S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

Corporation of Norfolk County

Simcoe Water Supply Class Environmental Assessment

Norfolk COUNTY

September 2023

SBA File No.: M21004

REPORT PREPARED BY:

S. BURNETT & ASSOCIATES LIMITED

www.sbaengineering.com |
Tel (519) 941-2949 | Fax (519) 941-2036 | info@sbaengineering.com
210 Broadway, Unit 203 Orangeville, ON L9W 5G4

S. BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

September 22, 2023

Banks Groundwater Engineering Limited
940 Watson Road South, RR 1
Puslinch, ON N0B2J0

Attn: Bill Banks

Re: Corporation of Norfolk County
Simcoe Water Supply Class Environmental Assessment
SBA File No: M21004

Dear Bill,

Please find attached a draft version of the Project File for the Simcoe Water Supply Class Environmental Assessment. This version is to be provided to the Ministry of the Environment, Conservation and Parks (MECP) for review to confirm that comments received on September 11, 2023. Once we have received confirmation from the MECP that comments have been addressed to their satisfaction, we will issue a Notice of Completion that initiates the 30-day public, agency, First Nation and Métis review period.

Yours truly,

Ian Callum
Senior Environmental Project Manager
S. Burnett & Associates Limited

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1. Introduction

S. Burnett & Associates Limited (SBA) was retained by Norfolk County, as a subconsultant to Banks Groundwater Engineering Limited (BGE), in March 2022 to complete a Municipal Class Environmental Assessment (EA) to facilitate the approval for a new municipal groundwater supply source for the Community of Simcoe located in Norfolk County, Ontario.

1.1 Background

Norfolk county provides municipal drinking water to several urban centres, including the community of Simcoe, which obtains its water supply exclusively from groundwater, with its current supply coming from seven (7) wells and an infiltration gallery / well system. Maximum daily water supply demand for the community is increasing and additional sources are required to augment the current groundwater sources.

Both the County and the community of Simcoe have experienced continued population growth. The community of Simcoe population grew from 13,383 in 2011, to 13,922 in 2016, and 16,121 in 2021. This translates to a 5-year annual rate growth rate of 3.2%, and 10-year annual growth rate of 2.0%. As a largely rural, single-tier municipality that was restructured in 2001 to include several smaller communities, Norfolk County completed an Integrated Sustainable Master Plan (ISMP), which included long-term planning for water. The ISMP projected a 2021 population of 15,680 in the community of Simcoe, suggesting that it is growing at a slightly faster rate than projected. The ISMP further projected a 2031 population of 16,800 and a 2041 population of 17,380 (MMM Group, R.V. Anderson Associates Limited, and XCG, 2016).

The ISMP further projected that the 2015 Average and Max Day Demands of 5,259 m^3/day and 7,947 m^3/day, would increase to 5,981 m^3/day and 9,039 m^3/day in 2041.

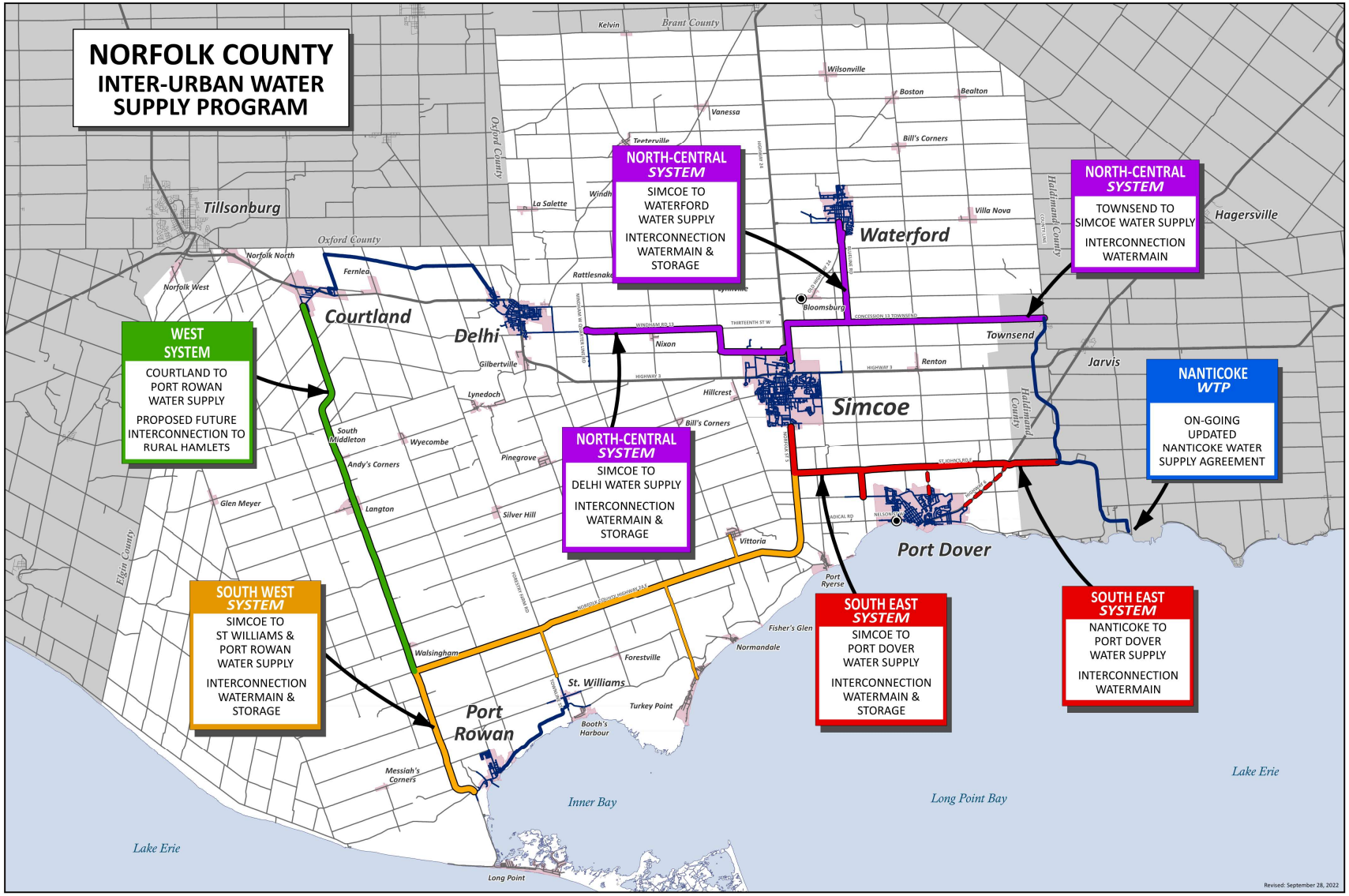
The ISMP concluded that although the Community of Simcoe had adequate water supply in 2016, as demand grows over the next 25 years, the risk of inadequate supply will increase. Accordingly, the ISMP made recommendations regarding the Community of Simcoe's water supply, which are summarized in **Table 1.**

Table 1: Summary of ISMP Community of Simcoe Water Supply Recommendations

Short-term Recommendations (0-5 years)	Medium Term Recommendations (6-15 years)	Long-term Recommendations (16-25 years)
• Maintain proactive well maintenance program. • Enhanced water conservation. • Interconnection with Port Dover via new pipeline (2,400-4,200 m3/day added capacity). • Increased Capacity of Cedar St. high lift pumps and northwest reservoir high lift pumps.	• Interconnection with Waterford via new pumping station and pipeline. • Interconnection with Delhi. • New Well to Northeast of Simcoe.	• Replace undersized watermains.

Based on the recommendations of the ISMP, Norfolk County has taken a regional approach to water supply to increase interconnection between lower-tier municipalities, minimize overall costs of water supply, and to improve the resilience of the water supply system. To do so, the County will implement the Inter-Urban Water Supply System (IUWSS) between 2021 and 2031, which includes several projects that will be implemented in stages. The projects from the IUWSS are summarized in **Figure 1.**

Figure 1: Summary of Inter-Urban Water Supply Projects



The Community of Simcoe has a current maximum permitted water supply capacity of 20,076 m^3/day. Early in 2021, Norfolk County began a process of testing and assessing the current sustainable and peak pumping rates of the seven production wells serving the community of Simcoe. This process was also intended to reassess the practical firm capacity of the system, based on real operating capacities, and allowing for the largest unit to be out of service (and excluding the Cedar Street Gallery). Based on the results of the testing and analysis, the practical firm capacity for the seven (7) current municipal production wells was updated to be 7,303 m^3/day. Based on the projected Max Day Water Demand of 9,039 m^3/day, this equates to a projected deficit of 1,736 m^3/day by 2041. It also is understood that estimated peak day demand could potentially exceed the firm capacity with the next few years.

Norfolk County is also currently in the process of completing a Municipal Class Environmental Assessment for the Simcoe-Townsend Interconnection, which is slated to be in service in early 2026.

1.2 Class EA Objectives

The scope of this Schedule 'B' Municipal Class EA is to find the preferred means of implementing the ISMP recommendation of developing a new well in the northeast of Simcoe. This new well will help provide resilience in the community of Simcoe water supply system until the Simcoe-Townsend Interconnection is complete. The new well will also provide resilience after the interconnection is complete if the interconnection pipeline fails or requires shutdown to allow periodic maintenance.

The preferred solution must be environmentally and socially responsible, cost-effective, technically feasible, and able to be completed within a reasonable time frame.

2. Class Environmental Assessment Planning Process

Under Ontario's *Environmental Assessment Act, R.S.O. 1990, Chapter E.18 (EA Act)*, the Class EA process is an approved process for a specific 'Class' of projects. Projects are approved subject to compliance with an approved Class EA process.

2.1 Class EA Schedule

Under the Class EA process, projects are categorized into different schedules based on their complexity and potential environmental impact. As the schedule progresses alphabetically, additional Class EA steps must be followed. Class EA projects are classified into the following schedules.

Schedule 'A' projects are limited in scale, have minimal potential adverse effects, and include most municipal maintenance and operation activities. These projects are approved and may proceed directly to implementation without following the full Class EA planning process.

Schedule 'B' projects have the potential for some adverse environmental effects. The municipality is required to undertake a screening process (i.e., Phase One and Two) involving mandatory contact with directly affected members of the public and relevant review agencies to ensure that they are aware of the project and that their concerns are addressed. Schedule 'B' projects require that a report is prepared and submitted for review by the public and review agencies. If there are no outstanding concerns at this point, then the municipality may proceed with project implementation.

Schedule 'C' projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA Document (i.e., Phases One to Four). Schedule 'C' projects require that an Environmental Study Report (ESR) be prepared and submitted for review by the public and review agencies. If there are no outstanding concerns, then the municipality may proceed with project implementation.

2.2 The Class EA Process for a Schedule 'B' Project

The municipal Class EA Planning and Design Process is presented in the following **Figure 2** provided by the Municipal Engineers Association.

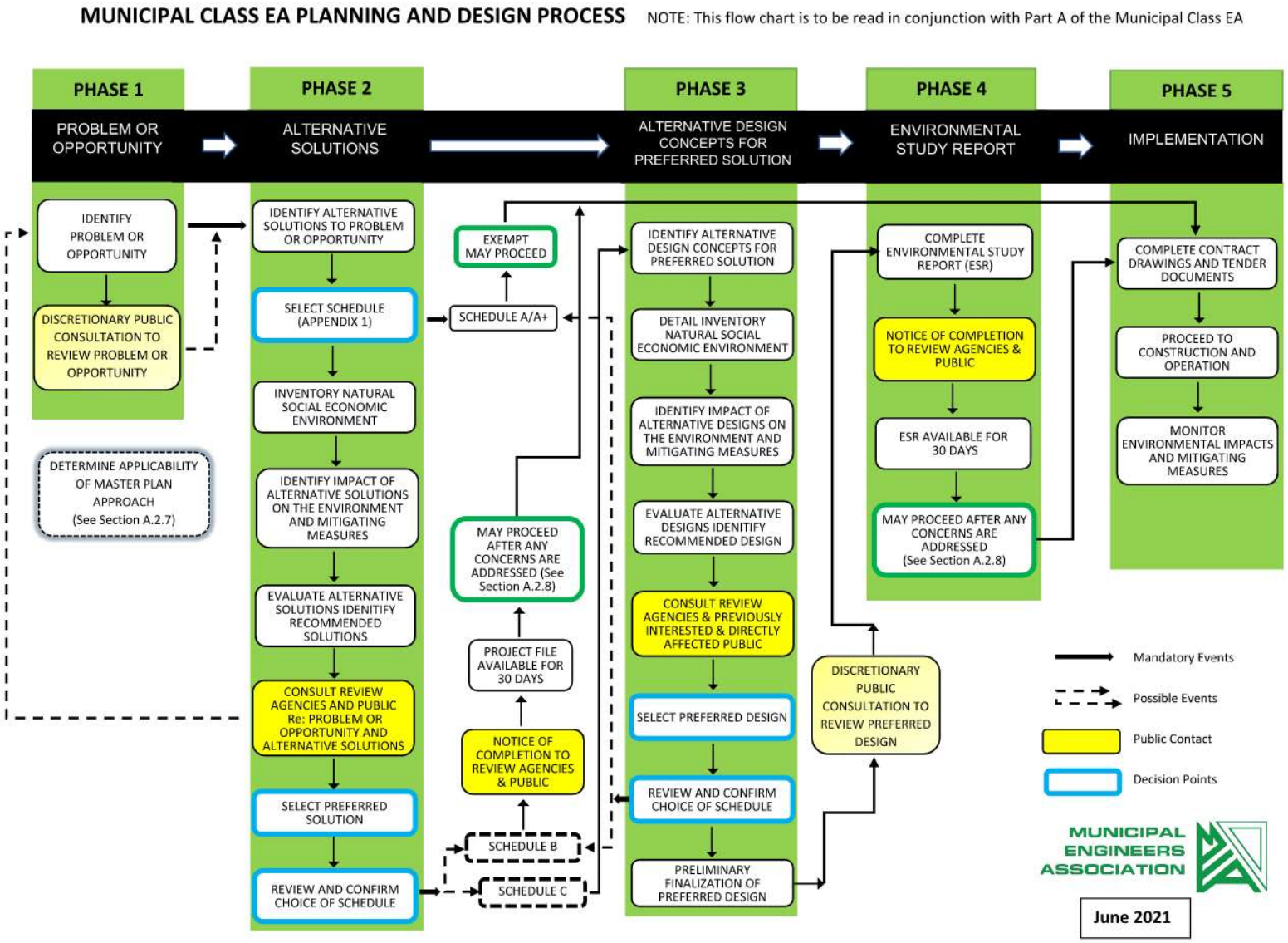
2.3 Provincial Policy Statement

The Provincial Policy Statement (Government of Ontario, 2020), under the *Planning Act*, sets out the policy foundation for regulating the development and use of land in Ontario. Under the Provincial Policy Statement (PPS), planning for water services shall:

1. accommodate forecasted growth in a manner that promotes the efficient use and optimization of existing municipal water services;
2. ensure that these systems are provided in a manner that:
    a. can be sustained by the water resources upon which such services rely;
    b. prepares for the impacts of a changing climate;
    c. is feasible and financially viable over their lifecycle; and
    d. protects human health and safety, and the natural environment;
3. promote water conservation and water use efficiency;
4. integrate servicing and land use considerations at all stages of the planning process; and
5. be in accordance with the servicing hierarchy outlined through policies.

The PPS also focusses on settlement areas, such as Simcoe, for growth and development.

Figure 2: Municipal Class EA Planning and Design Process (Municipal Engineers Association)



Phase 1 is initiated when a problem or opportunity is presented. A clear statement of the problem or opportunity is formulated.

Phase 2 identifies alternative solutions to address the problem or opportunity by considering the existing conditions and arrives at a preferred solution with public and government agency input.

Phase 5 the preferred solution is implemented. The design for the preferred solution with any mitigation measures identified during the process are completed, construction is completed, and operation begins. Any monitoring programs identified during the process are now undertaken to ensure that the environmental provisions and commitments made during the process are fulfilled and effective.

3. Phase 1: Problem or Opportunity Statement

Norfolk County is taking a regional approach to water supply through the implementation of the Inter-Urban Water Supply System, including the Townsend-Simcoe Interconnection Pipeline, which is currently being assessed through a separate municipal class environmental assessment. However, in the interim and until this inter-urban supply solution is operational, the County requires additional water supply for the community of Simcoe. This supply is needed to manage increasing demand from a growing population and to create resilience in Simcoe's water supply system until additional water supply is provided through the inter-urban supply projects. This additional supply will also provide resilience in the event of any temporary issues related to the operation of Inter-Urban Supply Projects.

