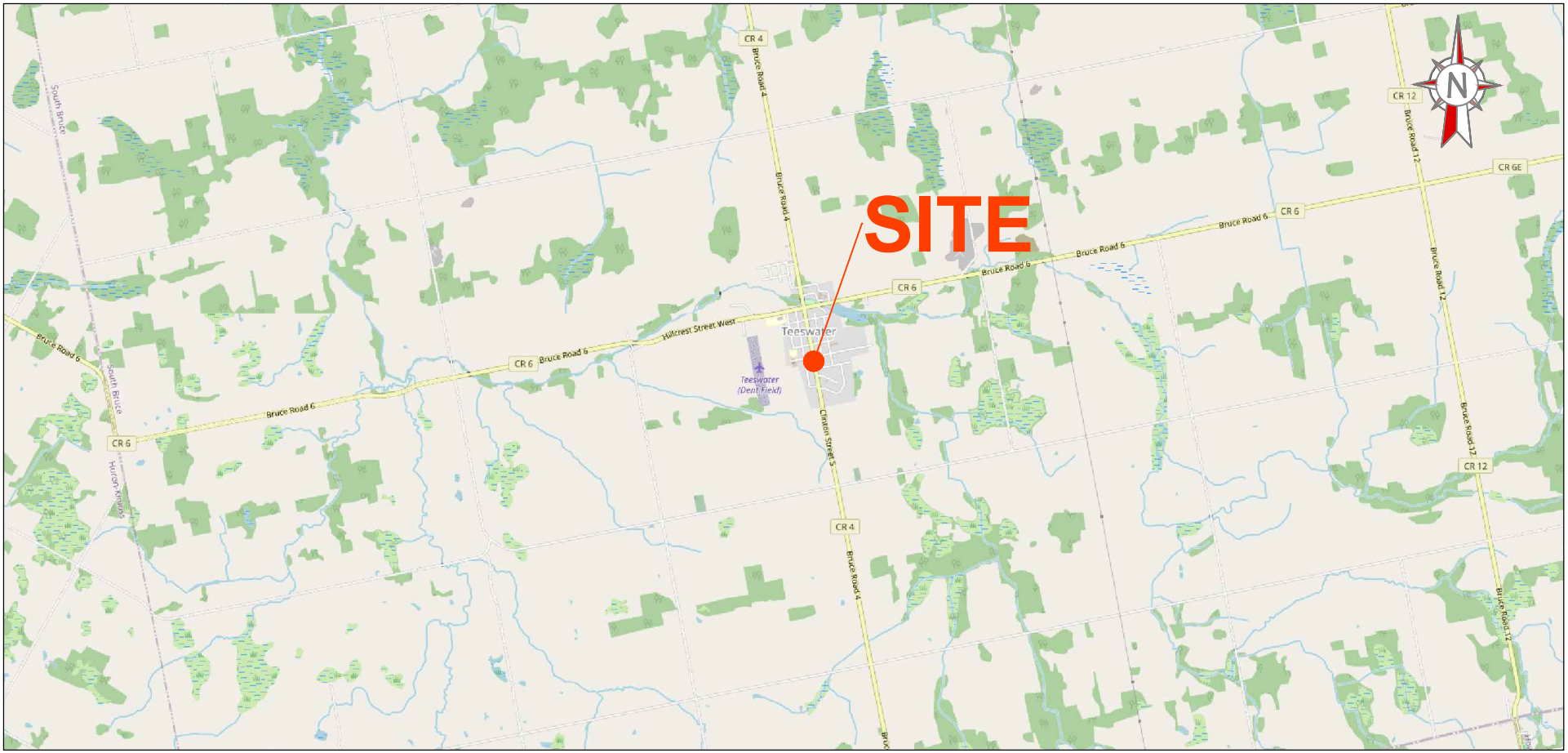
Appendix A
Drawings

Drawing 1 - Site Location Plan

Drawings 2, 3 and 4 - Borehole Location Plan

ENGLOBE

\\EGNYTEDRIVE\ENGLOBE\SHARED\CA\KITCHENER\DATA\PROJECTS\160\2024 (SWO)\GEOTECHNICAL\02311345.000 - ELEVATED WATER STORAGE TOWER AND WATERMAIN, TEESWATER\Z4_CAD\CAD\02311345.000 FIG 1.DWG



0 100 200 300 400 500 m

SCALE 1:15000

NOTES:

1-REFERENCES: © OpenStreetMap.

2-Drawing scale may be distorted due to file conversion and/or copying. Measurements taken from the drawing must be verified in the field.

Project

New Elevated Water Storage Tower and Watermain

Teeswater, Ontario

Title

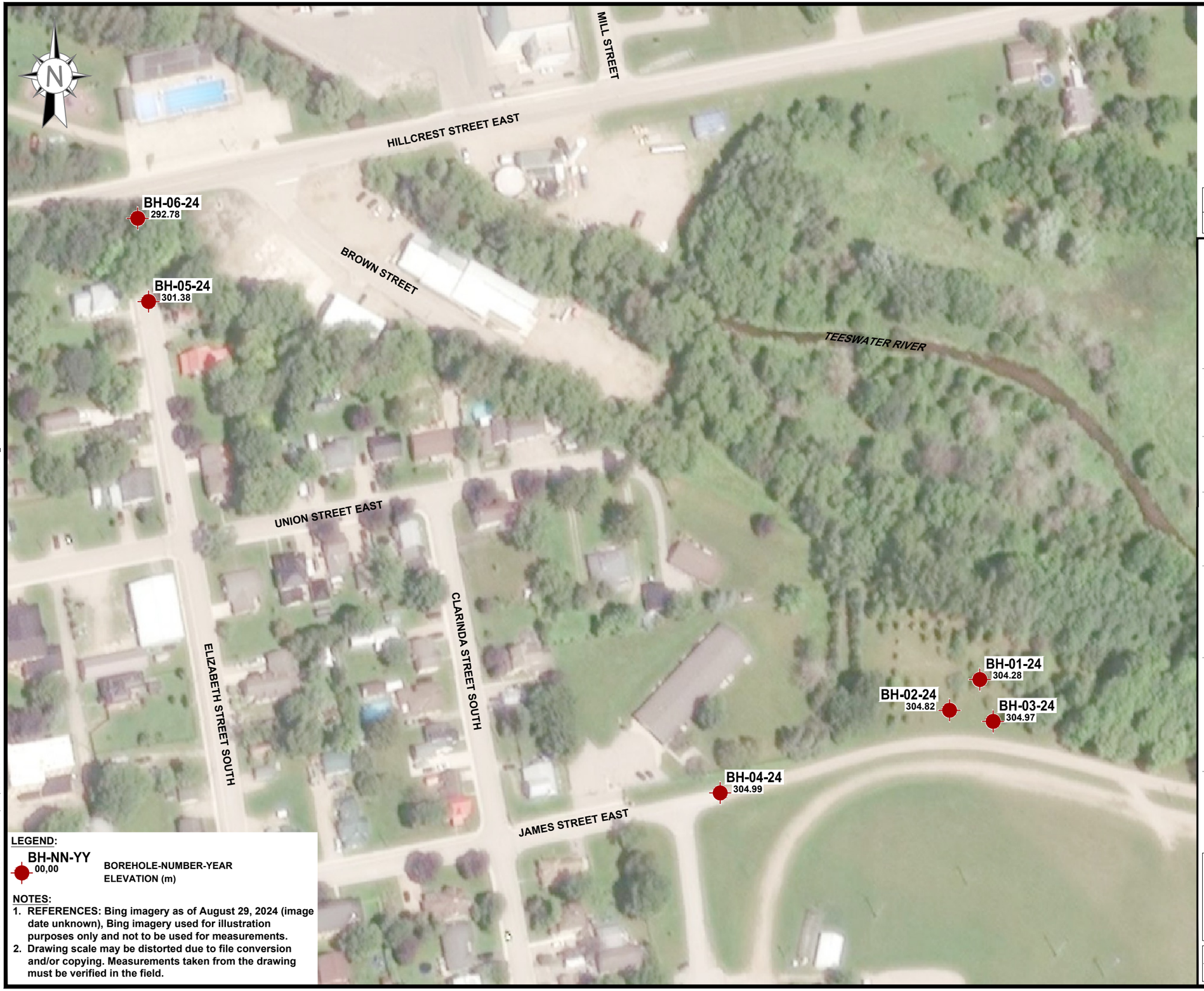
Site Location Plan

eNGLOBe

440, Hardy Road, Unit 3
Brantford (Ontario) N3T 5L8
Telephone : 519.720.0078
Fax : 519.720.0976

Prepared	D.Rana	Discipline	GEOTECHNICAL	Project manager	Z. Babar
Drawn	D.Rana	Scale	1:15000	Sequence no.	01 of 02
Checked	Z. Babar	Date	2024-04-01		

M. dept.	Project	Disc.	Dwg no.	Rev.
04	02311345.000	GE	001	00



LEGEND:

BH-NN-YY
00,00
BOREHOLE-NUMBER-YEAR
ELEVATION (m)

NOTES:

1. **REFERENCES: Bing imagery as of August 29, 2024 (image date unknown), Bing imagery used for illustration purposes only and not to be used for measurements.**
2. **Drawing scale may be distorted due to file conversion and/or copying. Measurements taken from the drawing must be verified in the field.**

This document must be used jointly with the recommendations formulated in the geotechnical study report

No.	Version	Date	By	Check	Appr.
XX	REVISION	JJ/MM/AA	XX	XX	XX

Seal

Scale

0 5 10 15 25 50 75 m

1:1 500

Client

Municipality of South Bruce

Englobe Corp.
440 Hardy Road, Suite 3
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Project

New Elevated Water Storage Tower and Watermain

Teeswater, Ontario

Title

Borehole Location Plan

Discipline: Geosciences		Prepared by: LK	Checked by: ZB
Scale: 1:1 500		Drawn by: LK	Approved by: ZB
Date: 29/08/2024		Figure N°: 02 of 02	
Page setup: 0002	Paper format: ANSI full bleed B (17,00 x 11,00 Inches)	Register N°:	

Resp.	Project	Phase	Disc.	Type	Drawing N°	Rev.
00	02311345.000	0000	GE	D	0002	00

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NOTES:
1.

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No.	Version	Date	By	Check	Appr.
XX	REVISION	JJ/MM/AA	XX	XX	XX

Seal

Scale

0 5 10 15 25 50 75 m

1:1 500

Client

Client

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Project

New Elevated Water Storage Tower and Watermain

Teeswater, Ontario

Title

Borehole Location and Section Location

Overall Site

Discipline: Geosciences		Prepared by: K.Chawla	Checked by: Z.Babar
Scale: 1:1 500		Drawn by: K.Chawla	Approved by: Z.Babar
Date: May 2024		Figure N°: 01 of 01	
Page setup: PLAN-3	Paper format: ANSI full bleed B (17.00 x 11.00 Inches)	Register N°:	

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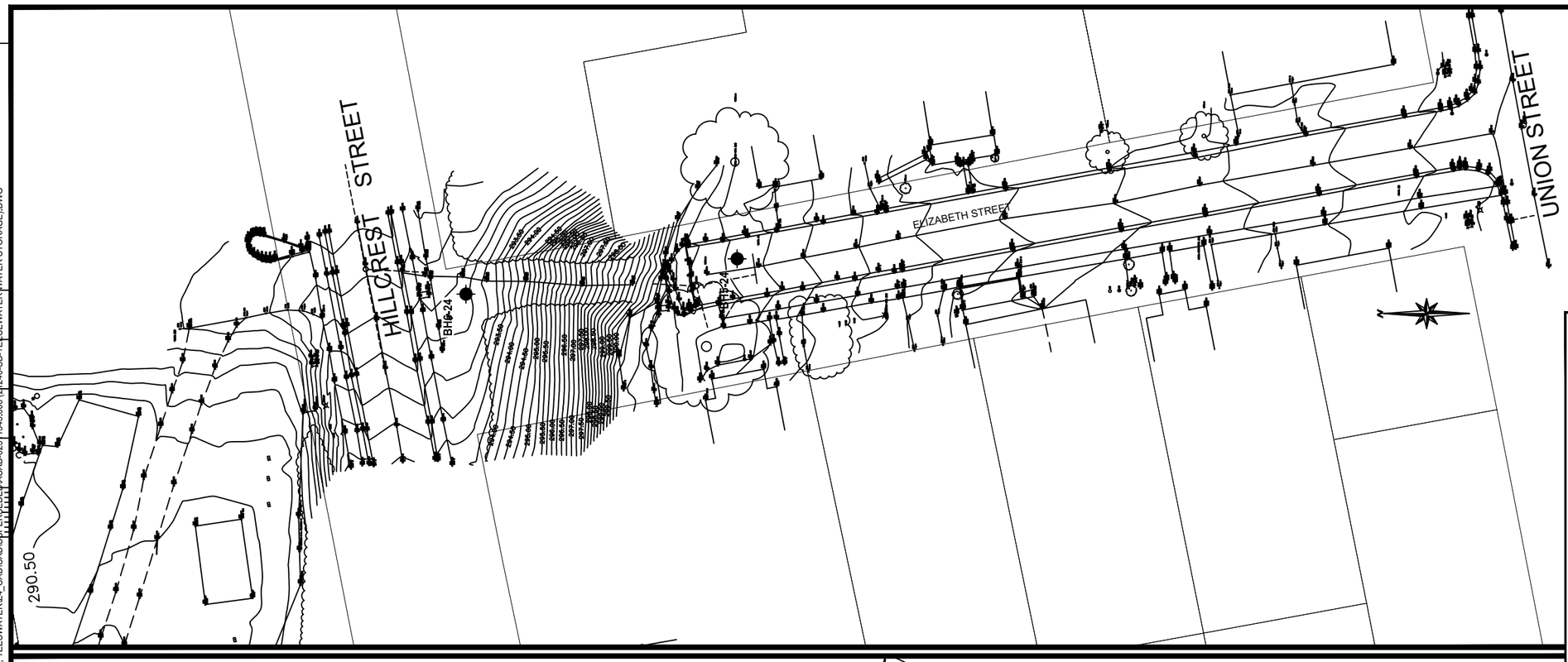

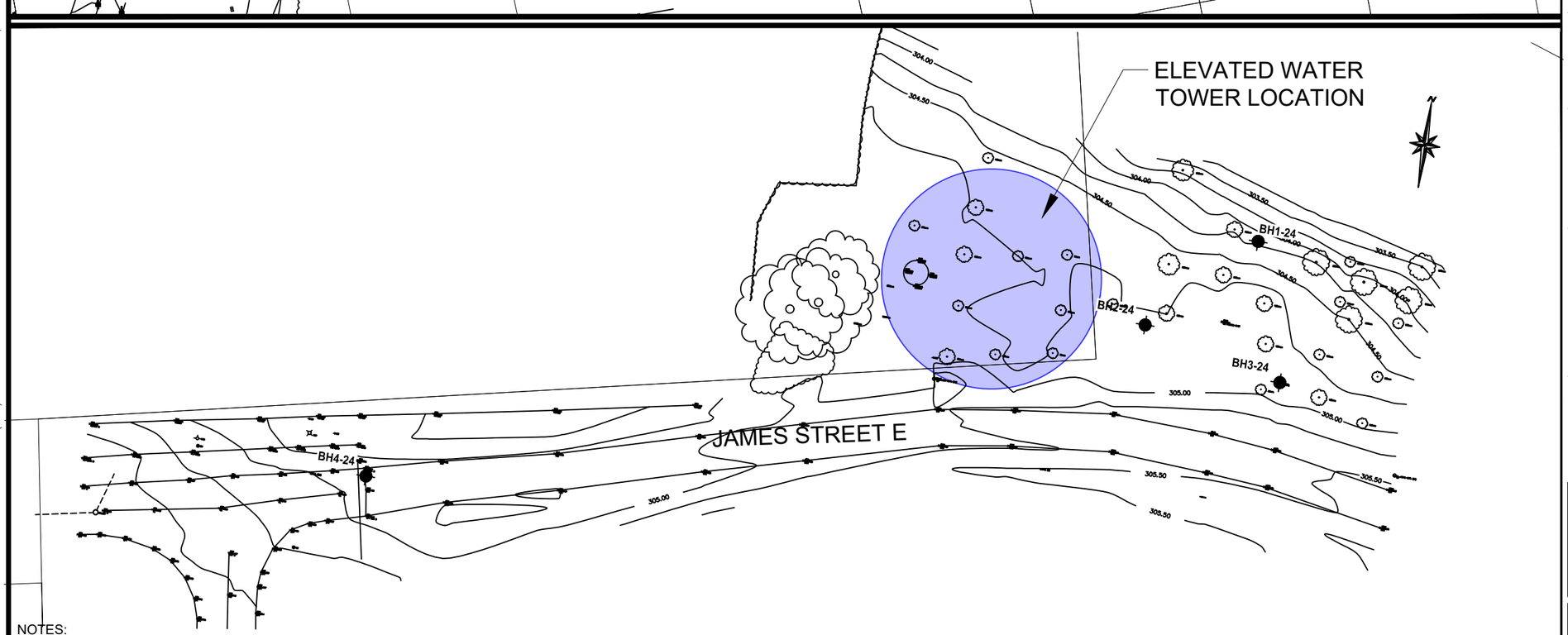

NOTES:
1.

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No.	Version	Date	By	Check	Appr.
XX	REVISION	JJ/MM/AA	XX	XX	XX

Seal

Scale

1:600 — 0 5 10 15 20 25m

Client

Client

Englobe Corp.
353 Bridge Street E
Kitchener, ON N2K 2Y5
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Project

New Elevated Water Storage Tower and Watermain

Teeswater, Ontario

Title

Borehole Location and Section Location

Discipline:		Prepared by:	Checked by:
Geosciences		K.Chawla	Z.Babar
Scale:		Drawn by:	Approved by:
1:1 500		K.Chawla	Z.Babar
Date:		Figure N°:	
May 2024		01 of 01	
Page setup:	Paper format:	Register N°:	
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Appendix B
Site Photographs

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SITE PHOTOGRAPHS

Photo 1 - Looking towards south, near BH-01-2024

Photo 2 - Looking towards the south, mature trees were observed at the edge of the slope.

Photo 3 - Looking towards the south, some mature trees were observed, due to snow there was no other vegetation.

Photo 4 - Looking towards the south, the face of the slope was highly vegetated.

Photo 5 - Looking towards the south, forested with mature trees

Photo 6 - Looking towards the south, at the toe of the slope

Appendix C
Slope Stability Rating

ENGLOBE

Section A-A'

TABLE 4.2 - SLOPE STABILITY RATING CHART

Site Location: Teeswater, Ontario
Client: Municipality of South Bruce
Inspected By: Mike Arthur

File No. 02311345.000
Inspection Date: Jan 09, 2024
Weather: Sunny, 0° C

1. SLOPE INCLINATION				
	degrees	**horiz. : vert.**		
a)	18 or less	3:1 or flatter	0	0
b)	18-26	2:1 to more than 3:1	6	
c)	more than 26	steeper than 2:1	16	
2. SOIL STRATIGRAPHY				
a)	Shale. Limestone, Granite (Bedrock)		0	6
b)	Sand, Gravel		6	
c)	Glacial Till		9	
d)	Clay, Silt		12	
e)	Fill		16	
t)	Leda Clay		24	
3. SEEPAGE FROM SLOPE FACE				
a)	None or Near bottom only		0	0
b)	Near mid-slope only		6	
c)	Near crest only or, From several levels		12	
4. SLOPE HEIGHT				
a)	2 m or less		0	4
b)	2.1 to 5 m		2	
c)	5.1 to 10 m		4	
d)	more than 10 m		8	
5. VEGETATION COVER ON SLOPE FACE				
a)	Well vegetated: heavy shrubs or forested with mature trees		0	0
b)	Light vegetation; Mostly grass, weeds, occasional trees, shrubs		4	
c)	No vegetation, bare		8	
6. TABLE LAND DRAINAGE				
a)	Table land flat, no apparent drainage over slope		0	2
b)	Minor drainage over slope, no active erosion		2	
c)	Drainage over slope, active erosion, gullies		4	
7. PROXIMITY OF WATERCOURSE TO SLOPE TOE				
a)	15 metres or more from slope toe		0	0
b)	Less than 15 metres from slope toe		6	
8. PREVIOUS LANDSLIDE ACTIVITY				
a)	No		**0**	0
b)	Yes		**6**	

SLOPE INSTABILITY RATING VALUES INVESTIGATION RATING SUMMARY **TOTAL** 12

Appendix D
Borehole Logs

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List of Abbreviations

The abbreviations commonly employed on the borehole logs, on the figures, and in the text of the report, are as follows:

Sample Types		Soil Test and Properties	
AS	Auger Sample	SPT	Standard Penetration Test
CS	Core Sample	UC	Unconfined Compression
RC	Rock Core	FV	Field Vane Test
SS	Split Spoon	ø	Angle of internal friction
TW	Thinwall, Open	γ	Unit weight
WS	Wash Sample	w_p	Plastic Limit
BS	Bulk Sample	w	Water content
GS	Grab Sample	w_L	Liquid Limit
WC	Water Content Sample	I_L	Liquidity Index
TP	Thinwall, Piston	I_p	Plastic Index
		PP	Pocket Penetrometer

Penetration Resistances	
Dynamic Penetration Resistance	The number of blows by a 63.5 kg (140 lb.) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) diameter 60˚ cone a distance 300 mm (12 in.). The cone is attached to 'A' size drill rods and casing is not used.
Standard Penetration Resistance, N (ASTM D1586)	The number of blows by a 63.5 kg (140 lb.) hammer dropped 760 mm (30 in.) required to drive a standard split spoon sampler 300 mm (12 in.)
WH	Sampler advanced by weight of hammer
PH	Sampler advanced by hydraulic pressure
PM	Sampler advanced by manual pressure

Soil Description		
Cohesionless Soils Compactness Condition	**SPT N-Value** (blows per 0.3 m)	**Relative Density (D_r)** (%)
Very Loose	0 to 4	0 to 20
Loose	4 to 10	20 to 40
Compact	10 to 30	40 to 60
Dense	30 to 50	60 to 80
Very Dense	Over 50	80 to 100
Cohesive Soils Consistency	**Undrained Shear Strength (C_u) kPa**	**psf**
Very Soft	Less than 12	Less than 250
Soft	12 to 25	250 to 500
Firm	25 to 50	500 to 1000
Stiff	50 to 100	1000 to 2000
Very Stiff	100 to 200	2000 to 4000
Hard	over 200	over 4000
DTPL	Drier than plastic limit	Low Plasticity, W_L<30
APL	About plastic limit	Medium Plasticity, 30< W_L <50
WTPL	Wetter than plastic limit	High Plasticity, W_L >50

LOG OF BOREHOLE 1-24

Project No. : 02311345.000 | Client : Municipality of South Bruce | Originated by : MA

Date started : February 22, 2024 | Project : New Elevated Water Storage Tower and Watermain | Compiled by :

Sheet No. : 1 of 1 | Location : Teeswater, Ontario | Checked by : MS

Position : E: 477404, N: 4871799 (UTM 17T) | Elevation Datum : Geodetic

Rig type : DSDT, truck-mounted | Drilling Method : Hollow stem augers

Elev Depth (m)	Description	Number	Type	SPT 'N' Value	Headspace Vapour (ppm)	Lab Data and Comments
304.3	**GROUND SURFACE**					
303.9 (0.4)	390mm **TOPSOIL**, sandy gravelly, loose, dark brown	1	SS	9	PID: 0	
302.9 (1.4)	**GRAVELLY SILTY SAND**, loose, brown, moist	2	SS	9	PID: 0	
302.1 (2.2)	**GRAVELLY SANDY SILT**, trace cobbles, compact, brown, moist	3	SS	28	PID: 0	
299.8 (4.5)	**GRAVELLY SILT**, some sand, trace clay, with clayey silt seams, compact, brown, moist	4	SS	20	PID: 0	26 19 50 5
		5	SS	26	PID: 0	
		6	SS	40		
298.8 (5.5)	**SILTY SAND and GRAVEL**, very dense, brown, moist	7	SS	50 / 100mm		
	SILT, some sand, some gravel, very dense, brown, moist	9	SS	50 / 50mm		
	...trace gravel	9	SS	50 / 25mm		
		10	SS	50 / 25mm		
		11	SS	50 / 25mm		
		12	SS	50 / 25mm		
290.0 (14.3)		13	SS	50 / 25mm		

END OF BOREHOLE

Unstabilized water level measured at 11.4 m below ground surface; borehole was open upon completion of drilling.

file: 02311345.000.gpj

LOG OF BOREHOLE 2-24

Project No. : 02311345.000 | Client : Municipality of South Bruce | Originated by : MA

Date started : February 22, 2024 | Project : New Elevated Water Storage Tower and Watermain | Compiled by :

Sheet No. : 1 of 1 | Location : Teeswater, Ontario | Checked by : MS

Position : E: 477392, N: 4871786 (UTM 17T) | Elevation Datum : Geodetic

Rig type : DSDT, truck-mounted | Drilling Method : Hollow stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value
0	**304.8**	**GROUND SURFACE**				
	304.6 / 0.2	200mm **TOPSOIL**, sandy, some gravel, compact, dark brown		1	SS	12
		SANDY SILT, some gravel, compact, brown, moist		2	SS	11
1						
		...compact to dense		3	SS	30
2	302.6 / 2.2	**SILTY SAND and GRAVEL**, with sandy silt seams, dense, brown, moist		4	SS	35
	301.8 / 3.0	**GRAVELLY SANDY SILT**, compact, brown, moist		5	SS	23
3		...compact				
		...dense			SS	40
4						
		...very dense			SS	50 / 150mm
5						
6	298.6 / 6.2				SS	50 / 100mm

END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

Elevation Scale (m): 304, 303, 302, 301, 300, 299

Penetration Test Values (Blows / 0.3m): Dynamic Cone 10 20 30 40

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane — 40 80 120 160

Moisture / Plasticity: Plastic Limit (PL) | Natural Water Content (MC) | Liquid Limit (LL) — 10 20 30

Headspace Vapour (ppm): PID: 0

Instrument Details

Unstabilized Water Level

Lab Data and Comments

GRAIN SIZE DISTRIBUTION (%) (MIT) — GR SA SI CL

file: 02311345.000.gpj

LOG OF BOREHOLE 3-24

Project No. : 02311345.000 | Client : Municipality of South Bruce | Originated by : MA

Date started : February 22, 2024 | Project : New Elevated Water Storage Tower and Watermain | Compiled by :

Sheet No. : 1 of 1 | Location : Teeswater, Ontario | Checked by : MS

Position : E: 477410, N: 4871782 (UTM 17T) | Elevation Datum : Geodetic

Rig type : DSDT, truck-mounted | Drilling Method : Hollow stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value	Elevation Scale (m)	Headspace Vapour (ppm)	Instrument Details	Lab Data and Comments
0	**305.0**	**GROUND SURFACE**								
	304.7 / 0.3	300mm **TOPSOIL**, silty, loose, dark brown		1	SS	9		PID: 0		
	304.4 / 0.6	**FILL**, silt, some sand, trace gravel, trace topsoil, loose, brown, moist								
1		**SANDY SILT**, some gravel, trace clay, compact, brown, moist		2	SS	11	304	PID: 0		12 34 49 5
		...very dense ...some cobbles and boulders		3	SS	50 / 150mm		PID: 0		
2							303			
		...with clayey silt seams, compact		4	SS	24		PID: 0		
3	302.0 / 3.0	**GRAVELLY SILT**, some sand, with clayey silt seams, compact to dense, brown, moist		5	SS	30	302	PID: 0		
	301.3 / 3.7	**SILTY SAND and GRAVEL**, trace cobbles, very dense, brown, moist		6	SS	59	301			
4				7	SS	50 / 75mm				
5	299.8 / 5.2	**SILT**, some sand, some gravel, very dense, brown, moist					300			
6	298.7 / 6.3	**END OF BOREHOLE**		8	SS	50 / 25mm	299			