3.1 Notice of Commencement

Norfolk County began looking for new sources of groundwater supply for the community of Simcoe in 2008. Following successful completion of a test well drilling and testing program, a potential new supply source was identified. A Notice of Commencement was issued on November 25, 2010, to initiate the Class EA. In addition to newspaper publication in the Simcoe Reformer, the Notice of Commencement was provided in a letter to 44 project stakeholders on January 4, 2011. A sample letter and the stakeholder list are provided in **Appendix A.**

In response to the Notice of Commencement, a request was received from Barbara Slattery at the Ministry of the Environment, requesting a digital copy of the Simcoe / Waterford Groundwater Investigation Final Report. This report was provided on January 4, 2011 and the accompanying letter is included in **Appendix A.**

3.2 Public Information Centre No. 1

A Public Information Centre (PIC) was held at the Bloomsburg Public School on Wednesday, November 30, 2011, from 5:30 to 7:30 p.m. A notice for the PIC was placed in the Simcoe

Reformer on November 7th, 2011 and copy of the newspaper notice is included in **Appendix A.** In addition, a notification letter was sent to 44 stakeholders on [date] and a sample letter is provided in **Appendix A.**

The PIC included representatives from the County, and several consultant subject matter experts. Additionally, information was presented on display boards, which are provided in **Appendix A**.

At this PIC, several residents raised concerns about potential drawdown impacts on their shallow wells, located in proximity to the proposed new well location. Although residents were informed that monitoring during a 72-hour pumping test did not show any significant impacts to nearby wells, the concern remained. Additional concerns included concerns about impact to the Waterford Heritage Trail and cost implications of the project, including impacts to property taxes. A list of the verbatim comments received is included in **Appendix A**.

3.3 Public Information Centre No.2

In response to comments received at PIC 1, a second PIC was held at the Bloomsburg School on April 25, 2012. Notification for this PIC was provided in the Simcoe Reformer on April 11, 2012. Instead of using display boards, a presentation by a hydrogeologist was delivered that specifically addressed the concerns raised in PIC 1. The presentation included a more technical explanation of the results of the first 72-hour pumping test and proposed a second 72-hour pumping test be completed with additional monitoring locations. A copy of the presentation is provided in **Appendix A**. At the end of the presentation, residents with nearby wells were provided with a Water Well Survey Form (**Appendix A**), that would allow their well to be monitored during an additional 72-hour pumping test that was proposed to help alleviate well impact concerns. Residents were to complete the form at the PIC or provide the form in a pre-paid envelope no later than May 2, 2012. A single comment sheet was completed, which raised concerns regarding potential project impacts on a private well. The landowner was provided with the opportunity to have their well tested during the planned pumping test.

4. Phase 2: Alternative Solutions

4.1 Identify Alternative Solutions

The following alternatives were considered to address the capacity and resilience deficiencies in the Community of Simcoe's current water supply infrastructure.

4.1.1. Alternative No. 1 – "Do Nothing"

The "Do Nothing" alternative would involve no further action by Norfolk County to meet the interim water supply demand for the community of Simcoe. Under this alternative, the community of Simcoe would need to limit their population growth and maintain the current water capacity.

4.1.2. Alternative No. 2 – Reduce Water Demand

Under this alternative, the increased demand in water supply and uncertainty regarding the performance of existing wells would be offset by a corresponding reduction in water demand, achieved through water conservation initiatives.

4.1.3. Alternative No. 3 – New Groundwater Supply

Under this alternative, a new groundwater water supply would be located and developed to produce enough water until the Townsend-Simcoe connection is operational. Once connected with Townsend, the new well would continue to provide system resilience in the event of malfunctions with IUWSP pipelines or short-term shutdowns to allow for maintenance.

The search for a new groundwater source began in 2008 with a groundwater investigation, which was completed in 2010. The study area investigated to find a new groundwater supply is shown in **Figure 3**, and two (2) locations were identified resulting in construction of two (2) test production wells, SW11/09 and SW12/20, which are shown in **Figure 4**. To date, considerable groundwater testing has been completed to locate and evaluate the location for a suitable groundwater supply well and this is summarized in Revised Draft Report 2012 Monitoring and Aquifer Testing Program (Banks Groundwater Engineering Limited, 2015) and in Hydrogeological Report 2020 Well Construction, Aquifer Testing, and Monitoring Program (Banks Groundwater Engineering Limited, 2021). The 2021 report is included in **Appendix B** as well as the 2019 updated workplan that it was based upon.

In 2011, G. Douglas Vallee Limited was retained to evaluate alternative transmission routes of raw ground water from the well site northeast of Simcoe to the water treatment plant on 14th Street in Simcoe. A draft report was completed in 2011, with an update in 2022 entitled Watermain Route Evaluation Section – Simcoe Water Supply Class EA Simcoe – Norfolk County (G. Douglas Vallee Limited, 2022) to confirm nothing had changed and to update construction cost estimates. The 2022 report is included in **Appendix C**.

The four (4) routes identified in the Vallee updated report include the following alternatives:

- Alternative 3A: Stone Quarry Road;
- Alternative 3B: Highway 24;
- Alternative 3C: Rail Trail; and,
- Alternative 3D: Rail Trail / Stone Quarry Road.

The four (4) alternative routes are shown on **Figure 5**.

4.1.3.1 2012 Pumping Test

Following PIC#2, several completed Water Well Survey Forms were received from local residents. However, it was determined only three (3) private wells were suitable (i.e., accessible) for monitoring of water levels during the upcoming pumping test. Monitoring wells were installed in selected locations where well owners had requested monitoring, but their wells could not be monitored. The notice of the PIC was sent to local farmers (i.e., within at least the 1.0 km radius of the test well site) to request if irrigation sources could be monitored. Responses were received from the three farmers who owned the three irrigation ponds that are closest to the test well site. Two (2) of the farmers approved monitoring of water levels in their ponds and one (1) declined access.

The aquifer pumping test began May 29, 2012, at 10:50 a.m., at a pumping rate of 2,620 m^3/day (400 Igpm). Pumping continued at this constant rate for an uninterrupted period of 72 hours. Pumping ceased at 10:50 a.m. on June 1. This was the same pumping rate and duration of the aquifer test conducted on this test well in 2009. In advance of the planned aquifer testing, groundwater monitoring stations were established at various locations within and beyond the anticipated area of influence (i.e., the area where groundwater levels could be reasonably expected to respond to pumping of the test well based on previous test results). Prior to, during, and following the aquifer testing, groundwater levels were measured and recorded in each monitoring station. Data loggers were installed in all stations and recorded groundwater levels at five-minute intervals. Manual measurements were also taken and recorded throughout the monitoring period on a less frequent basis. The groundwater monitoring stations included the following:

- Four (4) existing test wells and eight existing monitoring wells;
- Three (3) new monitoring wells;
- Six (6) shallow streambed piezometers;
- One (1) shallow wetland piezometer;
- Three (3) domestic wells.

Surface water levels were monitored in Davis Creek and two (2) local irrigation ponds.

Of the 14 conclusions presented in the Revised Draft Report 2012 Monitoring and Aquifer Testing Program (Banks Groundwater Engineering Limited, 2015), the following addressed the effects of the pumping test on local groundwater and surface water, and the potential for developing a new municipal water supply source:

- Based on the projected response of test well SW11/09 and the aquifer, and the effective available drawdown, the safe perennial yield for the well is confirmed to be 2,620 m^3/day (400 Igpm). The safe perennial yield for the aquifer at the site of SW11/09 is estimated to be 4,560 m^3/day (700 Igpm). Additional testing at this rate is required to confirm this safe perennial

yield for the aquifer. A minimum of two (2) wells pumping at this combined rate would be required for this purpose.

- Based on the analyses of monitored private and monitoring wells during the 2012 aquifer testing program, it is reasonable to expect that pumping at the potential municipal well site at the higher rate of 4,560 m^3/day would not interfere with any private sand point, drilled, and/or dug wells beyond a radius of 350 m. This would include all wells in the Community of Bloomsburg and wells located in all other directions to a radius of up to 1.0 km. Monitoring of wells while pumping at this rate is required to confirm this assessment.
- The 2012 aquifer test had no measurable effect on the water levels in two nearby ponds, including one of the on-line ponds (i.e., Pond 1), and an off-line pond (i.e., Pond 2) that is no longer in use for irrigation. It is not expected that pumping at a projected rate of 4,560 m^3/day, at the test well site, would have a measurable effect on any of the permitted ponds within a radius of 1.0 km. Monitoring of ponds while pumping at this rate is required to confirm this assessment.
- The aquifer test had no measurable effect on the flow in Davis Creek. It is also expected that further testing at a projected rate of 4,560 m^3/day, at the test well site, would not have a measurable effect on flow in Davis Creek. Long-term groundwater withdrawals at this site for municipal supply purposes are therefore not expected to have deleterious effects on Davis Creek, a local surface water feature that has historically been and continues to be a source of water for irrigation.
- The only location where drawdown was observed in the shallow water table aquifer was at piezometer PZ5/12, which was 0.10 m at the end of the 72-hour pumping test. The water level in PZ5/12 remained at more than 1.0 m above the creek surface at the end of pumping. The drawdown therefore represents a reduction in water level above the creek of less than 10 percent (10%). Based on these observations, it is apparent the aquitard separating the water table aquifer and the deeper pumped aquifer is thinner in the vicinity of this piezometer (i.e., the pumped aquifer is semi-confined in this local area). This response warrants further investigation, including additional shallow monitoring locations in this area to assess the extent of these conditions and the potential for, and magnitude of, reductions in groundwater discharge to this short reach of Davis Creek. It is not possible to quantify a reduction in discharge without determining the extent of the area potentially affected.
- Water levels and flow within the east branch of Davis Creek remained stable and there were no observed conditions within the creek during the aquifer test period that would pose a risk to fish or fish habitat. There was sufficient water depth within the creek throughout the aquifer test to maintain submergence of aquatic habitats and allow for upstream and downstream migration of fish. The intention of this scoped fisheries task was to monitor the fish and fish habitat of the upstream reaches of Davis Creek for possible risks (i.e.; low water and potential stranding) during the pumping test period only. The intention was not to assess risk to fish associated with future proposed groundwater supply. Appropriate field studies would be completed in support of future testing, impact assessment, and subsequent permitting.

- Permitted irrigation from on-line ponds and directly from Davis Creek has been, and continues to be, an unevaluated source of risk to fish habitat within the branches of Davis Creek. The Project Team's observations of the impacts of irrigation on the creek flow and habitat, prior to the 2012 pumping test, were significant.
- Groundwater samples previously collected from the test well during a 72-hour aquifer performance test in 2009 indicated the quality of the groundwater, based on the analyses conducted, is suitable for the development of a municipal water supply.

4.1.3.2 2020 Pumping Test

Since completion of the initial investigation in 2010, subsequent testing and monitoring was completed on a test production well located northeast of Simcoe. Following review of a first draft of a report on the results of this program by Provincial and Conservation Authority Staff, the following report was completed:

> *Revised Draft Report, 2012 Monitoring and Aquifer Testing Program, Community of Simcoe Additional Water Supply Class Environmental Assessment. September 2015. Prepared for the Public Works & Environmental Services Department of Norfolk County, by Banks Groundwater Engineering Limited.*

A work plan was then prepared in 2016 based on comments received to confirm a sustainable groundwater supply of is available from two test production wells, without causing unacceptable effects on existing groundwater supplies, permitted surface water irrigation supplies and the local environment, including local wetlands and streamflow in Davis Creek. Provided the measured effects and projected future effects are acceptable, the next steps will be to complete the Municipal Class Environmental Assessment (EA) and apply for a Permit to Take Water (PTTW) for a new groundwater supply source for the community of Simcoe in Norfolk County.

In 2019, an updated work plan was jointly prepared by Banks Groundwater Engineering Limited (BGE) and Natural Resource Solutions Inc. (NRSI). During initial preparation of the work plan in 2016, NRSI staff reviewed all comments received previously from agencies, with particular interest in those provided by staff from the Ministry of Natural Resources and Forestry (MNRF), and Long Point Region Conservation Authority (LPRCA), and the respective responses of our project team that are provided in the above-referenced report. The updated work plan reflected comments received following circulation of the 2016 version, as well as updates to information sources. The work plan was also prepared to be submitted to the Ministry of the Environment, Conservation and Parks (MOECP), in support of an Application for a Category 3 PTTW for the completion of the testing and monitoring program described herein.

The scope of work presented in the 2019 work plan has now been completed and this report presents the results. A second test production well has been constructed and a testing and monitoring program has been successfully completed. Analyses of the results support the conclusion that the sustainable yield for the aquifer at the locations of test production wells SW11/09 and SW12/20 is 3,500 L/minute (5,040 m3/day or 770 Igpm). The seven-day aquifer performance test at this total combined rate has confirmed this sustainable yield for the aquifer, without causing unacceptable effects on existing groundwater supplies, permitted surface water irrigation supplies, and the local environment, including local wetlands and flow in Davis Creek.

Figure 3: Hydrogeological Study Area (Banks Groundwater Engineering Limited, 2021)

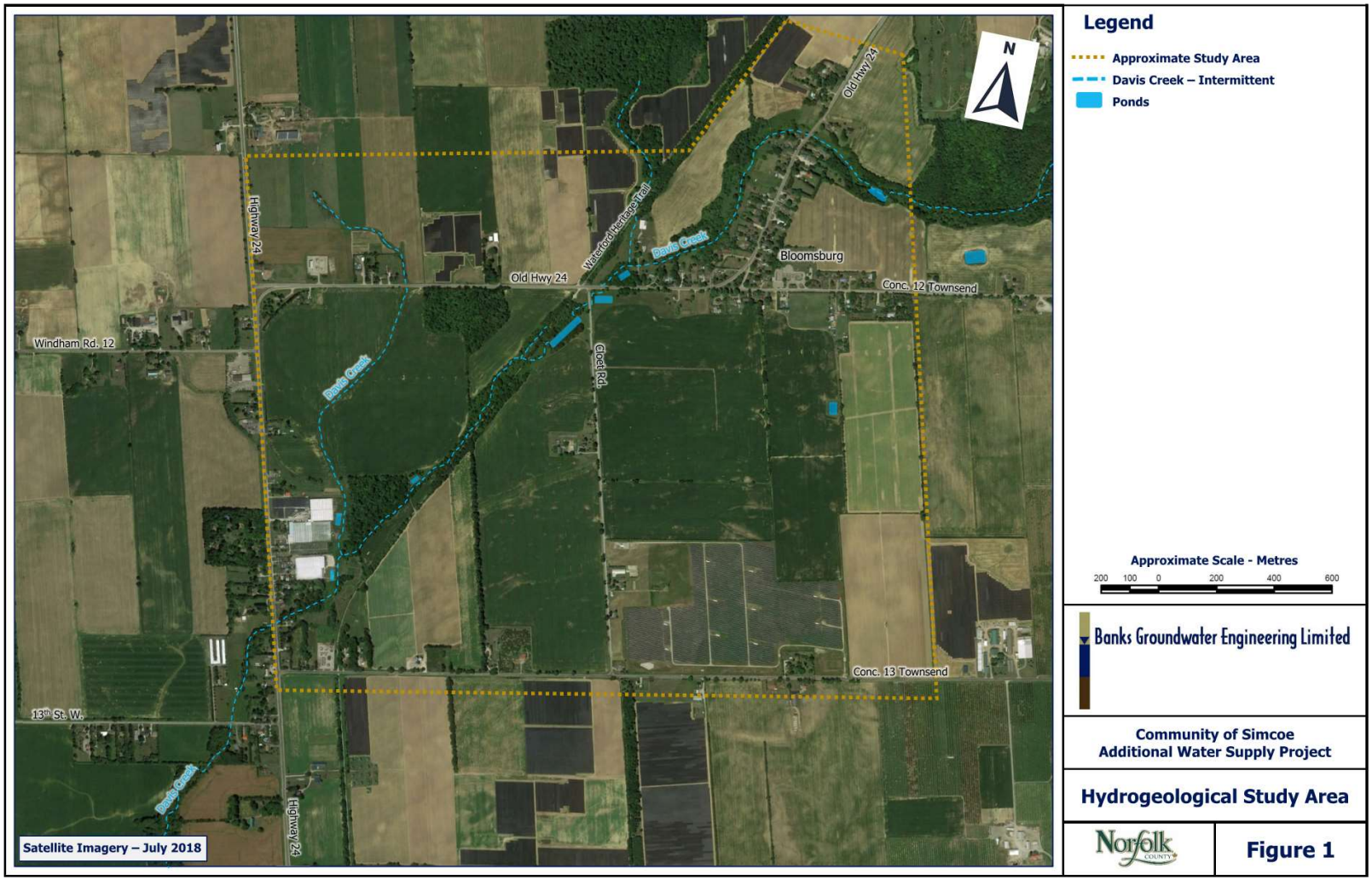


Figure 4: Test Production Wells (Banks Groundwater Engineering Limited, 2021)