Penetration Test Values (Blows / 0.3m): Dynamic Cone 10 20 30 40

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane — 40 80 120 160

Moisture / Plasticity: Plastic Limit (PL) 10 | Natural Water Content (MC) 20 | Liquid Limit (LL) 30

Unstabilized Water Level

Lab Data and Comments: GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

Borehole was dry and open upon completion of drilling.

file: 02311345.000.gpj

LOG OF BOREHOLE 4-24

Project No. : 02311345.000	Client : Municipality of South Bruce	Originated by : BT
Date started : February 22, 2024	Project : New Elevated Water Storage Tower and Watermain	Compiled by :
Sheet No. : 1 of 1	Location : Teeswater, Ontario	Checked by : MS

Position : E: 477302, N: 4871754 (UTM 17T) Elevation Datum : Geodetic

Rig type : DSDT, truck-mounted Drilling Method : Hollow stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value	Elevation Scale (m)	Penetration Test Values (Blows / 0.3m) / Undrained Shear Strength (kPa)	Moisture / Plasticity (PL MC LL)	Headspace Vapour (ppm)	Instrument Details	Unstabilized Water Level	Lab Data and Comments
0	**305.0**	**GROUND SURFACE**											
	304.8 / 0.2	240mm **GRANULAR BASE**, SAND & GRAVEL, some silt, brown, crushed		1	SS	18				PID: 0			GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL: 33 51 16 0
	304.6 / 0.4	200mm **GRANULAR SUBBASE**, GRAVELLY SAND, some silt, brown											
	304.4 / 0.6	170mm **TOPSOIL**, silty sandy, compact, dark brown, moist											
1		**SILTY SAND and GRAVEL**, compact, brown, moist		2	SS	29	304			PID: 5			
	303.6 / 1.4	**GRAVELLY SILT**, some sand, very dense, brown, moist		3	SS	40	303			PID: 0			
2				4	SS	50 / 100mm				PID: 0			
	302.3 / 2.7	**SILTY SAND and GRAVEL**, very dense, brown, moist		5	SS	54	302			PID: 0			
3	301.4 / 3.6	**END OF BOREHOLE**											

Penetration Test Values (Blows / 0.3m): Dynamic Cone (10 20 30 40)

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane (40 80 120 160)

Moisture / Plasticity: Plastic Limit (PL) 10, Natural Water Content (MC) 20, Liquid Limit (LL) 30

Borehole was dry and open upon completion of drilling.

file: 02311345.000.gpj

LOG OF BOREHOLE 5-24

Project No. : 02311345.000 | Client : Municipality of South Bruce | Originated by : BT

Date started : February 22, 2024 | Project : New Elevated Water Storage Tower and Watermain | Compiled by :

Sheet No. : 1 of 1 | Location : Teeswater, Ontario | Checked by : MS

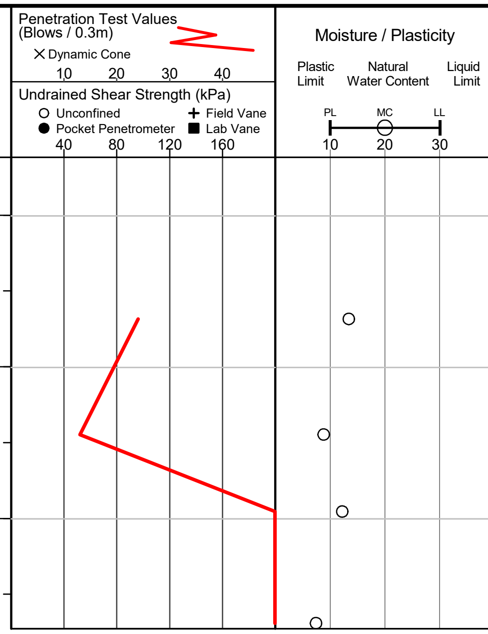
Position : E: 477075, N: 4871948 (UTM 17T) | Elevation Datum : Geodetic

Rig type : DSDT, truck-mounted | Drilling Method : Hollow stem augers

Depth Scale (m)	Elev / Depth (m)	Description	Sample Number	Type	SPT 'N' Value	Elevation Scale (m)	Headspace Vapour (ppm)	GR	SA	SI	CL
0	301.4	**GROUND SURFACE**									
		110mm **ASPHALT**	1	AS			PID: 0				
	301.2 / 0.2	140mm **GRANULAR BASE**, SAND & GRAVEL, some silt, brown, crushed				301					
	300.8 / 0.6	330mm **GRANULAR SUBBASE**, SILTY SAND & GRAVEL, brown									
1		**FILL**, gravelly sandy silt, trace topsoil, trace asphalt, compact, brown, moist	2	SS	24	300	PID: 0				
			3	SS	13		PID: 0				
2	299.2 / 2.2	**SANDY SILT**, trace gravel, trace clay, very dense, brown, moist	4	SS	50 / 100mm	299	PID: 0	2	22	74	2
3	298.3 / 3.1		5	SS	50 / 50mm		PID: 0				

END OF BOREHOLE

Borehole was dry and open upon completion of drilling.



Instrument Details | Unstabilized Water Level | Lab Data and Comments: GRAIN SIZE DISTRIBUTION (%) (MIT)

file: 02311345.000.gpj

LOG OF BOREHOLE 6-24

Project No. : 02311345.000	Client : Municipality of South Bruce	Originated by : BT
Date started : February 22, 2024	Project : New Elevated Water Storage Tower and Watermain	Compiled by :
Sheet No. : 1 of 1	Location : Teeswater, Ontario	Checked by : MS

Position : E: 477071, N: 4871981 (UTM 17T) Elevation Datum : Geodetic

Rig type : DSDT, truck-mounted Drilling Method : Hollow stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value	Elevation Scale (m)	Penetration Test Values (Blows / 0.3m) / Undrained Shear Strength (kPa)	Moisture / Plasticity	Headspace Vapour (ppm)	Instrument Details	Unstabilized Water Level	Lab Data and Comments
	292.8	**GROUND SURFACE**											
0		**FILL**, sandy topsoil and gravel, brown, moist											
		...loose		1	SS	6	292			PID: 0			
1		...silty topsoil, some gravel		2	SS	4	291			PID: 0			
2	290.6												
	2.2	**GRAVELLY SILT**, some sand, compact, brown, moist		3	SS	22				PID: 0			
3	289.8						290						
	3.0	**SILTY SANDY GRAVEL**, trace clay, dense, brown, moist		4	SS	33							48 25 26 1
	289.1												
	3.7	**END OF BOREHOLE**											

Penetration Test Values (Blows / 0.3m): Dynamic Cone; 10 20 30 40

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane; 40 80 120 160

Moisture / Plasticity: Plastic Limit, Natural Water Content, Liquid Limit; PL MC LL; 10 20 30

Lab Data and Comments: GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

Borehole was dry and open upon completion of drilling.

file: 02311345.000.gpj

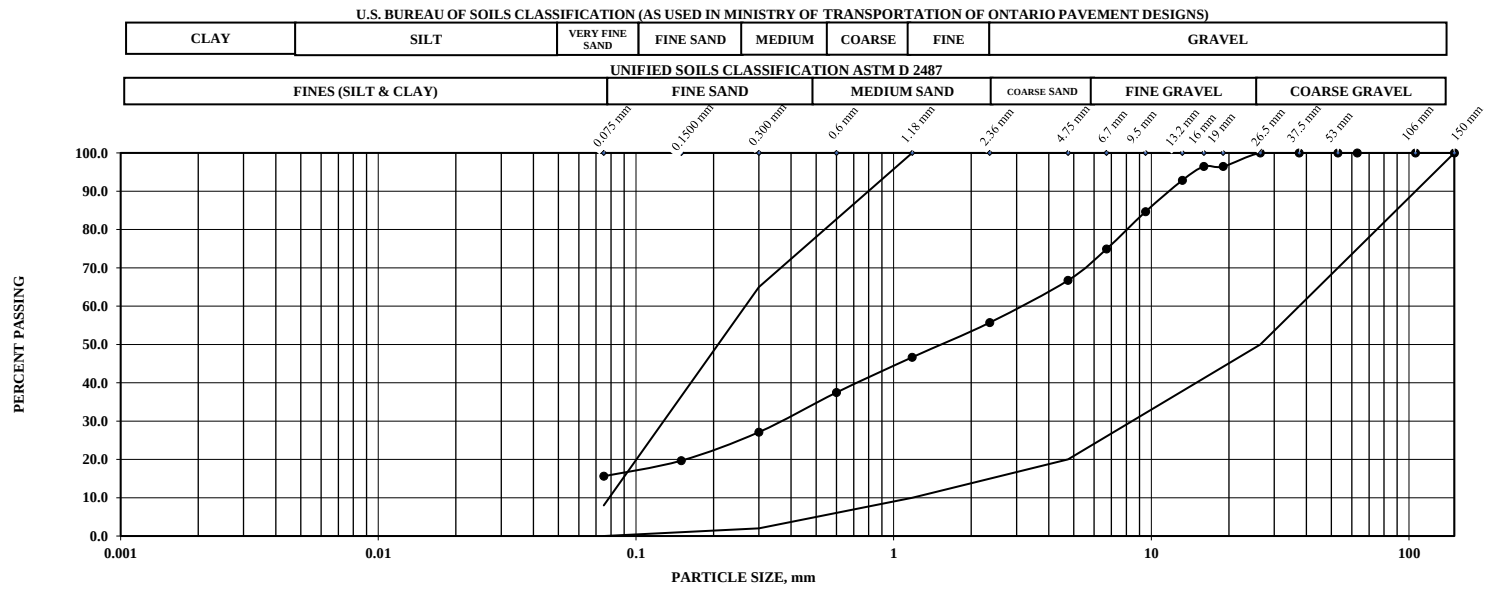
Appendix E
Laboratory Test Results

ENGLOBE

SIEVE ANALYSIS OF AGGREGATES
LS-602

Project Number:	**2311345**	Project Name:	**New Water Tower and Watermain, Teeswater, ON**	Client:	**BM Ross and Associated Ltd.**
ROS:	**9983**	Sample ID:	**Borehole 4-24 - Sample 1**	Depth:	**0.0 - 0.46m**
Sampled By:	**Englobe**	Date Received:	**February 28, 2024**	Date Completed:	**March 18, 2024**
File Number:	**04.02311345.000.MT-GR-001-00**			Englobe Laboratory:	**Kitchener**

PARTICLE SIZE DISTRIBUTION, MTO LS-602



Coefficients									
D60	**3.291**	D30	**0.383**	D10		Cc		Cu	

Sieve Analysis	
Sieve Size, mm	% Passing
150	**100.0**
106	**100.0**
53	**100.0**
37.5	**100.0**
26.5	**100.0**
19	**96.5**
16	**96.5**
13.2	**92.9**
9.5	**84.7**
6.7	**74.9**
4.75	**66.7**
2.36	**55.7**
1.18	**46.7**
0.6	**37.5**
0.3	**27.1**
0.15	**19.7**
0.075	**15.6**

Gran Size Porportions, %			
% Gravel (> 4.75 mm):	**33.3**	% Coarse Aggregate	**33.3**
% Sand (75 µm to 4.75 mm):	**51.1**	% Fine Aggregate	**66.7**
% Silt (2 µm to 75 µm):	**15.6**		
Group Symbol / Soil Description		**Gravelly SAND, some Silt**	

Remarks

Figure: 1

TESTED BY: Yuwei Gu
Laboratory Technician

Reviewed By: David McBay, CET. -Laboratory Supervisor

Date: March 25, 2024

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of test results is provided only on written request.

GRAIN SIZE AND HYDROMETER ANALYSIS REPORT

LS-602, 702 & 703/704

Project Number:	**2311345**	Project Name:	**New Water Tower and Watermain, Teeswater, ON**	Client:	**BM Ross and Associated Ltd.**
ROS:	**9984**	Sample ID:	**Borehole 1-24 - Sample 4**	Sample Depth:	**2.29 - 2.74m**
Sampled By:	**Englobe**	Date Received:	**February 28, 2024**	Date Completed:	**March 18, 2024**
File Number:	**04-02311345.000.MT-SH-001-00**			Englobe Laboratory	**Kitchener**

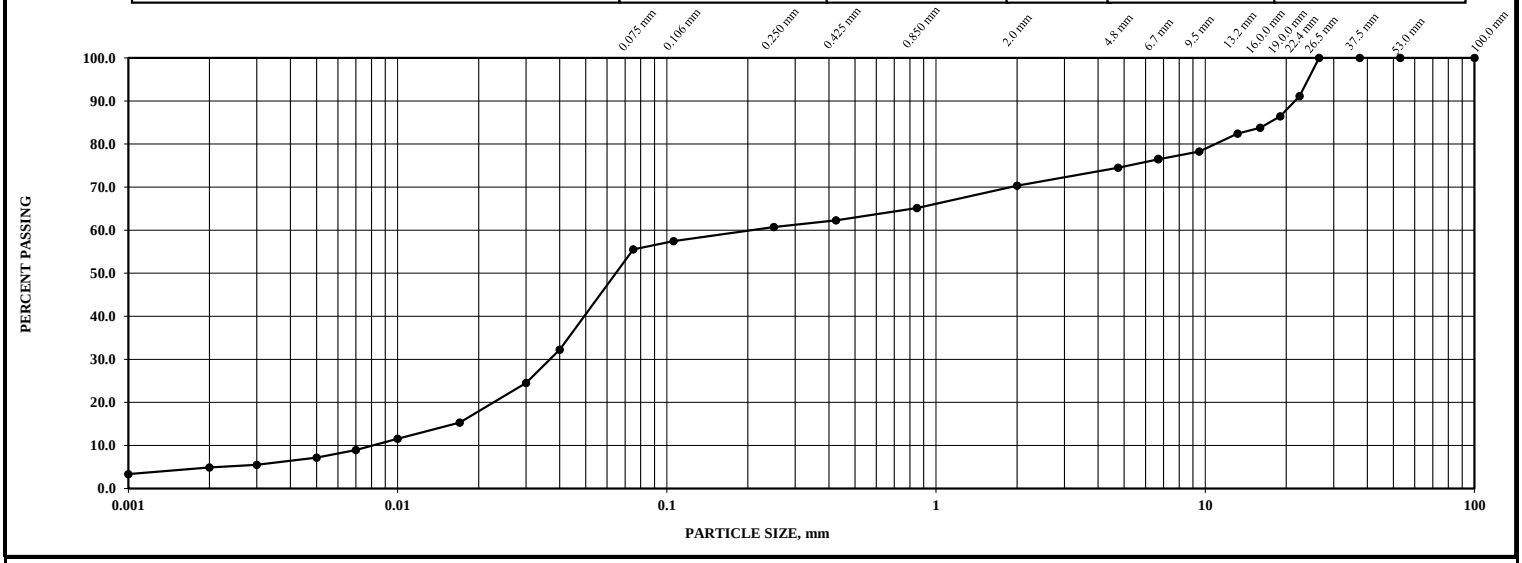
PARTICLE SIZE DISTRIBUTION, MTO LS-702

U.S. BUREAU OF SOILS CLASSIFICATION (AS USED IN MINISTRY OF TRANSPORTATION OF ONTARIO PAVEMENT DESIGNS)

CLAY	SILT	VERY FINE SAND	FINE SAND	MEDIUM SAND	COARSE SAND	FINE GRAVEL	GRAVEL

UNIFIED SOILS CLASSIFICATION ASTM D 2487

FINES (SILT & CLAY)	FINE SAND	MEDIUM SAND	COARSE SAND	FINE GRAVEL	COARSE GRAVEL



Coefficients

D60	**0.219**	D30	**0.037**	D10	**0.008**	Cc	**0.764**	Cu	**26.58**

Sieve Analysis		Hydrometer Analysis	
Sieve Size, mm	% Passing	Diameter, mm	% Passing
53	**100.0**	0.040	**32.2**
37.5	**100.0**	0.030	**24.5**
26.5	**100.0**	0.017	**15.3**
22.4	**91.1**	0.010	**11.5**
19	**86.4**	0.007	**8.9**
16	**83.8**	0.005	**7.2**
13.2	**82.4**	0.002	**4.9**
9.5	**78.2**	0.001	**3.4**
6.7	**76.5**	Atterberg Limits	
4.75	**74.5**		
2.00	**70.3**	Liquid Limit	
0.850	**65.1**		
0.425	**62.3**	Plastic Limit	
0.250	**60.7**		
0.106	**57.4**	Plastic Index	
0.075	**55.5**		

GRAIN SIZE PROPORTIONS, %	
% Gravel (> 4.75 mm):	**25.5**
% Sand (75 µm to 4.75 mm):	**19.0**
% Silt (2 µm to 75 µm):	**50.6**
% Clay (<2 µm):	**4.9**

Group Symbol / Soil Description		**Gravelly SILT, some Sand, trace Clay**

Remarks

Figure: 2

Tested By: Yuwei Gu
Laboratory Technician

Reviewed By: David McBay, CET.-Laboratory Supervisor

Date: 2024-03-25

GRAIN SIZE AND HYDROMETER ANALYSIS REPORT

LS-602, 702 & 703/704

Project Number:	**2311345**	Project Name:	**New Water Tower and Watermain, Teeswater, ON**	Client:	**BM Ross and Associated Ltd.**
ROS:	**9985**	Sample ID:	**Borehole 3-24 - Sample 2**	Sample Depth:	**1.53 - 1.98m**
Sampled By:	**Englobe**	Date Received:	**February 28, 2024**	Date Completed:	**March 18, 2024**
File Number:	**04-02311345.000.MT-SH-002-00**			Englobe Laboratory	**Kitchener**

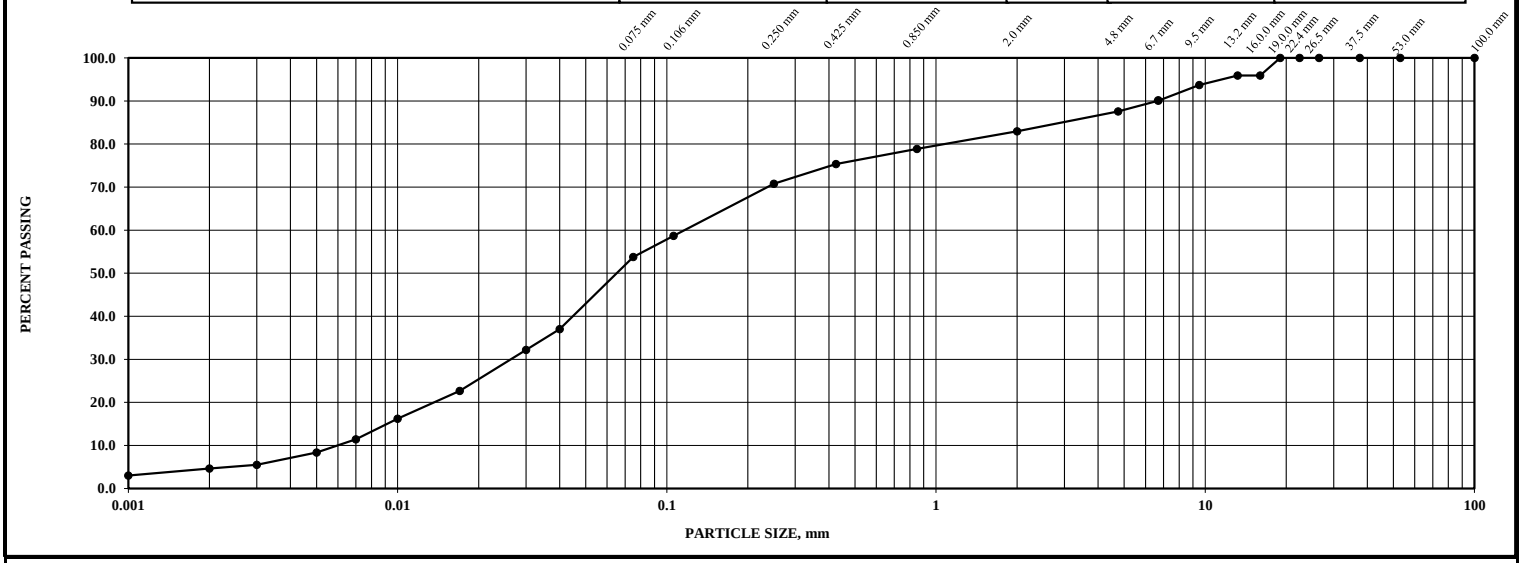
PARTICLE SIZE DISTRIBUTION, MTO LS-702

U.S. BUREAU OF SOILS CLASSIFICATION (AS USED IN MINISTRY OF TRANSPORTATION OF ONTARIO PAVEMENT DESIGNS)

CLAY	SILT	VERY FINE SAND	FINE SAND	MEDIUM SAND	COARSE SAND	FINE GRAVEL	GRAVEL

UNIFIED SOILS CLASSIFICATION ASTM D 2487

FINES (SILT & CLAY)	FINE SAND	MEDIUM SAND	COARSE SAND	FINE GRAVEL	COARSE GRAVEL



Coefficients

D60	**0.122**	D30	**0.027**	D10	**0.006**	Cc	**0.988**	Cu	**20.05**

Sieve Analysis		Hydrometer Analysis	
Sieve Size, mm	% Passing	Diameter, mm	% Passing
53	**100.0**	0.040	**37.0**
37.5	**100.0**	0.030	**32.2**
26.5	**100.0**	0.017	**22.7**
22.4	**100.0**	0.010	**16.2**
19	**100.0**	0.007	**11.4**
16	**95.9**	0.005	**8.4**
13.2	**95.9**	0.002	**4.7**
9.5	**93.7**	0.001	**3.0**
6.7	**90.1**	Atterberg Limits	
4.75	**87.6**		
2.00	**82.9**	Liquid Limit	
0.850	**78.9**		
0.425	**75.4**	Plastic Limit	
0.250	**70.8**		
0.106	**58.7**	Plastic Index	
0.075	**53.8**		

GRAIN SIZE PROPORTIONS, %	
% Gravel (> 4.75 mm):	**12.4**
% Sand (75 µm to 4.75 mm):	**33.8**
% Silt (2 µm to 75 µm):	**49.1**
% Clay (<2 µm):	**4.7**

Group Symbol / Soil Description		**Sandy SILT, some Gravel, trace Clay**

Remarks

Figure: 3

Tested By: Yuwei Gu
Laboratory Technician

Reviewed By:
David McBay, CET.-Laboratory Supervisor

Date: 2024-03-25

GRAIN SIZE AND HYDROMETER ANALYSIS REPORT

LS-602, 702 & 703/704

Project Number:	**2311345**	Project Name:	**New Water Tower and Watermain, Teeswater, ON**	Client:	**BM Ross and Associated Ltd.**
ROS:	**9986**	Sample ID:	**Borehole 5-24 - Sample 4**	Sample Depth:	**2.29 - 2.74m**
Sampled By:	**Englobe**	Date Received:	**February 28, 2024**	Date Completed:	**March 18, 2024**
File Number:	**04-02311345.000.MT-SH-003-00**			Englobe Laboratory	**Kitchener**

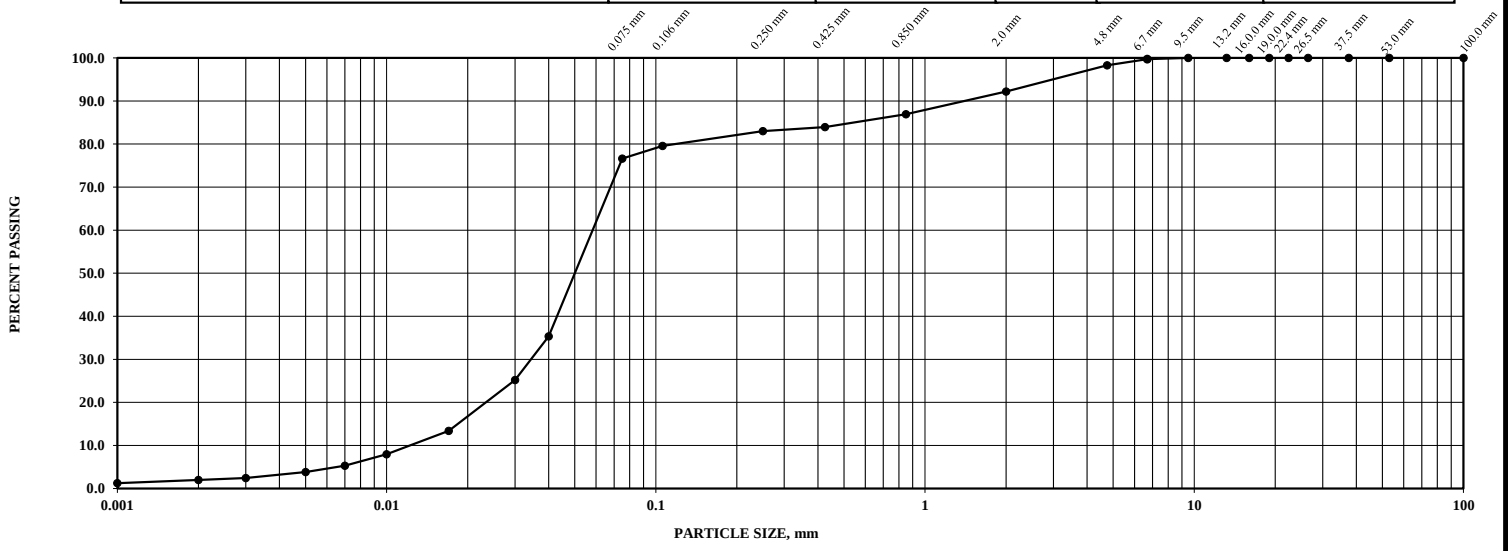
PARTICLE SIZE DISTRIBUTION, MTO LS-702

U.S. BUREAU OF SOILS CLASSIFICATION (AS USED IN MINISTRY OF TRANSPORTATION OF ONTARIO PAVEMENT DESIGNS)

CLAY	SILT	VERY FINE SAND	FINE SAND	MEDIUM SAND	COARSE SAND	FINE GRAVEL	GRAVEL

UNIFIED SOILS CLASSIFICATION ASTM D 2487

FINES (SILT & CLAY)	FINE SAND	MEDIUM SAND	COARSE SAND	FINE GRAVEL	COARSE GRAVEL



Coefficients									
D60	**0.061**	D30	**0.035**	D10	**0.013**	Cc	**1.569**	Cu	**4.82**

Sieve Analysis		Hydrometer Analysis	
Sieve Size, mm	% Passing	Diameter, mm	% Passing
53	**100.0**	0.040	**35.3**
37.5	**100.0**	0.030	**25.2**
26.5	**100.0**	0.017	**13.4**
22.4	**100.0**	0.010	**8.0**
19	**100.0**	0.007	**5.3**
16	**100.0**	0.005	**3.8**
13.2	**100.0**	0.002	**2.0**
9.5	**100.0**	0.001	**1.2**
6.7	**99.7**	Atterberg Limits	
4.75	**98.3**		
2.00	**92.2**	Liquid Limit	
0.850	**86.9**		
0.425	**83.9**	Plastic Limit	
0.250	**83.0**		
0.106	**79.6**	Plastic Index	
0.075	**76.6**		

GRAIN SIZE PROPORTIONS, %	
% Gravel (> 4.75 mm):	**1.7**
% Sand (75 µm to 4.75 mm):	**21.7**
% Silt (2 µm to 75 µm):	**74.6**
% Clay (<2 µm):	**2.0**

Group Symbol / Soil Description		**Sandy SILT, traces of Gravel and Clay**

Remarks

Figure: 4

Tested By: Yuwei Gu
Laboratory Technician

Reviewed By:
David McBay, CET.-Laboratory Supervisor

Date: 2024-03-25

GRAIN SIZE AND HYDROMETER ANALYSIS REPORT

LS-602, 702 & 703/704

Project Number:	**2311345**	Project Name:	**New Water Tower and Watermain, Teeswater, ON**	Client:	**BM Ross and Associated Ltd.**
ROS:	**9987**	Sample ID:	**Borehole 6-24 - Sample 4**	Sample Depth:	**3.05 - 3.51m**
Sampled By:	**Englobe**	Date Received:	**February 28, 2024**	Date Completed:	**March 18, 2024**
File Number:	**04-02311345.000.MT-SH-004-00**			Englobe Laboratory	**Kitchener**