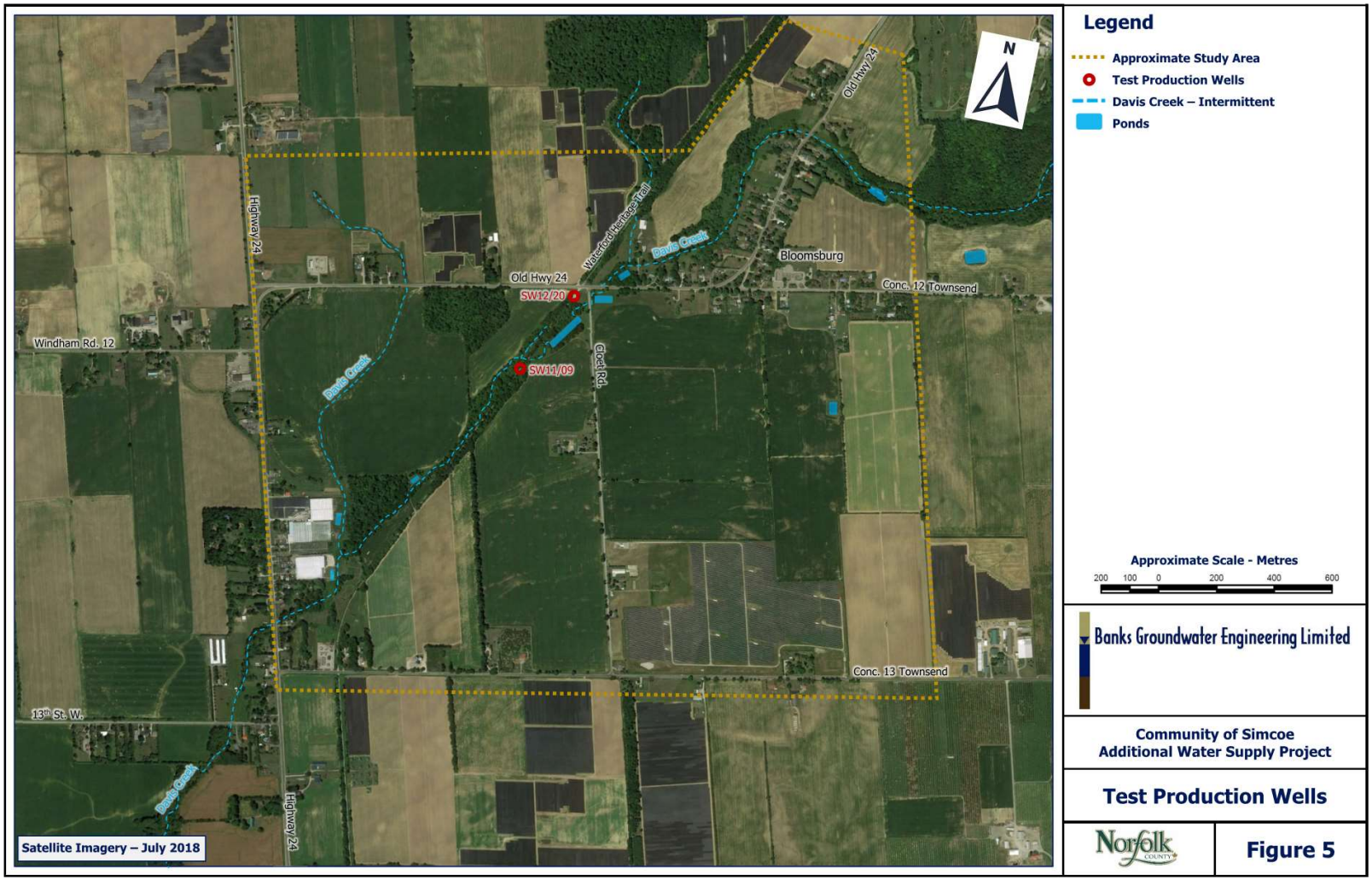
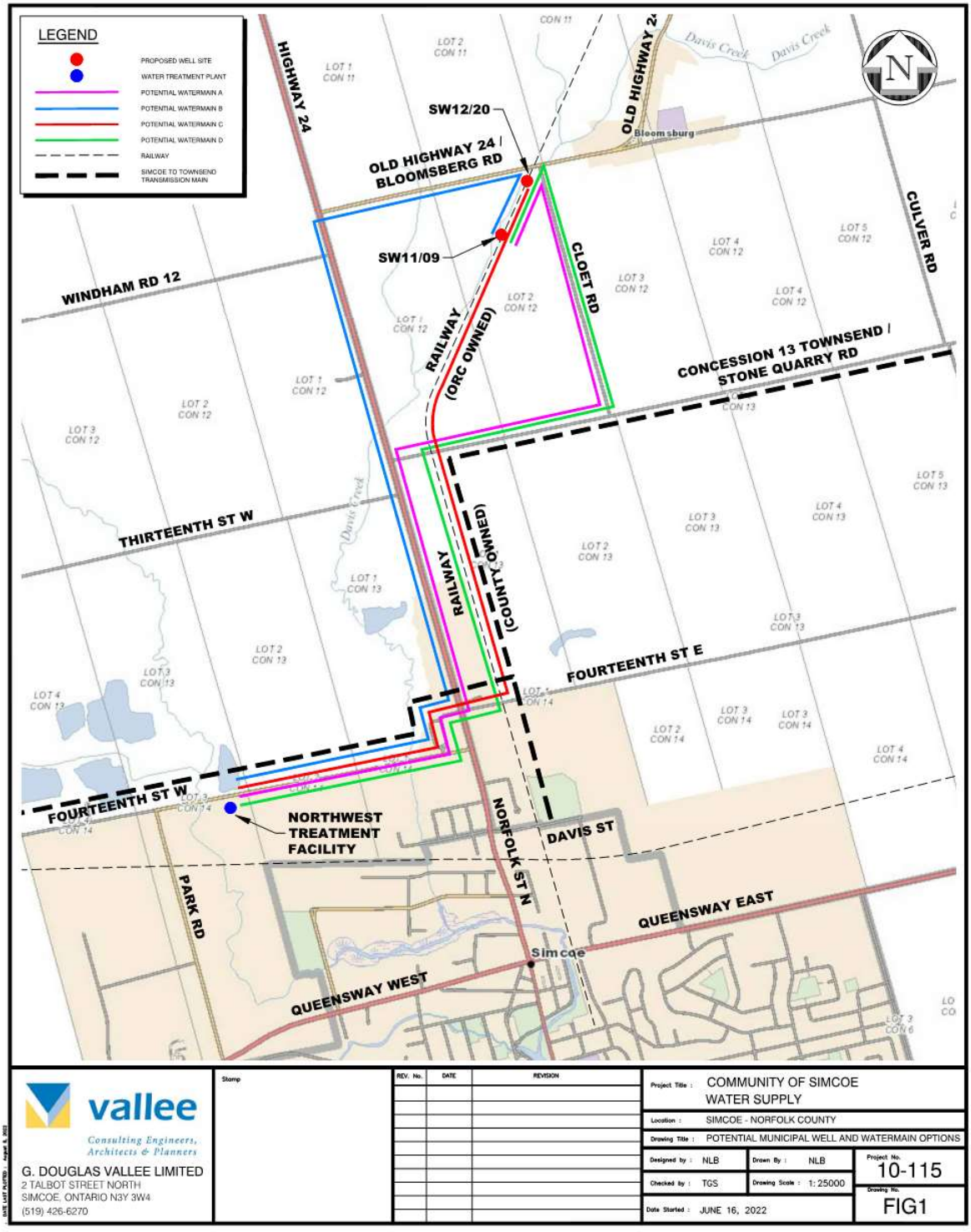


Figure 5: Potential Municipal Well and Watermain Options (G. Douglas Vallee Limited, 2022)



4.1.4. Alternative No. 4 – Pipeline

Under this alternative, additional water would be supplied to the community of Simcoe from a neighbouring community via a pipeline. This supply would be in addition to the planned Inter-Urban Supply Projects, including the Townsend-Simcoe Interconnection, which is currently undergoing a Municipal Class EA and is scheduled to be in service in 2026. As outlined in Section 3, the Problem / Opportunity to be addressed in this EA is to ensure adequate supply until the Townsend-Simcoe Interconnection is operational and to increase overall system resilience it is operational. Accordingly, the Townsend-Simcoe Interconnection is not considered an alternative solution in this EA.

4.2 Environmental Inventory

In 2015, Golder Associates Limited undertook a preliminary assessment of local fisheries resources and instream habitat within Davis Creek. The results and conclusions of the Golder assessment were documented included in a Memorandum, which is included in **Appendix B.** The Golder assessment focussed on the East upstream Tributary of Davis Creek, which is located north of Highway 24. The memorandum asserts that Davis Creek is an intermittent, coldwater watercourse with document fair to poor water quality and poor forest cover, both which impair local fisheries potential. Additionally, the East Upstream Tributary is stressed by adjacent agricultural activities. Based on the results of the May 2012 pumping test, Golder concluded that a future groundwater supply likely represents a low to moderate risk to fish and fish habitat within the East Upstream Tributary (Golder Associates Limited, 2015).

Natural Resource Solutions Inc. (NRS) conducted a natural environment study to create an environmental inventory and to identify potential environmental impacts associated with the production wells, or any of the potential watermain routes. The results were documented in the Simcoe Water Supply Class EA Natural Environment Report (Natural Resource Solution Inc., 2022) for the well site and surrounding areas and in the Community of Simcoe Additional Water Supply Class EA Natural Environment Assessment Report (Natural Resource Solutions Inc., 2022) for the watermain routes. This report is included in **Appendix D**. Adjacent agricultural activities are a significant existing and future stress to Davis Creek. The level of influence is well documented based on LPRCA surveys undertaken in the tributaries of Davis Creek, including the Eastern Upper Tributary. The largest effects of permitted surface water taking and adjacent agricultural land use are: (1) nutrient loading and sediment entry that directly impairs water quality and (2) removal of flow from the EUT that contributes to increased water temperatures and possibly migratory barriers at times of the year (Golder, 2015).

Existing natural features within the study area include wetland, forest, and dense areas of trees and shrubs. These features are found in the vicinity of Davis Creek and other surface water features in the study area. Most of the land in the study area is agricultural lands.

4.2.1. Study Area

The study area used for the natural heritage assessment is shown in Figure 6 and includes the estimated zone of influence of the well and 120-metre buffer around each of the potential watermain routes.

NRSI conducted surveys in 2019 and 2020 to characterize the natural environment within the estimate zone of influence of the wells. Surveys completed in 2022 characterized the preferred route identified in *G. Douglas Vallee Limited. (2022). Watermain Route Evaluation Section – Simcoe Water Supply Class EA Simcoe – Norfolk County*, while desktop studies were completed for the other three (3) possible watermain routes.

4.2.2. Soils, Terrain, and Drainage

The Study Area is located within the Norfolk Sandplain physiographic region, which slopes gradually from the northwest towards Lake Erie (Presant & Acton, 1984). Overburden deposits within this region are predominantly classed as Wentworth Till and the Paris and Galt Moraines (Barnett, 1978) (Banks Groundwater Engineering Limited, 2015).

Soil deposits are dominated by lacustrine sands, containing sandy or loamy sediments (Presant & Acton, 1984).

4.2.3. Vegetation

The Study Area is dominated by agricultural fields with associated roadways and rural residential lots. Vegetation surveys conducted in 2019 identified 168 and 133 vascular species within the study, 31% and 36% were considered non-native in the respective studies (Ontario Ministry of the Environment, 2019). Of the species reported, three (3) rare vegetation species were observed in 2019, all were located within a garden feature, which is generally not afforded protection. These species included Spiked Blazing Star (Liatris spicata), Gray-headed Coneflower (Ratibida pinnata), and Oswego-tea (Monarda didyma). In 2022, NRSI documented mature Butternut (Juglans cinerea) trees along, and adjacent to, the Rail Trail at seven (7) distinct locations. These locations along with any other natural environment constraints, are shown in **Figure 7**. Butternut is listed as Endangered provincially (Ministry of the Environment, Conservation, and Parks (MECP), 2020).

NRSI background review noted that Tallgrass Prairie vegetation community is located in the vicinity of the study area (Natural Heritage Information Centre, Ontario Ministry of Northern Development and Mines, Resources and Forestry, 2022). This community is not present along the preferred alignment based on 2022 Ecological Land Classification (ELC) field surveys, but may exist along the other watermain alignment options, although this is unlikely as the area is largely disturbed.

The vegetation communities were mapped using the ELC system for Southern Ontario (Lee, et al., 1998) and are shown in **Figure 8** and **Figure 9** (Natural Resource Solutions Inc., 2022).

Figure 6: Natural Feature Constraints Within the Study Area (Natural Resource Solutions Inc., 2022)

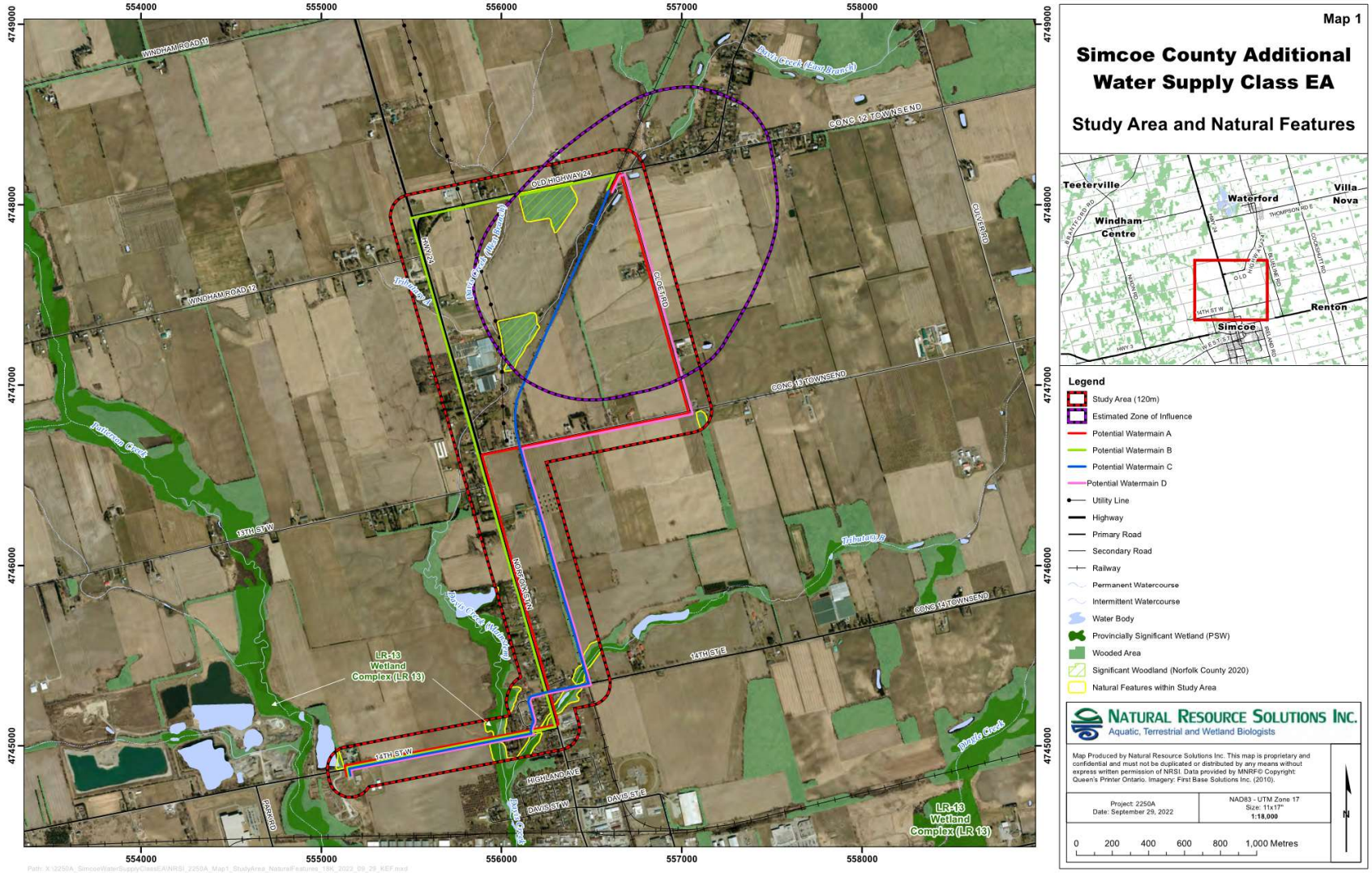


Figure 7: Natural Environment Constraints (Natural Resource Solutions Inc., 2022)