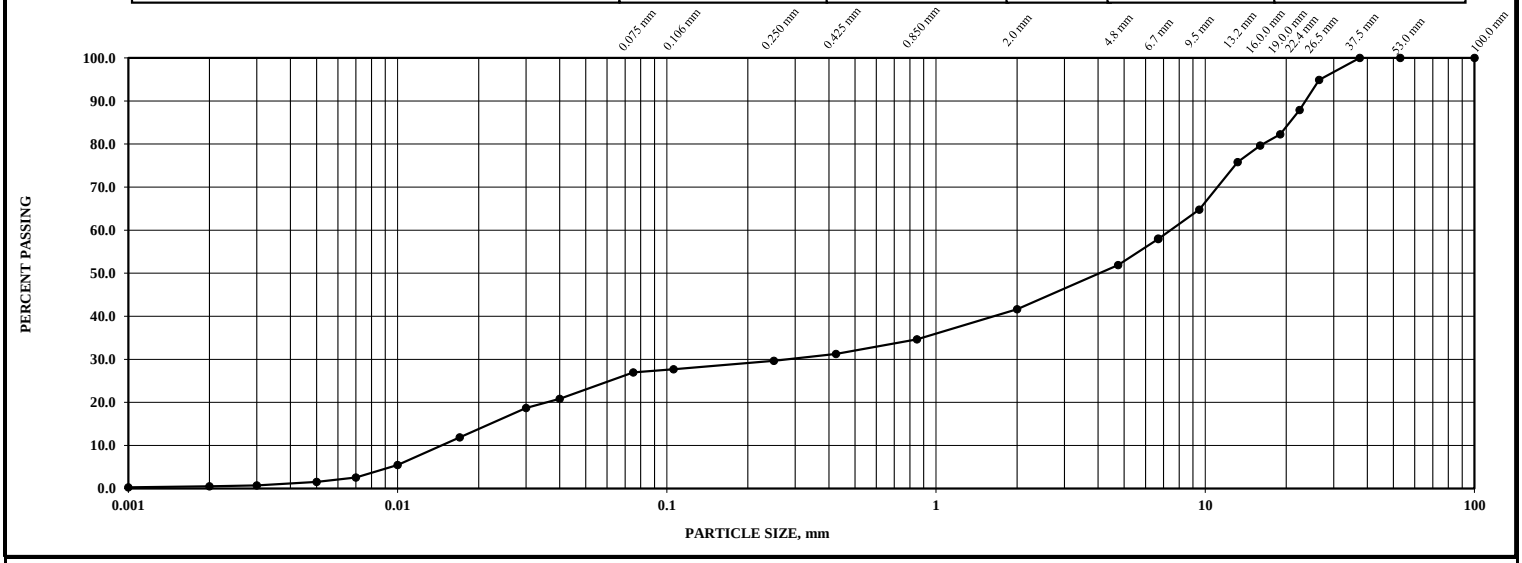
PARTICLE SIZE DISTRIBUTION, MTO LS-702

U.S. BUREAU OF SOILS CLASSIFICATION (AS USED IN MINISTRY OF TRANSPORTATION OF ONTARIO PAVEMENT DESIGNS)

CLAY	SILT	VERY FINE SAND	FINE SAND	MEDIUM SAND	COARSE SAND	FINE GRAVEL	GRAVEL

UNIFIED SOILS CLASSIFICATION ASTM D 2487

FINES (SILT & CLAY)	FINE SAND	MEDIUM SAND	COARSE SAND	FINE GRAVEL	COARSE GRAVEL



Coefficients									
D60	**3.593**	D30	**0.286**	D10	**0.015**	Cc	**1.522**	Cu	**240.15**

Sieve Analysis		Hydrometer Analysis	
Sieve Size, mm	% Passing	Diameter, mm	% Passing
53	**100.0**	0.040	**20.8**
37.5	**100.0**	0.030	**18.7**
26.5	**94.9**	0.017	**11.9**
22.4	**87.9**	0.010	**5.5**
19	**82.2**	0.007	**2.6**
16	**79.6**	0.005	**1.6**
13.2	**75.8**	0.002	**0.5**
9.5	**64.8**	0.001	**0.3**
6.7	**58.0**	Atterberg Limits	
4.75	**51.9**		
2.00	**41.7**	Liquid Limit	
0.850	**34.6**		
0.425	**31.3**	Plastic Limit	
0.250	**29.7**		
0.106	**27.7**	Plastic Index	
0.075	**26.9**		

GRAIN SIZE PROPORTIONS, %	
% Gravel (> 4.75 mm):	**48.1**
% Sand (75 µm to 4.75 mm):	**25.0**
% Silt (2 µm to 75 µm):	**26.4**
% Clay (<2 µm):	**0.5**

Group Symbol / Soil Description		**Silty Sandy GRAVEL, trace Clay**

Remarks

Figure: 5

Tested By: Yuwei Gu
Laboratory Technician

Reviewed By: David McBay, CET.-Laboratory Supervisor

Date: 2024-03-25

englobecorp.com

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since 1974

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P. O. Box 299
Clinton, Ontario
N0M 1L0

Wilson Associates

Consulting Hydrogeologists

January 5, 2023

Mr. Andrew Garland, P. Eng.
B. M. Ross and Associates Limited
Engineers and Planners
62 North Street
Goderich, ON
N7A 2T4

Dear Mr. Garland:

Re: Exploratory Subsurface Assessment - Teeswater Fairgrounds Area
Proposed Teeswater Water Supply Well and Storage
Municipality of South Bruce

Further to our on-going discussions, the site meeting of September 27, 2022, and Municipal authorization of October 6, 2022, in support of a preliminary risk evaluation of the Fairgrounds area for development of a water supply well and storage, an exploratory drilling program was completed at the Teeswater Fairgrounds area on November 28, 2022. The drilling program was designed as follows:

- Complete exploratory test hole(s) in the area of the suspected former landfill in the northeastern part of the fairgrounds, to confirm if there is in fact waste present, depth of overburden in that area, etc...
- Complete monitoring well(s) to the north/northwest (i.e. downgradient) of the suspected former landfill in the northeastern part of the fairgrounds.
- Complete an exploratory test hole in the vicinity of the currently preferred location of a potential test well in the southern part of the fairgrounds, to confirm overburden conditions.

The attached diagram shows the location of the Teeswater fairgrounds, as well as the locations of the November 28, 2022 test holes and monitoring wells. All drilling was completed after receipt of up-to-date utility locates at the staked drilling sites.

SITE SETTING, GEOLOGY AND HYDROGEOLOGY

The Teeswater fairgrounds is located on a ±13.5ha parcel within the eastern periphery of the community of Teeswater, generally east of Clarinda Street South, north of Gordon Street East, south of the base of south slope of the Teeswater River valley, and west of the west slope of the Muskrat Creek valley. The fairgrounds currently contains the community arena in the west, the curling club in the south, the racetrack, baseball diamonds and paddock in the centre, and various dormant agricultural buildings in the east. According to historical information (municipal knowledge, aerial photography), a suspected former landfill may be located in the northeast part of the fairgrounds.

Lands surrounding the fairgrounds are developed as residential properties to the west, a mix of residential and commercial properties to the southwest, the Teeswater River valley to the north, the Muskrat Creek valley to the east, and agricultural lands further to the southeast and east.

The majority of the fairgrounds property is relatively flat, with a slight slope of about 2m to the northeast and east. A 5m to 6m high knoll is located at the southwest corner of the fairgrounds. The steep-sided south slope of the Teeswater River valley situated along the north side of the fairgrounds drops about 10m below the fairgrounds lands, with the River valley deepening a further 5m at the River. The steep-sided west slope of the Muskrat Creek valley along the east side of the fairgrounds also drops about 10m below the fairgrounds lands.

The floor of the ±15m deep Teeswater River valley to the north is relatively flat, and the width of the River valley (south to north) is about 100m. The floor of the ±10m deep Muskrat Creek valley to the east is locally relatively flat, and is about 50m wide.

Teeswater is located within the Teeswater Drumlin Field physiographic region of southern Ontario. According to Ontario Geological Survey Maps P.2956 "Quaternary Geology of the Walkerton-Kincardine Area" and P.2957 "Quaternary Geology of the Wingham-Lucknow Area", the upper soils over most of the uplands in the north part of the fairgrounds area consists of glaciofluvial outwash gravel and gravelly sand. Within the southern part of the fairgrounds area, the upper soils are indicated to consist of Elma Till, a sandy silt to silt glacial till.

According to the Ontario Department of Mines Map P.296 "Bedrock Topography of the Lucknow-Wingham Sheet", the bedrock surface beneath the fairgrounds slopes in a northwesterly direction from about 297m above sea level (masl) in the southeast to about 290m above sea level in the northwest. Based on an approximate land surface elevation of 306masl across the majority of the fairgrounds area, Map P.296 suggests that the overburden would be in the range of 9m deep in the southeast to 16m deep in the northwest. Based on the above, the surface of the bedrock aquifer is likely exposed in the Teeswater River valley and the Muskrat Creek valley.

The bedrock beneath the site consists of limestone, dolostone and shale of the Detroit River Group.

Due to the thin, mainly fine-grained overburden in the area, the bedrock is the primary water supply aquifer. The existing Teeswater municipal well, situated to the northwest of the fairgrounds in the Teeswater River valley, is completed to a depth of about 85m in the bedrock aquifer. An unrecorded industrial well of similar depth to the existing municipal well is known to be located nearby to the north of the existing municipal well. Both of these wells are known to flow above grade, with the Teeswater municipal well reported to flow without use of a well pump into the municipal system. Based on historical file information, the piezometric surface of the bedrock aquifer is estimated to be 9m to 10m above grade at the Teeswater municipal well and the nearby industrial well, which corresponds approximately to 5m below current grade over most of the fairgrounds area.

According to the Ministry of the Environment, Conservation and Parks (MECP) water well records database, other than the existing Teeswater municipal well to the northwest (about 500m to the northwest of the fairgrounds' northwest corner), there are no records of wells within 500m of the fairgrounds. The MECP water well record summary for the Teeswater municipal well (Well No. 1408942) is attached for reference.

According to Source Water Protection mapping provided by the on-line Bruce County Maps, the Well Head Protection Area (WHPA) for the existing Teeswater municipal well to the northwest extends in an east-southeasterly direction from the well, and is mapped to be about 350m wide at the fairgrounds. The existing WHPA covers approximately the northeastern ½ of the fairgrounds area, but is north of the potential test well in the southern part of the fairgrounds.

BOREHOLES

On November 28, 2022 six exploratory boreholes (BH1 to BH6) were completed within the southern and northeastern portions of the fairgrounds using a power auger machine equipped with continuous flight augers. The locations of the borehole sites are shown on Figure 1. Two of the boreholes (BH5 and BH6) were equipped as monitoring wells, each completed using a 5.1cm diameter, flush-threaded PVC pipe equipped with a 1.52m length of #10-slot PVC well screen.

Visual logs of the boreholes/monitoring wells are attached. Copies of the water well records issued by the drilling contractor for the two monitoring well installations are attached.

BH1 was located in the southern portion of the fairgrounds, south of the grandstands, near a potential test well site. BH1 encountered a sequence of native silts and fine sands overlying glacial till, before encountering the bedrock surface at a depth of 5.8m below grade (approximate elevation 300masl). It should be noted that a significant odour of old petroleum hydrocarbon (diesel-like) was detected in the overburden at BH1 between 1.2m and 4.0m below grade, however no soil staining or free product was observed in the borehole. As the project scope and the utility locate area did not anticipate assessment of potential petroleum hydrocarbon impacts, no confirmatory soil sampling or further drilling was undertaken in this area. Supplementary exploratory boreholes with planned soil sampling for laboratory analysis are required, if further assessment of petroleum hydrocarbon impacts is undertaken in the vicinity of BH1.

BH2 was located in the eastern portion of the fairgrounds, immediately east of the current paddock within the racetrack area. BH2 was completed in this area due to land disturbance indicated by historical aerial photographs provided by the on-line Bruce County Maps. BH2 encountered upwards of 2.4m of coarse-grained deposits, which may be partially fill-derived, overlying a sequence of fine-grained and fine sand deposits. No evidence of contamination or landfill waste was observed at BH2.

BH3 and BH4 were located immediately north of the northeastern-most agricultural building on the fairgrounds, in the vicinity of the suspected former landfill area. Both BH3 and BH4 encountered 4.0m of fill materials, which consisted mainly of various imported soils with some inert construction materials (bricks, glass, metals, etc...) at depth. As in BH1, an odour of old petroleum hydrocarbon (diesel-like) was encountered between 0.9m and 2.1m below grade.

BH5 was located at the top of the steep-sided south slope of the Teeswater River valley, north of BH3 and BH4 and the suspected former landfill area. BH5 encounterer a greater depth of fill materials (7.3m) than BH3 and BH4, with the fill at BH5 also consisting of various imported soils with some inert construction materials (bricks, glass, metals, etc...) at depth. It should be noted that significant solvent odour (paint thinner-like) was detected at the base of fill materials at BH5 between 6.1m and 7.3m below grade, however no soil staining or free product was observed in the borehole. As the project scope and the utility locate area did not anticipate further assessment of potential solvent impacts, no confirmatory soil sampling or further drilling was undertaken in this area. Supplementary exploratory boreholes with planned soil sampling for laboratory analysis are required, if further assessment of solvent impacts is undertaken in the vicinity of BH5.

BH6 was located at the top of the steep-sided south slope of the Teeswater River valley, northwest of BH3 and BH4 and the suspected former landfill area. BH6 encounterer a similar depth of fill materials (3.4m) to BH3 and BH4, however the fill materials appeared to consist only of imported soils. No evidence of contamination or landfill waste was observed at BH6.

WATERTABLE

No emergent groundwater was encountered in the overburden in any of the six boreholes completed on November 28, 2022. Some groundwater was observed at the base of BH1, after drilling 2m into the bedrock.

Monitoring wells were installed in MW5 and MW6 to determine stabilized overburden groundwater impacts from the suspected former landfill generally upgradient (south and southeast) of these boreholes. On December 13, 2022, both monitoring wells were observed to be dry to the bedrock surface.

OPINION

The intent of the November 2022 exploratory drilling program was to assess preliminary aquifer security risk of a potential test well location in the southern portion of the fairgrounds area, the assessment to be based upon depth of overburden in the vicinity of the potential well, subsurface conditions in the vicinity of a suspected former landfill in the northeastern portion of the fairgrounds, and potential overburden groundwater contamination in the vicinity of the suspected former landfill. The following issues have been identified by the assessment:

- The depth of overburden in the vicinity of the of the currently preferred location of a potential test well in the southern part of the fairgrounds (near BH1) is 5.8m, less than predicted by the above readily-available background information. Much of the thin overburden consisted of moderately permeable deposits (i.e. silts and fine sand) with

some nearby high-permeability deposits (i.e. sand and gravel), rather than preferred low-permeability deposits. This depth of overburden atop the bedrock aquifer is well below the basic aquifer isolation criteria of Section 2 of Ontario Regulation 170 (i.e. 15m) and the low-permeability environment criteria of Section 22.5.14 of the MECP Design Guidelines for Sewage Works (i.e. 10m of deposits with a vertical hydraulic conductivity of 10^{-5}cm/sec or less). The depth of overburden deepened slightly to about 8m in the northeast.

- As exposed bedrock is likely in the Muskrat Creek valley about 350m upgradient (east-southeast) of the potential test well site, and as the overburden is thin throughout the fairgrounds, there is a high likelihood that a well completed in the southern part of the fairgrounds will be considered to be a source under the direct influence of surface water.

- Indications of overburden petroleum hydrocarbon impacts were encountered at BH1, in the vicinity of the of the currently preferred location of a potential test well. If the site remains in consideration for a new test well, as a minimum, subsurface conditions of the area in the vicinity of BH1 should be further characterized through an expanded assessment, including confirmation of chemical soil quality in the overburden and confirmation of groundwater quality in the upper bedrock through deeper cored installation of monitoring wells in the bedrock.

- Based on file information suggesting a bedrock aquifer piezometric surface at the Teeswater municipal well in the range of 9m to 10m above grade, the static water level in a bedrock well completed in the southern portion of the fairgrounds will be approximately 5m below current grade. As such, the flowing condition at the existing municipal well which helps prevent the movement of contaminants into the aquifer in the exposed bedrock setting of the Teeswater River valley will not be present beneath the fairgrounds.

- The presence of a significant depth of imported soils containing construction waste, but also indications of possible solvent impacts in the overburden, was confirmed at the suspected former landfill site within the northeast corner of the fairgrounds. The former landfill site is located within the central portion of the WHPA for the existing Teeswater municipal well, however the chemical analytical results reported by the on-line 2020 Annual Report for the municipal well (attached) indicates no detectable volatile organic compound parameters in the water from the existing well. To assess risk of the former landfill site to the existing Teeswater municipal well, it is recommended that the municipality undertake analysis of chemical soil quality in the overburden and groundwater quality in the upper bedrock, in particular for Volatile Organic Compounds.

- Assuming that the WHPA of a future test well in the southern part of the fairgrounds is of similar width and orientation to the existing WHPA of the Teeswater municipal well (i.e. 350m, in an east-southeast) direction, the former landfill site may be beyond the capture zone of a new well in the southern part of the fairgrounds.

In summary, the exploratory subsurface assessment of selected areas of the Teeswater fairgrounds has identified a thin, moderately permeable overburden, probable overburden petroleum hydrocarbon impacts in the vicinity of a potential test well site in the southern portion of the fairgrounds, confirmed the presence of deep imported fill soils and waste in the northeast, and identified probable overburden solvent impacts in the northeast. Additional study of overburden and bedrock conditions is recommended if the southern test well site remains in consideration. It is recommended that the risk of solvent impacts of the former landfill to the existing Teeswater well be further assessed.

Should there be any questions regarding the above information, please feel free to contact this office.

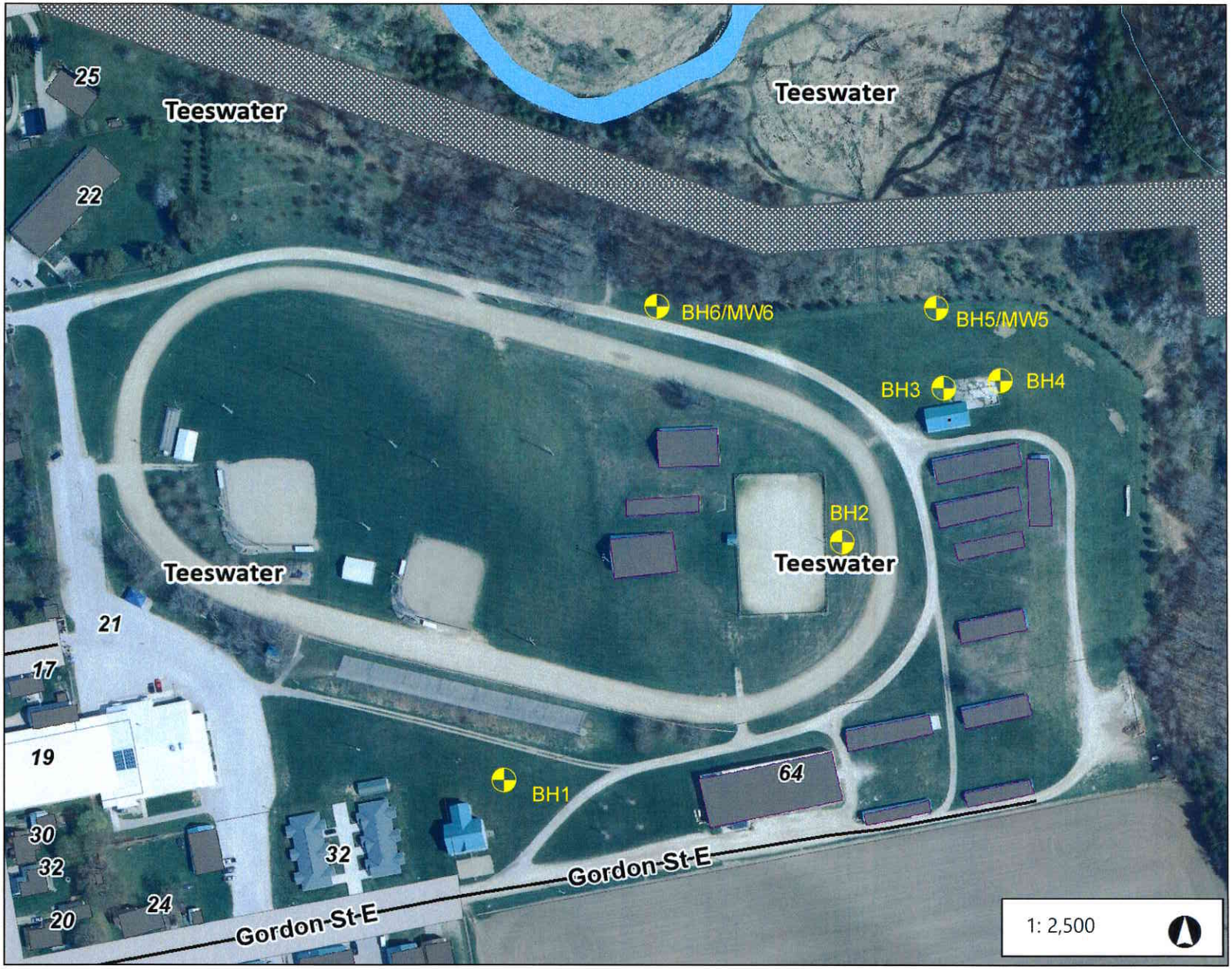
Yours sincerely,
IAN D. WILSON ASSOCIATES LIMITED

Geoffrey Rether, B.Sc., P.Geo.

County of Bruce

Teeswater Fairgrounds

APPROXIMATE LOCATIONS OF EXPLORATORY BOREHOLES



Legend

- Ferry
- Provincial Highway
- County Road
  - County Road
  - Bridge reconstruction
- Municipal or Other Road
  - Municipal or Other Road
  - Bridge Detrou
- OBM Building Location
- OBM Building Footprint
- Building Footprint
- Body of Water
- Evaluated Wetland
- Watercourse
  - Permanent Stream
  - Intermittent Stream
- Road Allowance and Right-of-Wa
  - Private Road Allowance
  - Right-of-Way
  - Road Allowance or Condo Road
  - Unopened Road Allowance
- Wetland
- Body of Water
- Stream
- Built-up area
- Adjacent Counties
- Lake Huron and Georgian Bay

0.1 0 0.06 0.1 Kilometers

NAD_1983_UTM_Zone_17N

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Notes

FIGURE 1

SCALE: as shown

VISUAL BOREHOLE LOGS **Completed November 28, 2022**

BOREHOLE	DEPTH (m)	MATERIALS
BH1	0 - 0.3	dark brown TOPSOIL
	0.3 - 1.2	brown, compact, dry gravelly SILT with some fine sand
	1.2 - 2.1	brown, compact, dry SILT with traces of fine sand
	2.1 - 4.5	light brown, lightly compact, dry fine SAND with some silt
	4.5 - 5.8	grey-brown, very compact, dry sandy SILT till
	5.8 - 7.8	light brown weathered LIMESTONE, wet below 7.6m

- Significant odour of old petroleum hydrocarbons (diesel?) in overburden between 1.2m and 4.0m. No stained soils or free product observed.
- Borehole backfilled with bentonite

BH2	0 - 0.2	dark brown TOPSOIL (possible fill)
	0.2 - 2.4	brown, loose, dry stony SAND and GRAVEL (possibly partial fill)
	2.4 - 4.0	brown, compact, dry sandy SILT till, stony
	4.0 - 4.6	brown, lightly compact, dry fine SAND with some silt

- No evidence of contaminants or landfill waste
- Borehole backfilled with bentonite

BH3	0 - 0.2	FILL - dark brown topsoil
	0.2 - 0.9	FILL - brown, loose, dry sand and gravel
	0.9 - 2.1	FILL - sand and gravel mixed with minor topsoil
	2.1 - 4.0	FILL - mixture of silt, sand and gravel and topsoil, some construction debris
	4.0 - 4.6	brown, compact, dry silty SAND till

- Minor odour of old petroleum hydrocarbons (diesel?) in fill between 0.9m and 2.1m.
- Some landfill waste observed in fill between 2.1m and 4.0m, mainly inert bricks, glass, metals
- Borehole backfilled with bentonite

VISUAL BOREHOLE LOGS **Completed November 28, 2022**

BOREHOLE	DEPTH (m)	MATERIALS
BH4	0 - 0.2	FILL - dark brown topsoil
	0.2 - 0.6	FILL - brown, loose, dry sand and gravel
	0.6 - 1.2	FILL - brown sandy silt till
	1.2 - 4.0	FILL - mixture of sand and gravel and topsoil, minor construction debris
	4.0 - 4.6	brown, compact, dry silty SAND till

- Minor landfill waste observed between 1.2m and 4.0m, mainly inert bricks, glass, metals
- Borehole backfilled with bentonite

BH5/MW5	0 - 0.2	FILL - dark brown topsoil
	0.2 - 0.9	FILL - brown, loose, dry stony sand and gravel
	0.9 - 1.2	FILL - brown, compact, dry gravelly sandy silt till
	1.2 - 1.4	FILL - dark brown topsoil
	1.4 - 7.3	FILL - mixture of topsoil and silty sand till, minor construction debris
	7.3 - 8.7	brown, compact, dry sandy silt till
	8.7 - 9.1	light brown weathered LIMESTONE, dry

- Significant solvent odour between 6.1m and 7.3m. No stained soils or free product observed.
- Minor landfill waste observed between 1.4m and 7.3m, mainly inert bricks, glass, metals.
- 5cm diameter PVC monitoring well installed with 1.5m length of #10 PVC well screen set 8.2m to 9.1m. Imported sand pack set 7.0m to 9.1m. Bentonite seal set 0.3m to 7.0m. Concrete and locking steel casing at surface.
- Monitoring well dry to 9.1m below grade December 13, 2022.

VISUAL BOREHOLE LOGS **Completed November 28, 2022**

BOREHOLE	DEPTH (m)	MATERIALS
BH6/MW6	0 - 0.3	FILL - dark brown topsoil
	0.3 - 1.2	FILL - brown, loose, dry stony sandy silt till
	1.2 - 3.4	FILL - mixture of topsoil, stones and sandy silt till
	3.4 - 5.2	brown, compact, dry sandy SILT till, stony
	5.2 - 7.9	grey-brown, very compact, dry silty SAND till, stony
	7.9	bedrock refusal

- No landfill waste observed in fill soils.
- 5cm diameter PVC monitoring well installed with 1.5m length of #10 PVC well screen set 6.4m to 7.9m. Imported sand pack set 5.8m to 7.9m. Bentonite seal set 0.3m to 5.8m. Concrete and locking steel casing at surface.
- Monitoring well dry to 7.9m below grade December 13, 2022.

Ontario

Ministry of the Environment, Conservation and Parks

Well Record - Regulation 903

Ontario Water Resources Act

Notice of Collection of Personal Information

Personal information contained on this form is collected pursuant to sections 35-50 and 75(2) of the *Ontario Water Resources Act* and section 16.3 of the Wells Regulation. This information will be used for the purpose of maintaining a public record of wells in Ontario. This form and the information contained on the form will be stored in the Ministry's well record database and made publicly available. Questions about this collection should be directed to the Water Well Customer Service Representative at the Wells Help Desk, 125 Resources Road, Toronto Ontario M9P 3V6, at 1-888-396-9355 or wellshelpdesk@ontario.ca.

Fields marked with an asterisk (*) are mandatory.