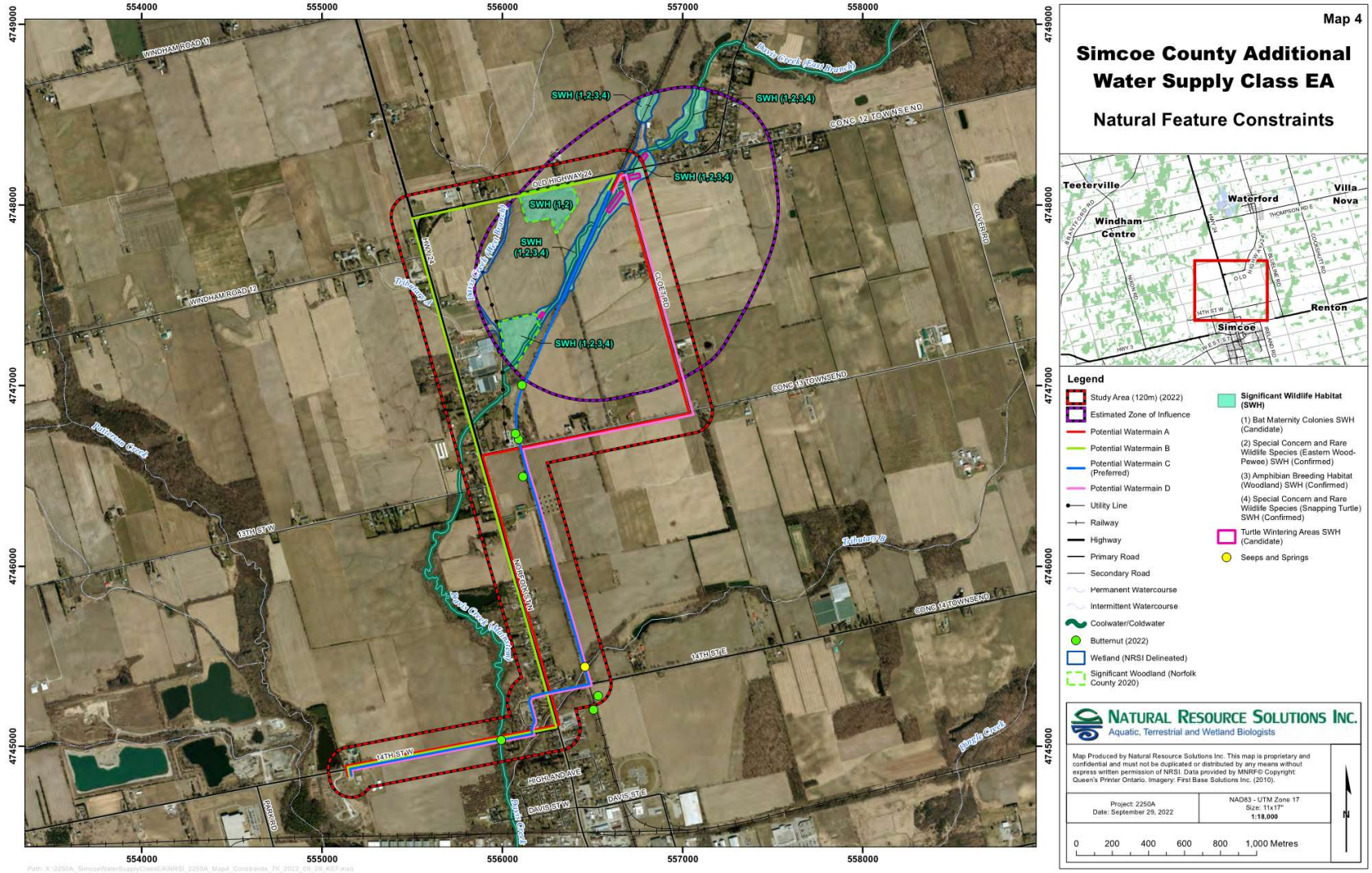


Figure 8: Vegetation Communities (Natural Resource Solutions Inc., 2022)

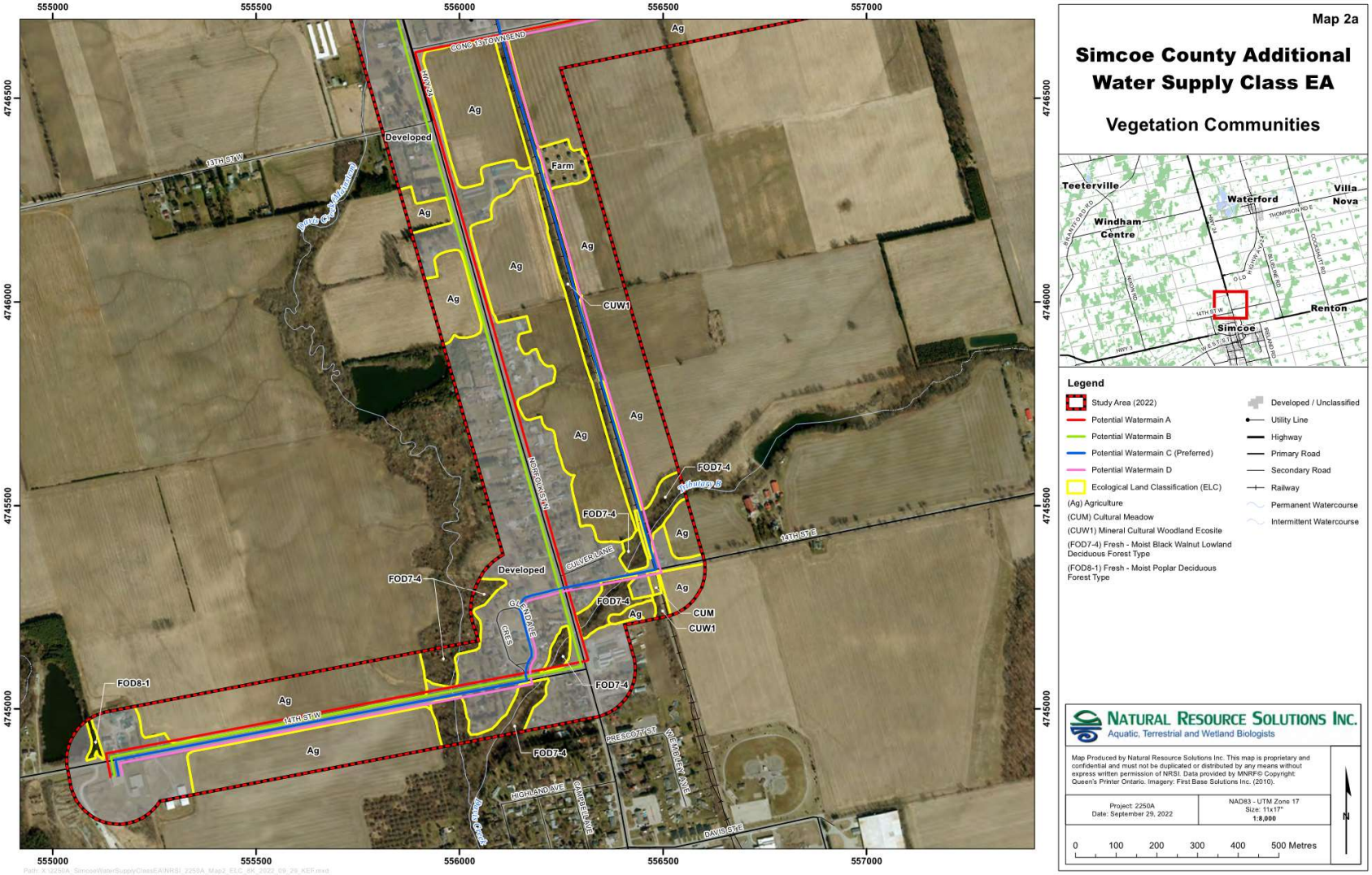
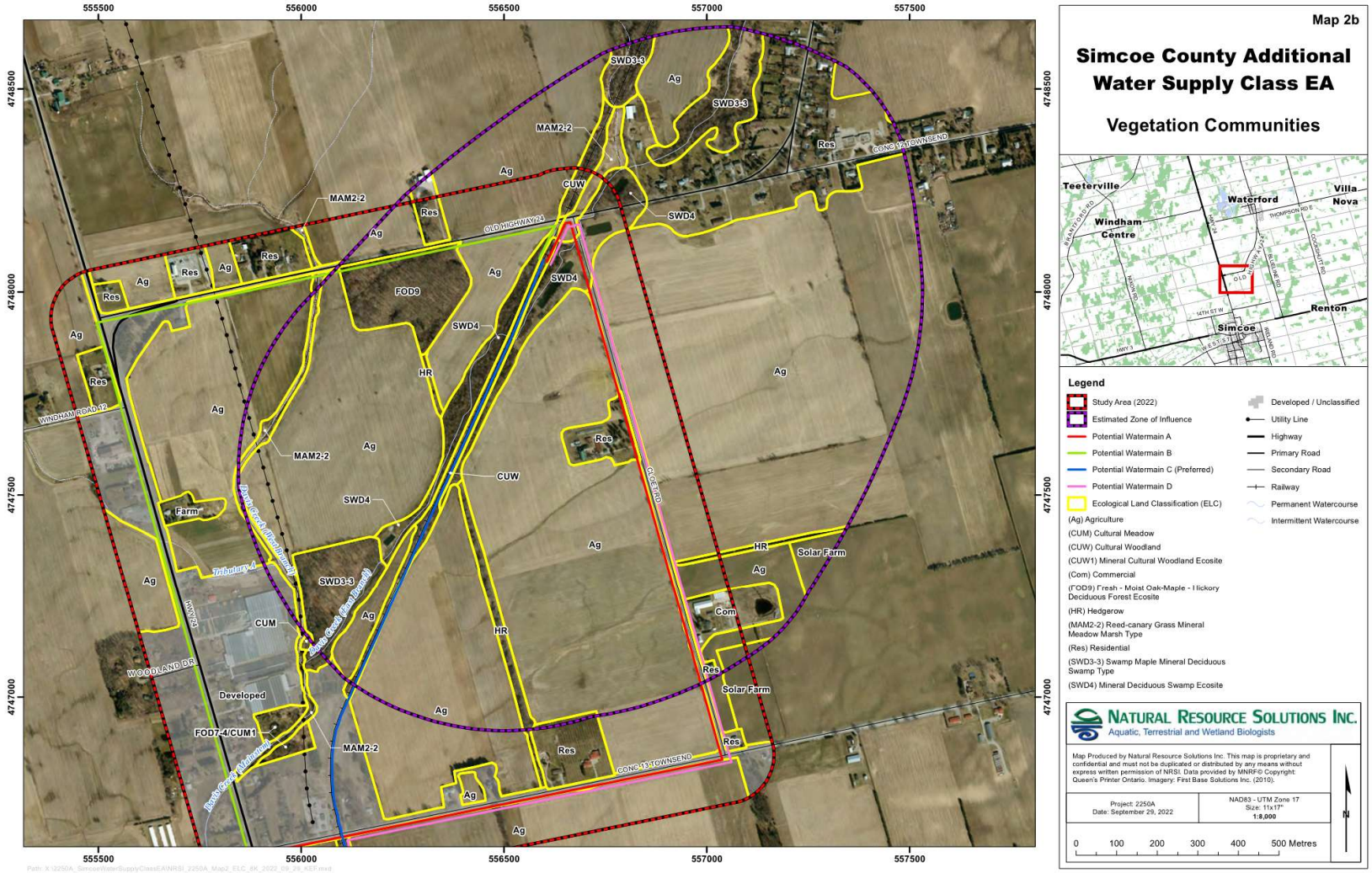


Figure 9: Vegetation Communities (Continued) (Natural Resource Solutions Inc., 2022)



4.2.4. Breeding Birds

Early morning breeding bird point count surveys were conducted in both 2019 and 2022 in accordance with the Ontario Breeding Bird Atlas protocol (Birds Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Forestry, Environment and Climate Change Canada, and Ontario Nature, 2021). A total of 45 species were documented within the Study Area, of which 36 species displayed evidence of possible, probable, or confirmed breeding based on OBBA breeding evidence codes (Birds Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Forestry, Environment and Climate Change Canada, and Ontario Nature, 2021).

NRSI identified a total of 11 Species at Risk / Species of Special concern through desktop research (Ontario Ministry of Natural Resources and Forestry (OMNRF), 2019) (Natural Heritage Information Centre, Ontario Ministry of Northern Development and Mines, Resources and Forestry, 2022). In both 2019 and 2021, NRSI confirmed the presence of Barn Swallow (Hirundo rustica) and Easter Wood-Pewee (Contopus virens), which are respectively classified as Species at Risk and Species of Special Concern. In 2021, NRSI also identified one additional Species at Risk, the Chimney Swift (Chaetura pelagica).

Barn Swallows are regulated Species at Risk that are listed as Threatened provincially and federally, and accordingly, individuals and their habitat are protected under the Endangered Species Act (Government of Ontario, 2007). Suitable nesting habitat, which consists of barns, sheds, and other buildings (Brown & Brown, 2020), may be present in the study area, but could not be confirmed by NRSI due to their location on private land.

Chimney Swifts are also listed as Threatened provincially and federally and are commonly found in urban areas near buildings. Suitable nesting habitat of chimneys, hollow trees, and crevices of rock cliffs (Ministry of the Environment, Conservation, and Parks (MECP), 2020) (Ontario Ministry of Natural Resources (OMNR), 2000) may existing within the study where chimneys and hollow trees are present.

Easter Wood-Pewee are regulated Species of Special Concern, listed as Special Concern provincially and federally and although common in Ontario, it has experienced widespread declines (Natural Resource Solutions Inc., 2022). Habitat typically includes deciduous or mixed intermediate forests with little understory, clearing, and edges (Ontario Ministry of Natural Resources (OMNR), 2000) (Committee on the Status of Endangered Wildlife in Canada, 2012). Suitable breeding habitat is present within the Study Area where forest community and riparian edges of Davis Creek provide appropriate habitat **Figure 7**.

4.2.5. Reptiles and Amphibians (Herpetofauna)

NRSI identified twenty-four herpetofauna species from background data, six of which were documented during field surveys in 2019, and one which was observed incidentally during surveys during 2021. A total of eight (8) species at risk/species of conservation concern were reported and a single Common Snapping

Turtle (*Chelydra serpentina serpentina*), was visually confirmed. Snapping turtles inhabit a wide range of habitats, including manufactured ponds, streams, and watercourses.

Frog and toad call surveys revealed the presences of Spring Peers (*Pseudacris crucifer*), American Toad (*Anaxyrus americanus*), Wood Frog (*Lithobates sylvaticus*) and Northern Green Frog (*Lithobates clamitans melanota).*

NRSI reported a total of eight Species at Risk / Species Special Concern herpetofauna from background review data in 2019 (Ontario Ministry of Natural Resources and Forestry (OMNRF), 2019) (Ontario Nature, 2019) and a total of nine Species at Risk / Species Special Concern in 2022. A single Species of Special Concern, Common Snapping Turtle (Chelydra serpentina serpentina), was documented by NRSI biologists incidentally on April 24, 2019. Snapping Turtles inhabit a wide range of habitats, including manufactured ponds, streams, and watercourses. Suitable over-wintering aquatic habitat is present within the study area in the form of wetlands and ponds **Figure 6**.

4.2.6. Insects

NRSI background review identified 26 species of Odonata (dragonfly and damselfly) in the vicinity of the Study Area (Natural Heritage Information Centre, Ontario Ministry of Northern Development and Mines, Resources and Forestry, 2022). In 2019, 57 Lepidoptera (butterfly) species and in 2022, 29 species were reported from the vicinity of the study based on the Ontario Butterfly Atlas (MacNaughton, Layberry, Jones, & Edwards , 2022). NRSI did not observe any species during their 2019 field visit, but in 2022, they observed two (2) species, including the Monarch (Danaus plexippus), which is listed provincially as a Species of Concern. Monarch is a widespread species associated with a variety of habitats, include roadsides, agricultural lands, and meadows. They require a variety of wildflowers for adults and milkweed for larvae (Ministry of the Environment, Conservation, and Parks (MECP), 2020). Given that only a single adult Monarch was observed, and there was no evidence of larvae on milkweed plants, suitable habitat is not considered present within the study area.

4.2.7. Mammals

In 2021, NRSI reported forty-one mammal species in the vicinity of the study area based on the Mammal Atlas of Ontario (Dobbyn, 1994). Several species of SAR bats are known to roost in tree cavities, hollows, or under loose bark, as well as within buildings (Ontario Ministry of Natural Resources (OMNR), 2000). Based on habitat present within the study area, NRSI concluded that all deciduous forested habitats provide suitable roosting habitat for SAR bats **Figure 7**.

4.2.8. Aquatic Environment

4.2.8.1 Watercourse Structure

The study area incudes the main branch of Davis Creek, a tributary of Lynn-Black Creek, and two (2) tributaries that flow into Davis creek from the northwest (**Figure 7**).

The main branch of Davis Creek flows into the Lynn-Black Creek which then flows into Lake Erie in Port Dover. Davis Creek has been identified as a cool to cold water feature (Long Point Region Conservation Authority (LPRCA), 2013) (McCloskey, 2014) (Natural Resource Solutions Inc., 2022) (LPRCA, MNR, 2014).

NRSI broke down the description of Davis Creek into the west branch, east branch, mainstem, and Tributary A and Tributary B (**Figure 7** and **Figure 9**).

East Branch

The east branch of Davis Creek originates northeast of the Study Area near the community of Bloomsburg, entering the Study Area at its northeast corner near the intersection of Old Highway 24 and Cloet Road before flowing southwest parallel to the trailway before turning west and crossing under the trailway approximately 300 m southwest of Cloet Road. Portions of the east branch are meandering, while other parts suggest historical channelization. The average wetted widths range from 0.5 to 2.5 m with depths from 0.15 to 0.2 m, with substrates dominated by sand silt and gravel. Generally, the natural corridor provides relatedly high-quality shade, with mature deciduous forest and thick riparian shrub growth (Natural Resource Solutions Inc., 2022).

Several ponds exist along this segment, with a pond of approximately 2,800 m2 remaining connected to east branch, a pond of approximately 1,300 m2 having a historic connection, and a smaller pond of 500 m^2 having a potential connection at times of year (Natural Resource Solutions Inc., 2022). The first two (2) ponds were historically used for irrigation (Banks Groundwater Engineering Limited, 2021).

NRSI observed watercress (Nasturtium officinale) at various locations along the east branch, suggesting the presence of groundwater inputs to the creek that help to support baseflow and maintain cool water temperatures (Natural Resource Solutions Inc., 2022).

West Branch

The west branch of Davis Creek originates within active agricultural lands north of the Study Area and crosses Old Highway 24 approximately 650m west of Cloet Road and the east branch crossing. The west branch flows south for approximately 1.0km to where it merges with the east branch. Within the study area the watercourse flows as a channelized feature through agricultural lands with a limited riparian corridor that appears to consist primarily of grasses with occasional trees and shrubs. The width of the corridor ranges from approximately 10 to 20m and appears to provide relatively poor shading to the channel. Based on aerial imagery, the channel widens at the downstream (south) sides of laneway crossings, suggesting the presence of undersized culverts and channel scouring.

Mainstem

The mainstem of Davis Creek diverges from the adjacent trailway approximately 120 m south from the confluence of the east and west branches. The channel travels southwest and crosses Highway 24 approximately 170 m north from Concession 13 where it exits the study area and then turns south. The mainstem then crosses the study area again at 14th Street West approximately 330 m west from Norfolk Street North (Highway 24). Similar to the east branch, the mainstem flows primarily through an agricultural landscape within a narrow naturally vegetated corridor. South of the study area Davis Creek flows through a predominately developed landscape. The creek flows through a relatively straight channel over a low to moderate gradient with substrates comprised of gravel, sand, and silt with some cobble. The channel was slightly incised, and evidence of bank erosion and undercutting was noted. Watercress was observed in relatively low abundance at this location.

Tributary A

Tributary A is a minor feature that originates northwest of the Study Area and flows southeast, crossing Highway 24 before flowing to the west branch of Davis Creek. This feature appears to be historically channelized and flows within a narrow riparian corridor across agricultural lands, which provides limited shading (Natural Resource Solutions Inc., 2022).

Tributary B

Tributary B originates east of the study area and flows through an agricultural landscape generally west and southwest, crossing the study area near its southeast corner. Within the study area the tributary crosses the trailway approximately 80 m north of 14th Street East before crossing 14th Street East, Norfolk Street, and 14th Street West. The tributary merges with the mainstem of Davis Creek approximately 200 m south of 14th Street West and outside the study area. Approximately 400 m east of the trailway Tributary B flows through a large online pond (Natural Resource Solutions Inc., 2022).

At the point were Tributary B crosses the rail trail, the wetted width ranges from approximately 1.5 to 3.5 m with a bankfull width up to approximately 5.0 m. Water depths ranged from 0.1 to 0.3 m. Riparian vegetation was dominated by wetland species, including Skunk Cabbage (Natural Resource Solutions Inc., 2022).

NRSI confirmed Tributary B as fish habitat based on the presence of several small-bodied and young-of-year fish species (Natural Resource Solutions Inc., 2022).

4.2.8.2 Fish Community

Fish collected by NRSI to assess each section of Davis Creek within the study were consistent with cool water communities (Banks Groundwater Engineering Limited, 2015) (Natural Resource Solution Inc., 2022) (Golder Associates Limited, 2015). NRSI identified 21 fish species based on historical data and confirmed the presence of six species during electrofishing. NRSI did not identify any Species at Risk during desktop review or during electrofishing (Natural Resource Solutions Inc., 2022).

A known population of Brook Trout exists near the lower extent of Davis Creek near the confluence with Patterson Creek. However, in its current state, the aquatic habitat within the study area is likely to limit the presence of a Brook Trout population due to degraded water quality, temperature, and flow conditions resulting from adjacent agricultural practices, including online irrigation ponds (Natural Resource Solutions Inc., 2022).

4.2.8.3 Wetland

There are both unevaluated wetlands and wetland features along Davis Creek within the study area.

4.2.9. Significant Natural Features

NRSI conducted an evaluation of the significance of natural features to identify features that are either rare, or sensitive to change, or of a function / process that contributes toward their significance. NRSI completed this evaluation using professional judgement, policies, legislation, and regulations.

4.2.9.1 Wetlands

According to Natural Resources Solutions Inc. (2022), the unevaluated wetlands in the northern section of the study area are not Provincially Significant Wetlands. The only identified Provincially Significant Wetland is located 900 m southwest of the study area (**Figure 6** and **Figure 7**).

4.2.9.2 Significant Woodlands

The Norfolk County Official Plan (2020) (Schedule C-1; and C-4) identifies the presence of two (2) "Significant Woodland" features within the western portion of the study area (Map 4). Development or site alteration in, or adjacent to, Significant Woodlands shall not be permitted unless it has been demonstrated that there will be no negative impacts on the Woodlands and the ecological functions that sustain them. Under the Official Plan, a minimum setback of 10 m from the Woodland dripline is required.

4.2.9.3 Significant Wildlife Habitat

NRSI identified four (4) candidate and three (3) confirmed Significant Wildlife Habitats, shown on **Figure 7**:

- Bat maternity colonies (candidate);
- Turtle wintering areas (candidate);
- Tallgrass Prairie (candidate);
- Amphibian breeding habitat (woodland) (confirmed);
- Turtle Nesting Area (candidate);

- Seeps and springs (confirmed); and,
- Special Concern and Rare Wildlife species (Eastern Wood-Pewee, Monarch, and Snapping Turtle) (Confirmed).

4.2.10. Species at Risk

Species at risk listed as Threatened or Endangered under the provincial Endangered Species Act, 2007 and Species of Conservation Concern were considered for this project because the habitat of these statuses are provided habitat protection. NRSI completed desktop searches and field surveys to identify potential species at risk or habitats of species at risk in the study area. NRSI concluded that habitat for species at risk are potentially present in the study area. Confirmed significant wildlife habitat features were found in proximity to Davis Creek and the woodland areas. The mitigation measures for the removal of vegetation that has the potential to impact species at risk is outlined in the Simcoe Water Supply Class EA Natural Environment Report (Natural Resource Solution Inc., 2022) and the community of Simcoe Additional Water Supply Class EA Natural Environment Assessment Report (Natural Resource Solutions Inc., 2022).

Additionally, information provided by the MECP Species at Risk Unit on September 11, 2023, indicated the potential for American Badger (endangered, with species and regulated habitat protection) and observation of Eastern Hog-nosed Snake (threatened, with species and general habitat protection), both in the general area of the project area.

4.2.11. Areas of Natural and Scientific Interest

An Area of Natural and Scientific Interest (ANSI) are designated land regions that have significant geological or ecological features. The following are the potential ANSI in the study area:

- Two (2) significant woodland areas;
- Candidate and confirmed significant wildlife habitat.

4.2.12. Socio-Cultural Environment

The local area surrounding the potential municipal wells and watermain routes is predominantly agricultural and rural residential. Only the portion of the watermain routes along 14th Street and a small part of Highway 24 that connects to 14th Street, which is an urban area. The two test production wells and two (2) of the watermain alternatives occur on part of an abandoned rail line that has been converted to a public trail, known as the Waterford Trail.

Based on the Heritage Designated Parcels of Land for Norfolk County, there appears to be two (2) properties in the hamlet of Bloomsburg that has designated heritage buildings. The study also

contains the Waterford Heritage Trail. The land use of the study area includes agricultural, residential, commercial, institutional and community use.

4.3 Impact Evaluation and Identification of Preferred Alternative Solutions

4.3.1. Preliminary Screening of Alternative Solutions

The Alternative Solutions outlined in Section 4.1 were screened against criteria adapted from the MECP's Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario (MOE, 2009). The requirements for an Alternative Solution are that it is feasible, viable, and makes efficient use of existing wastewater treatment resources, which is a requirement of the Provincial Policy Statement 2020. Only Alternative Solutions meeting these criteria were advanced for further comparison and consideration. If only one option meets the criteria, this option would become the preferred option. The screening of Alternative Solutions is presented in **Table 2**.

Table 2: Preliminary Screening of Alternative Solutions

Criteria	1 Do Nothing	2 Reduce Demand	3 New Groundwater Supply	4 Pipeline
Do they provide a viable solution to the problem?	No	No	Yes	No
Are they proven technologies?	Yes	Yes	Yes	Yes
Are they technically feasible?	Yes	Yes	Yes	Yes
Are they consistent with planning objectives?	No	No	Yes	No
Are they consistent with provincial government priority initiatives?	No	No	Yes	Yes
Do they avoid potential impacts to sensitive environmental features?	Yes	Yes	Yes	Yes
Are they practical, financially realistic, and economically viable?	Yes	Yes	Yes	No
Are they within the ability of the County to implement?	Yes	Yes	Yes	No

Based on the above screening criteria, the following alternatives were "screened-out" and will not be considered further:

- The do-nothing option;
- Reduced Demand; and,
- Pipeline.

The Do-Nothing option was screened out, as it does not address the water supply capacity issue, nor does it address the need for increased resilience in the water supply system. It was therefore not considered to be a feasible option. Additionally, this option does not allow the Community to meet its planning objectives for growth, as the Community would not have adequate water supply capacity or resilience in the water supply infrastructure with which to meet the demands of a growing population. Accordingly, this option is not consistent with the Provincial Policy Statement (PPS), which requires that water servicing accommodate forecasted growth in a manner that promotes the efficient use and optimization of existing municipal water services.

Similarly, water conservation does not represent a viable solution to the problem given that the amount of required additional capacity needed is too high to offset by water conservation initiatives. Based on the results of recent testing and analysis, the practical firm capacity for the seven (7) current municipal production wells was updated to be 7,303 m^3/day. Based on the projected Max Day Water Demand of 9,039 m^3/day, this equates to a projected deficit of 1,736 m^3/day by 2041. It is also understood that estimated peak day demand could potentially exceed the firm capacity within the next few years. As it is not viable for the Community to reduce water demand by 24% through water conservation initiatives, this option is not considered viable. Accordingly, while meeting the requirement of the PPS to encourage water conservation, this option does not accommodate forecasted growth and therefore does not meet the requirements of the PPS.

Norfolk County has already implemented water conservation strategies, starting with the outdoor Water Use Restriction By-law, which was implemented to reduce the consumption of water utilized during the summer months (Watering of lawns etc.). The Universal metering of all Municipal Water Consumers is tracked and billed to determine water consumption and demands and help to detect high water consumers and / or leaks. Public and Employee Education is achieved through ongoing training of employees and Norfolk County utilizes an active notification program via website and radio and newspapers to relay information to the public such as water rates, hydrant flushing programs and water restrictions in place.

In Norfolk County, potable water consumption is metered for all consumers and the system allows detection of high consumptions at residences and industries in Norfolk County by recording a high consumption alarm. These are flagged and a follow up investigation is initiated. Norfolk County also conducts an annual water consumption spreadsheet to determine the actual water usage per town. Norfolk county also conducts Unaccounted Water Calculations on an annual basis to determine water loss / non-metered water usage.

Water conservation does not allow the community to meet its planning objectives for growth, as the community would not have adequate water supply capacity or resilience in the water supply infrastructure with which to meet the demands of a growing population.

Adding water supply capacity through a new pipeline is not a viable, practical, financially realistic, and economically viable solution that is within the County's ability to implement, given a new pipeline could not be permitted and built any earlier than the already planned and in progress Townsend-Simcoe interconnection project.

Given that all but one (1) option was screened out from further consideration, the only remaining option that addresses the problem statement is to establish a new groundwater supply, and this is considered the preferred solution.

4.3.2. Assessment of Screened Alternative Solutions

Evaluating the alternative solutions not screened out during the preliminary screening was based on the following Evaluation Categories:

- Total project cost;
- Approval requirements / land ownership;
- Accessibility for construction and maintenance;
- Coordination with Simcoe to Townsend Transmission Watermain;
- Potential environmental impacts.

Each of these evaluation categories were evaluated for the groundwater supply well northeast of the Community of Simcoe, in combination with four (4) alternative watermain routes.

4.3.2.1 Project Cost

The cost of the four (4) alternative watermain routes was estimated by G. Douglas Vallee Limited in 2011 and then updated in 2022 in a report included in **Appendix C** (G. Douglas Vallee Limited, 2022). The Vallee Report watermain route costing and ranking is shown in **Table 3**.

Table 3: Ranking of Alternatives Based on Cost (G. Douglas Vallee Limited, 2022)

Route	Opinion of Total Project Cost	Relative Ranking (1 = worst, 4 = best)
3A: Stone Quarry Road	$7,095,270	1
3B: Highway 24	$6,985,095	2
3C: Rail Trail	$5,259,020	4
3D: Rail Trail / Stone Quarry Road	$6,610,500	3

Watermain routes 3A and 3B travel through predominantly urban areas, resulting in high restoration and traffic control costs during construction. Additionally, Ministry of Transportation (MTO) ownership of Highway 24 will require additional design, construction, testing, and adherence to MTO procedures, resulting in additional project cost.

Alternative 3C is the least costly option, given that most of the route is along a gravel walking trail, which will minimize restoration costs compared to working in a road right-of-way. Alternative D, which uses a shorter section of the Waterford Trail than Alternative 3C, is less costly than alternatives 3A and 3B, but more costly than 3C.

Another factor in estimating cost was the respective watermain lengths. Alternative 3C was also the shortest watermain at 4.9 km, followed by Alternative 3D at 6.0 km, Alternative 3B at 6.1 km, and Alternative 3A at 6.2 km.

Costing of all alternatives was based on open cut construction, however, the Norfolk County has indicated a preference for using directional drilling to minimize restoration requirements and potential environmental impacts. This will be confirmed during detailed design.

4.3.2.2 Approval Requirements / Land Ownership

The approval requirements depend largely on the ownership of the land along the watermain route. The ranking of alternatives based on approval requirements / land ownership is provided in **Table 4**.

Table 4: Ranking of Alternatives Based on Approval Requirements / Land Ownership (G. Douglas Vallee Limited, 2022)

Route	Approval Requirements/Land Ownership	Relative Ranking (1 = worst, 4 = best)
3A: Stone Quarry Road	• Majority of works on Norfolk County Road allowances and Highway 24. • Permission required for use of Highway 24 road allowance. • Ministry of Transportation Ontario has indicated that “deep trunk watermain services are not permitted along our corridor”. • Approval by MTO may not be possible.	1
3B: Highway 24	• Permission required for use of Highway 24 road allowance. • Ministry of Transportation Ontario has indicated that “deep trunk watermain services are not permitted along our corridor”. • Approval by MTO may not be possible.	1
3C: Rail Trail	• Majority of Road on Norfolk County Road allowances. • Approval required by the Ontario Realty Corporation for the northern section of the rail trail. • Crossing of Highway 24 should only require a simple approval.	3
3D: Rail Trail / Stone Quarry Road	• All works on Norfolk County Road allowances or Norfolk County Trail. • Crossing of Highway 24 should only require a simple approval.	4

4.3.2.3 Accessibility for Construction and Maintenance

Accessibility is an important consideration, both for construction access with heavy construction equipment, and for required maintenance work. The ranking of alternatives based on approval requirements / land ownership is provided in **Table 5**.

Table 5: Ranking of Alternatives Based on Accessibility (G. Douglas Vallee Limited, 2022)

Route	Approval Requirements/Land Ownership	Relative Ranking (1 = worst, 4 = best)
3A: Stone Quarry Road	• All on Norfolk County Road allowances and Highway 24. • Excellent access.	4
3B: Highway 24	• Good access, subject to MTO approval / conditions.	3
3C: Rail Trail	• Portion on County roads provides excellent access. • Rail train provides good access; however, the trail width results in some limitations. • Access only via trail ends. • Potential snow removal difficulty if required.	2
3D: Rail Trail / Stone Quarry Road	• Potion on County roads provides excellent access. • Rail train provides good access; however, the trail width results in some limitations. • Access only via trail ends. • Potential snow removal difficulty if required. • Shorter distance on rail trail compared to Route 3C.	2

4.3.2.4 Coordination with Simcoe to Townsend Transmission Watermain

Norfolk County is currently completing a Schedule 'B' Municipal Class Environmental Assessment for the Townsend-Simcoe connection as part of the Inter-Urban Water Supply System. The new well will deliver raw water to the County's treatment facility on 14th Street, whereas the Townsend watermain will deliver treated water directly to Simcoe's distribution system. As a result, the same watermains cannot be used, but where the routes overlap, construction could occur concurrently to minimize disruption to traffic and adjacent landowners. The areas that overlap are shown in **Figure 5** and the ranking of alternatives based on approval requirements / land ownership is provided in **Table 6**.

Table 6: Ranking of Alternatives Based Overlap with Townsend Watermain (G. Douglas Vallee Limited, 2022)

Route	Overlapping Sections with the Simcoe to Townsend Watermain	Relative Ranking (1 = worst, 4 = best)
3A: Stone Quarry Road	• 14th Street from Treatment Facility to Glendale Crescent • Glendale Crescent to Norfolk Street • 13th Concession/Stone Quarry Road to Cloet Road	2
3B: Highway 24	• 14th Street from Treatment Facility to Glendale Crescent • Glendale Crescent to Rail Trail	1
3C: Rail Trail	• 14th Street from Treatment Facility to Glendale Crescent • Glendale Crescent to Rail Trail • Rail Trail to 13th Concession/Stone Quarry Road	3
3D: Rail Trail / Stone Quarry Road	• 14th Street from Treatment Facility to Glendale Crescent • Glendale Crescent to Rail Trail • Rail Trail to 13th Concession/Stone Quarry Road • 13th Concession/Stone Quarry Road to Cloet Road	4

4.3.2.5 Potential Environmental Impacts

The potential environmental impacts considered included both socio-economic and natural environmental impacts. All alternatives involve pumping of groundwater from two production wells and based on the results of a 7-day pumping test in 2020 (Banks Groundwater Engineering Limited, 2021) and two (2) 72-hour pumping tests (Banks Groundwater Engineering Limited, 2015), there is no evidence to suggest that there will be any negative short or long term effects on the form or function of Davis Creek, its tributaries, or adjacent wetland features. The County of Norfolk has committed that regardless of the selection of a preferred watermain alignment, watermain construction, including watercourse crossings, will occur through directional drilling to minimize restoration requirements and to avoid in-stream works and associated potential environmental effects.

Table 7: Ranking of Alternatives Based on Potential Environmental Effects (G. Douglas Vallee Limited, 2022)

Route	Overlapping Sections with the Simcoe to Townsend Watermain	Relative Ranking (1 = worst, 4 = best)
3A: Stone Quarry Road	• Temporary traffic disruption during construction • Contains one (1) concession of four-lane Highway 24 where traffic would be disrupted during construction	1
3B: Highway 24	• Temporary traffic disruption during construction • Contains two (2) concession of four-lane Highway 24 where traffic would be disrupted during construction	2
3C: Rail Trail	• Minimizes traffic disruption due by using the rail trail • Results in disruption to trail users during construction	4
3D: Rail Trail / Stone Quarry Road	• Moderate traffic disruption during construction • Results in disruption to trail users during construction	3

4.3.2.6 Climate Change

The Provincial Policy Statement contains several policies that require land use planning and infrastructure projects consider their impact on climate change. Some of the applicable policies require that land use planning and infrastructure projects:

- Policy 1.6.6.1 (b4): prepare for the impacts of a changing climate.
- Policy 1.8.1: support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and preparing for the impacts of a changing climate through land use and development patterns.
- Policy 3.1.3: prepare for the impacts of a changing climate that may increase the risk associated with natural hazards.

None of the alternatives will have an appreciable impact on climate change, nor would there be any appreciable differences in climate change impacts between the alternatives. The watermain construction will occur either in a road right-of-way, or on the existing rail trail, and vegetation removal will be limited, with no planned tree removal.

No emissions of greenhouse gases are expected during the operation of the pumphouse, and limited emissions will occur during construction, resulting from the operation of construction equipment. All construction equipment will be required to be kept in good working condition to minimize emissions of greenhouse gases.

There is potential for climate change to impact the groundwater recharge of aquifers, due to changes in the timing of snow melt, which is essential to the recharge of aquifers, and through increased drought and reduced soil moisture, and higher evaporation rates (Mortsch, Alden, & Scheraga, 2003). This further highlights the importance of the resilience to Simcoe's water supply system that will be achieved by this project. Norfolk County will record daily water takings at the proposed wells, which will be reported to the Ministry of the Environment, Conservation and Parks in accordance with requirements that will be outlined in a Permit to Take Water. These recordings will help determine if there is a reduction in well output over time that could be attributed to climate change.

4.3.2.7 Selection of Preferred Alternative

Based on the evaluation of the Alternative Solutions in terms of Project Cost, Approval Requirements / Land Ownership, Accessibility for Construction and Maintenance, Coordination with Simcoe to Townsend Pipeline and Potential Environmental Impacts, a summary scoring was compiled to determine the preferred Alternative Solution, as shown in **Table 8**.

Table 8: Summary of Evaluation of Preferred Alternative Evaluation Scoring

Route	Project cost	Approval Requirements/Land Ownership	Accessibility for Construction and Maintenance	Coordination with Simcoe to Townsend Pipeline	Potential Environmental Impacts,	Total
3A: Stone Quarry Road	1	1	4	2	1	9
3B: Highway 24	2	1	3	1	2	9
3C: Rail Trail	4	3	2	3	4	16
3D: Rail Trail / Stone Quarry Road	3	4	2	4	3	16

Based on this analysis either Alternative 3C or 3D could be advanced as the preferred solution, however, since Alternative 3C is less costly than Alternative 3D, Norfolk County would like to proceed with Alternative 3C: Rail Trail as the preferred solution, subject to reaching an agreement with the Ontario Realty Corporation for the use of purchase of the Rail Trail between Stone Quarry Road and Bloomsburg

Road. This means that Alternative 3D: Rail Trail / Stone Quarry Road will serve as a back-up option if an Agreement cannot be reached with the Ontario Realty Corporation.

4.3.3. Additional Assessment of the Preferred Alternative Solution

ASI Archaeological and Cultural Heritage Services (ASI) completed a Stage 1 archaeological assessment of the Preferred Alternative Solution, which is documented in the following two (2) reports:

- *Stage 1 Archaeological Assessment Norfolk Well Connection Route (Lots 1-2, Concessions 13-14, Geographical Township of Windham, and Lot 1, Concessions 13-14, Geographical Township of Townsend, County of Norfolk), Norfolk County (ASI Archaeological and Cultural Heritage Services, 2022), and*
- *Stage 1 Archaeological Assessment Norfolk Railway Lands (Lots 1-2, Concession 12, Former Townsend Township, County of Norfolk) Norfolk County, Ontario (ASI Archaeological and Cultural Heritage Services, 2022)*.

The archaeological assessment concluded that there were lands along the preferred alternative that have archaeological potential and will require Stage 2 Archaeological Assessment prior to construction.

4.4 Mitigation Measures for Preferred Solution

A summary of the potential environmental effects associate with the preferred solution and their corresponding mitigation measures are shown in **Table 9**.

Table 9: Recommended Mitigation Measures

Potential Effects	Recommended Mitigation Measures
Erosion and sedimentation	• Prepare and implement and Erosion and Sediment Control (ESC) Plan. • Implement trenchless technology where appropriate (e.g., crossing watercourses). • Install heavy-duty ESC fencing prior to construction works. • Contract Administrator or Environmental Monitor to inspect ESC fencing until soils have stabilized. • Re-vegetation of all areas of bare soil within the construction area with a conservation-authority-approved seed mix within 30 days of area being left inactive. • Minimize potential for soil compaction. • Control vehicle and machinery access routes and avoid water bodies and wetlands wherever possible to minimize potential disturbance to riparian and bank vegetation.

Potential Effects	Recommended Mitigation Measures
	• Avoid clearing, grubbing, and grading activities during seasonally wet periods (i.e., spring). • Avoid work during high volume rain events (>20mm in 24hrs) or snow melts. • If deemed necessary through on-site monitoring, stabilize exposed soils / banks as soon as possible after construction disturbance (i.e., plantings, rock etc.). If insufficient time is available in the growing season to establish vegetative cover, an overwintering treatment such as biodegradable erosion control blankets, fiber matting etc. should be applied to contain the site over the winter period. • Work in dry conditions (i.e., low flow period) or isolate in-water work area (if necessary) with use of a water containment structure. • No storage of equipment, materials or fill is to occur within natural areas.
Accidental contaminant spills	• Implement an LSRCA-approved Spill Response Plan. • Keep machinery clean and refuel a minimum of 30 m away from any water body and wetlands. • Maintenance of machinery during construction should occur at a designated location away from natural areas on-site (30 m from watercourse, 10 m from woodland). • Fuel and other construction-related chemical must be stored securely away from water bodies and wetlands. • Any discharges to a water body must meet MOE Policy 2 standards (at or better water quality that than of the receiving water body). • Contract Administrator or Environmental Monitor to be on-site during any on-site directional drilling to monitor for frac-outs (where applicable).
Damage to/removal of trees and vegetation	• Install protective fencing at or 1m beyond drip line of trees. • Delineate limits of work zones with heavy-duty ESC fencing. • Control vehicle access routes to avoid areas of trees and vegetation. • Locate staging areas away from protected trees, wooded areas, and associated root zones (i.e., 10-20 m). • Complete a Butternut Health Assessment if construction activities are anticipated within 25 m of any Butternuts to inform setbacks, protection measures and compensation / authorization requirements. • Delineate natural areas of vegetation to be retained (e.g., Butternut individuals and communities). • Properly prune tree limbs accidentally damaged using arboricultural techniques. • Adhere to MBCA breeding bird timings windows for vegetation and tree removal to prevent the destruction of nesting birds.

Potential Effects	Recommended Mitigation Measures
	• Conduct nest searches within 'simple' habitats if construction must occur outside MBCA breeding bird timing windows. • Any vegetation removal, if required, is to occur outside of the core nesting period for migratory birds, as established by the Canadian Wildlife Service (CWS 2012), and SAR bats, as established under the *Endangered Species Act*. • Vegetation clearing should occur between November 1 and March 31.
Impacts to wildlife and their habitat	• Restrict daily timing of construction activities to between 7:00am and 7:00pm. • Lighting equipment associated with construction activities to be turned off following cessation of daily construction activities or turned away from natural features. • Moisten exposed soils / dry soil with water as needed during construction to reduce dust. • Any vegetation and tree removal should adhere to the applicable MBCA breeding bird timing windows to prevent the destruction of nesting birds. • Conduct nest searches within 'simple' habitats only where construction schedule will not allow for vegetation. • removal to be outside of MBCA timing window to confirm no nesting birds present prior to any removals. • Apply for an authorization under the *Endangered Species Act* if impacts to species at risk, or their habitat, cannot be avoided. The County will contact SAROntario@ontario.ca if impacts are anticipated, or if there is any uncertainty relating to impacts.
Eastern Badger habitat loss	• Survey of the project for potential burrows that may be used by American Badger prior to the start of project activities to determine if there are ESA requirements for the project • Conduct burrow surveys for the project location as well as within a 50 m range of adjacent lands if possible, focusing on a thorough coverage of woodlands, woodland edges, hedgerows, rail beds, roadsides, old fields, and edges of farm fields, etc. If open field transects are being completed, they should be no further than 20 m apart. Locations of any potential badger burrows as well as all groundhog / woodchuck burrows should be noted. • A minimum of two surveys throughout spring and summer to determine presence/absence of potential badger burrows. Timing of day is flexible. • Generally, potential badger burrows are burrows that are 6 inches in diameter or greater. Badger burrows usually have large, excavated mounds / sand piles near the entrance, lateral claw marks at the entrance, and potentially have a musky smell if the burrow has been used recently. In addition to the lateral claw marks, there may also be small indents / divots on both sides of the walls throughout the burrow (where the paw takes hold so the other paw can continue excavating).

Potential Effects	Recommended Mitigation Measures
	Also, if there are any nearby logs or branches, these should be checked for claw marks (instead of chew marks that a groundhog might make). • Data collected for each potential badger burrow should include at a minimum: UTM coordinates, observation dates, photographs (with a visible scale reference) of the entrance, inner walls, and nearby mounds. • Depending on the timing between surveys and proposed start date of the project, it is recommended to re-visit all potential badger burrows every few weeks or monthly to check for signs of use/occupancy.
Hog-nosed Snake Mortality and/or habitat loss	• Survey of the project for suitable habitat or sightings to be conducted in conjunction with American Badger Surveys. • Contract Administrator or Environmental Monitor to be made aware of potential for Hog-nosed Snakes. • If observed during construction, construction will halt around the observed snake and a licensed biologist contacted to determine appropriate measures.
Debris entering a waterbody	• Stabilize construction debris away from water bodies and wetlands using equipment such as tarps. • Dispose of refuse and other material appropriately off-site. • Locate staging areas away from water bodies and wetlands (i.e., 30 m). • Locate drilling shafts away from water bodies and wetlands (i.e., 30 m).
Impact to Archaeological Resources	• Stage 2 archaeological assessment to be completed prior to construction and any recommendations from that assessment will be implemented.

In addition to the proposed mitigation measures, all waste generated during construction will be disposed of in accordance with ministry requirements, including the *Environmental Protection Act* regulation *On-Site and Excess Soil Management (O. Reg. 406/19)* and the guidance document Management of Excess Soil – A Guide for Best Management Practices.

4.5 Monitoring

The aquifer performance test, the results of which are documented in the Hydrogeological Study (Banks Groundwater Engineering Limited, 2021) , had no measurable effect on the flow in Davis Creek, other than the increase downstream of the location where the groundwater pumped from the test production wells was discharged. Therefore, long-term groundwater withdrawals from the proposed production wells are not expected to have deleterious effects on Davis Creek, a local surface water feature that has historically been (and may continue to be) a source of water for irrigation.

However, to ensure that operation of the two production wells does not effect flow in Davis Creek, a monitoring, contingency and mitigation plan will developed and submitted to the MECP as part of the Permit to Take Water Application.

Figure 10: Areas Identified for Stage 2 Archaeological Assessment - Key Map (ASI Archaeological and Cultural Heritage Services, 2022)

Figure 11: Areas Identified for Stage 2 Archaeological Assessment – Sheet 1 (ASI Archaeological and Cultural Heritage Services, 2022)

Figure 12: Areas Identified for Stage 2 Archaeological Assessment – Sheet 2 (ASI Archaeological and Cultural Heritage Services, 2022)

Figure 13: Areas Identified for Stage 2 Archaeological Assessment – Sheet 3 (ASI Archaeological and Cultural Heritage Services, 2022)

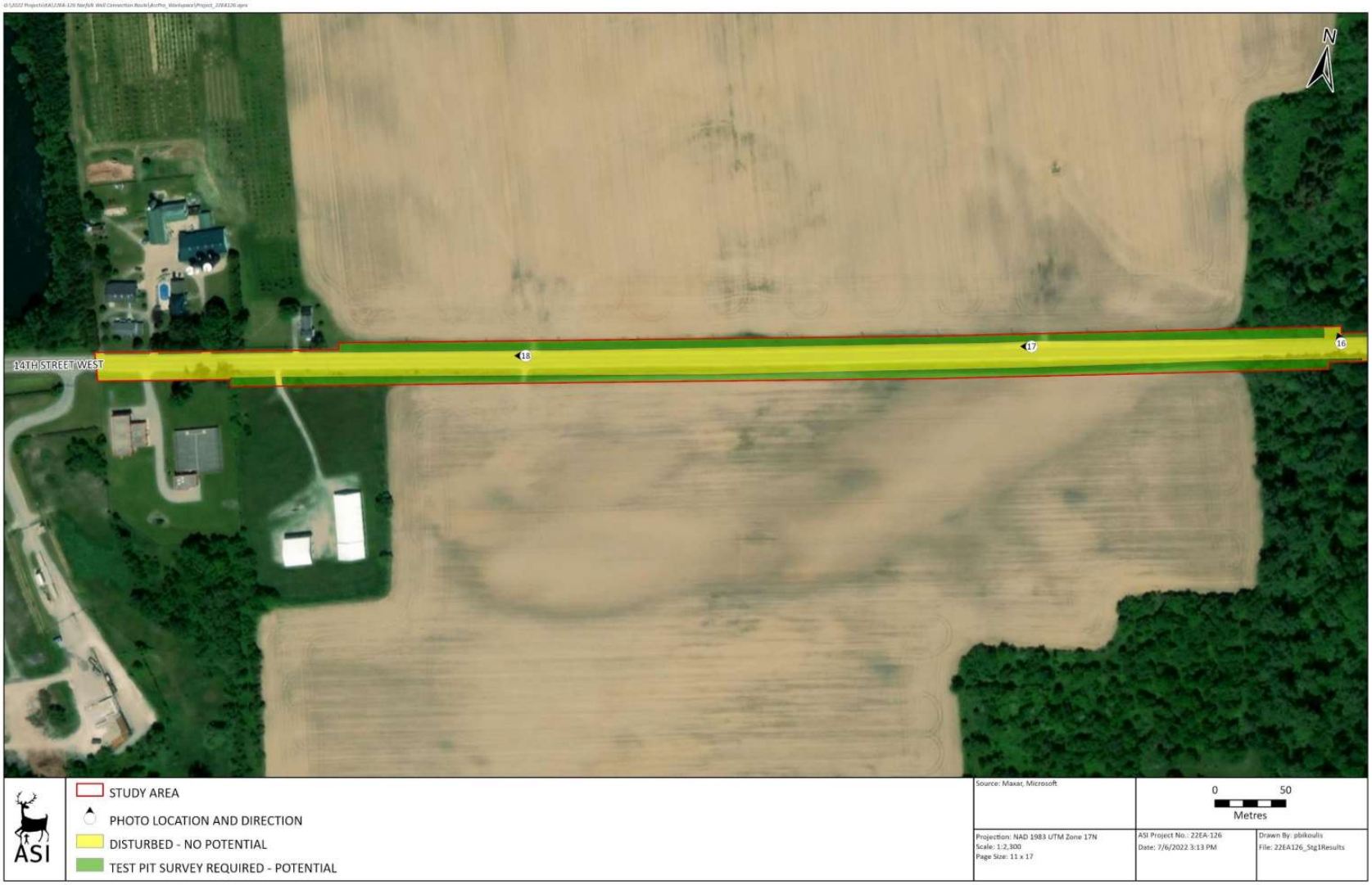


Figure 14: Areas Identified for Stage 2 Archaeological Assessment – Rail Trail (ASI Archaeological and Cultural Heritage Services, 2022)

4.6 Public Information Centre No.3

A Public Information Centre (PIC) was held at the Norfolk County Robinson Administration Building on Wednesday, March 22, 2023, from 5:00 to 7:00 p.m. Notification for the PIC was provided on the County's website, via twitter, and in the Norfolk and Tillsonburg News on March 16th.

In addition to the newspaper notice, letters were sent to stakeholders inviting them to the PIC. The agency and First Nations stakeholder list and sample letter are provided in **Appendix A.**

The PIC included a representative from the County, and consultants who were available to provide information and answer questions. Additionally, information was presented on display boards, which are provided in **Appendix A**.

The PIC was attended by three members of the public, two councillors and a representative from the Long Point Region Conservation Authority. Based on questions asked and comment sheets filled out, the primary concern was how this project related to the Inter-Urban Water Supply Project (IUWSP), with some stakeholders preferring that groundwater supply be developed instead of the IUWSP. Although Norfolk Staff were on hand to discuss the IUWSP, it is not part of the scope of this environmental assessment and has undergone its own assessment. Additional comments provided by one stakeholder at the PIC are summarized in

Table 10. PIC3 Comment Disposition

Comment	How comment is addressed in the Environmental Assessment
The trail will become too open due to all the digging for the pipes and to have access.	The proposed watermain will be situated under the existing gravel trail and vegetation clearing to allow access and watermain installation will be minimized to the extent possible. Impacts on vegetation cover are expected to be minor and temporary, as vegetation will grow once the watermain is installed.
I think your choice of watermain route has been made up and this is just a step to push the rail trail route through because it is the cheapest and easy.	A transparent comparison of alternative watermain routes was completed by Vallee, considering technical, cost, environmental and social considerations. This assessment is summarized in **Section 4.3.2** and concluded that the rail trail route is the recommended alternative solution.
Any of your testing results aren't published or were done during summer month when there is a higher demand on the water table.	Testing results are summarized in this report, with the supporting hydrogeological studies provided as Appendices. This report will be made available for 30 days for public review, agency and First Nations and Métis review, following publication of the Notice of Completion. No requests from members of the public to obtain any reports were received throughout the environmental assessment.
Was expecting a meeting with everything explained and questions answered.	A PIC format with display boards was selected as the preferred means of conveying the project information. Staff reached out to all attendees offering to discuss the project and to answer questions. The same information provided on the display boards would have been delivered in a presentation.

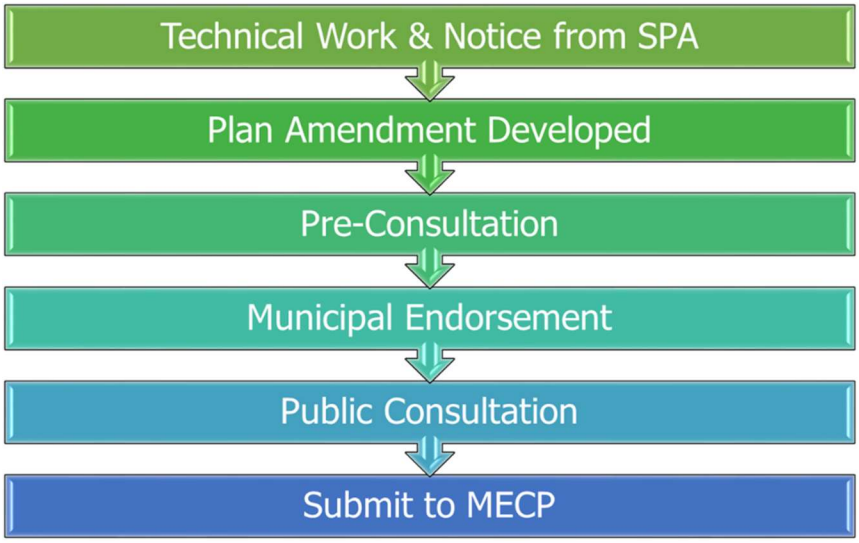
5. Source Water Protection

In 2006, the Government of Ontario passed the *Clean Water Act* to implement some of the recommendation from the Walkerton Inquiry. The *Act* empowered regional source water protection authorities (SPAs) to oversee the protection of drinking water sources from contamination, depletion, or other types of stresses. Simcoe is located within the Lake Erie Source Protection Region and source water policies are outlined in the Long Point Source Protection Plan (LPSPP), in which Volume II, Chapter 4 outlines policies for Norfolk County. An update to the LPRSPP came into effect on May 22, 2020, with a further minor amendment in March 2022. Volume II of the LPRSPP contains policies that apply to the Norfolk County water supply systems.

5.1.1. Summary of Wellhead Protection Area Delineation, Vulnerability Scoring and Water Quality Threats Assessment

Bringing online new groundwater production wells creates new wellhead protection areas that need to be defined, and within those areas, significant drinking water threats identified. This requires an amendment to the existing source water protection plan, the process for which is define in Section 34 of the *Act.* The process for a Section 34 amendment to a source protection plan is summarized in **Figure 15.**

Figure 15: Summary of the Section 34 Process to Amend a Source Protection Plan



To initiate this process, Matrix Solutions completed technical studies that were submitted to the SPA (Long Point Conservation Authority in November of 2022 (Matrix Solutions Inc., 2022). The work by Matrix Solutions followed the *2021 Technical Rules under the Clean Water Act* (Ministry of the Environment Conservation and Parks, 2021) to achieve the following objectives:

- Delineating draft captures zones and wellhead protection areas (WHPAs) for the proposed Simcoe municipal wells, and
- Assigning draft vulnerability scores based on the existing vulnerability of the municipal groundwater aquifer.

Throughout this process, Matrix Solutions has worked closely with the Long Point Region Conservation Authority and MECP, and review comments on the Matrix Solutions technical work are included in Appendix 4.

The WHPAs delineated by Matrix Solutions are shown in Error! Reference source not found. with the WHPA-A representing a 100-m radius around the wells. WHPA-B was delineated as the area outside WHPA-A, within which the time-of-travel to the well is less than or equal to 2 years. WHPA-C was delineated as the area outside WHPA-B, within which the time-of-travel to the well is greater than 2 years but less than or equal to 5 years. Lastly, WHPA-D was delineated as the area outside WHPA-C, within which the time-of-travel to the well is greater than 5 years but less than or equal to 25 years.

Based on the delineated WHPAs, consideration of aquifer geology and hydrogeologic properties, and preferential pathways along which a contaminant could travel, the WHPA were assigned a groundwater vulnerability category of high, medium, or low. Then based on the scoring matrix from Table 2(b) of the *Technical Rules: Assessment Report, Clean Water Act, 2006* (Ministry of the Environment Conservation and Parks, 2021), shown below in a vulnerability score was assigned as summarized in **Figure 17**.

Table 11. Wellhead Protection Rankings (MECP, 2021).

Groundwater Vulnerability Category for the Area	Location Within a Wellhead Protection Area			
	WHPA-A	WHPA-B	WHPA-C	WHPA-D
High	10	10	8	6
Medium	10	8	6	4
Low	10	6	2	2

Figure 16. Wellhead Protection Areas for Proposed Simcoe Production Wells (Matrix, 2022)

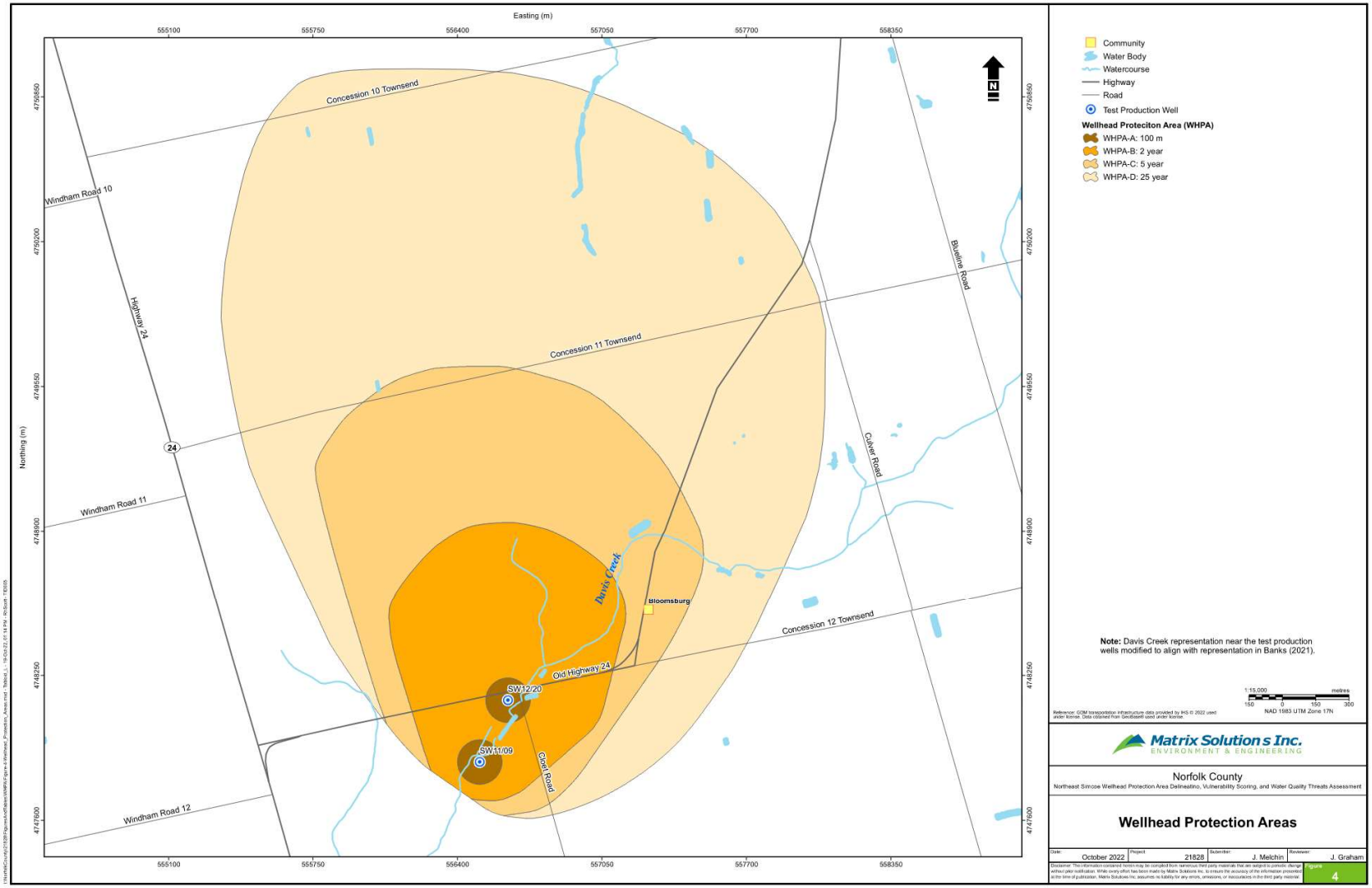
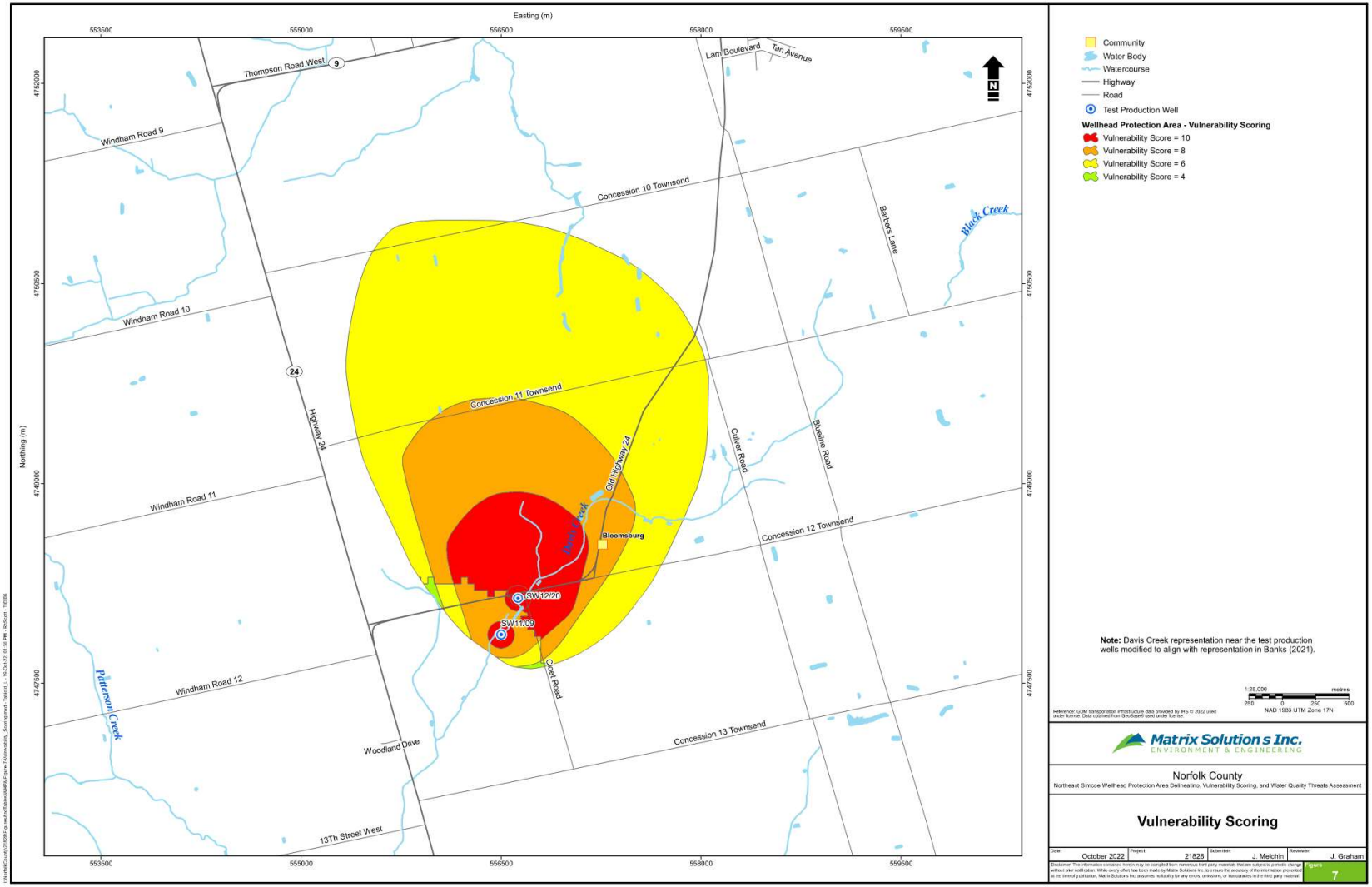


Figure 17. Vulnerability Scoring.



Matrix Solutions also conducted a water quality threats assessment, which included and assessment of activities, conditions and issues that could impact water quality. The assessment of activities considered managed lands, livestock density, and impervious surfaces. A summary of the significant activity-based drinking water quality threats in the wellhead protection areas is provided in **Table 12**.

Table 12. Significant Activity-based Drinking Water Quality Threats in the Wellhead Protection Areas.

PDWT No.(1)	Threat Subcategory	Number of Activities - Chemical	Number of Activities - Pathogenic	Vulnerable Areas
2	Septic System, Sewage System or Sewage Works	14	14	WHPA-B
3	Application of Agricultural Source Material to Land	-	6	WHPA-A1 WHPA-A2 WHPA-B
4	Storage of Agricultural Source Material	3	3	WHPA-B
9	Storage of Commercial Fertilizer	3	-	WHPA-B
10	Application of Pesticide to Land	5	-	WHPA-A1 WHPA-A2 WHPA-B
11	Storage of a Pesticide	3	-	WHPA-B
15	Handling and Storage of Fuel	3	-	WHPA-B
16	Handling and Storage of DNAPL	2	-	WHPA-B WHPA-C
17	Handling and Storage of an Organic Solvent	3	-	WHPA-B
21	Livestock Grazing, Pasturing Land, Outdoor Confinement Area, or a Farm-animal Yard	1	1	WHPA-B
Total Number of Properties (not Including road/pipeline rights-of-way)		**20**	**20**	WHPA-A1 WHPA-A2 WHPA-B WHPA-C
Total Number of Activities		**37**	**24**	

(1) PDWT number refers to the PDWT listed in Ontario Regulation 287/07 s.1.1.(Government of Ontario 2021)
(2) Residential application and storage of pesticides and fertilizers, storage of organic solvents, and storage and handling of fuel were interpreted to be minor in terms of quantity and occurrence and were, therefore, not included in the identification of threats.

The County of Norfolk will work with landowners who have a significant drinking water threat identified on their property to ensure that relevant activities conform to the requirements of the Long Point Source Protection Plan.

Matrix Solutions identified a possible leaking oil tank, chloropicrin injected into the soil, and a spill on pavement of 180 litres of hydraulic oil as conditions that could impact water quality.

Matrix Solution's evaluation of issues that could impact water quality, considered microbiological, radiological, health-related chemical and aesthetic or operationally significant parameters. There evaluation concluded that there were no microbiological, radiological or health related chemical parameter that were identified as issues. Aesthetic or operationally significant parameters that may be potential issues are:

- Iron at SW11/09 and SW12/09
- Organic nitrogen at SW11/09
- Aluminum at SW12/20.

5.1.2. Consideration of Existing Source Water Protection Areas

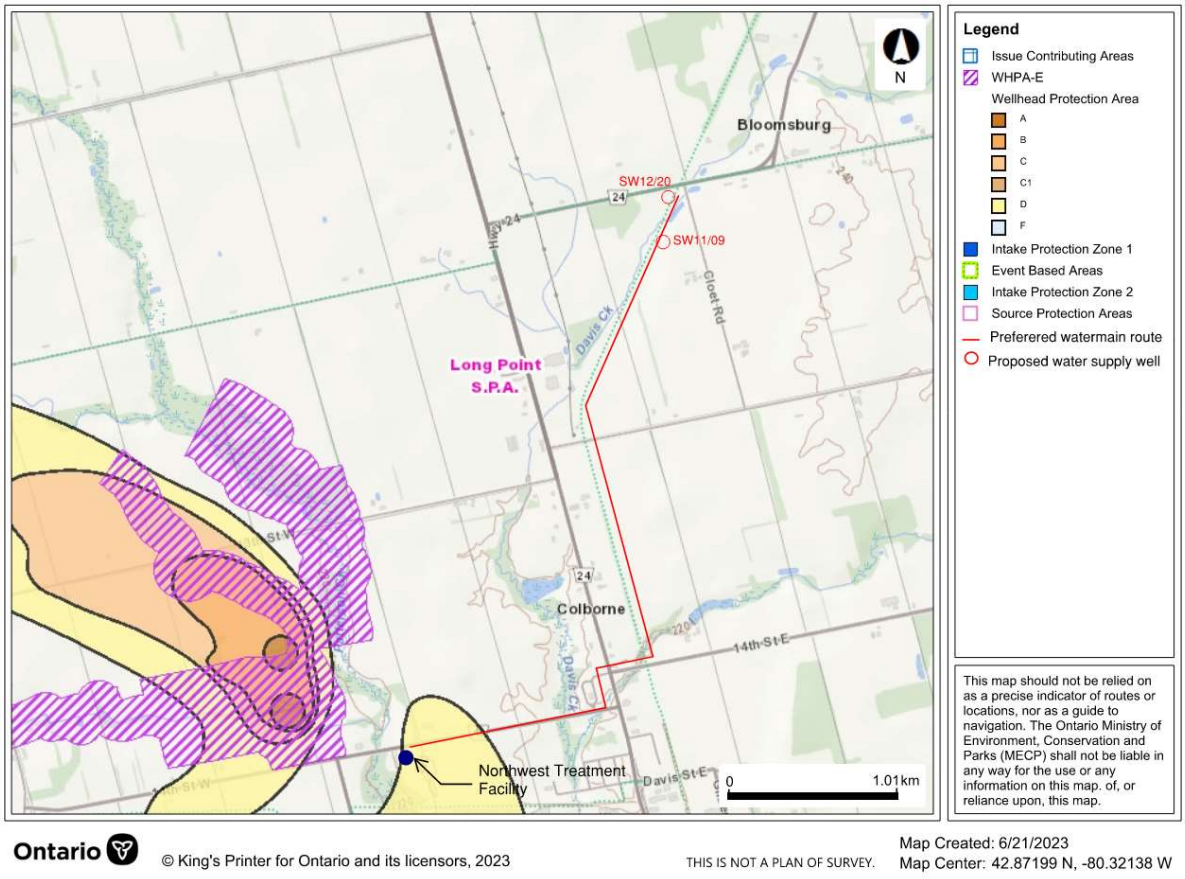
As part of this Municipal Class EA, an assessment was completed to determine if any of the proposed infrastructure posed a risk to existing water supply wells.

Figure 18 shows that the proposed watermain overlaps the small portion of a WHPA-D, which has vulnerability score of 6, is highly vulnerable, and the overlapping area represents a significant groundwater recharge area. The operation of the watermain poses a low risk to water quality as does its construction. During construction of the watermain, accidental spills could impact water quality in the WHPA-D area, although it would take between 5 and 25 years for this to reach the water supply well, giving ample time to mitigate the spill. As documented in Mitigation Measures for Preferred Solution 4.4, the following mitigation measures will be implemented to prevent impacts from accidental spills of contaminants:

- Implement an LSRCA-approved Spill Response Plan.
- Keep machinery clean and refuel a minimum of 30 m away from any water body and wetlands.
- Maintenance of machinery during construction should occur at a designated location away from natural areas on-site (30 m from watercourse, 10 m from woodland).
- Fuel and other construction-related chemical must be stored securely away from water bodies and wetlands.
- Any discharges to a water body must meet MOE Policy 2 standards (at or better water quality that than of the receiving water body).
- Contract Administrator or Environmental Monitor to be on-site during any on-site directional drilling to monitor for frac-outs (where applicable).

Additionally, the County will incorporate the location of the new WHPA-A into their emergency response plans to protect drinking water sources from potential spills along old Highway 24.

Figure 18. Overlap of Project Infrastructure with Existing Source Water Protection Areas.



6. Review of Draft Report

A draft version of this Class EA was provided to Western-Central branch of the MECP for review on April 5, 2023. A summary of the comments received from the MECP on June 15, 2023, and how they were addressed in the Final Report, is provided in **Appendix A.**

7. Notice of Completion

Once complete, the Community of Simcoe will issue a Notice of Completion on the County's website, via twitter, and in the Norfolk and Tillsonburg News and to all project stakeholders on our stakeholder list and will make this report available at the Norfolk County Robinson Administration Building, 2nd floor, for a period of 30 days for public, First Nation and Métis, and agency review.

During this period, members of the public, First Nations, or agencies can submit a Section 16(6) Order if they believe that the Simcoe Water Supply Project may result in an adverse impact on constitutionally protected Aboriginal and treaty rights and that completing an Individual Environmental Assessment may prevent, mitigate, or remedy this impact.

To submit your Section 16(6) Order request, interest parties should provide the following:

- your name, address and email address
- project name
- proponent name
- what kind of Order is being requested
- a request for additional conditions
- a request for an individual environmental assessment
- details about your concerns about potential adverse impacts on constitutionally protected Aboriginal or treaty rights and how the proposed Order may prevent, mitigate or remedy the identified adverse impacts
- whether you belong to, represent or have spoken with an Indigenous community whose constitutionally protected Aboriginal or treaty rights may be adversely impacted by the proposed project
- whether you have raised your concerns with the proponent, the proponent's response (if any) and why the concerns could not be resolved with the proponent
- any other information to support your request

Requests that are made after the 30-day review period, may not be considered by the Minister. Upon review of any Section 16 Orders, the Minster of the Environment, Conservation and Parks has the authority and discretion to require the proponent of a project to:

1. Deny the request,
2. Complete a more rigorous study, referred to as an Individual Environmental Assessment,
3. Fulfill additional conditions in addition to the Class EA that could include further study, monitoring, or
4. Refer the matter to mediation.

In making their decision, the Minister will consider factors set out in Section 16(5) of the *Environmental Assessment Act*.

Members of the public having concerns about the potential environmental effects of a project, or the planning process being followed, have a responsibility to bring their concerns to the attention of the proponent early in the planning process.

Should no Section 16Order requests be received, or if they are rejected by the Minister, then the project will have met all the requirements of the Schedule B Municipal Class EA process.

8. Conclusion

This Municipal Class Environmental Assessment was undertaken to determine the best way for Norfolk County to provide additional water supply for the community of Simcoe. This supply is needed to manage increasing demand from a growing population and to create resilience in Simcoe's water supply system until additional water supply is provided through the inter-urban supply projects. This additional supply will also provide resilience in the event of any temporary issues related to the operation of Inter-Urban Supply Projects.

The EA evaluated several alternative solutions and determined that the preferred alternative solution was to develop a new groundwater supply. Through extensive hydrogeologic work, two new production wells were located northeast of Simcoe and testing concluded that operating these wells would not have a measurable effect on private wells or on flow rates in Davis Creek. Development of these wells will provide additional water supply to meet growing demand, up until the Inter—Urban Supply Projects are completed.

Four routes were evaluated to determine the best way to connect the production wells to the existing Simcoe Water Treatment Facility. The preferred route was the 'Rail Trail' route, which follows an existing trail before crossing Highway 24 and travelling west on 14th Street West.

The next steps in developing the preferred alternative include:

- Issuing the Notice of Completion and responding to any comments received during the 30-day review period (complete the Municipal Class Environmental Assessment process),
- Obtain an Environmental Compliance Approval from the Ministry of the Environment, Conservation and Parks (MECP),
- Obtain MECP approval for the Source Protection Plan amendment.
- Collaborate with MECP regarding the sharing of information and consultation on the issuance of prescribe instruments that relate to water quality, for example, nutrient management plans, and
- Initiate detailed engineering design.

Once these steps are complete, the project can then move to construction.

9. References

ASI Archaeological and Cultural Heritage Services. (2022). *Stage 1 Archaeological Assessment Norfolk Railway Lands (Lots 1-2, Concession 12, Former Townsend Township, County of Norfolk) Norfolk County, Ontario.*

ASI Archaeological and Cultural Heritage Services. (2022). *Stage 1 Archaeological Assessment Norfolk Well Connection Route (Lots 1-2, Concessions 13-14, Geographical Township of Windham, and Lot 1, concessions 13-14, Geographical Township of Townsend, County of Norfolk), Norfolk County.*

Banks Groundwater Engineering Limited. (2015). *Revised Draft Report, 2012 Monitoring and Aquifer Testing Program, Community of Simcoe, Additional Water Supply Class Environmental Assessment. Septmenber 2015. Prepared for the Public Works & Environmental Services Department of Norfolk County.*

Banks Groundwater Engineering Limited. (2021). *Hydrogeological Report 2020 Well Construction, Aquifer Testing, and Monitoring Program. Community of Simcoe. Additional Water Supply Class Environmental Assessment.*

Barnett, P. (1978). *Quaternary Geology of the Simcoe Area Southern Ontario. Geoscience Report No. 1e62.* Ontario Ministry of natrual Resources, Geology Branch.

Birds Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Forestry, Environment and Climate Change Canada, and Ontario Nature. (2021). *Ontario Breeding Bird Atlas.*

Brown, M. B., & Brown, C. R. (2020). *Barn Swallow (Hirundo rustica), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.* Retrieved from https://doi.org/10.2173/bow.barswa.01.

Committee on the Status of Endangered Wildlife in Canada. (2012). *COSEWIC Assessment and Satus Report on the Eastern Wood-Pewee in Canada. (Species at Risk Public Registry).*

Dobbyn, J. (1994). *Atlas of the Mammals of Ontario. Don Mills, Federation of Ontario Naturalists.*

G. Douglas Vallee Limited. (2022). *Watermain Route Evaluation Section – Simcoe Water Supply Class EA Simcoe – Norfolk County.*

Golder Associates Limited. (2015). *Community of Simcoe Addtional Water Supply Class Environmental Assessment - Fisheries Update and Preliminary Fisheries Risk Self Assessment.*

Government of Ontario. (2007). *Endangered Species Act.* Retrieved from https://www.ontario.ca/laws/statute/07e06

Lee, H., Bakowsky, W., Bowles, J., Puddister, M., Uhlig, P., & McMurray, S. (1998). *Ecological Land Classification For Southern Ontario.*

Long Point Region Conservation Authority (LPRCA). (2013). *Ontario Reg. 178/06: Long Point Region Conservation Authority (LPRCA): Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*. Retrieved from https://www.ontario.ca/laws/regulation/060178

MacNaughton, A., Layberry, R., Jones, R., & Edwards , B. (2022). Ontario Butterfly Atlas Online. Sqare 17NJ54. Retrieved from http://www.ontarioinsects.org/atlas_online.html

McCloskey, A. (2014, March 3). District Planner. Ministry of natural Resources.

Ministry of the Environment, Conservation, and Parks (MECP). (2020). *Species at Risk in Ontario. Published: 12-07-2018. Updated: 09-11-2011.* Retrieved from https://www.ontario.ca/page/species-risk-ontario

MMM Group, R.V. Anderson Associates Limited, and XCG. (2016). *Norfolk Coundty Integrated Sustainable Master Plan (ISMP). Final Report - September 2016.*

Natural Heritage Information Centre, Ontario Ministry of Northern Development and Mines, Resources and Forestry. (2022). Ontario Odonata Database (OOAD). Species List from atlas square 17NH54. Retrieved July 12, 2022

Natural Resource Solution Inc. (2021). *Simcoe Water Supply Class EA Natural Environment Report.*

Natural Resource Solutions Inc. (2022). *Community of Simcoe Additional Water Supply Class EA Natural Environment Assessment Report.*

Ontario Ministry of Natural Resources annd Forestry (OMNRF). (2019). *Natural Heritage Information Centre (NHIC); Biodiversity Explorer.* Retrieved 2019 and 2022, from https://www.ontario.ca/page/natural-heritage-information-centre

Ontario Ministry of the Environment. (2019). *Natural Heritage Information Centre (NHIC): Biodiversity Explorer.* Retrieved 2019, from https://www.ontario.ca/page/natural-heritage-information-centre

Ontario Minstry of Natural Resources (OMNR). (2000). *Significant Wildlife Habitat Technical Guide.*

Ontario Nature. (2019). *Ontario Reptile and Amphibian Atlas.* Retrieved 2019 and 2021, from http://www.ontarioinsects.org/herpatlas/herp_online.html

Presant, E., & Acton, C. (1984). *The Soils of the Regional Municipality of Haldimand-Norfolk, Volume 2; Report No. 57 of the Ontario Institute of Pedology.* Agriculture Canada (Research Bran), Ontario Ministry of Agriculture and Food (Soil and Water Management Branch), and University of Guelph (Department of Land Resources Science).