Well Tag Number *
A369205

Type *

BH5

☑ Construction ☐ Abandonment

Measurement recorded in: *

☐ Metric ☑ Imperial

1. Well Owner's Information

Last Name and First Name, or Organization is mandatory. *

Last Name	First Name

Organization	Email Address
Municipality of South Bruce	jschneider@southbruce.ca

Current Address

Unit Number	Street Number *	Street Name *	City/Town/Village
	21	Gordon Street East	Teeswater

Country	Province	Postal Code	Telephone Number
Canada	Ontario	N0G 2S0	519-392-6623

2. Well Location

Address of Well Location

Unit Number	Street Number *	Street Name *	Township
	21	Marcy Street East	

Lot	Concession	County/District/Municipality
		BRUCE

City/Town	Province	Postal Code
Teeswater	Ontario	

UTM Coordinates	Zone *	Easting *	Northing *		Municipal Plan and Sublot Number
NAD 83	17	477665	4871749	Test UTM in Map	

Other

3. Overburden and Bedrock Material *

Well Depth * 30 (ft)

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

				(ft)	(ft)
Brown	Fill			0	24
Brown	Silt	Sand	Till	24	30

4. Annular Space *

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	1	Concrete	0.4
1	23	Bentonite	8.29
23	30	Silica Sand	2.67

5. Method of Construction *

☐ Cable Tool ☑ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☐ Air percussion ☐ Diamond
☐ Jetting ☐ Driving ☐ Digging ☐ Rotary (Air) ☑ Augering ☐ Direct Push
☐ Other (specify) _____

6. Well Use *

☐ Public ☐ Industrial ☐ Cooling & Air Conditioning
☐ Domestic ☐ Commercial ☐ Not Used
☐ Livestock ☐ Municipal ☑ Monitoring
☐ Irrigation ☐ Test Hole ☐ Dewatering
☐ Other (specify) _____

7. 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) _____

8. Construction Record - Casing * (use negative number(s) to indicate depth above ground surface)

Inside Diameter (in)	Open Hole **or** Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)
2	Plastic	0.154	-3	25
4	Steel	0.125	-3	1

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)
2.375	Plastic	0.01	25	30

10. Water Details

Water found at Depth (ft) ☐ Gas Kind of water ☐ Fresh ☑ Untested ☐ Other

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0	30	8.5

12. Results of Well Yield Testing

☐ Pumping Discontinued

Explain

If flowing give rate

☐ Flowing (GPM)

Draw down

Time (min)	Static Level	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)														

Recovery

Time (min)	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)													

After test of well yield, water was

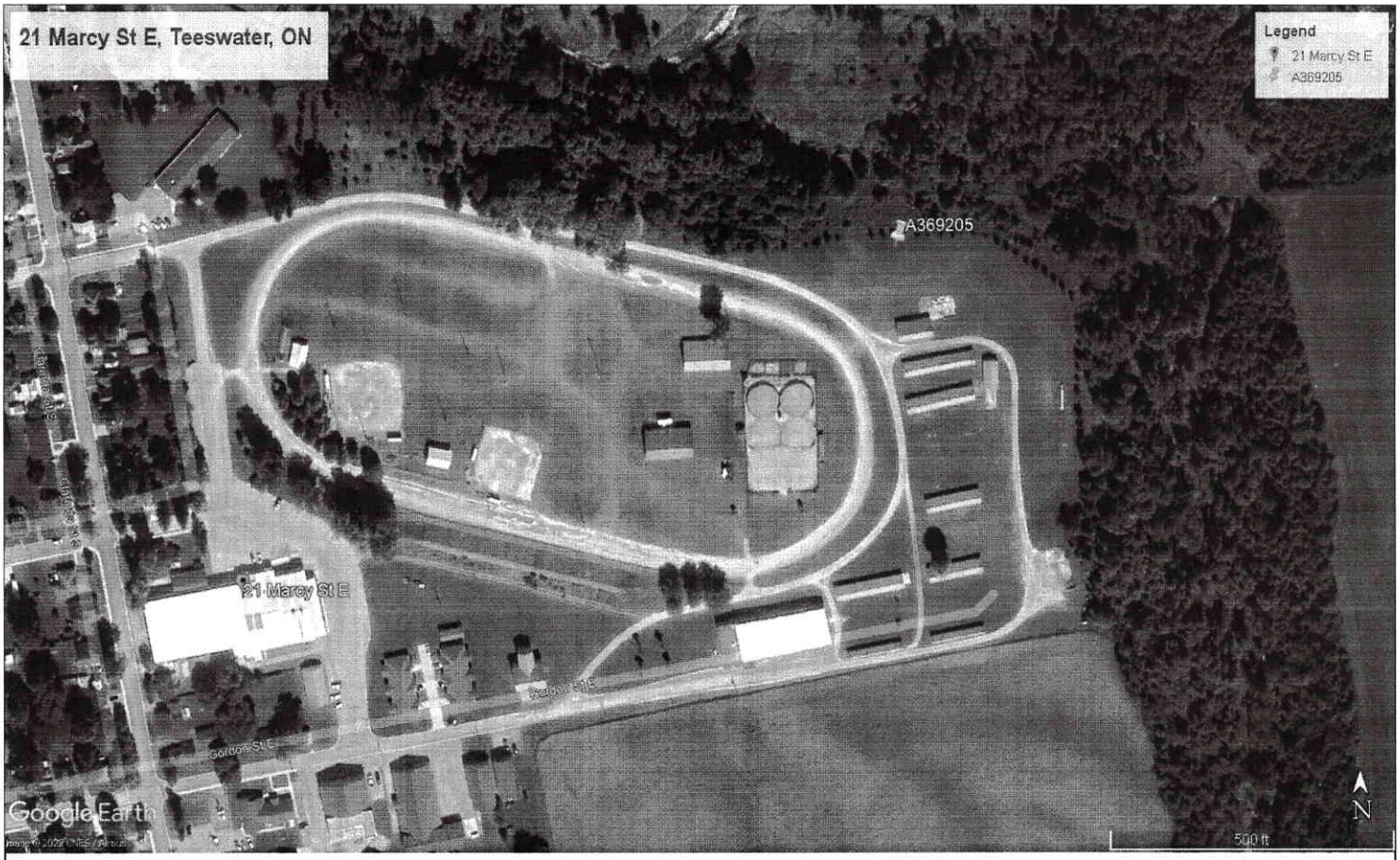
☐ Clear and sand free ☐ Other (specify)

Pump intake set at (ft)	Pumping rate (GPM)	Duration of pumping hrs + min	Final water level end of pumping (ft)	Disinfected? *
				☐ Yes ☑ No

Recommended pump depth (ft)	Recommended pump rate (GPM)	Well production (GPM)

13. Map of Well Location *

Map 1. Please Click the map area below to import an image file to use as the map. ☑ Make map area bigger



14. Information

Well owner's information package delivered	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
☐ Yes ☑ No		2022/11/28

Comments

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *	Well Contractor's License Number *
London Soil Test Ltd.	7190

Business Address

Unit Number	Street Number	Street Name *
	712078	Southgate Sdrd 71

City/Town/Village *	Province	Postal Code *
Dundalk	ON	N0C 1B0

Business Telephone Number	Business Email Address
519-455-5777	info@londonsoil.com

Last Name of Well Technician *	First Name of Well Technician *	Well Technician's License Number *
McIntosh	Tyler	4037

16. Declaration *

☑ I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate.

Last Name	First Name	Email Address
McIntosh	Tyler	info@londonsoil.com

Signature		Date Submitted (yyyy/mm/dd)
Tyler McIntosh	Digitally signed by Tyler McIntosh DN: cn=Tyler McIntosh, o=London Soil Test Ltd., ou, email=info@londonsoil.com, c=CA Date: 2022.12.15 12:58:03 -05'00'	2022/12/15

17. Ministry Use Only

Audit Number

9DR9 S355

Ontario

Ministry of the Environment, Conservation and Parks

Well Record - Regulation 903

Ontario Water Resources Act

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Fields marked with an asterisk (*) are mandatory.

Well Tag Number *
A369208

Type *

BH6

☑ Construction ☐ Abandonment

Measurement recorded in: *

☐ Metric ☑ Imperial

1. Well Owner's Information

Last Name and First Name, or Organization is mandatory. *

Last Name	First Name

Organization	Email Address
Municipality of South Bruce	jschneider@southbruce.ca

Current Address

Unit Number	Street Number *	Street Name *	City/Town/Village
	21	Gordon Street East	Teeswater

Country	Province	Postal Code	Telephone Number
Canada	Ontario	N0G 2S0	519-392-6623

2. Well Location

Address of Well Location

Unit Number	Street Number *	Street Name *	Township
	21	Marcy Street East	

Lot	Concession	County/District/Municipality
		BRUCE

City/Town	Province	Postal Code
Teeswater	Ontario	

UTM Coordinates	Zone *	Easting *	Northing *		Municipal Plan and Sublot Number
NAD 83	17	477559	4871752	Test UTM in Map	

Other

3. Overburden and Bedrock Material *

Well Depth * 26 (ft)

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To

				(ft)	(ft)
Brown	Fill			0	11
Brown	Silt	Sand	Till	11	26

4. Annular Space *

Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0	1	Concrete	0.4
1	19	Bentonite	6.68
19	26	Silica Sand	2.67

5. Method of Construction *

☐ Cable Tool ☑ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☐ Air percussion ☐ Diamond
☐ Jetting ☐ Driving ☐ Digging ☐ Rotary (Air) ☑ Augering ☐ Direct Push
☐ Other (specify) _____

6. Well Use *

☐ Public ☐ Industrial ☐ Cooling & Air Conditioning
☐ Domestic ☐ Commercial ☐ Not Used
☐ Livestock ☐ Municipal ☑ Monitoring
☐ Irrigation ☐ Test Hole ☐ Dewatering
☐ Other (specify) _____

7. 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) _____

8. Construction Record - Casing * (use negative number(s) to indicate depth above ground surface)

Inside Diameter (in)	Open Hole **or** Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)
2	Plastic	0.154	-3	21
4	Steel	0.125	-3	1

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)
2.375	Plastic	0.01	21	26

10. Water Details

Water found at Depth (ft) ☐ Gas Kind of water ☐ Fresh ☑ Untested ☐ Other

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0	26	8.5

12. Results of Well Yield Testing

☐ Pumping Discontinued

Explain _____

If flowing give rate

☐ Flowing _____ (GPM)

Draw down

Time (min)	Static Level	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)														

Recovery

Time (min)	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)													

After test of well yield, water was

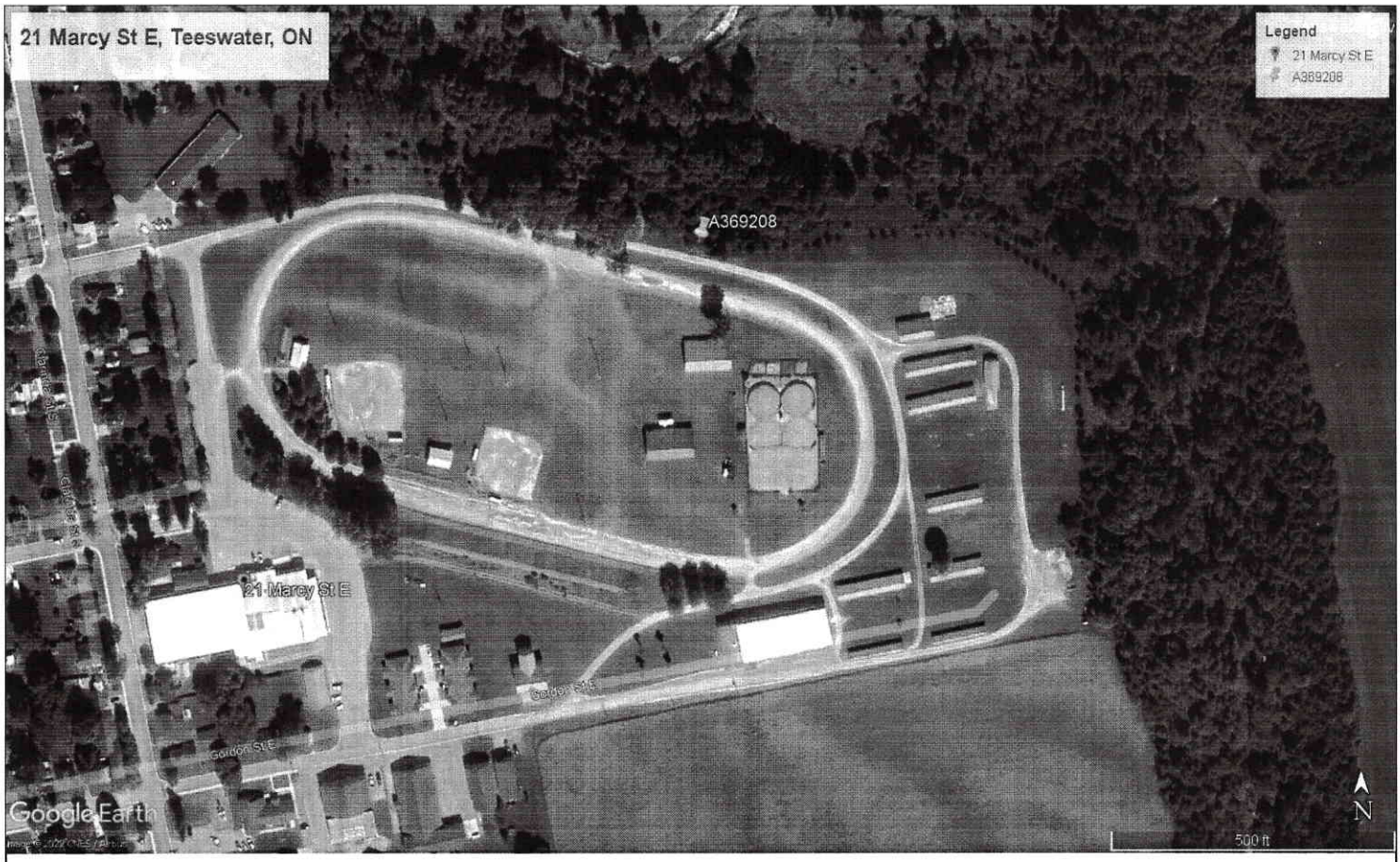
☐ Clear and sand free ☐ Other (specify)

Pump intake set at (ft)	Pumping rate (GPM)	Duration of pumping hrs + min	Final water level end of pumping (ft)	Disinfected? *
				☐ Yes ☑ No

Recommended pump depth (ft)	Recommended pump rate (GPM)	Well production (GPM)

13. Map of Well Location *

Map 1. Please Click the map area below to import an image file to use as the map. ☑ Make map area bigger



14. Information

Well owner's information package delivered	Date Package Delivered (yyyy/mm/dd)	Date Work Completed (yyyy/mm/dd) *
☐ Yes ☑ No		2022/11/28

Comments

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *	Well Contractor's License Number *
London Soil Test Ltd.	7190

Business Address

Unit Number	Street Number	Street Name *
	712078	Southgate Sdrd 71

City/Town/Village *	Province	Postal Code *
Dundalk	ON	N0C 1B0

Business Telephone Number	Business Email Address
519-455-5777	info@londonsoil.com

Last Name of Well Technician *	First Name of Well Technician *	Well Technician's License Number *
McIntosh	Tyler	4037

16. Declaration *

☑ I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate.

Last Name	First Name	Email Address
McIntosh	Tyler	info@londonsoil.com

Signature		Date Submitted (yyyy/mm/dd)
Tyler McIntosh	Digitally signed by Tyler McIntosh DN: cn=Tyler McIntosh, o=London Soil Test Ltd., ou, email=info@londonsoil.com, c=CA Date: 2022.12.15 13:01:24 -05'00'	2022/12/15

17. Ministry Use Only

Audit Number

MEF4 5OYV

TEESWATER MUNICIPAL WELL

Ontario (https://www.ontario.ca/page/government-ontario)

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the Open Data catalogue (https://data.ontario.ca/dataset/well-records) .

Go Back to Map

Well ID

Well ID Number: 1408942
Well Audit Number: *146352*
Well Tag Number:
This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	
Township	TEESWATER VILLAGE
Lot	015
Concession	07
County/District/Municipality	BRUCE
City/Town/Village	
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 476991.00 Northing: 4872006.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
BRWN	GRVL	SAND	SOFT	0 ft	2 ft
BRWN	SILT	CLAY	SOFT	2 ft	13 ft
BRWN	LMSN	MGRD	HARD	13 ft	17 ft
BRWN	LMSN	SHLE	SOFT	17 ft	18 ft
BRWN	LMSN	MGRD	HARD	18 ft	38 ft
BRWN	LMSN	SHLE	SOFT	38 ft	39 ft
BRWN	LMSN	HARD		39 ft	119 ft
BRWN	LMSN	HARD		119 ft	158 ft
BRWN	LMSN	SHLE	SOFT	158 ft	176 ft
BRWN	LMSN	MGRD	HARD	176 ft	198 ft
BRWN	LMSN	HARD		198 ft	275 ft
BRWN	LMSN	SHLE	SOFT	275 ft	276 ft
BRWN	LMSN	HARD		276 ft	280 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 ft	20 ft		
0 ft	85 ft		

Method of Construction & Well Use

Method of Construction	Well Use
Not Known	
	Municipal

Status of Well

Water Supply

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
13 inch	STEEL		20 ft
8 inch	STEEL		85 ft
8 inch	OPEN HOLE		280 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 1737

Results of Well Yield Testing

After test of well yield, water was	CLEAR
If pumping discontinued, give reason	
Pump intake set at	
Pumping Rate	500 GPM
Duration of Pumping	24 h:0 m
Final water level	
If flowing give rate	1000 GPM
Recommended pump depth	
Recommended pump rate	
Well Production	PUMP
Disinfected?	

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL	FLW		

1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind
86 ft	Fresh
174 ft	Not Stated
185 ft	Not Stated
202 ft	Not Stated
221 ft	Not Stated

Hole Diameter

Depth From	Depth To	Diameter

Audit Number: 146352

Date Well Completed: July 02, 1996

Date Well Record Received by MOE: November 21, 1996

Related

How to use a Ministry of the Environment map (https://www.ontario.ca/page/how-use-ministry-environment-map#wells)

Technical documentation: Metadata record (https://data.ontario.ca/dataset/well-records/resource/3031344e-e3f2-48d5-888c-c1deadfd2f77)

Updated: October 18, 2021

Ontario

Ministry of the Environment / Ministère de l'Environnement

Drinking-Water Systems Regulation O. Reg. 170/03

Part III Form 2
Section 11.ANNUAL REPORT.

Drinking-Water System Number:	**220002618**
Drinking-Water System Name:	**Teeswater Water System**
Drinking-Water System Owner:	**Municipality Of South Bruce**
Drinking-Water System Category:	**Large Municipal Residential**
Period being reported:	**January 1, 2020 to December 31, 2020**

Complete if your Category is Large Municipal Residential or Small Municipal Residential	***Complete for all other Categories.***
Does your Drinking-Water System serve more than 10,000 people? Yes [ ] No [X] **Is your annual report available to the public at no charge on a website on the Internet? Yes [X] No [ ]** **Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.** **Municipality of South Bruce** **Administration Office** **21 Gordon Street East** **Teeswater, Ontario**	**Number of Designated Facilities served:** **Did you provide a copy of your annual report to all Designated Facilities you serve?** **Yes [ ] No [ ]** **Number of Interested Authorities you report to:** **Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?** **Yes [ ] No [ ]**

Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
N/A	N/A

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

Yes [x] No [ ]

Indicate how you notified system users that your annual report is available, and is free of charge.

[X] Public access/notice via the web
[X] Public access/notice via Government Office
[X] Public access/notice via a newspaper
[ ] Public access/notice via Public Request
[ ] Public access/notice via a Public Library
[ ] Public access/notice via other method

Describe your Drinking-Water System

The Teeswater Water System was established in 1947; however, the original well was replaced in 1996 with a new 330 mm diameter, 85 meter deep drilled well. The artesian aquifer into which the well has been drilled provides enough head that the system does not require a well pump to provide the required water to the pumphouse.
The pumphouse contains 3 pumps to maintain pressure in the distribution system. The pump house has a chlorine board with 2 chemical pumps capable of automatic switch over. There is also a diesel generator with auto transfer, and a diesel pump as a back-up. Data is stored on the PLC which gathers information as per MOE requirements. This data is printed off daily and kept at the pumphouse. It records chlorine residual, turbidity, flow,pressure and any alarms that occur. It also creates a daily summary sheet and a monthly report.
Prior to entering the distribution system, the water is treated by adding a disinfectant (sodium hypochlorite also known a chlorine) to protect against microbial contaminants. Residual chlorine levels are maintained in the water distribution system to effectively provide disinfection throughout the entire system.
The drilled well supplies the consumers with groundwater. The well is located outside the pumphouse on the east side of County Road #4 (Clinton Street) and south of the Teeswater River in the former Village of Teeswater within the Municipality of South Bruce. The well casing extends approximately 900 mm above ground.

List all water treatment chemicals used over this reporting period

Sodium Hypochlorite

Were any significant expenses incurred to?

[ ] Install required equipment
[ ] Repair required equipment
[ ] Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred

N/A

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
Apr. 23, 2020	Primary Disinfection - Chlorine	Loss of Monitoring	mg/L (FREE chlorine)	Temporary battery back-up failure, loss of primary disinfection - the treatment system was restored in time that it did not affect the distribution.	Apr. 23, 2020

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

	# of E.Coli & Total Coliform Samples	Range of E.Coli Results (# - #)	Range of Total Coliform Results (# - #)	# of HPC Samples	Range of HPC Results (# - #)
Raw	52	0 – 0	0 – 0		
Treated (Pumphouse tap point Entry)	52	0 – 0	0 – 1	52	0 - >500
Distribution	156	0 – 0	0 – 0	52	0 - 3

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

	Raw Water (hand held)		Pumphouse		Pumphouse Tap (point of Entry)		Distribution System	
	# grab samples	Range of Results (#-#)	# grab samples	Range of Results (#-#)	# grab samples	Range of Results (#-#)	# grab samples	Range of Results (#-#)
Turbidity	53	0.04-0.24 NTU	366(Ana.)	0.02-0.60 NTU	55	0.02-0.18 NTU	156	0.04-0.26 NTU
Free Chlorine (hand held)	N/A	N/A	366 (Ana.)	1.13 - 3.25	258	1.18 - 2.20	467	0.79 - 1.98

*NOTE: Record the unit of measure if it is **not** milligrams per litre.*

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
N/A				

Summary of Inorganic parameters tested during this reporting period or the most recent sample results (Well #3)

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alkalinity	Mar. 17, 2020 Sep. 22, 2020	262 265 253 250	mg/L	No
Antimony	Jan. 23, 2018	<0.6	ug/L	No
Arsenic	Jan. 23, 2018	<1.0	ug/L	No
Barium	Jan. 23, 2018	226	ug/L	No
Boron	Jan. 23, 2018	<50	ug/L	No
Cadmium	Jan. 23, 2018	<0.1	ug/L	No
Chromium	Jan. 23, 2018	<1.0	ug/L	No
Lead (Distribution)	Jan. 21, 2020	<1.0	ug/L	No
Lead 15.1	Mar. 12, 2020 Sep. 22, 2020	<1.0 <1.0 <1.0 <1.0	ug/L	No
Mercury	Jan. 23, 2018	<0.1	ug/L	No
Selenium	Jan. 23, 2018	<5.0	ug/L	Yes
Sodium every 5 years next 2021	Jan. 19/16	3.30	mg/L	No
Uranium	Jan. 23, 2018	<5.0	ug/L	No
Fluoride every 5 years next 2021	Jan. 19, 2016 April 19, 2016	0.40 0.40	mg/L	No
Nitrate 1	Jan. 21, 2020	2.41	mg/L	No
2	Apr. 21, 2020	1.91	mg/L	No
3	Jul. 21, 2020	1.63	mg/L	No
4	Oct. 20, 2020	1.89	mg/L	No
Nitrite 1	Jan. 21, 2020	<0.01	mg/L	No
2	Apr. 21, 2020	<0.01	mg/L	No
3	Jul. 21, 2020	<0.01	mg/L	No
4	Oct. 20, 2020	<0.01	mg/L	No

Summary of Organic parameters sampled during this reporting period or the most recent sample results (Well #3)

Parameter	Sample Date	Results Value	Unit of Measure	Exceedance
Alachlor	Jan. 23, 2018	<0.1	ug/L	No
Atrazine + N-dealkylated metabolites	Jan. 23, 2018	<0.2	ug/L	No
Azinphos-methyl	Jan. 23, 2018	<0.1	ug/L	No
Benzene	Jan. 23, 2018	<0.5	ug/L	No
Benzo(a)pyrene	Jan. 23, 2018	<0.01	ug/L	No
Bromoxynil	Jan. 23, 2018	<0.2	ug/L	No
Carbaryl	Jan. 23, 2018	<0.2	ug/L	No
Carbofuran	Jan. 23, 2018	<.0.2	ug/L	No
Carbon Tetrachloride	Jan. 23, 2018	<0.2	ug/L	No
Chlorpyrifos	Jan. 23, 2018	<0.1	ug/L	No
Diazinon	Jan. 23, 2018	<0.1	ug/L	No
Dicamba	Jan. 23, 2018	<0.2	ug/L	No
1,2-Dichlorobenzene	Jan. 23, 2018	<0.5	ug/L	No
1,4-Dichlorobenzene	Jan. 23, 2018	<0.5	ug/L	No
1,2-Dichloroethane	Jan. 23, 2018	<0.5	ug/L	No
1,1-Dichloroethylene (vinylidene chloride)	Jan. 23, 2018	<0.5	ug/L	No
Dichloromethane	Jan. 23, 2018	<5.0	ug/L	No
2-4 Dichlorophenol	Jan. 23, 2018	<0.3	ug/L	No
2.4-Dichlorophenylacetic Acid	Jan. 23, 2018	111.2	%	No
2,4-D (2,4-Dichlorophenoxy acetic acid)	Jan. 23, 2018	<0.2	ug/L	No
Diclofop-methyl	Jan. 23, 2018	<0.2	ug/L	No
Dimethoate	Jan. 23, 2018	<0.1	ug/L	No
Diquat	Jan. 23, 2018	<1.0	ug/L	No
Diuron	Jan. 23, 2018	<1.0	ug/L	No
Glyphosate	Jan. 23, 2018	<5.0	ug/L	No
HAA (Haloacetic Acid)	Jan. 21, 2020 Apr. 21, 2020 Jul. 21, 2020 Oct. 20, 2020	<2.20 <2.20 <2.20 <2.20	ug/L	No
Malathion	Jan. 23, 2018	<0.1	ug/L	No
MCPA (2-Methyl-4-chlorophenoxyacetic acid)	Jan. 23, 2018	<0.2	ug/L	No
Metolachlor	Jan. 23, 2018	<0.1	ug/L	No
Metribuzin	Jan. 23, 2018	<0.1	ug/L	No
Monochlorobenzene	Jan. 23, 2018	<0.5	ug/L	No
Paraquat	Jan. 23, 2018	<1.0	ug/L	No
Pentachlorophenol	Jan. 23, 2018	<0.5	ug/L	No
Phorate	Jan. 23, 2018	<0.1	ug/L	No
Picloram	Jan. 23, 2018	<0.2	ug/L	No
Polychlorinated Biphenyls (PCB)	Jan. 23, 2018	<0.035	ug/L	No
Prometryne	Jan. 23, 2018	<0.10	ug/L	No
Simazine	Jan. 23, 2018	<0.1	ug/L	No
THM (Note: show latest annual average)	**2020 Average**	4.0	ug/L	No

Terbufos	Jan. 23, 2018	<0.2	ug/L	No
Tetrachloroethylene	Jan. 23, 2018	<0.5	ug/L	No
2,3,4,6-Tetrachlorophenol	Jan. 23, 2018	<0.5	ug/L	No
Triallate	Jan. 23, 2018	<0.1	ug/L	No
Trichloroethylene	Jan. 23, 2018	<0.5	ug/L	No
2,4,6-Trichlorophenol	Jan. 23, 2018	<0.5	ug/L	No
Trifluralin	Jan. 23, 2018	<0.1	ug/L	No
Vinyl Chloride	Jan. 23, 2018	<0.2	ug/L	No

***N.D. = Not Detected**

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample