S.BURNETT & ASSOCIATES LIMITED
ENGINEERING & ENVIRONMENTAL

TOWN OF SHELBURNE

Increased Capacity of the Town of Shelburne's Water Supply
Schedule 'B' Municipal Class Environmental Assessment

A People Place, A Change of Pace
SHELBURNE
ONTARIO, CANADA

May 2025

SBA File No.: M17025

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

June 19, 2025

Town of Shelburne
203 Main Street East
Shelburne, ON L9V 3K7

Attn: Jim Moss, Director, Development and Operations

Re: Town of Shelburne
Increased Capacity of the Town of Shelburne's Water Supply
Schedule 'B' Municipal Class Environmental Assessment
SBA File No: M17025

Dear Jim,

As you are aware, S. Burnett & Associates Limited (SBA) was retained to determine the best means for the Town to meet increased water supply demand for the next 20 years. To do so, SBA undertook Schedule 'B' Class Environmental Assessment (EA), which is documented in this project file.

The outcome of the EA is the recommendation that Pumping Wells (PW) 7 and 8 be pumped concurrently at a combined rate of 37.8 L/s to help meet water supply demands. The EA also recommends that the Town start design and installation of arsenic treatment at PW5/PW6 to allow pumping at a higher rate while keeping arsenic concentrations below half maximum allowable concentration (MAC) for arsenic. Additionally, arsenic treatment would allow PW5/PW6 to operate without dependence on blending water from PW7/PW8, which would increase system resilience if supply from PW7/PW8 was disrupted.

With these improvements, along with ongoing upgrades to PW1 and PW3, the Town is projected to have enough water supply capacity to meet average and maximum day demand until 2038, at which point a new well will need to be brought online. Due to the time required to locate, test and permit a new well, it is recommended that this process start no later than 2033.

Upon completion of the EA process, we will amend the Permit to Take Water and Municipal Drinking Water License, at which point PW7 and PW8 can be pumped concurrently at a combined rate of 37.8 L/s. Although amendment to the Source Water Protection Plan may still be ongoing at that time, its amendment is not required prior to increasing the pumping rate.

Yours truly,

Stephen Burnett, P.Eng.
Principal
S. Burnett & Associates Limited

Ian Callum, M.Sc., PMP
Project Manager
S. Burnett & Associates Limited

Executive Summary

Background

S. Burnett & Associates Limited (SBA) was retained by the Town of Shelburne to provide engineering and environmental services to complete a Schedule 'B' Class Environmental Assessment (EA) to determine the preferred means of meeting water supply needs for the next 20 years.

This Project File has been prepared in accordance with Municipal Class Environmental Assessment (Municipal Engineers Association, 2021), and approval under the Ontario Environmental Assessment Act for municipal infrastructure. This Master Plan Report is prepared following the Schedule 'B' Approach, which includes the completion of the following phases of the standard Class EA process:

- Phase 1 – Problem / Opportunity Identification
- Phase 2 – Alternative Solutions and Selection of Preferred Options
- Phase 5 – Implementation

Several alternatives were examined as part of this study, and an assessment was completed to identify the most cost-effective, environmentally sound, and sustainable approach to increasing the capacity of the existing facility.

Problem Statement

A problem statement was developed and implemented through two (2) public consultation meetings. The problem statement was articulated as follows:

> "Current water supply in the Town of Shelburne is not sufficient to meet anticipated demands placed by a growing population over the next 20 years."

Alternative Solutions

Alternative solutions to the problem statement were identified and comparatively evaluated, including:

1. Alternative 1 – "Do Nothing"
2. Alternative 2 – Implement Water Conservation
3. Alternative 3 – Pumping Wells PW7 and PW8 Concurrently
4. Alternative 4 – Increasing the Pumping Rate of PW5 and PW6 by Adding Arsenic Treatment
5. Alternative 5 – Locating and Developing a New Well
6. Alternative 6 – Alternatives 3 and 4 Combined
7. Alternative 7 – Alternatives 3 and 5 Combined
8. Alternative 8 – Alternative 4 and 5 Combined
9. Alternative 9 – Alternatives 3, 4, and 5 Combined

Project Consultation

Project consultation began with issuing the Notice of Commencement in the Shelburne Free Press and Orangeville Citizen on October 12, 2017. A stakeholder list was then developed that included First Nations and Métis organizations, municipal and provincial government staff, and conservation authorities.

A discretionary virtual Public Information Centre (PIC) was held June 24, 2020, from 6:30 p.m. to 7:30 p.m. and a survey was provided to all attendees to collect information regarding the process and the potential alternative solutions.

A second virtual PIC was held May 30, 2024, from 6:30 p.m. to 7:30 p.m. to present an overview of the evaluation of alternative solutions and the recommended preferred alternate solutions.

Evaluation of Alternative Solutions

A preliminary screening of alternative solutions was completed to remove any alternatives that were not feasible or did not address the problem statement. Alternatives 1, 2, 3, 4, and 5 were "screened out", as they did not address the current and future water demand of the Town.

The remaining alternative solutions underwent a weighted evaluation using a wide range of environmental, social, technical and economic factor criteria. Each of these four (4) Evaluation Categories were assigned an equal weighting of 25%, totaling 100%. A Criterion Importance Ranking was developed for each Evaluation Criterion and summed to provide a Criterion Importance Total. The Criterion Importance Rankings were divided by the Criterion Importance Total and multiplied by 25 to calculate a Relative Criterion Weight. The Alternative Solutions were scored for each criterion, then multiplied by the Relative Criterion Weighting and summed. Each Alternative Solution can score up to 25% for each of the four (4) Evaluation Categories, with a Total Score of up to 100%.

The results of the weighted evaluation are shown in the table below.

Table E1: Summary of Assessment of Alternative Solutions

Evaluation Category	Relative Weighting	Alternative Solutions			
		Alternative 6 – Alternatives 3 and 4 Combined	Alternative 7 – Alternatives 3 and 5 Combined	Alternative 8 – Alternatives 4 and 5 Combined	Alternative 9 – Alternatives 3, 4 and 5 Combined
Environmental	25%	25.0%	25.0%	25.0%	25.0%
Technical	25%	12.0%	11.1%	7.7%	17.2%
Economic	25%	13.7%	13.7%	9.7%	12.6%
Social	25%	19.7%	18.9%	18.9%	22.6%
TOTAL	**100%**	**70.4%**	**68.7%**	**61.3%**	**77.4%**

Based on the assessment the preferred alternative is Alternative 9 – Alternatives 3, 4, and 5 Combined, as it is the preferred alternative solution that ranks highest in the environmental, technical, and social evaluation categories, as well as scoring highest overall.

Adding additional capacity at PW7/PW8 does not address that PW5/PW6 currently exceeds half maximum allowable concentration (MAC) for arsenic and blending with the increased contribution from PW7/PW8 is not sufficient to reduce arsenic concentrations to below the half MAC without reducing the pumping rate of PW5/PW6 below the sustainable rate of 24.3 L/s (1458 L/min or 2100 m^3/day). Additionally, any issues with supply from PW7/PW8, whether caused by issues with the wells or the connecting watermain, would require additional reductions of supply from PW5/PW6 due to the reduction in supply of low arsenic concentration water for blending. As a result, it is recommended that the Town immediately proceed with adding arsenic treatment to PW5/PW6 to avoid the need for any supply reductions from PW5/PW6 and to remove its supply rate dependence on blending water from PW7/PW8.

With the increased pumping rate achieved through the concurrent pumping of PW7/PW8, and pumping PW5/PW6 at its sustainable rate of 24.3 L/s (1458 L/min or 2100 m^3/day), the Town should have sufficient water supply to meet the maximum day flow for an estimated population of just 13,574. Based on the linear growth rate of 534 persons per year, as shown in **Figure 1,** this population would be reached in 2038, and additional water supply would be needed at this time. The only viable means of additional water supply is to develop a new groundwater supply well. Given that locating, permitting and developing a new well takes several years, it is recommended that the Town commence this process no later than 2033.

Mitigation Measures

A summary was developed of the list of the potential environmental effects associated with the preferred solution and the corresponding mitigation measures.

Pumping PW7/PW8 concurrently will require installation of a backup well, PW9. The well will be installed immediately adjacent to PW7/PW8 within a previously levelled area that is surrounded by an agricultural field and not in proximity of any water bodies. Well construction will adhere to all requirements of the *Ontario Water Resources Act* and the *Wells Regulation.* Well installation will be conducted by a licensed well technician. Additional mitigation measures for the new well will be identified during a separate Schedule 'B' Municipal Class EA process.

Installation of arsenic treatment equipment at PW5/PW6 will occur within existing disturbed areas. Mitigation measures will be identified during detailed design, but construction will follow the recommended mitigation measures identified as part of this Report.

Although a separate class environmental assessment will be required for the new production will and site-specific mitigation measures identified through that process, well construction will also follow the mitigation measures identified as part of this Report.

Intra-Basin Transfer Considerations

Ontario signed the Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement in 2005 to cooperate with Quebec and eight (8) U.S. Great Lakes States to allow protection and conservation of this shared resource through enhanced cooperation. In Ontario, the Agreement and the *Ontario Water Resources Act (OWRA)* outline requirements for the transfer of water between Great Lakes watersheds for new or increased water withdrawals of 379,000 L/day or greater, averaged over any 90-day period. The transfer of water from Great Lake watershed to another is referred to as intra-basin transfer.

Increasing the pumping rate of PW7/PW8 is considered intra-basin transfer as these wells are in the Grand River Watershed, flowing into Lake Erie, while water used by the Town of Shelburne is discharged to the Nottawasaga Valley Watershed, which discharges to Lake Ontario. This EA concluded that no other solution exists to supply water to the Town of Shelburne and the increased consumptive use would be proportionally minimal. Notification of other member states will be completed by the Ministry of Natural Resources and Forestry once the Town applies for the amendment to the existing Permit to Take Water.

Source Water Protection

Increasing the pumping rate of PW7/PW8 requires amendment to the Grand River Source Protection Plan. Given that PW7 and PW8 were constructed prior to O.Reg. 205/18 Municipal Residential Drinking Water Systems in Source Protection Areas, amendment to the Source Water Protection Plan is not required prior to increasing the pumping rate at PW7/PW8.

To initiate this process, EarthFX Incorporated completed technical studies that were documented in a report entitled *Updated Wellhead Protection Area Delineation, Vulnerability Scoring, and Threats Assessment for the Town Shelburne, Ontario* (EarthFX Incorporated, 2022). The work by EarthFX followed the *2021 Technical Rules under the Clean Water Act* (Ministry of the Environment Conservation and Parks, 2021).

The technical studies resulted in updates to well protection areas, vulnerability scoring, and significant activity-based drinking water quality threats in the Wellhead Protection Areas. This information will be used to update the Grand River Source Protection Plan based on Conservation Authority, Source Water Protection Authority, municipal government, and Ministry of the Environment and Climate Change consultation.

Review of Draft Report

A draft version of the Project File was submitted to the Ministry of the Environment and Climate Change for review prior to issuing the Notice of Completion.

Notice of Completion

A Notice of Completion was issued to all project stakeholders and in the Shelburne Free Press on June 19, 2025.

The notice included information regarding where the Project File could be reviewed by public and agencies and on Section 16(6) Order request procedures.

Conclusion

The recommendations from this Municipal Class EA process are proceed with pumping PW7/PW8 concurrently, adding arsenic treatment to PW5/PW6, and to start looking for a new supply well in 2033. Prior to increasing the pumping rate of PW7/PW8, the Town will need to amend the Permit to Take Water and municipal drinking water license. Adding arsenic treatment at PW5/PW6 will require detailed design and amendment of the Drinking Water Works License.

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1. Introduction

The Town of Shelburne is in southwestern in Dufferin County, Ontario and has a population of 8,994 (Statistics Canada, 2021). This represents a population growth of 10.7% from 2016. The rapid growth has largely been attributed to the Town's proximity to major centers, its relative affordability, and its small-town feel.

As shown in **Figure 1**, based on recent population growth and considering the build-out area for the Town, the population for the Town is expected to reach 15,000 by 2041. Areas of planned Town development that will account for this growth are shown in Schedule B1 of the Town's Official Plan, which is reproduced in **Figure 2**. An additional development is planned on the west side of the Town, within the Town boundary. This development will be reflected in the next iteration of the Official Plan.

Figure 1: Town of Shelburne Population Projection

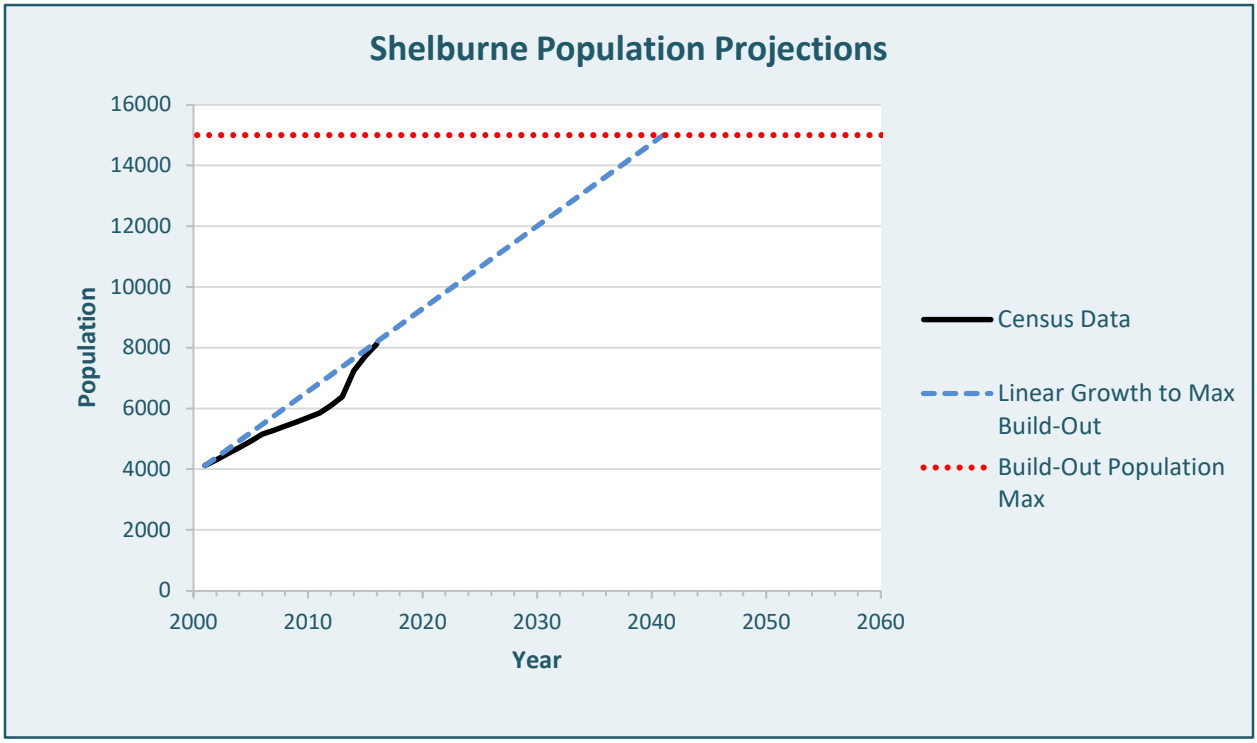
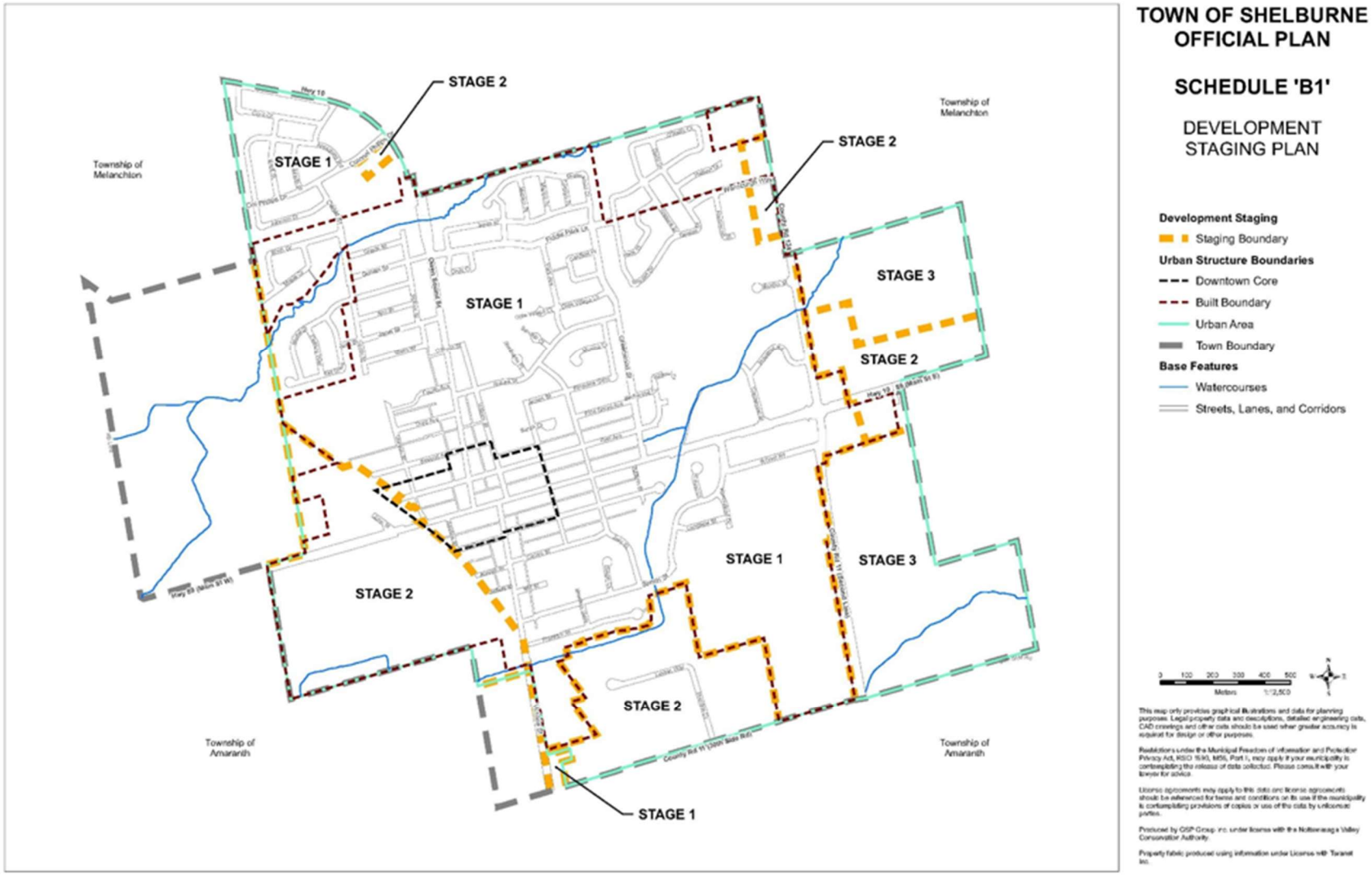


Figure 2: Town of Shelburne Official Plan Development Staging Plan



1.1 Current Water Supply

Water in Shelburne is currently supplied by six (6) production wells from four (4) pumphouses (PW1, PW3, PW5/PW6, and PW7/PW8). All wells are in the shallow Guelph Formation Aquifer, except for PW7/PW8, which are in the deeper Gasport Formation Aquifer. In Shelburne, the shallow aquifer contains arsenopyrite, which under aerobic conditions is broken down by microbes (Brunton & Brintnell, 2020), resulting in water with arsenic concentrations that require treatment or dilution to meet Provincial Drinking Water Standards.

A Permit to Take Water (PTTW No. P-300-1082818689) was issued by the Ontario Ministry of the Environment and Climate Change for these wells was issued on December 10, 2020, and expires on August 31, 2030. The pumping rates of the six production wells allowed under this permit are shown in **Table 1**.

Table 1: Maximum Permitted Rates for Municipal Production Wells

Production Well ID	Maximum Permitted Rate			Well Depth (m)	Groundwater Classification of Well	Bedrock Aquifer / Formation
	L/s	L/min	m^3/day			
PW1	19	1,140	1640	22.9	GUDI	Guelph
PW3	15	909	1300	18.6	GUDI	Guelph
PW5 PW6	23* 23*	1,364* 1,364*	1960* 1960*	23.5 24.4	Groundwater	Guelph
PW7 PW8	19** 19**	1,135** 1,135**	1630** 1630**	86.6 86.6	Groundwater	Lower Goat Island & Gasport

* Maximum permitted rate from either PW5 or PW6 or total combined.

** Maximum permitted rate from either PW7 or PW8 or total combined.

Within the Permit to Take Water, Condition 4.2 states a well field capacity assessment report is to be completed in accordance with the approved scope of work dated May 16, 2016. The wellfield capacity assessment for the Town of Shelburne was completed and sent to the Ministry of the Environment, Conservation and Parks (MECP) in December 2023. The current permitted rates for each municipal production well and summary of the well field capacities are presented in **Table 2**.

Table 2: Summary of Municipal Production Well Permitted Rates and Well Field Capacities, 2024.

Well ID	Permitted Rate			Well Capacity		
	L/s	L/min	m^3/day	L/s	L/min	m^3/day
PW1	19	1,140	1640	14***	846***	1220***
PW3	15	909	1300	13	780	1120
PW5	23*	1,364*	1960*	20	1,212	1750
PW6	23*	1,364*	1960*	4	240	346
PW7	19**	1,135**	1630**	19	1,135	1630
PW8	19**	1,135**	1630**	19	1,135	1630

* Maximum permitted rate from either PW5 or PW6 or total combined.

** Maximum permitted rate from either PW7 or PW8 or total combined.

*** Rated and tested for a 72-hour period.

PW1 was taken offline in 2020 due to low production and was successfully rehabilitated in the same year. Air entrainment issues were encountered through late 2020 when the well was returned to operation and upgrades to the infrastructure were completed in 2021 by installing an air release valve at the wellhead and new turbidity monitoring equipment. At this time, turbidity issues were encountered due to the entrained air and was investigated. It was originally speculated that the turbidity originated from the well itself and over time accumulated solids had settled to the bottom of the tank due to low flow velocities. However, based on-site testing confirmed that a substantial amount of turbidity was being introduced to the well water from the chlorine contact tanks, likely due to deterioration of the inside walls of the tank and sediment accumulation.

Early testing suggested that well rehabilitation would allow a new sustainable pumping rate of 14 L/s (846 L/min or 1220 m^3/day) for PW1. The 72-hour pumping test was completed for PW1 in July 2023, and it was confirmed that the well could maintain a pumping rate of 14.1 L/s (846 L/min or 1218m^3/day) for a 72-hour period. Durations past this were inconclusive as trends show that the water level may approach the bottom of the existing well liner and could present issues with increased turbidity and entrained air.

Capital upgrades to the sediment and contact tanks need to be completed before PW1 can return to service. The construction of a large diameter chlorine contact pipe was proposed to replace the existing chlorine contact tanks. This option was recommended over replacing the chlorine contact tanks, as the pipe is less likely to accumulate sediment because of higher flushing velocities and preferred operator option. This project is anticipated to be designed and constructed in summer / fall 2025, allowing PW1 to return to service by the end of the year.

Rehabilitation of PW3 was also completed in 2020, during which bubbling and small turbid spots were observed in the creek adjacent to the site during remediation. This raised the possibility that PW3 was Groundwater Under the Direct Influence of surface water or "GUDI". As a result, PW3 was taken offline, and additional sampling and testing were performed as a part of the GUDI analysis. A GUDI study report

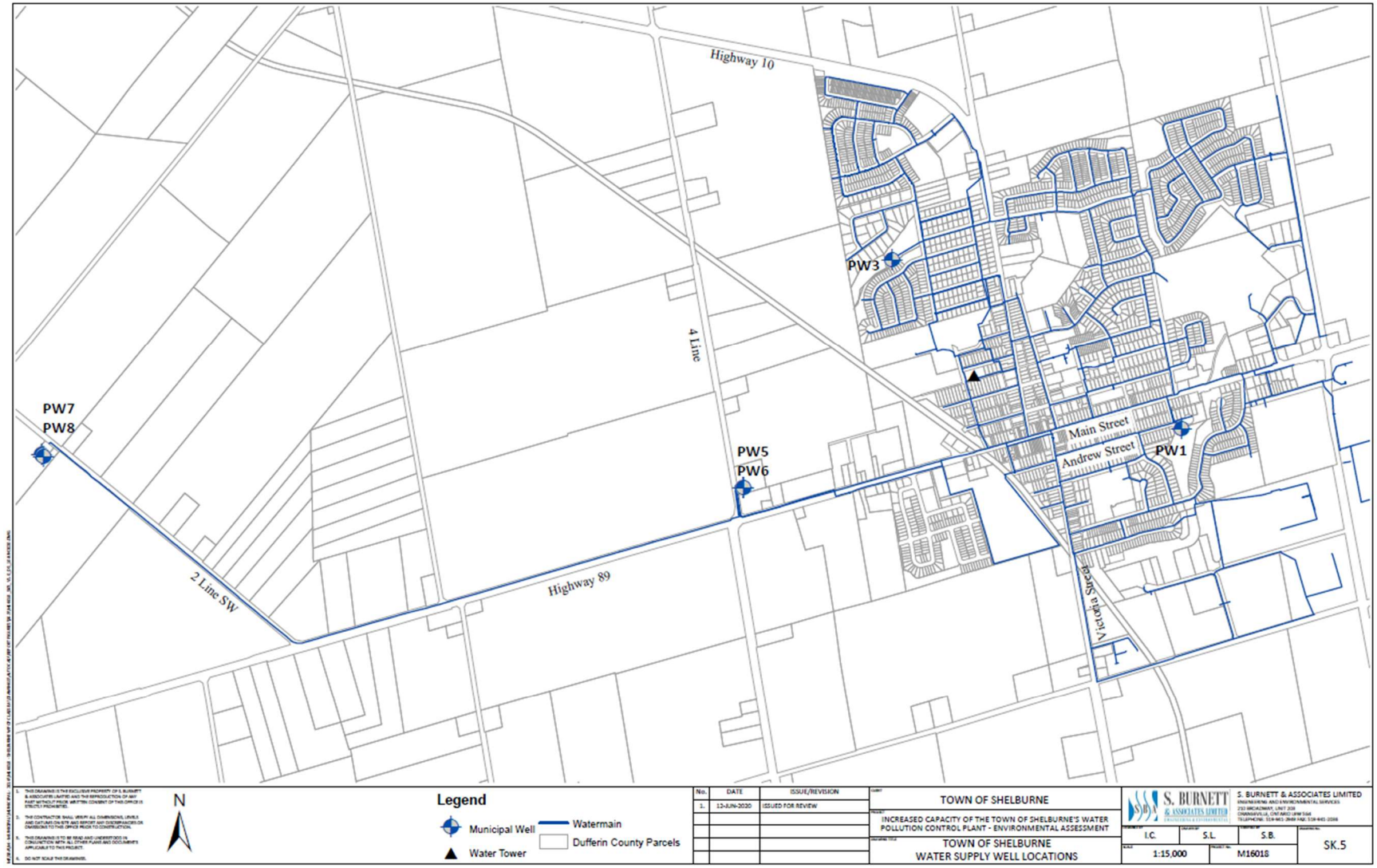
was submitted and subsequently approved by MECP in April 2021. The report concluded that under the current guidelines PW3 is considered a GUDI well with adequate in-situ filtration and that as a result, an ultraviolet system and additional monitoring was recommended. Additionally, arsenic treatment and UV treatment system will be added to ensure that water quality meets Provincial Water Quality Objectives based on the well's classification of GUDI with adequate in-situ filtration. PW3 is awaiting a new valve to help with high pressure, and it is anticipated to be back online in the summer of 2025 with a sustainable maximum supply rate of 13 L/s (780 L/min or 1123 m^3/day).

PW5 and PW6 are rated to operate at 22.7 L/s (1362 L/min or 1960 m^3/day) either in singular or in combination with the other and the combined total shall not exceed 22.7 L/s (1362 L/min or 1960 m^3/day). Wellfield capacity testing in 2016/2017 confirmed that when the wells are operated concurrently, they are able to achieve a slightly higher combined sustainable rate of 24.32 L/s (1459 L/min or 2100 m^3/day). PW5 and PW6 require blending with water from PW7 and PW8 to meet Provincial Water Quality Objectives for arsenic and flowrate must be limited to 67% of its permitted rate (i.e., 15.2 L/s) to achieve an acceptable blended arsenic rate below 10 ug/L from the combined supply.

Currently, only one of PW7 and PW8 can operate at a given time, with a permitted pumping rate of 18.9 L/s (1134 L/min or 1630 m^3/day). Due to its lower arsenic concentrations, water from PW7 and PW8 is blended with water from PW5 and PW6 to meet Provincial Water Quality Objectives. To ensure blending occurs, one of the PW7 or PW8 wells is considered a backup in the event of equipment malfunction.

In 2018 a 72-hour pumping test was conducted to determine if both wells could sustainably pump a combined rate of 37.8 L/s (2268 L/min or 3265 m^3/day) to meet projected future water demand. During this test, the pumping rate had to be reduced to 15.5 L/s (930 L/min or 1340 m^3/day) as the existing pumping equipment could not maintain the rate, and thus a combined rate of 31.0 L/s (1860 L/min or 2680 m^3/day) was sustained for the remainder of the test. This led to the need for the pumps and equipment to be upgraded in 2021, and a seven (7) day pumping test subsequently completed in May 2021 at a combined rate of 37.8 L/s (2268 L/min or 3270 m^3/day) to confirm aquifer capacity.

Figure 3: Location of Shelburne Production Wells



1.2 Projected Water Supply

Based on technical studies completed for the local groundwater resources and production wells, the future estimated pumping rate from all the wells is summarized in **Table 2** above and total projected supply is presented in **Table 3** below after operational and permitting considerations regarding the production wells.

Table 3: Town Water Supply w/ 2024 Permitted Rates Compared to Operational Pumping Rates, 2024.

Production Well ID	Permitted Pumping Rates			Operational Pumping Rates		
	L/min	L/s	m^3/day	L/min	L/s	m^3/day
PW1	1,140	19.0	1,642	846	14	1,210
PW3	909	15.2	1,309	780	13	1,123
PW5 and PW6	1,364	24.3	1,964	690[1]	11.5[1]	994[1]
PW7 and PW8	1,135	18.9	1,635	1,135[2]	18.9[2]	1635[2]
Total	**4,548**	**75.8**	**6,550**	**3,451**	**57.4**	**4,962**

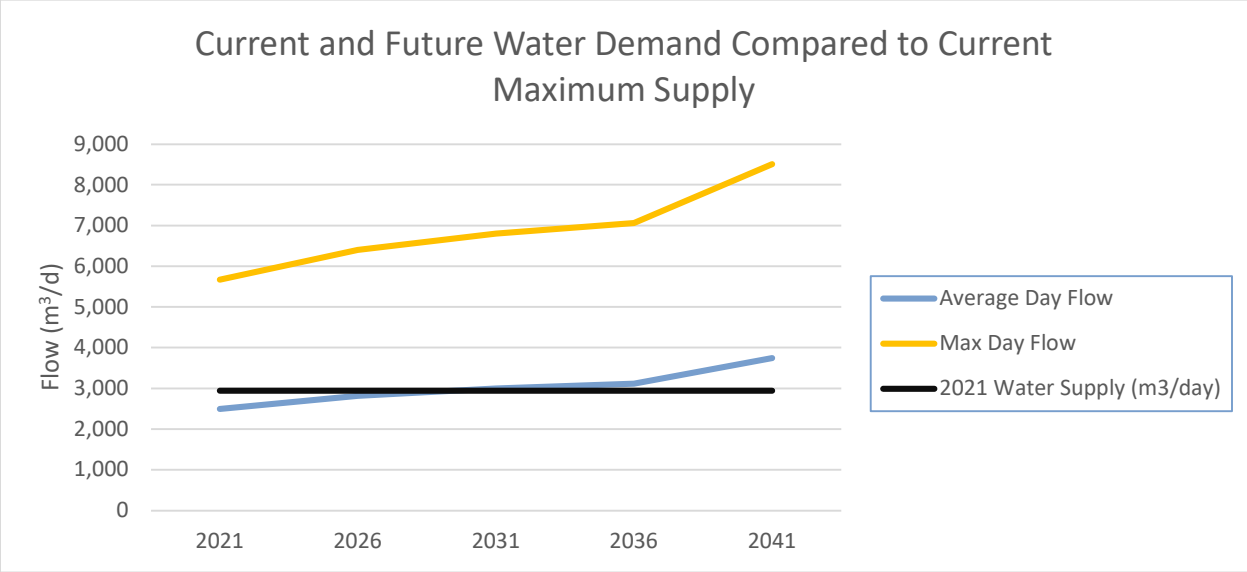
[1] Although PW5 and PW6 have a combined sustainable pumping rate of 24.32 L/s, there is not sufficient blending water from PW7 or PW8 to meet drinking water requirements for arsenic. This is maximum rate possible while keeping arsenic below half of the maximum allowable concentration.

[2] A 72-hour pumping test was conducted at a combined rate of 37.8 L/s in 2021 however the combined rate is not permitted to operate in exceedance of 18.9 L/s.

1.3 Projected Future Water Demand Compared to Supply

Based on historical data, the Town of Shelburne uses an average of 250 L of water per person per day and peak demand is 2.27 times higher than average demand based on the average of maximum day peak factors from 2013 to 2019. These assumptions were used to project future water demand, based on the projected rate of population increase shown in **Figure 1** and then as compared to the projected 2024 pumping rate. As shown in **Figure 4**, the Town can meet the average day flow today and beyond 2041 but cannot meet the 2021 maximum day demand of 5,671 m^3/day, which increases to 8,513 m^3/day in 2041. This means that in summer months when water demand is highest, the Town will depend heavily on water storage, intended for emergency fire suppression, and even then, may not be able to meet demand.

Figure 4: Future Water Supply Compared to Projected Maximum Water Supply



1.4 Class EA Objectives

In response to continued growth and increased water demand, The Town initiated a Schedule 'B' Municipal Class EA to assess alternatives for increasing the Town's Water Supply to meet water demand over the next 20 years, while meeting Ontario Drinking Water Quality Standards as per *O. Reg. 169/03* under the *Safe Drinking Water Act, 2002, S.O. 2002, c. 32.*

The preferred solution must be:

- Environmentally and socially responsible;
- Cost effective;
- Technically feasible; and
- Able to be completed in a timely manner.

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, in this case, the Municipal Class EA Process.

2.1 Class EA Schedule

Under the Municipal Class EA Process, projects are categorized into different schedules based on their complexity and environmental impact. With each higher schedule, additional Class EA steps must be followed. Under Class EAs, projects are classified into the following schedules:

- Schedule 'A' projects are limited in scale, have minimal adverse effects and include most municipal maintenance and operational 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 (Phases One and Two) involving mandatory contact with directly affected 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 be prepared and submitted for review by the public and review agencies. If there are no outstanding concerns, then the municipality may proceed to 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 (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 to implementation.

As per **Appendix 1** – Project Schedules of Municipal Class Environmental Assessment (Municipal Engineers Association, 2000), establishing a new production well or increasing the pumping capacity of an existing production well is considered a Schedule 'B' Project. Accordingly, determining the best means of meeting the Town's current and future water supply needs was conducted as a Schedule 'B' Municipal Class EA.

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

The standard Class EA phases for a Schedule 'B' Project are illustrated in **Figure 5** and summarized below:

Phase 1: Problem or Opportunity
Come up with a clear statement of the problem or opportunity.

Phase 2: Alternate Solutions

Identify alternative solutions to address the problem opportunity by considering the existing environment and arrive at a preferred solution while allowing for public and government agency input.

Phase 5: Implementation

Complete drawings and design of the preferred solution, while incorporating any mitigating measures identified during the process. Any monitoring programs identified during the process shall be undertaken to ensure that the environmental provisions and commitments made during the process are fulfilled and effective.

The EA process was undertaken as a Master Plan, following the Schedule 'B' process outlined in the Municipal Class Environmental Assessment (Municipal Engineers Association, 2021).

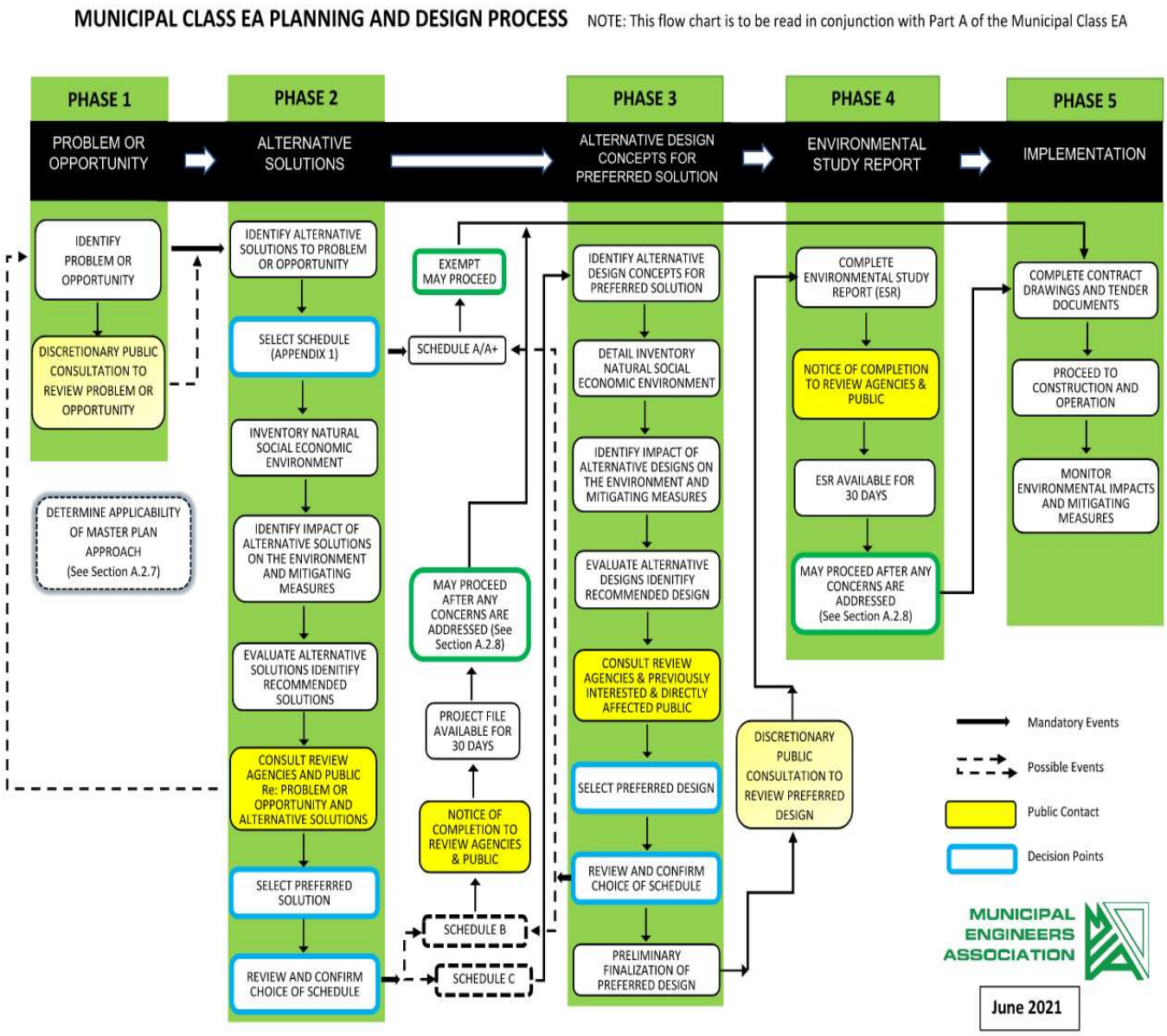
2.3 Provincial Policy Statement

The Provincial Policy Statement (PPS) (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 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 focuses on settlement areas, such as the Town of Shelburne, for growth and development.

Figure 5: Municipal Class EA Planning & Design Process (Municipal Engineers Association, 2021).



2.4 Notice of Commencement

A Notice of Commencement was published on October 12, 2017, in the Orangeville Citizen and the Shelburne Free Press. The notice conveyed the following information:

- The need to increase the capacity of existing water supply facilities;
- That the study would follow the Class EA process for a Schedule "B" project;
- Who to contact for more information; and,
- Opportunities to provide input at public meets and by reviewing the study report.

A copy of the Notice of Commencement is provided in **Appendix A**.

2.5 Public Information Centre No. 1

A discretionary Public Information Centre (PIC1) was held on June 24, 2020, from 6:30 p.m. to 7:30 p.m. to inform stakeholders about the EA process and how they could participate. Due to health and safety considerations arising from the COVID-19 virus, PIC1 was conducted as video conference using the Zoom platform. Additionally, the meeting was livestreamed on the Town's YouTube Channel to create a meeting record and to allow viewing at other times for anyone who could not participate at the designated time. Notification for PIC1 appeared in the Shelburne Free Press on May 28, 2020. Additionally, a stakeholder list was developed, consisting of agencies, neighbouring municipalities, First Nations and Métis communities and organizations (provided in **Appendix A**). Included on the list were the following First Nation and Métis communities:

- Chippewas of Georgina Island
- Saugeen First Nation
- Beausoleil First Nation
- Chippewas of Nawash Unceded First Nation
- Chippewas of Rama First Nation
- Mississaugas of Scugog Island First Nation
- Mississaugas of the New Credit First Nation
- Métis Nation of Ontario
- Six Nations of the Grand River Territory

Stakeholders on the list were invited to participate in PIC1 by email on May 28, 2020, and again on June 15, 2020. PIC1 attendees were instructed to contact the Town of Shelburne to register for the meeting. 12 stakeholders registered for PIC1, with eight (8) attending.

The PIC1 presentation is included in **Appendix A** and covered the following topics:

- Project background;
- The Municipal Class EA process;
- Studies completed to date;
- Alternative solutions; and
- Next steps.

A PDF version of the presentation slides was provided to all registrants the day of the meeting. Within an hour of the conclusion of PIC1, an electronic survey was emailed to stakeholders that had registered. A copy of the survey is provided in **Appendix A**. The survey provided an opportunity to comment on the meeting, on the alternative solutions, or to provide other feedback.

Four surveys were completed and included representatives from local developers and the MECP. One (1) survey respondent indicated they were unable to ask questions. Through follow-up by email on June 25, 2020, it was confirmed that the respondent inadvertently viewed the live streaming on YouTube instead of registering and participating in the Zoom meeting. The respondents were provided with the opportunity to ask any questions and provide additional feedback beyond what they provided in the survey. The same respondent wanted to make sure that intra-basin transfer was considered in the EA, and this was also confirmed by email on June 25, 2020.

Three responses were received to the survey question, "Do you have any comments or concerns regarding any of the alternative solutions presented?". A summary of the responses and how they were addressed is provided in Table 4.

Table 4: Summary of How Survey Comments were Addressed through Class EA.

Comment	How Comment was Addressed through the Class EA
I as wondering if there should have been some discussion on the interbasin transfer issues - would this be an issue requiring consideration for options 3, 4 and 5?	Although not discussed at the PIC, interbasin transfer was discussed at length with MNRF staff and interbasin transfer considerations are outlined in Section 5.
"Do nothing" is not an option nor is "limiting growth" because neither resolve the issue at hand It would be better to add a new well and treat wells 5, 6 & 7 along with conservation now where possible in the summer months.	These recommendations are consistent with the preferred solution arrived at in the Class EA, as outlined in **Section 4.4.**

On behalf of the Flato team we are supportive of improvements to the Town's water supply system to accommodate future growth. Following the additional pump testing scheduled for summer 2020, kindly keep us informed of the results and how the results impact the evaluation of the alternative solutions. Thank you for confirming during the PIC that the Flato lands are included as part of the study boundary.	The Town of Shelburne is in regular contact with Flato, who were included in the all-project correspondence regarding the Class EA.

Only two (2) of the four (4) participants in the survey requested to be kept informed about the project going forward, and those participants were included in the stakeholder distribution list for all project correspondence.

3. Phase 2: Alternative Solutions

3.1 Identification of Alternative Solutions

The following alternatives were considered in the Schedule 'B' Master Plan to meet the long-term sewage treatment needs of the Town of Shelburne:

3.1.1. Alternative 1 – "Do Nothing"

The "Do Nothing" alternative would involve no further action by the Town of Shelburne to increase the water supply capacity. Under this option, the Town would need to restrict population growth by cancelling approved and planned developments. For some of these developments, cancellation of development contracts would result in financial penalties.

3.1.2. Alternative 2 – Implement Water Conservation

Water conservation was considered as an option that could reduce or eliminate the Town's need for additional water supply to address future water supply needs. This alternative involved continued implementation of water efficiency programs within the Town of Shelburne.

The Town has already implemented significant water conservation measures. In 2011, the Town of Shelburne installed approximately 2,200 new water meters and replaced 800 existing water meters. The new meters allowed the Town to introduce tiered costing, where billings are based on a fixed base rate and a consumption charge for water and sewer. By charging higher rates for higher rates of water consumptions, conservation of water is encouraged. Per capita water demand in Shelburne continues to drop, with per capita demand decreasing by 11% between 2013 and 2018.

Implementation of additional water efficiency measures, including for example the use of low flow toilets and other water saving fixtures in existing and new developments. It is not possible to determine the amount of savings that would result from installing low-flow toilets, as the number of these toilets already in use is not known. However, as an example, if of the approximate population of 10,000, 10% switched to low flow toilets (i.e., 1000 persons), at an average 3 flushes per person per day, and a savings of 8 L per flush from a 14L toilet compared to a 6L toilet, this would result in a savings of 24 m^3 of water per day, or 1 % of the project 2498 m^3 per day 2021 water demand.

3.1.3. Alternative 3 – Pumping Wells PW7 and PW8 Concurrently

A Federal / Provincial Environmental Assessment was initiated in 2007 to determine the best means of meeting the Towns' water supply and water quality needs at the time. Based on the recommendations of this EA, PW7/PW8 were developed in the Township of Melancthon and blended with PW5/PW6 to bring the blended arsenic rate below the 10 µg/L Ontario Drinking Water Quality Standard maximum allowable concentration for arsenic. Although the EA discussed the possibility of running PW7 and PW8 concurrently, there was not enough water demand, and accordingly, this EA only assessed the impacts of either PW7or PW8 being pumped at 18.9 L/s (1134 L/min or 1630 m^3/day) (250 Igpm), but not the concurrent pumping of both wells. The current Permit to Take Water (#P-300-1082818689) and the Environmental Assessment / Environmental Impact Statement (Golder Associates Ltd., 2013) allow either PW7 or PW8 to be pumped at a rate of 18.9 L/s (1134 L/min or 1630 m^3/day). Given that the water from PW7/PW8 is blended with water from PW5/PW6 to reduce arsenic from PW5/PW6 to below the MAC, whichever of wells PW7 or PW8 that are not being pumped acts as a backup to ensure that blending with wells PW5/PW6 can always occur.

The results of a seven (7) day pumping test and monitoring in May 2021, indicate that PW7 and PW8 can be pumped sustainably at a rate of 37.8 L/s (2268 L/min or 3270 m^3/day) with minimal effect on bedrock wells and, except for one well, no impact on local domestic wells. The overburden well located at 116116 2 Line SW had a significant effect during the pumping and recovery periods combined with usage by the resident. No impacts on flow in Willowbrook Creek are anticipated, nor associated impacts on aquatic habitat. After completion of the upgrades to PW1 and PW3, and assuming pumping rates shown in **Table 3,** adding an additional 18.9 L/s (1134 L/min or 1630 m^3/day) to the Town's water supply would meet demand for a population of just under 12,500, which under current projections, would occur in 2036.

If PW7/PW8 were pumped concurrently, a new well, PW9, would need to be constructed as a backup. If there was a malfunction in either PW7 or PW8, then PW9 would be pumped so that supply from this location would remain unchanged and the arsenic concentration of the water blended with PW5/PW6 would remain unchanged.

3.1.4. Alternative 4 - Increasing Pumping Rate of PW5 and PW6 by Adding Arsenic Treatment

The current Permit to Take Water (#P-300-1082818689) allows PW5/PW6 to pump at a maximum rate of 22.73 L/s (1364 L/min or 1960 m^3/day) each. As summarized in the Wellfield Capacity Assessment technical memorandum for this scope of work dated February 28, 2020, from Banks Groundwater Engineering Limited (BGE), a March 2017 pumping test confirmed a combined sustainable pumping of 24.32 L/s (1459 L/min or 2100 m^3/day), which is lower than the current permitted maximum pumping rate (Banks Groundwater Engineering Ltd., 2023).

Measured arsenic levels between 2013 and 2017 for PW5 and PW6 are shown in **Table 5**.

Table 5: Historic Arsenic Concentration at PW5 and PW6

	PW5 Arsenic Concentration (µg/L)	PW6 Arsenic Concentration (µg/L)	Average PW5/PW6 Arsenic Concentration (µg/L)
2013	—	—	14.7
2015	14.5	14.4	14.5
2016	16	16.6	16.3
2017	15.3	14.7	15.0
Average (2013, 2015, 2016, 2017)			**15.1**
95th Percentile			**16.1**

Table 5.

Table 5 shows PW5 and PW6 to have a combined average arsenic concentration of 15.11 micrograms per litre, and a 95th percentile concentration of 16.14 micrograms per litre. The arsenic limit in the Ontario Drinking Water Standards was lowered on January 1, 2018, from 25 to 10 micrograms per litre (Government of Ontario., 2003). To meet that standard, the Town blends water from PW5/PW6 with water from PW7/PW8, which pumps water from a deeper aquifer and has lower arsenic concentrations. From 2013 to 2017, PW7/PW8 had a combined average and 95th percentile arsenic concentration of 1.55 and 1.64 micrograms per litre.

Based on 95th percentile arsenic concentrations, if PW5 and PW6 were pumped at their maximum sustainable capacity of 24.32 L/s (1459 L/min or 2100 m^3/day), blending with water from PW7 and PW8, pumped concurrently at a rate of 37.8 L/s (2268 L/min or 3270 m^3/day), would result in an arsenic concentration of 7.31 micrograms per litre. Although this is below the drinking water standard maximum allowable concentration of 10 micrograms per litre, it exceeds the half maximum allowable concentration of 5 micrograms per litre and therefore corrective action is required. Ontario regulation 170/03 requires that should concentrations of arsenic exceed half of the maximum allowable concentration of 10 micrograms per litre, then sampling needs to be increased to every three (3) months (Government of Ontario., 2003). Also, if only PW7 or PW8 were pumped at the current limit of 18.9 L/s (1134 L/min or 1630 m^3/day), only 5.7 L/s (342 L/min or 490 m^3/day) could be pumped from PW5/PW6.

Currently the only means of reducing the arsenic concentration of water from PW5/PW6 is to curtail water supply from these wells so that greater proportion of the blended water comes from PW7/PW8 blends. To achieve a level below 5 micrograms per litre, supply at PW5/PW6 would need to be curtailed to below 11.5 L/s (690 L/min or 994 m^3/day). Given that the Town requires an additional water supply to meet projected demand, this would not be a desirable outcome. Accordingly, the Town considered adding arsenic treatment at PW5/PW6 as Alternative Solution 4, similar to what is currently being installed at PW3. This option would ensure that PW5/PW6 could be pumped to their maximum sustainable pumping rate without exceeding the half maximum allowable concentration for arsenic. Additionally, this alternative would add resiliency to the Town's water supply. Currently the water supply from PW5/PW6 depends on blending with water from PW7/PW8 to be below the maximum allowable concentration for arsenic. Any interruptions in supply from PW7/PW8 would also mean that PW5/PW6 could not be operated. Interruptions could result from issues with the aquifer used by PW7/PW7, the wells themselves, pumps, blending equipment, or the watermain that connects these wells to PW5/PW6. Although it is unlikely that both PW7 and PW8 would experience issues at the same time, the impact of this occurrence would be significant for the Town's water supply.

3.1.5. Alternative 5 - Locating and Developing a New Well

This alternative involved locating a new well that could be added to the Town's water supply. There is considerable cost for testing multiple well locations to confirm a location that supports sustainable pumping without impacting adjacent private well owners or sensitive environmental features. Therefore, this alternative only provides a Study Area within which a new well could be located, based on work done to locate the Town's existing wells and the resulting understanding of the local hydrogeology. Should this alternative solution be selected as the preferred solution, a separate Schedule 'B' Class EA will be undertaken to identify a preferred location for the well and to assess environmental impacts associated with its construction and operation.

Experience has shown that water supply wells dug in the shallower Guelph Formation in Shelburne can experience increasing levels or arsenic concentrations over time. Examples include PW3, where arsenic treatment is currently planned, and PW5/PW6, which require blending with water from PW7/PW8 to meet provincial arsenic water quality objectives. Arsenic in the Guelph formation is the result of microbial degradation of pyrite under aerobic conditions, and the variable presence of pyrite would account for variation in arsenic levels between wells (Brunton & Brintnell, 2020). Accordingly, any new water supply well should be constructed in the deeper Gasport Formation, like the Town's most recently constructed PW7 PW8, as these wells do not exhibit the same arsenic-producing conditions. The Gasport formation thickens with distance to the west of the Niagara Escarpment, which was confirmed by Ontario Geological Society testing in a monitoring well adjacent to PW5/PW6 that did not encounter deep aquifer conditions suitable to developing a production well. Accordingly, investigation of a new potential well location will focus on a location a least as far west from the Niagara Escarpment as PW 7/PW8. Given that the new well would connect to the water distribution system at PW7/PW8 and considering the cost of installing

new horizontal water distribution piping, the potential new well location was limited to 5 km distance from PW7/PW8.

3.1.6. Alternative 6 – Alternatives 3 and 4 Combined

This alternative would consist of:

- Pumping Wells PW7 and PW8 Concurrently; and
- Increasing Pumping Rate of PW5 and PW6 by Adding Arsenic Treatment.

3.1.7. Alternative 7 - Alternatives 3 and 5 Combined

This alternative would consist of:

- Pumping Wells PW7 and PW8 Concurrently; and
- Locating and Developing a New Well

3.1.8. Alternative 8 - Alternative 4 and 5 Combined

This alternative would consist of:

- Increasing Pumping Rate of PW5 and PW6 by Adding Arsenic Treatment; and
- Locating and Developing a New Well.

3.1.9. Alternative 9 – Alternatives 3, 4, and 5 Combined

This alternative would consist of:

- Pumping Wells PW7 and PW8 Concurrently;
- Increasing Pumping Rate of PW5 and PW6 by Adding Arsenic Treatment; and
- Locating and Developing a New Well.

3.2 Existing Environmental Conditions for Alternative Solutions

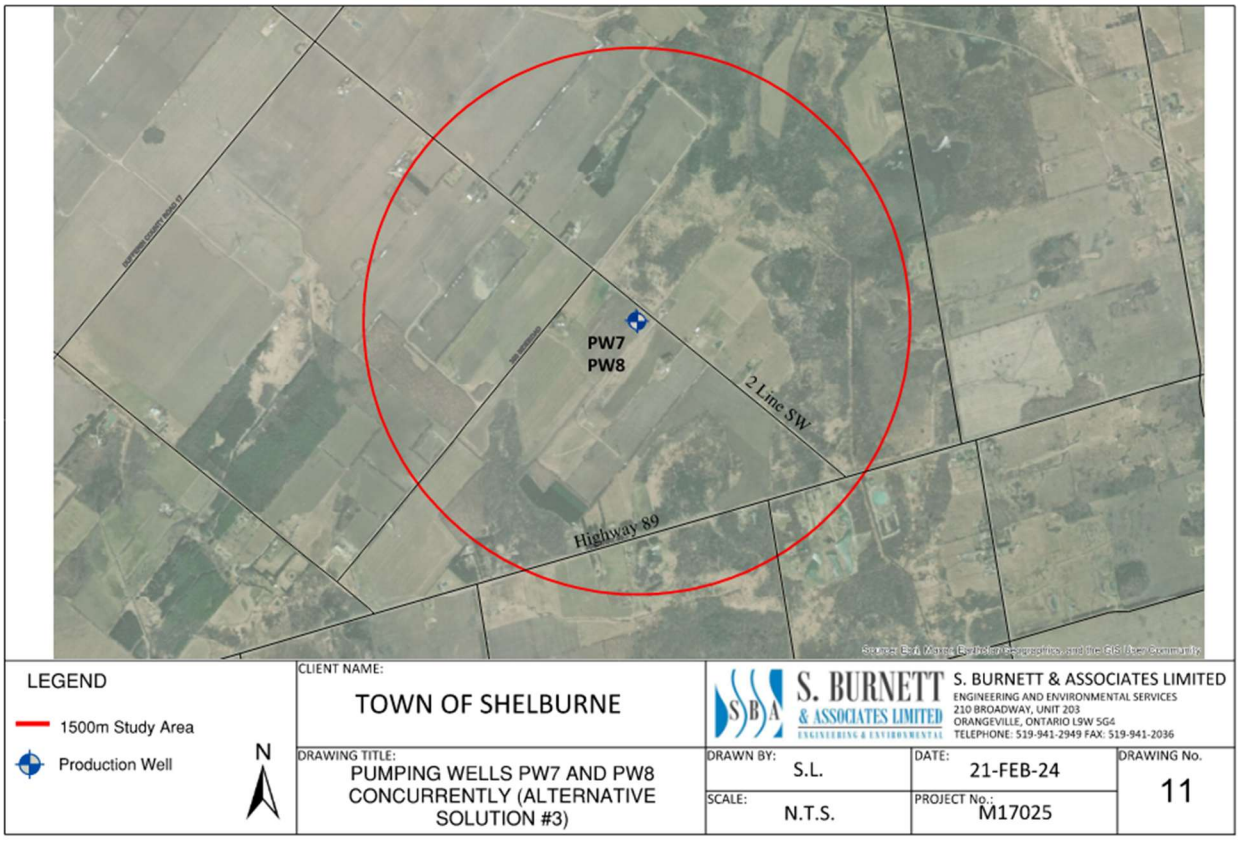
An understanding of existing environmental conditions within the Study Area is needed to allow comparative evaluation of the alternative solutions and to evaluate the environmental effects of the preferred alternative solution. Although completed as a desktop exercise, additional studies may be required, depending on the final selection of the preferred alternative solution and prior to detailed design.

3.2.1. Study Area Selection

A Study Area was selected that encompassed the potential environmental effects of the nine (9) alternative solutions introduced in **Section 3.1**.

The Study Area, shown in **Figure 6**. included a 1.5 km radius around wells PW7 and PW8 to capture any potential changes to water levels during pumping and their impacts on natural features and landowner wells. All other potential effects associated with this alternative solution are expected to fall within this Study Area. The Study Area also included an area extending 1.5 km from potential new well locations.

Figure 6: Water Supply Environmental Assessment Study Area



3.2.2. Study Area Description

PW7 and PW8 are located on a privately-owned agricultural property, within the Township of Melancthon, in a rural-zoned area to the west of the Town of Shelburne. Similarly, the location for a new well would be located on agricultural land to the west of the Town of Shelburne, either within the Township of Melancthon or Amaranth. The well locations are within the Grand River Watershed, with PW7/PW8 located 150 m to the west of the Nottawasaga Valley Watershed.

3.2.2.1 Soils and Physiography

The Town of Shelburne is located approximately 500 m above sea level. Overburden thickness in the Study Area is approximately 10 m thick, consisting of glacial formations from glacio-lacustrine (lakes) sediments, fluvial (river), and glaciofluvial deposits and ice-deposited drift. The Town's underlying bedrock deposits consist of Silurian Dolostones from the Palaeozoic Area and include the shallower Gasport and deeper Guelph Format Formations. Regionally, these formations represent extensive aquifers that support other cities such as Guelph and Cambridge. The Guelph Formation is underlain by the Cabot Head formation, a low-permeability shale deposit (S. Burnett & Associates Limited, 2023).

3.2.2.2 Quaternary and Bedrock Geology

Overburden is underlain by Paleozoic bedrock of the Guelph Formation whose eastern boundary is represented by the Niagara Escarpment. The Silurian bedrock formations underlying the Town comprise of one of the most extensive bedrock aquifers in Ontario. The dolostone and shale sequences range from 20 to 40 m in thickness (Golder Associates Ltd., 2013). Local bedrock stratigraphy, beginning with the youngest bedrock formation, includes the following.

Guelph Formation

The Guelph Formation consist of open marine, medium to thickly bedded, cross-stratified, crinoidal grainstones and wackestones and lagoonal, thinly bedded, megalodont–gastropod-dominated wackestones and packstones, and lesser bio stromal and biohermal reefal complexes (Brunton & Brintnell, 2020). It is the uppermost bedrock unit in the Town, including in the vicinity of PW7/PW8. Due to its reefal structure, the Guelph Formation is generally recognized as a moderately permeable, water bearing aquifer.

Eramosa Formation

The Eramosa Formation consists of three (3) members, including the Stone Road Member, the Reformatory Quarry Member, and the Vinemount Member (listed from youngest to oldest). This bedrock formation is generally recognized as cream-coloured, coarsely crystalline dolostone. The thickness of the upper Stone Road Member is approximately 5.5 m. The Reformatory Quarry Member possesses exceptionally preserved soft-bodied biota (fauna and flora) and the lower Vinemount Member of the formation acts as a local to regional aquitard (Brunton & Brintnell, 2020).

Goat Island Formation

The Goat Island Formation consists of two (2) members, the lower Niagara Falls Member, and the upper Ancaster Member. The basal member of the Goat Island Formation is the crinoidal grainstone facie of the Niagara Falls Member, which is commonly finely crystalline and cross laminated with a distinctive pin-striped appearance. The overlying Ancaster Member of the Goat Island Formation is a chert-rich, finely crystalline dolostone that is medium to ash-grey in colour, thin to medium bedded and bioturbated

(Brunton & Brintnell, 2020). Due to its crystalline structure, the Goat Island Formation is generally regarded to have low vertical hydraulic conductivity and is not significantly water bearing.

Gasport Formation

The Gasport Formation consists of a basal cross-bedded crinoidal grainstone-packstone succession with sequences of microbial-crinoidal reef mound and coquina (shell bed) lithofacies. This unit has been referred to as the Amabel Formation in previous hydrogeological investigations. The Gasport Formation is generally recognized as a permeable water bearing confined bedrock aquifer (Brunton & Brintnell, 2020).

Bedrock Underlying the Gasport Formation

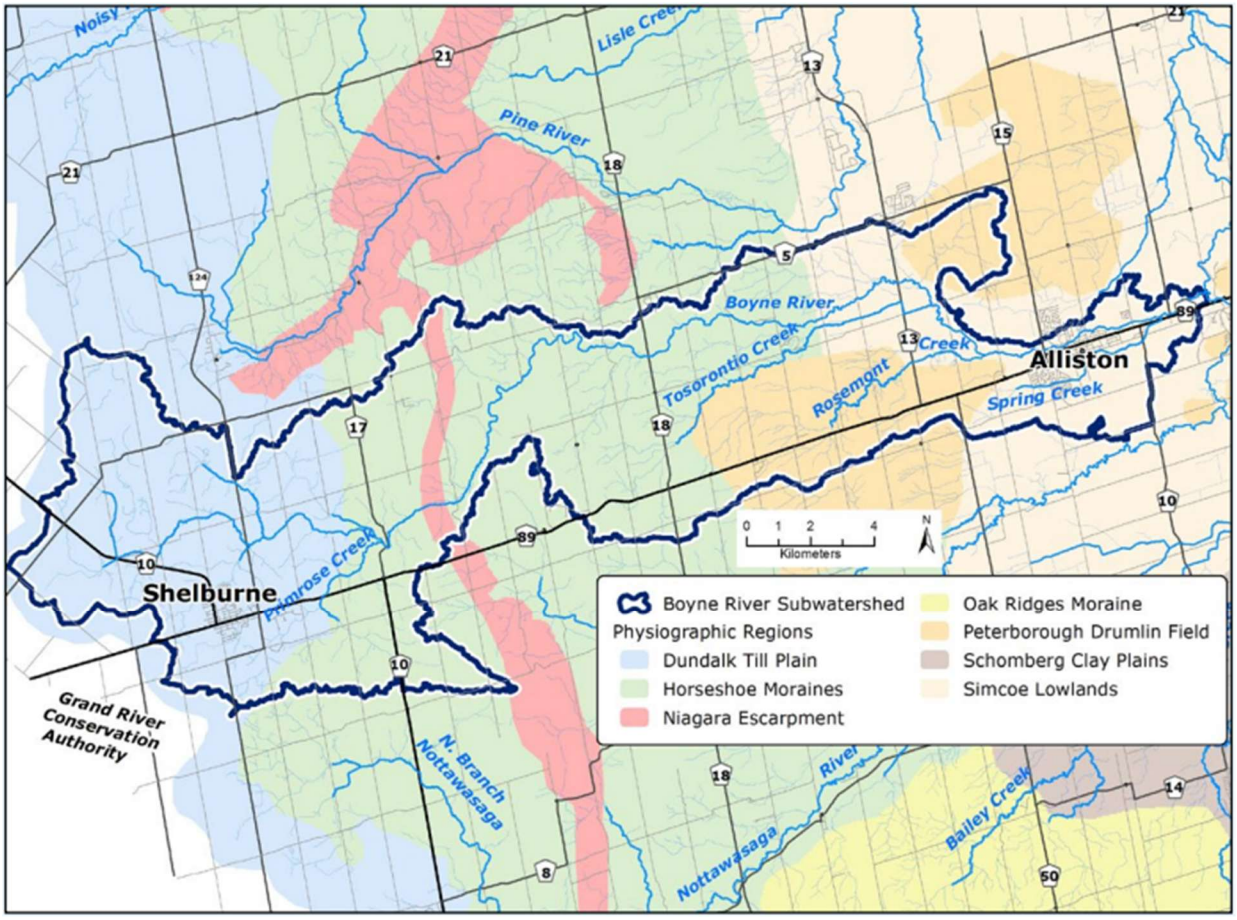
Under the Gasport Formation are a series of bedrock deposits, including the Irondequoit and Rockway Formation, with marginal thickness of 1 m or less. These bedrock deposits and underlain by the Merritton Formation, which is referred to as the upper Fossil Hill Formation in previous hydrogeological investigations. Merritton Formation is generally less than a metre thick and possesses pentamerid brachiopods and tabulate corals. The formation underlying the Merritton Formation is the Cabot Head Formation, which represents the base of the active groundwater flow system and referred to as the regional aquitard (Brunton & Brintnell, 2020).

3.2.2.3 Surface Water

The portion of the Nottawasaga Valley Watershed within the Study Area is the start of the Boyne River Subwatershed, shown in **Figure 7**.The Boyne River, a coldwater habitat, begins as a series of tributaries from headwater wetlands northwest of Shelburne. Many of the stream sections between wetlands have been altered to drain agricultural lands and in doing so has introduced agriculture runoffs to these streams. These tributaries flow eastward through a gently rolling headwater landscape, joining to form the main branch of the Boyne River northeast of Shelburne (Nottawasaga Conservation Authority, 2018).

The majority of the Study Area is within the Grand River Watershed and include non-Provincially evaluated wetland complexes that include the former Willow Brook Swamp and Melancthon #38 wetlands and the Canadian Pacific Swamp (MN3) (Ministry of Natural Resources and Forestry, 2024).

Figure 7: Map of the Boyne River Subwatershed (Nottawasaga Conservation Authority, 2018).



To manage overland runoff towards Willow Brook tributaries, several drains have been engineered within surrounding wetland regions. These drains primarily compose the surface water courses across PW7/PW8's zone of influence. Surface water flows through the Willow Brook Swamp in a south-westerly direction, ultimately discharging into the Grand River. The flow direction is generally towards the south from the production wells to Highway 89.

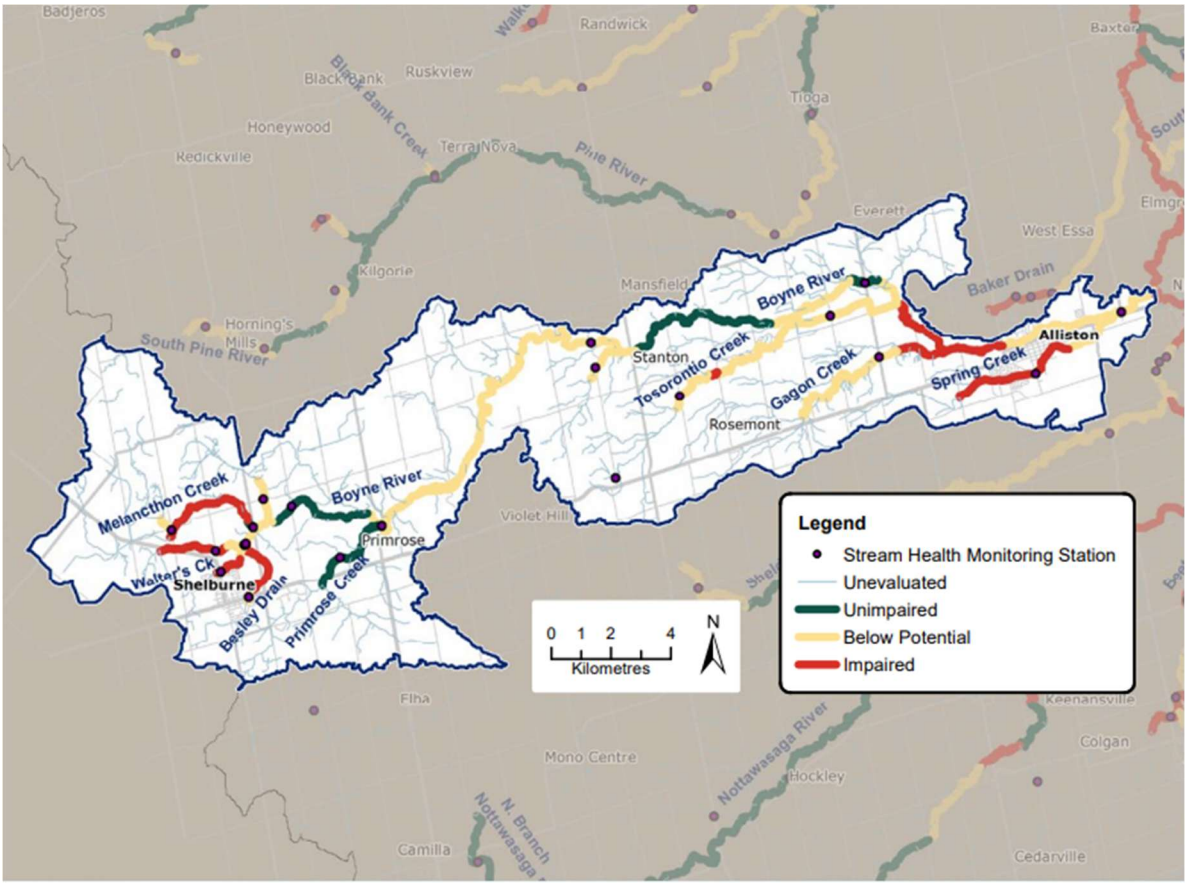
The headwaters of Will Brook consist of a series of anthropogenically modified agricultural drains, with the main headwater tributary known as the Amos Drainage Works north of Highway 89, and No. 48 Drainage Works south of Highway 89. The drains were previously straightened and are subject to on-going maintenance activities to promote drainage of the surrounding lands (Golder Associates Ltd., 2013).

Approximately 23% of the Boyne River Subwatershed has forest cover, compared to 33% for the Nottawasaga Valley Conservation Authority (NVCA) Watershed, and accordingly the NVCA characterizes it as a disturbed environment (Nottawasaga Conservation Authority, 2018). According to Environment and Climate Change Canada, 30% forest cover is needed to support healthy wildlife habitat (Environmental Commissioner of Ontario, 2018). The Boyne River Subwatershed also has levels of forest

interior cover and riparian habitat that are below those of the NVCA Watershed and are characterized as highly disturbed and disturbed, respectively.

As shown below in **Figure 8**, the NVCA has evaluated watercourses within the Town of Shelburne as either "impaired", or "below potential".

Figure 8: River Health in the Boyne River Subwatershed (Nottawasaga Conservation Authority, 2018)



3.2.2.4 Fish and Fish Habitat

As part of the Environmental Impact Study completed in 2013 for PW7 and PW8, field studies were conducted by Golder Associates Ltd. Staff divided Amos Drainage Works into 3 reaches. Reach 1 is located downstream of 2nd Line Southwest and consists of a dug channel that is 4 to 6 m wide with bank heights up to 3 m. Reach 1 is characterized by abundant cattail, willow shrubs, and terrestrial grasses, indicating intermittent flow restricted to after storm event or spring runoff. Very low water was observed in November 2010, and no water was observed in July 2012. No fish were observed and Reach 1 was not identified as potential fish habitat (Golder Associates Ltd., 2013).

Reach 2 is located within the Willow Brook Wetland Complex, is deeper than Reach 1, and contained water during field visits. The presence of watercress suggests contribution of water from groundwater seepage, which was confirmed by the presence of water during drought conditions in July 2012. This reach represents permanent fish habitat, and numerous cyprinids were observed during field studies (Golder Associates Ltd., 2013).

Reach 3, located to south of Reach 2, like Reach 1, Reach 3 is heavily modified by agricultural practices and likely does not contain water during low flow conditions. (Golder Associates Ltd., 2013).

The Amos Drainage Works is classified is classified as warm water with no top predators, while the No. 48 Drainage Works is coolwater immediately downstream of Highway 89, and cold / cool water with no trout / salmon / predators present and warm water to predators present downstream of 20th Sideroad (Golder Associates Ltd., 2013).

3.2.2.5 Species at Risk

Based on a review of the Ministry of Natural Resource's Natural Heritage Information Centre, there is potential for the presence of species at risk within the Study Area. Potential species are listed in **Table 6**. The Study Area is agricultural land that already disturbed, and no adverse effects are expected at this time for species at risk.

Table 6: Species at Risk Potentially Located within the Study Area

Species Name	Species at Risk Ontario (SARA) Statues	Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Status
Eastern Wood-pewee	Special concern	Special concern
Eastern Meadowlark	Threatened	Threatened
Bobolink	Threatened	Threatened
Midland Painted Turtle	—	Special concern
Snapping Turtle	Special concern	Special concern
Western Chorus Frog	Not a risk	Threatened
Wood Thrush	Special concern	Threatened
Massasauga	Threatened	Threatened

4. Impact Evaluation and Selection of Preferred Alternative

4.1 Preliminary Screening of Alternative Solutions

The alternative solutions outlined in Section 3 were screened against criteria adapted from the Ministry of the Environment, Conservation and Parks (MECP)'s Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario (MOE, 2009). The requirements for an alternative solution that is feasible, viable, and makes efficient use of existing wastewater treatment resources is a requirement of the PPS, outlined in Section 1.6.6.1. Only alternative solutions meeting these criteria were brought forward for further comparison. If only one option meets the criteria, this becomes the preferred option. The preliminary screening of alternative solutions is presented in **Table 7.**

If any of the screening questions cannot be answered without additional information regarding the alternative solution, including through acquiring existing conditions information, the alternative solutions were not "screened out", and were carried forward for further assessment.

Table 7: Preliminary Screening of Alternative Solutions

Criteria	Alternative 1 - Do Nothing	Alternative 2 – Implement Water Conservation	Alternative 3 – Increasing Pumping Rate of PW5 and PW6 by Adding Arsenic Treatment	Alternative 4 – Pumping PW 7 and PW8 Concurrently	Alternative 5 – Locating and Developing a New Well	Alternative 6 – Alternatives 3 and 4 Combined	Alternative 7 – Alternatives 3 and 5 Combined	Alternative 8 – Alternatives 4 and 5 Combined	Alternative 9 – Alternatives 3, 4, and 5
Do they provide a viable solution to the problem?	No	No	No	No	No	Yes	Yes	Yes	Yes
Are they proven technologies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Are they technically feasible?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Are they consistent with planning objectives?	No	No	No	No	No	Yes	Yes	Yes	Yes
Are they consistent with provincial government priority initiatives?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Do they avoid potential impacts to sensitive environmental features?	Yes	Yes	Yes	Yes	Yes (assumes new location will avoid sensitive features)	Yes	Yes (assumes new location will avoid sensitive features)	Yes (assumes new location will avoid sensitive features).	Yes (assumes new location will avoid sensitive features)
Are they practical, financially realistic, and economically viable?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Are they within the ability of the Town to implement?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

- Alternative 1 – "Do Nothing"
- Alternative 2 – Implement Water Conservation
- Alternative 3 – Pumping Wells PW7 and PW8 Concurrently
- Alternative 4 – Increasing the Pumping Rate of PW5 and PW6 by Adding Arsenic Treatment
- Alternative 5 – Locating and Developing a New Well

Alternative 1 – "Do Nothing" is not viable, since the Town already lacks an adequate water supply to meet maximum daily demand. This demand is projected to increase as the Town population grows in response to local and provincial planning objectives. Similarly, Alternative 2 – Implement Water Conservation does not allow the Town to meet the maximum daily water demand. The Town has already significantly increased water efficiency over the past five (5) to seven (7) years by installing individual meters and moving to a tiered fee structure to encourage conservation. Any additional efficiencies would not be sufficient to meet current or future water demand needs. Given that Alternatives 1 and 2 do not meet demand requirements nor allow the Town to accommodate forecasted growth, they do not meet the requirements of the PPS. As a result, these two options are not considered further.

It was also determined that options that do not at least meet the 2036 maximum day demand would not be considered further, as this would not represent a viable solution to the problem. The projected water supply of the remaining alternative solutions is shown below in **Table 8**.

Table 8: Water Produced by Alternative Solutions

Alternative Solution	Current Supply (m_3/day)	Additional Resulting Supply (m_3/day)	Total supply (m_3/day)	2031 Max Day Demand Shortfall/ Surplus (m_3/day)	2036 Max Day Demand Shortfall/ Surplus (m_3/day)	2041 Max Day Demand Shortfall/ Surplus (m_3/day)
Alternative 3 – Pumping Wells PW7 and PW8 Concurrently	4962.0	1635.0	6597.0	-202	-465	-1,916
Alternative 4 – Increasing the Pumping Rate of PW5 and PW6 by Adding Arsenic Treatment	4962.0	1105.5	6067.5	-731	-994	-2,445
Alternative 5 – Locating and Developing a New Well	4962.0	1635.0	6597.0	-202	-465	-1,916
Alternative 6 – Alternatives 3 and 4 Combined	4962.0	2740.5	7702.5	904	641	-810
Alternative 7 – Alternatives 3 and 5 Combined	4962.0	3270.0	8232.0	1,433	1,170	-281
Alternative 8 – Alternatives 4 and 5 Combined	4962.0	2740.5	7702.5	904	641	-810
Alternative 9 – Alternatives 3, 4, and 5 Combined	4962.0	4375.5	9337.5	2,539	2,276	825

Of the alternative solutions shown in **Table 8**, alternative solutions 6 to 9 are projected to meet the 2036 maximum day demand and therefore will be further considered. Similarly, options not meeting maximum day demand until at least 2036 were considered to not meet the Town's planning objectives.

4.2 Assessment of Screened Alternative Solutions

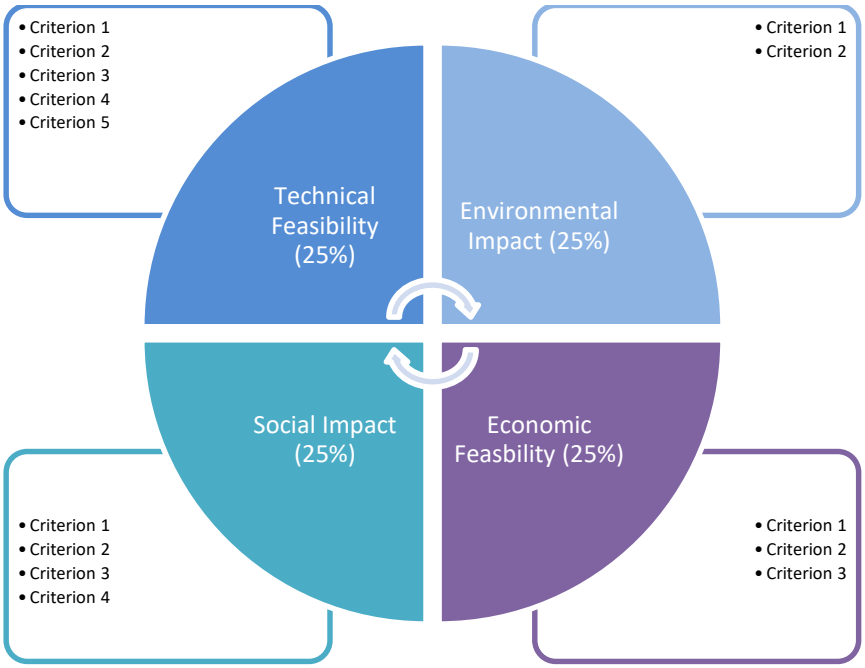
4.2.1. Evaluation Method

Evaluating the alternatives for meeting the Town's current and future water supply needs was conducted based on the following categories:

- Environmental impacts;
- Technical feasibility;
- Economic feasibility, and
- Social impacts.

As shown in **Figure 9**, each evaluation category was assigned an equal weighting of 25%, with an overall weighting total of 100%. These relative weightings were used in conjunction with the Evaluation Criteria to assess and compare Alternative Solutions. As illustrated in **Figure 9**, there are a different number of Evaluation Criteria for each Evaluation Category.

Figure 9: Example of Unequal Criterion Across Evaluation Categories



For each Evaluation Criterion, a Criterion Importance Ranking was assigned, based on environmental regulations, technical expertise, and input from the Town of Shelburne and the current WPCP operator. Criterion Importance Rankings were assigned as follows:

- **5** Is the most important criterion or is equally important;
- **2** Is slightly less important than the most important criterion; and
- **1** Is significantly less important than the most important criterion.

Once each Evaluation Criterion is assigned a Criterion Importance Ranking, the Critical Importance Rankings were summed to provide a Criterion Importance Total. In the example provided in **Table 9**, the Criterion Importance Total is "8". Given that each Evaluation Category was weighted equally as 25%, each Criterion Importance Ranking was divided by the Criteria Importance Total (i.e., "8") and then multiplied by 25 to calculate a Relative Criterion Weight. Once the Relative Criterion Weighting is established, each Alternative Solution is scored for each criterion according to the following scoring scheme:

- **1** Alternative Solution completely meets criterion, or is not applicable to the criterion;
- **0.5** Solution partially meets criterion; and
- **0** Solution does not meet criterion.

The score is multiplied by the Relative Criterion Weighting and summed to Total Score for each Alternative Solution. Given the relative weighting assigned, each Alternative Solution can score up to 25% for each of the four (4) Evaluation Categories.

Table 9: Example of Criteria Scoring for Alternative Solutions

Criterion	Criterion Importance Ranking (1-low, 2-medium, 5-high)	Relative Criteria Weighting[1]	Alternative Solution Scores			
			Option 1		Option 2	
			Score	Relative Score	Score	Relative Score
Criterion 1	**5**	**5** ÷ 8 X 25 = 15.63 %	**1**	15.63% X **1** = 15.63%	**0.5**	15.63% x **0.5** = 7.82%
Criterion 2	**1**	**1** ÷ 8 X 25 = 3.12	**1**	3.12% X **1** = 3.12%	**1**	3.12% x **1** = 3.12%
Criterion 3	**2**	**2** ÷ 8 X 25 = 6.25 %	**0**	6.25% x **0** = 0%	**1**	6.25% x **1** = 6.25%
Total	**8**	**25% (Criteria Category Total)**		15.63% + 3.12% + 0% = **18.75%**		7.82% + 3.12% + 6.25% = **17.19%**

In the example in the table above, Alternative Solution "Option 1" received a total score of 18.75% out of a possible 25%, while "Option 2" scored 17.19%. Therefore, Option 1 is the preferred Alternative Solution for this Evaluation Category. The scores of each Evaluation Category are summed up to arrive at the overall preferred Alternative Solution score.

For the "Economic Evaluation Category", the lowest cost estimate received a "1" score, and the most expensive option was scored as a "0". Alternative Solutions, within 30% of the lowest and highest scores, received the same scores, respectively. All other costs received a score of "0.5".

4.2.2. Environmental Assessment

Alternative solutions were evaluated in terms of environmental criteria to consider potential impacts to aquatic and terrestrial wildlife and compliance with applicable regulations. Environmental criteria were given a relative weight of 25%.

Table 10: Environmental Criteria Scoring for Alternative Solutions

Criteria	Criterial Importance (1-low, 2-medium, 5-high)	Relative Criteria Weighting	Alternative Solutions			
			Alternative 6 – Alternatives 3 and 4 Combined	Alternative 7 – Alternatives 3 and 5 Combined	Alternative 8 – Alternatives 4 and 5 Combined	Alternative 9 – Alternatives 3, 4 and 5 Combined
Does not result in short-term impacts on water quality and aquatic life	2	1.7%	1 (1.7%) Monitoring Willow Brook Swamp during the seven (7) day pumping test for concurrent pumping of PW7 and PW8 confirmed no impacts water levels are anticipated. Arsenic treatment would have no impact on aquatic life and would have a beneficial effect on water quality. Wellfield Capacity testing in 2016/2017 confirmed that this increased pumping rate is sustainable and will not impact nearby surface water features.	1 (1.7%) Monitoring Willow Brook Swamp during the seven (7) day pumping test for concurrent pumping of PW7 and PW8 confirmed no impacts water levels are anticipated. A new well would only be located where a pumping test and monitoring confirmed no adverse impacts to water quality and aquatic life, including any cumulative effects associated with the existing well field.	1 (1.7%) Arsenic treatment would have no impact on aquatic life and would have a beneficial effect on water quality. Wellfield Capacity testing in 2016/2017 confirmed that this increased pumping rate is sustainable and will not impact nearby surface water features. The new well would only be located where a pumping test and monitoring confirmed no adverse impacts on water quality and aquatic life.	1 (1.7%) Monitoring Willow Brook Swamp during the seven (7) day pumping test for concurrent pumping of PW7 and PW8 confirmed no impacts water levels are anticipated. Arsenic treatment would have no impact on aquatic life and would have a beneficial effect on water quality. Wellfield Capacity testing in 2016/2017 confirmed that this increased pumping rate is sustainable and will not impact nearby surface water features. The new well would only be located where a pumping test and monitoring confirmed no adverse impacts on water quality and aquatic life.
Does not result in long-term impacts on water quality and aquatic life	5	4.3%	1 (4.3%) Monitoring in Willow Brook Swamp during the seven (7) day pumping confirmed no impacts water levels are anticipated. Arsenic treatment would have no impact on aquatic life and would have a beneficial effect on water quality. Wellfield Capacity testing in 2016/2017 confirmed that this increased pumping rate is sustainable and will not impact nearby surface water features.	1 (4.3%) Monitoring in Willow Brook Swamp during the seven (7) day pumping confirmed no impacts water levels are anticipated. The new well would only be situated in a location where a pumping test and monitoring confirmed no adverse impacts on water quality and aquatic life. Wellfield Capacity testing in 2016/2017 confirmed that this increased pumping rate is sustainable and will not impact nearby surface water features.	1 (4.3%) Arsenic treatment would have no impact on aquatic life and would have a beneficial effect on water quality. The new well would only be situated in a location where a pumping test and monitoring confirmed no adverse impacts on water quality and aquatic life. Wellfield Capacity testing in 2016/2017 confirmed that this increased pumping rate is sustainable and will not impact nearby surface water features.	1 (4.3%) Monitoring in Willow Brook Swamp during the seven (7) day pumping confirmed no impacts water levels are anticipated. Arsenic treatment would have no impact on aquatic life and would have a beneficial effect on water quality. Wellfield Capacity testing in 2016/2017 confirmed that this increased pumping rate is sustainable and will not impact nearby surface water features.

Criteria	Criterial Importance (1-low, 2-medium, 5-high)	Relative Criteria Weighting	Alternative Solutions			
			Alternative 6 – Alternatives 3 and 4 Combined	Alternative 7 – Alternatives 3 and 5 Combined	Alternative 8 – Alternatives 4 and 5 Combined	Alternative 9 – Alternatives 3, 4 and 5 Combined
						The new well would only be situated in a location where a pumping test and monitoring confirmed no adverse impacts on water quality and aquatic life.
Does not result in short-term impacts on terrestrial wildlife	2	1.7%	1 (1.7%) No impacts to terrestrial wildlife anticipated and would be limited to short-term construction related noise.	1 (1.7%) No impacts to terrestrial wildlife anticipated and would be limited to short-term construction-related noise.	1 (1.7%) No impacts to terrestrial wildlife anticipated and would be limited to short-term construction related noise. Watermain construction would be limited to the road right-of-way.	1 (1.7%) No impacts to terrestrial wildlife anticipated and would be limited to short-term construction related noise. Watermain construction would be limited to the road right-of-way.
Does not result in long-term impacts on terrestrial wildlife	5	4.3%	1 (4.3%) No long-term impacts anticipated.	1 (4.3%) No long-term impacts anticipated.	1 (4.3%) No long-term impacts anticipated.	1 (4.3%) No long-term impacts anticipated.
Complies with environmental regulations	5	4.3%	1 (4.3%) Complies with all environmental regulations.	1 (4.3%) Complies with all environmental regulations.	1 (5.3%) Complies with all environmental regulations.	1 (4.3%) Complies with all environmental regulations.
Does not impact migratory birds	5	4.3%	1 (4.3%) No impacts to migratory birds anticipated.	1 (4.3%) No impacts to migratory birds anticipated.	1 (5.3%) No impacts to migratory birds anticipated.	1 (4.3%) No impacts to migratory birds anticipated.
Environmental Totals	**29**	**25%**	**25%**	**25%**	**25%**	**25%**

4.2.3. Technical Assessment

Alternative solutions were evaluated in terms of technical criteria to consider technical suitability and other engineering considerations. Technical criteria were given a relative weight of 25%.

Table 11: Technical Criteria Scoring for Alternative Solutions

Criteria	Criterial Importance (1-low, 2-medium, 5-high)	Relative Criteria Weighting	Alternative Solutions			
			Alternative 6 – Alternatives 3 and 4 Combined	**Alternative 7 – Alternatives 3 and 5 Combined**	**Alternative 8 – Alternatives 4 and 5 Combined**	**Alternative 9 – Alternatives 3, 4 and 5 Combined**
Quantity of water supplied meets demand	5	4.3%	0 (0%) Concurrent pumping of PW7 and PW8 would add an additional 1,635.0 m^3/day of water with low arsenic concentrations. Adding arsenic treatment at PW5/PW6 would allow a sustainable pumping rate of 2,099.5 m3/day. Adding an additional 2,740.5 m^3/day of supply would meet the maximum day demand beyond 2036 but not of 2041.	0 (0%) Concurrent pumping of PW7 and PW8 would add an additional 1,635.0 m^3/day of water with low arsenic concentrations. The sustainable pumping rate of this new well is not known, but it will access the same aquifer as PW7/PW8 and it is assumed that similar production can be obtained. Adding an additional 3,270.0 m^3/day of supply would meet the maximum day demand beyond 2036 but not of 2041.	0 (0%) Adding arsenic treatment at PW5/PW6 would allow a sustainable pumping rate of 2,099.5 m^3/day. The sustainable pumping rate of this new well is not known, but it will access the same aquifer as PW7/PW8 and it is assumed that similar production can be obtained. Adding an additional 2,740.5 m^3/day of supply would meet the maximum day demand beyond 2036 but not of 2041.	1 (4.3%) Concurrent pumping of PW7 and PW8 would add an additional 1,635.0 m^3/day of water with low arsenic concentrations. Adding arsenic treatment at PW5/PW6 would allow a sustainable pumping rate of 2,099.5 m^3/day. The sustainable pumping rate of this new well is not known, but it will access the same aquifer as PW7/PW8 and it is assumed that similar production can be obtained. Adding an additional 4,375.5 m^3/day of supply would meet the maximum day demand beyond 2041.
Time required to implement	2	1.7%	1 (1.7%) Upon completion of this Class EA, concurrent pumping of PW7 and PW8 would only require amendment of the permit to take water and municipal drinking water license. Adding arsenic treatment to PW5/PW6 would require time for design and permitting but would not require additional environmental assessment.	0.5 (0.85%) Upon completion of this Class EA, concurrent pumping of PW7 and PW8 would only require amendment of the permit to take water and municipal drinking water license. Locating a new well, associated testing, conducting a separate Class EA, and permitting, would take several years.	0 (0%) Adding arsenic treatment to PW5/PW6 would require time for design and permitting but would not require additional environmental assessment. Locating a new well, associated testing, conducting a separate Class EA, and permitting, would take several years.	0.5 (0.85%) Upon completion of this Class EA, concurrent pumping of PW7 and PW8 would only require amendment of the permit to take water and municipal drinking water license. Adding arsenic treatment to PW5/PW6 would require time for design and permitting but would not require additional environmental assessment.

Criteria	Criterial Importance (1-low, 2-medium, 5-high)	Relative Criteria Weighting	Alternative Solutions			
			Alternative 6 – Alternatives 3 and 4 Combined	Alternative 7 – Alternatives 3 and 5 Combined	Alternative 8 – Alternatives 4 and 5 Combined	Alternative 9 – Alternatives 3, 4 and 5 Combined
			This option has the advantage that a portion of the resulting increased supply would occur within a year of Class EA completion.	This option has the advantage that a portion of the resulting increased supply would occur within a year of Class EA completion.		Locating a new well, associated testing, conducting a separate Class EA, and permitting, would take several years. This option has the advantage that a portion of the resulting increased supply would occur within a year of Class EA completion.
Is reliable and efficient	5	4.3%	0.5 (2.15%) Upon completion of well testing, production wells are expected to operate in a reliable and efficient manner. Arsenic treatment achieved through same technology currently being installed at PW3. Beyond 2036 the water supply will be unable to meet max day demand and if any well encounters issues, the system would struggle to reliably meet demand.	0.5 (2.15%) Upon completion of well testing, production wells are expected to operate in a reliable and efficient manner. Beyond 2036 the water supply will be unable to meet max day demand and if any well encounters issues, the system would struggle to reliably meet demand.	0.5 (2.15%) Arsenic treatment achieved through same technology currently being installed at well PW3. Beyond 2036 the water supply will be unable to meet max day demand and if any well encounters issues, the system would struggle to reliably meet demand.	1 (4.3%) Upon completion of well testing, production wells are expected to operate in a reliable and efficient manner. The addition of another production well will increase the reliability of supply on dry days, in particular, if there are production issues with any of the other wells.
Is easy to operate and maintain	2	1.7%	1 (1.7%) No foreseen issues regarding maintenance of the existing wells at the new pumping rate, nor regarding the maintenance of arsenic treatment equipment.	1(1.7%) No foreseen issues regarding maintenance of the existing wells at the new pumping rate, nor with operating a new well.	1 (1.7%) No foreseen issues regarding maintenance of arsenic treatment, nor with operating a new well.	1 (1.7%) No foreseen issues regarding maintenance of the existing wells at the new pumping rate, arsenic treatment equipment, nor with operating a new well.
Allows for easy connection to the existing system	2	1.7%	1 (1.7%) No new connection required.	1 (1.7%) No new connection required.	0.5 (0.85%) Would require a new underground pipeline, the length of which would depend on the new well's location.	0.5 (0.85%) Would require a new underground pipeline, the length of which would depend on the new well's location.
Is flexible in terms of its ability to address unforeseen growth	5	4.3%	0.5 (2.15%) Rapidly increasing water supply with concurrent pumping of PW7 and PW8, and	0.5 (2.15%) Rapidly increasing water supply with concurrent pumping of PW7 and PW8, and	0.5 (2.15%) It will take more than a year to design, permit and construct arsenic treatment at	1 (4.3%) Creates the most flexibility by rapidly increasing water supply with concurrent

Criteria	Criterial Importance (1-low, 2-medium, 5-high)	Relative Criteria Weighting	Alternative Solutions			
			Alternative 6 – Alternatives 3 and 4 Combined	**Alternative 7 – Alternatives 3 and 5 Combined**	**Alternative 8 – Alternatives 4 and 5 Combined**	**Alternative 9 – Alternatives 3, 4 and 5 Combined**
rates/processing demands.			the subsequent addition of arsenic treatment at PW5/6 It will take more than a year to design, permit and construct arsenic treatment at PW5/PW6 and even with addition of a new well, maximum day demand will not be met in 2041, thereby limiting flexibility.	the subsequent addition of arsenic treatment at PW5/6 If Shelburne's population increases faster than currently anticipated, a new well can be developed earlier than currently planned. However, not meeting maximum day demand in 2041 does not allow for flexibility should Shelburne's population increase at a faster rate than anticipated.	PW5/PW6 and even with addition of a new well, maximum day demand will not be met in 2041, thereby limiting flexibility. If Shelburne's population increases faster than currently anticipated, a new well can be developed earlier than currently planned. However, not meeting maximum day demand in 2041 does not allow for flexibility should Shelburne's population increase at a faster rate than anticipated.	pumping of PW7 and PW8, with increased water supply coming online soon after with introduction of arsenic treatment at PW5/PW6. If Shelburne's population increases faster than is currently anticipated, a new well can be developed earlier than currently planned.
Is simple in terms of constructability	2	1.7%	0.5 (0.85%) Installing a new backup well at PW7/PW8 would be relatively simple to construct. Adding arsenic treatment to PW5/PW6 would be relatively simple to construct and would be the same as the arsenic treatment recently added to PW3. Detailed design would need to be undertaken.	0.5 (0.85%) Installing a new backup well at PW7/PW8 would be relatively simple to construct. Depending on the location of the other new well, it may be difficult to connect with the existing water supply network, requiring road or watercourse crossings.	0.5 (0.85%) Adding arsenic treatment to PW5/PW6 would be relatively simple to construct and would be the same as the arsenic treatment recently added to PW3. Detailed design would need to be undertaken. Depending on the location of the other new well, it may be difficult to connect with the existing water supply network, requiring road or watercourse crossings.	0.5 (0.85%) Installing a new backup well at PW7/PW8 would be relatively simple to construct. Adding arsenic treatment to PW5/PW6 would be relatively simple to construct and would be the same as the arsenic treatment recently added to PW3. Detailed design would need to be undertaken. Depending on the location of the other new well, it may be difficult to connect with the existing water supply network, requiring road or watercourse crossings.
Is straight-forward from a permitting and approval standpoint, including delayed construction timeline.	2	1.7%	1 (1.7%) Pumping PW7/PW8 concurrently would require amendment of the existing Permit to Take Water and municipal drinking water license.	0.5 (0.85%) Pumping PW7/PW8 concurrently would require amendment of the existing Permit to Take Water and municipal drinking water license. Constructing a new well would require these same permits and would also require a	0.5 (0.85%) Adding arsenic treatment to PW5/PW6 would require amendment of the existing municipal drinking water license. Constructing a new well would require these same permits and would also require a temporary Permit to Take Water or a water	0.5 (0.85%) Pumping PW7/PW8 concurrently would require amendment of the existing Permit to Take Water and municipal drinking water license.

Criteria	Criterial Importance (1-low, 2-medium, 5-high)	Relative Criteria Weighting	Alternative Solutions			
			Alternative 6 – Alternatives 3 and 4 Combined	**Alternative 7 – Alternatives 3 and 5 Combined**	**Alternative 8 – Alternatives 4 and 5 Combined**	**Alternative 9 – Alternatives 3, 4 and 5 Combined**
			Adding arsenic treatment to PW5/PW6 would require amendment of the existing municipal drinking water license.	temporary Permit to Take Water or a water taking Environmental Activity and Sector Registry (EASR) to allow pumping test of prospective well locations. No permitting work has begun for this.	taking Environmental Activity and Sector Registry (EASR) to allow pumping test of prospective well locations. No permitting work has begun for this.	Adding arsenic treatment to PW5/PW6 would require amendment of the existing municipal drinking water license. Constructing a new well would require these same permits and would also require a temporary Permit to Take Water or a water taking Environmental Activity and Sector Registry (EASR) to allow pumping test of prospective well locations. No permitting work has begun for this. Adding arsenic treatment to PW5/PW6 would require amendment of the existing municipal drinking water license.
Vulnerability of the project to the effects of climate change	2	1.7	0.5 (0.85%) 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 **(Kuang, et al., 2024)**. This will need to be addressed by ensuring supply calculations for Shelburne's water supply system consider these potential impacts.	0.5 (0.85%) 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 **(Kuang, et al., 2024)**. This will need to be addressed by ensuring supply calculations for Shelburne's water supply system consider these potential impacts.	0.5 (0.85%) 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 **(Kuang, et al., 2024)**. This will need to be addressed by ensuring supply calculations for Shelburne's water supply system consider these potential impacts.	1 (1.7%) 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 **(Kuang, et al., 2024)**. This will need to be addressed by ensuring supply calculations for Shelburne's water supply system consider these potential impacts. Increasing the Town's water supply will help mitigate any decreases in production across the Town's production wells.
Potential for greenhouse gas emission reduction measures	2	1.7%	0.5 (0.85%) Pump operation will require power, but its operation does not represent a significant	0.5 (0.85%) Pump operation will require power, but its operation does not represent a significant	0.5 (0.85%) Pump operation will require power, but its operation does not represent a significant	0.5 (0.85%) Pump operation will require power, but its operation does not represent a significant

Criteria	Criterial Importance (1-low, 2-medium, 5-high)	Relative Criteria Weighting	Alternative Solutions			
			Alternative 6 – Alternatives 3 and 4 Combined	**Alternative 7 – Alternatives 3 and 5 Combined**	**Alternative 8 – Alternatives 4 and 5 Combined**	**Alternative 9 – Alternatives 3, 4 and 5 Combined**
			emission contribution. There is limited potential for emission reduction measures. The addition of arsenic will not significantly change power consumption and the associated greenhouse gas emissions.	emission contribution. There is limited potential for emission reduction measures.	emission contribution. There is limited potential for emission reduction measures. The addition of arsenic will not significantly change power consumption and the associated greenhouse gas emissions.	emission contribution. There is limited potential for emission reduction measures. The addition of arsenic will not significantly change power consumption and the associated greenhouse gas emissions.
Technical Totals	**29**	**25%**	**12.0%**	**11.1%**	**7.7%**	**17.2%**

4.2.4. Economic Assessment

Alternative solutions were evaluated in terms of economic criteria to consider their cost implications. Economic criteria were given a relative weight of 25%.

Table 12: Economic Criteria Scoring for Alternative Solutions

Criteria	Criterial Importance (1-low, 2-medium, 5-high)	Relative Criteria Weighting	Alternative Solutions			
			Alternative 6 – Alternatives 3 and 4 Combined	**Alternative 7 – Alternatives 3 and 5 Combined**	**Alternative 8 – Alternatives 4 and 5 Combined**	**Alternative 9 – Alternatives 3, 4 and 5 Combined**
Capital costs	5	7.4%	0.5 (3.7%) Capital costs for pumping PW7/PW8 concurrently are limited to the construction of a backup well and amendment of the Permit to Take Water, estimated at $450,000. Capital and design costs for arsenic treatment at PW5/PW6 are estimated at $3.5 million.	0.5 (3.7%) Capital costs for pumping PW7/PW8 concurrently are limited to the construction of a backup well and amendment of the Permit to Take Water, estimated at $450,000. Costs associated with finding a new well location are anticipated to be two (2) to five (5) times higher than drilling new wells at existing locations. Costs for the design, permitting and construction of a new well are estimated at $5 million.	0 (0%) Capital and design costs for arsenic treatment at PW5/PW6 are estimated at $3.5 million. Costs associated with finding a new well location are anticipated to be two (2) to five (5) times higher than drilling new wells at existing locations. Costs for the design, permitting and construction of a new well are estimated at $5 million.	0 (0%) Capital costs for pumping PW7/PW8 concurrently are limited to the construction of a backup well and amendment of the Permit to Take Water, estimated at $450,000. Capital and design costs for arsenic treatment at PW5/PW6 are estimated at $3.5 million. Costs associated with finding a new well location are anticipated to be two (2) to five (5) times higher than drilling new wells at existing locations. Costs for the design, permitting and construction of a new well are estimated at $5 million.
Operation and Maintenance Costs	2	2.9%	1 (2.9%) No appreciable change in current operation and maintenance costs resulting from concurrent pumping. Operation and maintenance costs for arsenic treatment will be minimal, in the order of $250,000 per year.	1 (2.9%) No appreciable change in current operation and maintenance costs resulting from concurrent pumping. Operation and maintenance costs will be minimal for the new well, in the order of $250,000 per year.	0.5 (1.45%) Operation and maintenance costs for arsenic treatment will be minimal, in the order of $250,000 per year. Operations and Maintenance costs will be minimal for the new well, in the order of $250,000 per year.	0.5 (1.45%) No appreciable change in current operation and maintenance costs resulting from concurrent pumping. Operation and maintenance costs for arsenic treatment will be minimal, in the order of $250,000 per year. Operations and Maintenance costs will be minimal for the new well, in the order of $250,000 per year.

Criteria	Criterial Importance (1-low, 2-medium, 5-high)	Relative Criteria Weighting	Alternative Solutions			
			Alternative 6 – Alternatives 3 and 4 Combined	Alternative 7 – Alternatives 3 and 5 Combined	Alternative 8 – Alternatives 4 and 5 Combined	Alternative 9 – Alternatives 3, 4 and 5 Combined
Economic sustainability	5	7.4%	0.5 (3.7%) Increased water supply and system resilience would allow the Town to grow its population and tax base, leading to economic growth and sustainability, however although this Alternative would meet the maximum day demand beyond 2036, it does not meet demand of 2041.	0.5 (3.7%) Increased water supply and system resilience would allow the Town to grow its population and tax base, leading to economic growth and sustainability, however although this Alternative would meet the maximum day demand beyond 2036, it does not meet demand of 2041.	0.5 (3.7%) Increased water supply and system resilience would allow the Town to grow its population and tax base, leading to economic growth and sustainability, however although this Alternative would meet the maximum day demand beyond 2036, it does not meet demand of 2041.	1 (7.4%) Increased water supply and system resilience would allow the Town to grow its population and tax base, leading to economic growth and sustainability. This Alternative would meet the maximum day demand beyond 2041.
Financial implications for residents	5	7.4	0.5 (3.7%) The costs of this option would be passed on to residents, either through higher taxes, or through higher costs of new homes passed on by developers who would pass on higher development fee costs.	0.5 (3.7%) The costs of this option would be passed on to residents, either through higher taxes, or through higher costs of new homes passed on by developers who would pass on higher development fee costs.	0.5 (3.7%) The costs of this option would be passed on to residents, either through higher taxes, or through higher costs of new homes passed on by developers who would pass on higher development fee costs.	0 (0.5%) The higher costs of this option would be passed on to residents, either through higher taxes, or through higher costs of new homes passed on by developers who would pass on higher development fee costs. This option has the highest capital and lifecycle costs but would result in additional developments to spread costs across through development charges.
Economic Totals	**22**	**25%**	**13.7%**	**13.7%**	**9.7%**	**12.6%**

4.2.5. Social Assessment

Alternative solutions were evaluated in terms of social criteria to consider their implications for the residents of Shelburne. Social criteria were given a relative weight of 25%.

Table 13: Social Criteria Scoring for Alternative Solutions

Criteria	Criterial Importance (1-low, 2-medium, 5-high)	Relative Criteria Weighting	Alternative Solutions			
			Alternative 6 – Alternatives 3 and 4 Combined	Alternative 7 – Alternatives 3 and 5 Combined	Alternative 8 – Alternatives 4 and 5 Combined	Alternative 9 – Alternatives 3, 4 and 5 Combined
Conformity to local planning provisions	5	3.7%	0 (0%) Provision of water supply capacity is consistent with planned community growth, but this option does not provide sufficient water to meet local planning requirements in terms of population growth.	0 (0%) Provision of water supply capacity is consistent with planned community growth, but this option does not provide sufficient water to meet local planning requirements in terms of population growth.	0 (0%) Provision of water supply capacity is consistent with planned community growth, but this option does not provide sufficient water to meet local planning requirements in terms of population growth.	1 (3.7%) Provision of water supply capacity and resilience is consistent with planned community growth.
Impacts on quality of life	5	3.7	1 (3.7%) Meeting peak water demand will reduce or eliminate the need for mandated water use restrictions.	1 (3.7%) Meeting peak water demand will reduce or eliminate the need for mandated water use restrictions.	1 (3.7%) Meeting peak water demand will reduce or eliminate the need for mandated water use restrictions.	1 (3.7%) Meeting peak water demand will reduce or eliminate the need for mandated water use restrictions.
Short-term impacts to adjacent land uses	2	1.5%	1 (1.5%) No short-term impacts to adjacent lands are anticipated.	0.5 (0.7%) No short-term impacts to adjacent lands are anticipated. Installation of a new watermain to connect the new well could result in short-term traffic disruption.	0.5 (0.7%) No short-term impacts to adjacent lands are anticipated. Installation of a new watermain to connect the new well could result in short-term traffic disruption.	0.5 (0.7%) No short-term impacts to adjacent lands are anticipated. Installation of a new watermain to connect the new well could result in short-term traffic disruption.
Long-term impacts on adjacent land uses	5	3.7%	0.5 (1.9%) The increased pumping rate will expand wellhead protection areas, requiring increased management by landowners adjacent to the wells to minimize threats groundwater water quality.	0.5 (1.9%) The increased pumping rate will expand wellhead protection areas, requiring increased management by landowners adjacent to the wells to minimize threats groundwater water quality.	0.5 (1.9%) The increased pumping rate will expand wellhead protection areas, requiring increased management by landowners adjacent to the wells to minimize threats groundwater water quality.	0.5 (1.9%) The increased pumping rate will expand wellhead protection areas, requiring increased management by landowners adjacent to the wells to minimize threats groundwater water quality.
Impacts on archaeological resources	5	3.7%	1 (3.7%) The Stage 1 Archaeological Assessment conducted in 2011 did not identify archaeological potential in the area adjacent	1 (3.7%) The Stage 1 Archaeological Assessment conducted in 2011 did not identify archaeological potential in the area adjacent	1 (3.7%) Construction for arsenic treatment would be limited to the existing footprint of the	1 (3.7%) The Stage 1 Archaeological Assessment conducted in 2011 did not identify archaeological potential in the area adjacent

Criteria	Criterial Importance (1-low, 2-medium, 5-high)	Relative Criteria Weighting	Alternative Solutions			
			Alternative 6 – Alternatives 3 and 4 Combined	**Alternative 7 – Alternatives 3 and 5 Combined**	**Alternative 8 – Alternatives 4 and 5 Combined**	**Alternative 9 – Alternatives 3, 4 and 5 Combined**
			to wells PW7/PW8 where a backup well would be installed. Construction for arsenic treatment would be limited to the existing footprint of the PW5/PW6 site, and no archaeological impacts are anticipated.	to wells PW7/PW8 where a backup well would be installed. Stage 1 and possibly additional archaeological investigations would be required for the new well site and watermain route. Archaeological investigation would ensure no impact to archaeological resources.	PW5/PW6 site, and no archaeological impacts are anticipated. Stage 1 and possibly additional archaeological investigations would be required for the new well site and watermain route. Archaeological investigation would ensure no impact to archaeological resources.	to wells PW7/PW8 where a backup well would be installed. Construction for arsenic treatment would be limited to the existing footprint of the PW5/PW6 site, and no archaeological impacts are anticipated. Stage 1 and possibly additional archaeological investigations would be required for the new well site and watermain route. Archaeological investigation would ensure no impact to archaeological resources.
Short-term impacts on local businesses	2	1.5%	1 (1.5%) No businesses are located near PW7/PW8, nor PW5/PW6. No businesses are in the study area where the new well and watermain would be located.	1 (1.5%) No businesses are located near PW7/PW8. No businesses are in the study area where the new well and watermain would be located.	1 (1.5%) No businesses are located near PW7/PW8, nor PW5/PW6. No businesses are in the study area where the new well and watermain would be located.	1 (1.5%) No businesses are located near PW7/PW8, nor PW5/PW6. No businesses are in the study area where the new well and watermain would be located.
Long-term impacts on local businesses	5	3.7%	1 (3.7%) No businesses are located near PW7/PW8. No businesses are in the study area where the new well and watermain would be located.	1 (3.7%) No businesses are located near PW7/PW8. No businesses are in the study area where the new well and watermain would be located.	1 (3.7%) No businesses are located near PW7/PW8. No businesses are in the study area where the new well and watermain would be located.	1 (3.7%) No businesses are located near PW7/PW8, nor PW5/PW6. No businesses are in the study area where the new well and watermain would be located.
First Nations land rights or traditional land use	5	3.7%	1 (3.7%) No impacts to First Nations land rights or traditional land use are anticipated.	1 (3.7%) No impacts to First Nations land rights or traditional land use are anticipated.	1 (3.7%) No impacts to First Nations land rights or traditional land use are anticipated.	1 (3.7%) No impacts to First Nations land rights or traditional land use are anticipated.
Social Totals	**34**	**25**	**19.7%**	**18.9%**	**18.9%**	**22.6%**

4.2.6. Climate Change

The PPS contains several policies that require land use planning and infrastructure projects to consider their impact on climate change. Some of the applicable policies require 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 prepare 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 will 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. Limited emissions of greenhouse gases will occur during construction resulting from the operation of construction equipment. All construction equipment will be required to be kept in good working conditions to minimize emissions.

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 (Kuang, et al., 2024). This further highlights the importance of the resilience to Shelburne's water supply system that will be achieved by this project. The Town of Shelburne will record daily water takings at the proposed wells, which will be reported to the MECP 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 Consultation on Problem / Opportunity and Alternative Solutions

4.3.1. Public Information Centre #2

A second Public Information Centre (PIC2) was held May 30, 2024, from 6:30 p.m. to 7:30 p.m. as a video conference using the Zoom platform. Additionally, the meeting was livestreamed on the Town's YouTube Channel to create a meeting record and to allow viewing at other times for anyone who could not participate at the designated time. Notification for PIC2 appeared in the Shelburne Free Press on May 16, 2024. Additionally, a stakeholder list was developed, consisting of agencies, neighbouring

municipalities, First Nations and Metis communities and organizations (provided in **Appendix A**). Stakeholders on the list were invited to participate in PIC2 by email on May 13. PIC2 attendees were instructed to contact the Town of Shelburne to register for the meeting. One (1) stakeholder from the Nottawasaga Valley Conservation Authority attended the PIC.

The PIC2 presentation is included in the Appendix and covered the following topics:

- Project background;
- The Municipal Class EA process;
- Problem / opportunity statement;
- Alternative solutions;
- Evaluation of alternative solutions and preferred solution recommendation; and
- Next steps.

After the meeting, a PDF copy of the presentation slides was provided to the MECP. There were no questions asked during the PIC and the attendees indicated that they were pleased with the presentation.

4.4 Selection of Preferred Solution

The assessment of alternative solutions is summarized below in **Table 14** to determine the overall preferred solution.

Table 14: Summary of Assessment of Alternative Solutions.

Evaluation Category	Relative Weighting	Alternative Solutions			
		Alternative 6 – Alternatives 3 and 4 Combined	Alternative 7 – Alternatives 3 and 5 Combined	Alternative 8 – Alternatives 4 and 5 Combined	Alternative 9 – Alternatives 3, 4 and 5 Combined
Environmental	25%	25.0%	25.0%	25.0%	25.0%
Technical	25%	12.0%	11.1%	7.7%	17.2%
Economic	25%	13.7%	13.7%	9.7%	12.6%
Social	25%	19.7%	18.9%	18.9%	22.6%
TOTAL	**100%**	**70.4%**	**68.7%**	**61.3%**	**77.4%**

Based on the assessment the preferred alternative is Alternative 9 – Alternatives 3, 4, and 5 Combined, as it is the preferred alternative solution that ranks highest in the environmental, technical, and social evaluation categories, as well as scoring highest overall. This alternative solution will provide 9337.5 m^3/day of water, which is projected to meet the average and max day demand beyond 2041.

Adding additional capacity at PW7/PW8 does not address that PW5/PW6 currently exceeds half maximum allowable concentration (MAC) for arsenic and blending with the increased contribution from PW7/PW8 is not sufficient to reduce arsenic concentrations to below the half MAC without reducing the pumping rate of PW5/PW6 below the sustainable rate of 24.3 L/s (1458 L/min or 2100 m^3/day). Additionally, any issues with supply from PW7/PW8, whether caused by issues with the wells or the connecting watermain, would require additional reductions of supply from PW5/PW6 due to the reduction in supply of low arsenic concentration water for blending. As a result, it is recommended that the Town immediately proceed with adding arsenic treatment to PW5/PW6 to avoid the need for any supply reductions from PW5/PW6 and to remove its supply rate dependence on blending water from PW7/PW8.

With the increased pumping rate achieved through the concurrent pumping of PW7/PW8, and pumping PW5/PW6 at its sustainable rate of 24.3 L/s (1458 L/min or 2100 m^3/day), the Town should have sufficient water supply to meet the maximum day flow for an estimated population of just 13,574. Based on the linear growth rate of 534 persons per year, as shown in **Figure 1,** this population would be reached in 2038, and additional water supply would be needed at this time. The only viable means of additional water supply is to develop a new groundwater supply well. Given that locating, permitting and developing a new well takes several years, it is recommended that the Town commence this process no later than 2033.

4.5 Mitigation Measures for Preferred Solution

A summary of the potential environmental effects associated with the preferred solution and their corresponding mitigation measures are shown in **Table 15** below.

Pumping PW7/PW8 concurrently does not require any mitigation measures, as no new construction is required. The backup well, PW9, will be installed immediately adjacent to PW7/PW8 within a previously levelled area that is surrounded by an agricultural field and not in proximity of any water bodies. Well construction will adhere to all requirements of the *Ontario Water Resources Act* and the *Wells Regulation.* Well installation will be conducted by a licensed well technician. Additional mitigation measures for the new well will be identified during a separate Schedule 'B' Municipal Class EA process.

Installation of arsenic treatment equipment at PW5/PW6 will occur within existing disturbed areas. Mitigation measures will be identified during detailed design, but construction will follow the recommended mitigation measures outlined in **Table 15** below.

Although a separate class environmental assessment will be required for the new production will and site-specific mitigation measures identified through that process, well construction will also follow the mitigation measures outlined in **Table 15** below.

Table 15: 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. • Avoid clearing, grubbing, and grading activities during seasonally wet periods (i.e., spring). • Avoid work during high volume rain events (>20 mm in 24 hrs) 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 NVCA-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 MECP 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).

Potential Effects	Recommended Mitigation Measures
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. • 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 and species at risk bats, should suitable habitat be for bat maternity roosts be identified. • 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.

Potential Effects	Recommended Mitigation Measures
Species at Risk	• No mitigation measures are proposed due to the area consisting of disturbed habitat.
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).

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.

4.6 Monitoring

The hydrogeological study for increased water takings from PW7/PW8 completed by SBA determined that increased pumping from the deep bedrock aquifer appears to influence the groundwater levels in groundwater monitoring locations located near the production well. Specifically, the overburden well located at 116116 2 Line SW. During the pumping test, water levels in the well were observed to decrease through the test. In the days immediately after the test was concluded, the resident at the property noted low water levels requiring additional supply to be trucked to the property.

Communication will be maintained with this well owner as to the effects on the well when pumping rates are increased or any observed seasonal effects. If effects are due to increased pumping of the production wells, action may involve periodically supplying water to the well during low water seasons, or construction of a deeper, drilled well to provide adequate supply to the property owner.

The shallow, intermediate, and deep groundwater monitoring network established through the wellfield capacity study and PW7/PW8 study remains in place and equipped with water level monitoring equipment. A surface water monitoring station remains in place and is monitored intermittently as creek conditions allow. This network will remain in place and periodically monitored manually as required by the Permit to Take Water.

5. Intra-Basin Transfer Considerations

Ontario signed the Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement in 2005 to cooperate with Quebec and eight U.S. Great Lakes States to allow protection and conservation of this shared resource through enhanced cooperation. In Ontario, the Agreement and the *Ontario Water*

Resources Act (OWRA) outline requirements for the transfer of water between Great Lakes watersheds for new or increased water withdrawals of 379,000 L/day (379 m^3/day) or greater, averaged over any 90-day period. The transfer of water from a Great Lakes watershed to another is referred to as intra-basin transfer.

The Town currently has a withdrawal limit of 1,635,000 L/day (1,635 m^3/day) for PW7/PW8 under Permit to Water No. P-300-1082818689. Condition 3.3 of the Permit to Take Water further identifies this limit as the amount of intra-basin transfer that the Director has established as the "threshold amount" in accordance with Section 34.8 of the OWRA. Any exceedance of this amount must be approved by the Director and Town must show adherence to requirements outlined in Section 34.6 of the OWRA.

The Great Lakes Regional Water Use Database was consulted to determine the total annual withdrawal amount and consumptive use in a regional context. This data was used to compare the proposed volume of water that would be removed from the Lake Erie Watershed through the combined pumping of PW7/PW8 to a regional context. The results for 2022 are shown below in **Table 16**.

Table 16: Lake Erie Withdrawals and Consumptive Use for Adjoining States and Provinces

Jurisdiction	Basin	Sector	Withdraw Type	Withdraw Amount (ML/day)	Consumptive use (MLD)
Pennsylvania	Lake Erie	All	All	29.98	3.16
New York	Lake Erie	All	All	49399.69	61.34
Indiana	Lake Erie	All	All	50.39	8.57
Michigan	Lake Erie	All	All	7,521.01	339.92
Ohio	Lake Erie	All	All	1148.03	128.39
Ontario	Lake Erie	All	All	1270.34	57.12
			TOTAL	**59419.44**	**598.80**

Since water withdrawn from PW7/PW8 would not be returned to the Lake Erie Watershed, it is considered consumptive use and adding an additional 1,635,000 L/Day (1.64 ML/Day) would increase Ontario's consumptive use to 58.76 ML/Day, an increase of 2.79% and both wells pumped concurrently representing 5.57%. With this increase, Ontario's consumptive use would represent 9.8% of total consumptive use from all jurisdictions.

For the Town to increase the pumping rate of PW7/PW8 to 3,270,000 L/day (3,265 m^3/d), the following applicable conditions of Section 34.6 must be demonstrated:

Table 17: Intra-basin Requirements and How These Conditions will be Met

Applicable Legislation	Applicable Section	Condition	How the Town's Proposal meets the condition
OWRA	34.6(2) i.	The portion of the new or increased transfer amount that is lost through consumptive use is: A. Are always less than 19 million litres, or the lower amount prescribed by the regulation, per day, or B. If a regulation is made prescribing the manner of calculating average amounts of water, is less than an average of 19 million litres, or the lower amount prescribed by the regulations, per day.	The Town proposes an increase of 1,635,000 litres per day, which is less than the 19 million litres per day requirement.
	34.6(2) ii.	The water is taken by the operating authority of a municipal drinking water system within the meaning of the *Safe Drinking Water Act, 2002* or by any other person.	The water is taken by the Town of Shelburne, the operating authority for a municipal drinking water system within the meaning of the *Safe Drinking Water Act, 2002.*
	34.6(2) iii.	It has been demonstrated that conservation of existing water supplies is not a feasible, environmentally sound and cost-effective alternative to: A. the transfer, in the case of a new transfer, or B. the transfer of the additional amount, in the case of an increased transfer.	After rehabilitating two (2) of the Town's water supply wells, the Town will be able to supply 4,985,000 L/day, compared to a maximum day demand of 5,374,000 L/day. This amounts to a shortfall of 389,000 L/day, or 8% of current supply. The Town is located within Ontario's Greater Golden Horseshoe Growth Plan Area and is anticipated to grow to a population of 15,000 by 2041. The addition of more than 5,000 residents will result in a maximum day water demand of 8,025,000 L/day. This amounts to a shortfall of 3,040,000 L/day, or 61% of current supply. There are no feasible water conservation methods that would address the current or future anticipated water supply shortfalls.

Applicable Legislation	Applicable Section	Condition	How the Town's Proposal meets the condition
	34.6(2) iv.	There are no other feasible, environmentally sound and cost-effective alternatives to: A. the transfer, in the case of a new transfer, or B. the transfer of the additional amount, in the case of an increased transfer.	All reasonable alternative means of meeting the Town's water supply needs were considered in this Municipal Class EA. The only option that meets the Town's20-year water demand requires the concurrent pumping of wells PW7 and PW8, in additional to other means of increase the Town's water supply. Developing a new well in the shallow Guelph formation would require arsenic treatment based on other Town wells in this aquifer, which would cost approximately $1.5-2 million based on arsenic treatment recently installed at PW3. The deeper aquifer, the Gasport Formation, has limited production capability within the developed portion of the Town, and grows as it moves to the west, away from the Niagara Escarpment.
	34.6(2) v. and 34.6(3) 1.	The criterion described in paragraph 1 of subsection (3) is satisfied, or it is not feasible, environmentally sound or cost effective to satisfy that criterion. The new or increased transfer amount is returned, either naturally or after use, to the same Great Lakes watershed from which it was taken, except for an amount prescribed by the regulations that may be lost through consumptive use.	The additional water supply from PW7/PW8 above the "threshold amount" would be used by the Town, then discharged to the through the Towns Water Pollution Control Plant (WPCP) to the Nottawasaga Valley Watershed, minus consumptive use. The closest discharge point from the WPCP that is in the Grand River Watershed, and would therefore not constitute intra-basin transfer, is Willow Brook, which is approximately 4.5 km to the west. Installing 4.5 km of watermain would be cost-prohibitive and disruptive for the Town. Furthermore, the habitat in the Boyne River currently depends

Applicable Legislation	Applicable Section	Condition	How the Town's Proposal meets the condition
			on flow contributions from the WPCP.
	34.6(2) vi.	The criteria described in paragraphs 2 to 7 of subsection (3) are satisfied.	Description of how these conditions is satisfied is provided in subsequent rows of this table.
	34.6(2) vii.	Notice of the application for the permit or amendment has been given to the Province of Quebec, the states of Illinois, Indiana, Michigan, Minnesota, New York, Ohio and Wisconsin and the Commonwealth of Pennsylvania in accordance with the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement of 2005.	Submission by the Town for a Permit to Take Water for the proposed new pumping rate would be the catalyst for the Ministry of Natural Resources and Forestry to provide the parties to the Agreement with Prior Notice of the proposal for an inter-basin transfer. The Permit to Take Water application will be submitted upon completion of the 30-day review period for this Municipal Class EA.
	34.6(3) 2.	The efficient use and conservation of existing water supplies cannot reasonably avoid: A. the transfer, in the case of a new transfer, or B. the transfer of the additional amount, in the case of an increased transfer.	See response above for 34.6(2) iii.
	34.6(3) 3.	The new or increased transfer amount is reasonable, given the purposes for which: i. the transfer is done, in the case of a new transfer, or ii. the transfer of the additional amount is done, in the case of an increased transfer.	The increased amount of water supply is required to meet a current and projected maximum day water supply shortfall. This Municipal Class EA has evaluated multiple alternative solutions and concluded that this is the only reasonable solution.
	34.6(3) 4.	The transfer, in the case of a new transfer, or the transfer of the additional amount, in the case of an increased transfer, is implemented so as to ensure that it does not result in any significant individual or cumulative adverse impacts on the quantity or quality of the waters, or the water-dependent natural resources, of the Great Lakes-St. Lawrence River Basin, considering the potential cumulative	The hydrogeology report (Appendix B) concluded that the proposed pumping rate at PW7/PW8 would not result in any adverse impacts to water quantity or quality. The increased water taking would only increase Ontario's consumptive use by 2.79%, with Ontario's consumptive use being lower than Michigan, Ohio and New York. It is

Applicable Legislation	Applicable Section	Condition	How the Town's Proposal meets the condition
		impacts of any precedent-setting consequences associated with the transfer or the transfer of the additional amount, as the case may be.	not likely that this increased taking would result in significant individual or cumulative adverse impacts on the quantity or quality of the waters of the Great Lakes-St. Lawrence River Basin. It should also be noted that this water takin is to provide drinking water for residents of Shelburne, not for a for-profit enterprise.
	34.6(3) 5.	The transfer, in the case of a new transfer, or the transfer of the additional amount, in the case of an increased transfer, is implemented so as to incorporate feasible, environmentally sound and cost-effective water conservation measures to minimize the taking of water and losses of water through consumptive use.	The Town already employs water conservation strategies. In 2011, the Town of Shelburne installed approximately 2,200 new water meters and replaced 800 existing water meters, which allowed metering users and charging a tiered water consumption rate based on usage thresholds. Per capita water demand in Shelburne continues to drop, with per capita demand decreasing by 11% between 2013 and 2018.
	34.6(3) 6.	6. The transfer is implemented so as to ensure that it complies with: i. the Boundary Waters Treaty of 1909, ii. the International Boundary Waters Treaty Act (Canada), and iii. any other treaty, agreement or law that is prescribed by the regulations.	The transfer will be implemented in compliance with the applicable Treaties and Acts.
	34.6(3) 7.	The transfer, in the case of a new transfer, or the transfer of the additional amount, in the case of an increased transfer, is implemented so as to ensure that it complies with any other criteria that are prescribed by the regulations for the purpose of implementing Article 209 (Amendments to the Standard and Exception Standard and Periodic Assessment of Cumulative Impacts) of the Great Lakes-St.	The Town will cooperate with the Ministry of Natural Resources and Forestry and the Ministry of the Environment, Conservation and Parks to ensure that the increased transfer amount complies with any other criteria that are prescribed by the regulations for the purpose of implementing Article 209.

Applicable Legislation	Applicable Section	Condition	How the Town's Proposal meets the condition
		Lawrence River Basin Sustainable Water Resources Agreement of 2005, including criteria relating to climate change or other significant threats to the Great Lakes-St. Lawrence River Basin. 2007, c. 12, s. 1 (12).	
Great Lakes St. Lawrence River Basin Sustainable Water Resources Agreement Article 201 - Exceptions to the prohibition of diversions Intra-basin Transfers		If the Proposal results from a New or Increased Withdrawal 100,000 gallons per day (379,000 litres per day) or greater average over any 90-day period and if the Consumptive Use resulting from the Withdrawal is less than 5 million gallons per day (19 million litres per day) average over any 90-day period: i. The Proposal shall meet the Exception Standard and be subject to management and regulation by the Originating Party, except that the Water may be returned to another Great Lake watershed rather than the Source Watershed; ii. The Applicant shall demonstrate that there is no feasible, cost effective and environmentally sound water supply alternative within the Great Lake watershed to which the Water will be transferred, including conservation of existing water supplies; and, iii. The Originating Party shall provide notice to the other Parties prior to making any decision with respect to the Proposal.	An explanation of how the Exception Standard is met, except that water may be returned to another Great Lake watershed, are described in the following rows. Demonstration that there is no feasible cost effective and environmentally sound alternative that avoids intra-basin transfer is provided above in response to Section 34.6(2) v. and 34.6(3) 1. of the OWRA. Submission by the Town for a Permit to Take Water for the proposed new pumping rate would be the catalyst for the Ministry of Natural Resources and Forestry to provide the parties to the Agreement with Prior Notice of the proposal for an inter-basin transfer. The Permit to Take Water application will be submitted upon completion of the 30-day review period for this Municipal Class EA.
Great Lakes St. Lawrence River Basin Sustainable Water	4a	The need for all or part of the Exception cannot be reasonably avoided through the efficient use and conservation of existing water supplies;	See above response for OWRA Section 34.6(2) iii.
	4b	The Exception shall be limited to quantities that are considered	As demonstrated in this Municipal Class EA, the additional transfer

Applicable Legislation	Applicable Section	Condition	How the Town's Proposal meets the condition
Resources Agreement Article 201 - Exceptions to the prohibition of diversions Exception Standard		reasonable for the purposes for which it is proposed;	amount is required to meet current and future Town drinking water requirements. The Town currently cannot meet maximum day water demands, and planned population growth will further compound this shortfall.
	4c	All Water Withdrawn shall be returned, either naturally or after use, to the Source Watershed less an allowance for Consumptive Use. No surface water or groundwater from outside the Basin may be used to satisfy any portion of this criterion except if it: i. Is part of a water supply or wastewater treatment system that combines water from inside and outside of the Basin; ii. Is treated to meet applicable water quality discharge standards and to prevent the introduction of invasive species into the Basin;	As per Section i under Article 201 – Exceptions to the prohibition of diversions (Intra-basin Transfers), shown above, this standard does not apply.
	4d	The Exception shall be implemented so as to ensure that it shall result in no significant individual or cumulative adverse impacts to the quantity or quality of the Waters and Water Dependent Natural Resources of the Basin with consideration given to the potential Cumulative Impacts of any precedent-setting consequences associated with the Proposal;	Demonstration that individual or cumulative adverse impacts are not anticipated is provided in response to Section 34.6(3) 4.
	4e	The Exception shall be implemented so as to incorporate Environmentally Sound and Economically Feasible Water Conservation Measures to minimize Water Withdrawals or Consumptive Use;	Demonstration that individual or cumulative adverse impacts are not anticipated is provided in response to Section 34.6(3) 5.
	4f	The Exception shall be implemented so as to ensure that it is following all applicable municipal, State, Provincial and federal laws as well as regional	Through the Municipal Class EA and permitting process, this undertaking occurs in compliance with all legislative requirements.

Applicable Legislation	Applicable Section	Condition	How the Town's Proposal meets the condition
		interstate, inter-provincial and international agreements, including the Boundary Waters Treaty of 1909;	
	4g	All applicable criteria in this Article have also been met.	All criteria in this Article have also been met.

In addition to meeting the OWRA requirements, the Towns proposal must also meet the requirement under *Article 201-Exceptions to the Prohibitions of Diversions,* Paragraph 2.b under the *Agreement.* This section outlines:

"If the Proposal results from a New or Increased Withdrawal 100,000 gallons per day (379,000 litres per day) or greater average over any 90-day period and if the Consumptive Use resulting from the Withdrawal is less than 5 million gallons per day (19 million litres per day) average over any 90-day period:

- The Proposal shall meet the Exception Standard and be subject to management and regulation by the Originating Party, except that the Water may be returned to another Great Lake watershed rather than the Source Watershed;
- The Applicant shall demonstrate that there is no feasible, cost effective and environmentally sound water supply alternative within the Great Lake watershed to which the Water will be transferred, including conservation of existing water supplies; and,
- The Originating Party shall provide notice to the other Parties prior to making any decision with respect to the Proposal.

All alternatives to intra-basin transfer were considered in this Municipal Class EA, and no alternatives were identified that are feasible. Notification will be completed by the Ministry of Natural Resources and Forestry (MNRF) once the Permit to Take Water amendment is applied for.

6. Source Water Protection

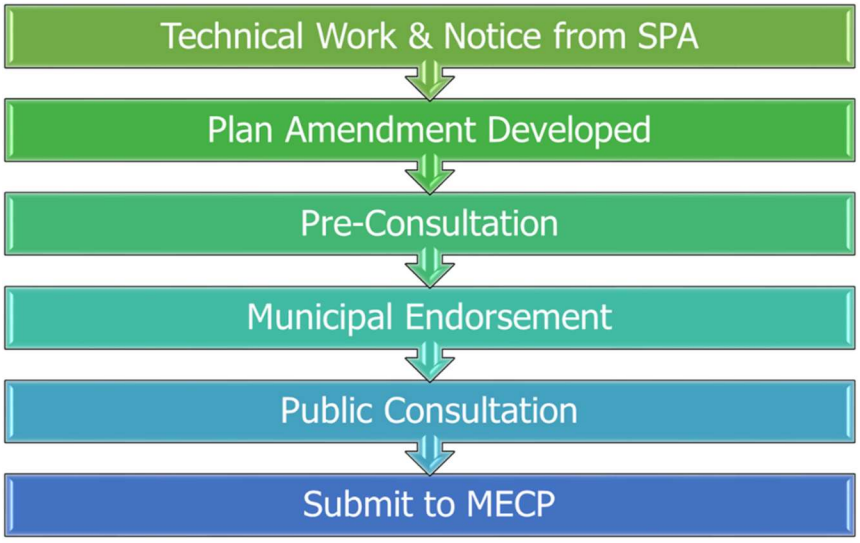
In 2006, the Government of Ontario passed the *Clean Water Act* to implement some of the recommendations from the Walkerton Inquiry. The *Act* empowered regional source water protection authorities (SPAs) to oversee the protection of drinking water sources from contamination, depletion, or other types of stresses. The Shelburne Water Supply System consists of six groundwater supply wells. PW1, PW3, PW4, and PW5 are located within the Nottawasaga Valley Source Protection Area, which is part of the Georgian Bay Lake Simcoe Source Protection Region. PW7 and PW8 are within the Lake Erie Region Source Protection Area and source water policies are outlined in the Grand River Source Protection Plan), in which Volume II, Chapter 4 outlines policies for the Townships of Amaranth and East Garafraxa, and Chapter 7 the polices for Melancthon Township. An update to the Grand River Source Protection Plan came into effect on February 15, 2022.

Given that PW7 and PW8 were constructed prior to O.Reg. 205/18 Municipal Residential Drinking Water Systems in Source Protection Areas, amendment to the Source Water Protection Plan is not required prior to increasing the pumping rate at PW7/PW8.

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

Adding new groundwater production wells or increasing production at existing wells requires that wellhead protection areas be defined or redefined, 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 10.**

Figure 10: Summary of the Section 34 Process to Amend a Source Protection Plan



To initiate this process, EarthFX Incorporated completed technical studies that were documented in a report entitled "Updated Wellhead Protection Area Delineation, Vulnerability Scoring, and Threats Assessment for the Town Shelburne, Ontario" (EarthFX Incorporated, 2022). The work by EarthFX 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 production wells, and
- Assigning draft vulnerability scores based on the existing vulnerability of the municipal groundwater aquifer.

Throughout this process, EarthFX worked closely with the GRCA and NVCA Conservation Authorities and the MECP. The EarthFX report was provided to the GRCA on March 7, 2022, for review and comments from GRCA discussed in a meeting on April 29, 2022. Following that meeting, a revised report was provided on July 8, 2022, with additional comments received from GRCA on July 27, 2022. EarthFX addressed comments from GRCA in a 2nd version of their report, which was issued to GRCA on August 10, 2022. This second version of the report included a revision of the number of significant drinking water threats based on a windshield survey conducted by Ryan Post from the NVCA.

Presentations of the findings of the technical report were made by S. Burnett and Associates Limited (SBA) and EarthFX to the South Georgian Bay Lake Simcoe Source Protection Committee on October 26, 2022, and distributed to the Lake Erie Source Protection Committee on September 22, 2022.

The EarthFX report was then reviewed by Lake Erie Region staff, who found that older (2010) orthoimagery had been utilized in the calculation of impervious surfaces, managed lands, and livestock density. As there have been some land use changes since 2010, namely the addition of the new Barnett Drive subdivision within the Town of Shelburne, this difference affects these calculations, and subsequently the threat counts within the WHPAs. To address these concerns, the Town of Shelburne requested the Grand River SPA identify concerns and provide updated impervious surface, managed lands, and livestock density calculations and maps. Correspondence with GRCA regarding their technical report is included in **Appendix A**.

The WHPAs delineated by EarthFX are shown in **Figure 11** 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 two (2) years. WHPA-C was delineated as the area outside WHPA-B, within which the time-of-travel to the well is greater than two (2) years but less than or equal to five (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. **Figure 11** also shows the previously delineated WHPAs to show changes from the proposed increase combined pumping rate at PW7/PW8 and changes resulting from updates to the hydraulic model used to delineate the WHPAs.

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), a vulnerability score was assigned as summarized in **Figure 12**.

Table 18: 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 11: Wellhead Protection Areas for Shelburne Water Supply Wells (EarthFX Incorporated, 2022)

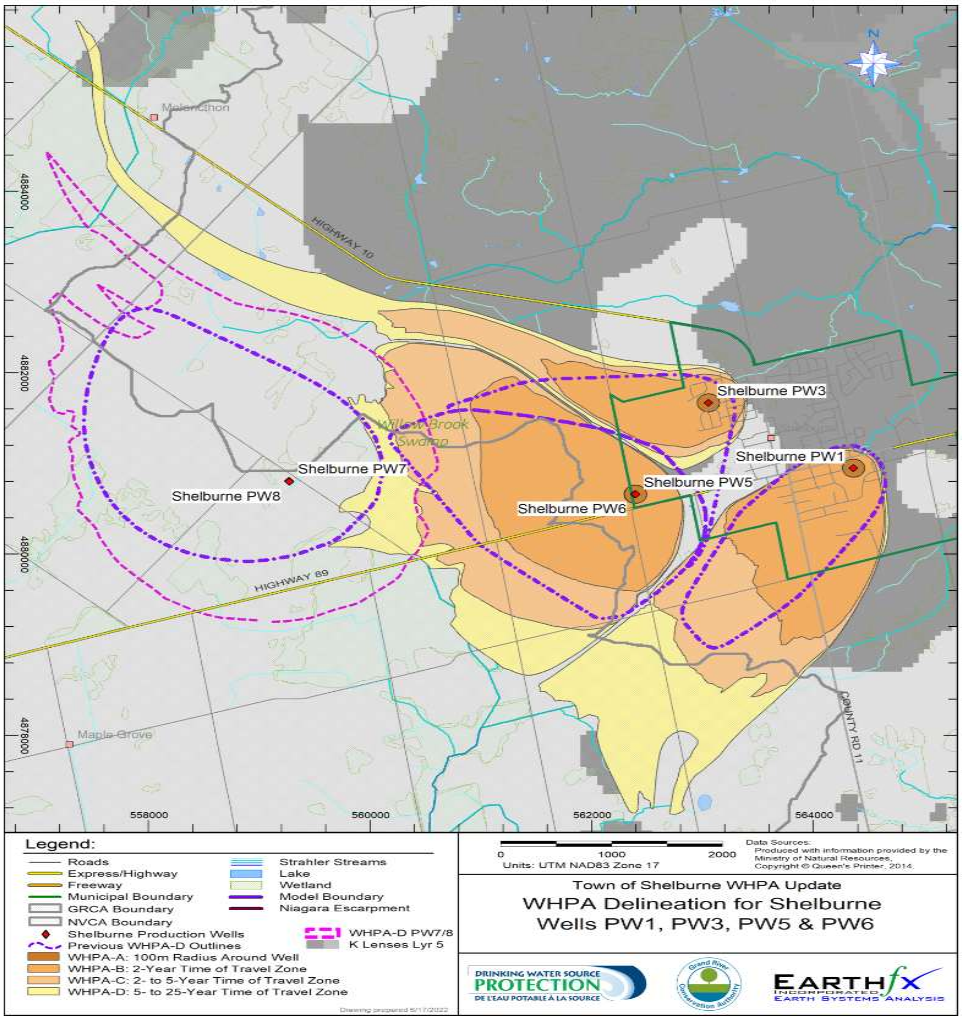
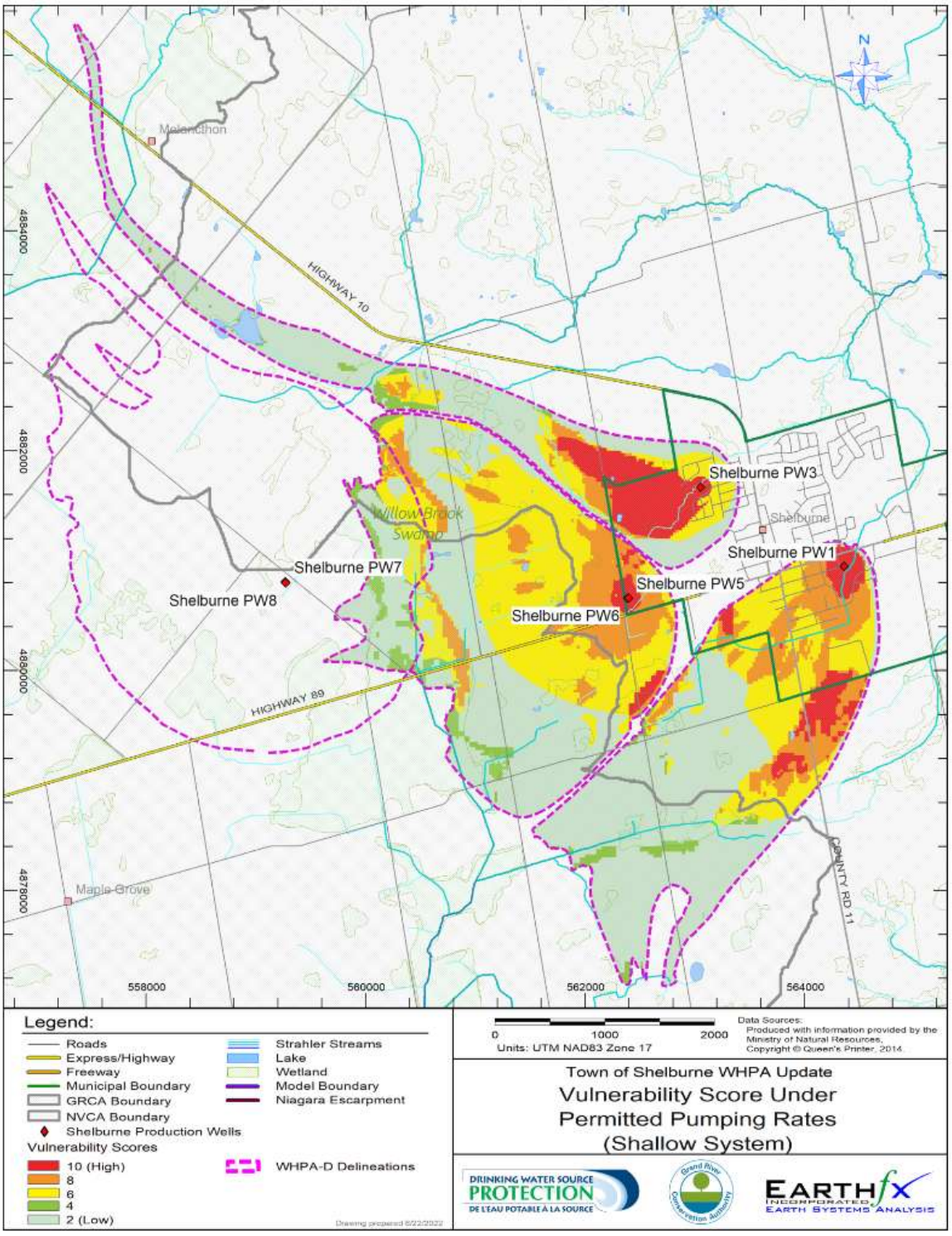


Figure 12: Vulnerability Scoring



EarthFX, with support from NVRCA and GRCA staff, 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 WHPAs is provided in **Table** 19**,** which shows eight (8) significant drinking water threats identified on three properties.

Table 19: Significant Activity-based Drinking Water Quality Threats in the Wellhead Protection Areas

Threat Number	Threat	Significant Threat Counts Number of Threats	Significant Threat Counts Number of Parcels
1	The establishment, operation or maintenance of a waste disposal site within the meaning of Part V or the Environmental Protection Act		
2	The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage		
3	The application of agricultural source material to land	2	2
4	The storage of agricultural source material to land		
5	The management of agricultural source material		
6	The application of non-agricultural source material to land	2	2
7	The handling and storage of non-agricultural source material		
8	The application of commercial fertilizer to land	2	2
9	The handling and storage of commercial fertilizer to land		
10	The application of pesticide to land	1	1
11	The handling and storage of pesticide		
12	The application of road salt		
13	The handling and storage of road salt		
14	The storage of snow		
15	The handling and storage of fuel	1	1
16	The handling and storage of dense non-aqueous phase liquid		
17	The handling and storage of an organic solvent		
18	The management of runoff that contains chemicals used in the de-icing of aircraft		
21	The use of land as livestock grazing or pasturing land, and outdoor confinement area, or a farm-animal yard		
22	The establishment and operation of a liquid hydrocarbon pipeline. O. Reg. 385/08, s. 3; O. Reg. 206/18, s. 1.		
-	**Total Number**	8	3

The Town of Shelburne will work closely with the NVCA and landowners who have a significant drinking water threat identified on their property to ensure that relevant activities conform to the requirements of the South Georgian Bay Lake Simcoe Source Protection Plan.

7. Review of Draft Report

A draft version of this Class EA was provided to Western-Central branch of the MECP for review on **September 3, 2024**. The MECP responded October 2, 2024, to ask for additional information in order to complete the groundwater and surface water reviews. SBA responded with a summary letter on December 10, 2024. The MECP provided comments on the draft of this Class EA on February 28, 2025, and a disposition table showing how MECP comments were addressed is included in **Appendix A**. SBA held a virtual meeting with the MECP to receive clarification on several comments. A summary of these comments and how they were addressed in the Final Report was emailed back to the MECP on May 12, 2025. This series of correspondence is provided in **Appendix A.**

8. Notice of Completion

On June 19, 2025, the Town of Shelburne issued a Notice of Completion on the Town's website, in the Shelburne Free Press, and by email to all project stakeholders on our stakeholder list. This Project File was made available at Shelburne Town Hall, 203 Main Street, Shelburne ON and on the Town's website for public, First Nation and Métis, and agency review until July 21, 2025.

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 who's 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; and
- any other information to support your request.

Requests that are made after the 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 16 Order 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.

9. Conclusion

The purpose of the Schedule 'B' Class EA Report was to determine the means of meeting the water supply requirements for the Town of Shelburne for the next 20 years. Based on technical, environmental, social, and economic considerations evaluated in this Report, the preferred Alternative Solution is Alternative 9 – Alternatives 3, 4, and 5 Combined:

- Pumping Wells PW7 and PW8 Concurrently;
- Increasing Pumping Rate of PW5 and PW6 by Adding Arsenic Treatment; and
- Locating and Developing a New Well.

The preferred alternative design, once constructed and operational, is not anticipated to result in any significant adverse environmental impacts.

The hydrogeological report completed by SBA determined that increased pumping from the aquifer appears to influence the groundwater levels in the overburden well located at 116116 2 Line SW. During the pumping test, water levels in the well were observed to decrease through the test. In the days immediately after the test was concluded, the resident at the property noted low water levels requiring additional supply to be trucked to the property. Communication will be maintained with this well owner as to the effects on the well when pumping rates are increased or any observed seasonal effects. If effects are due to increased pumping of the production wells, action may involve periodically supplying water to the well during low water seasons, or construction of a deeper, drilled well to provide adequate supply to the property

Following the public review period and approval of this Report, the public's comments will be incorporated into the report and presented to the study team. Once MECP has completed its review of the Section 34 amendment to Lake Erie Region Source Protection Plan, the Town will amend the Permit to Take Water to allow for the increased combined pumping rate of PW7 and PW8. The Town will then amend their Municipal Drinking Water License.

Adding additional capacity at PW7/PW8 does not address that PW5/PW6 currently exceeds half maximum allowable concentration (MAC) for arsenic and blending with the increased contribution from PW7/PW8 is not sufficient to reduce arsenic concentrations to below the half MAC without reducing the pumping rate of PW5/PW6 below the sustainable rate of 24.3 L/s (1458 L/min or 2100 m^3/day). Additionally, any issues with supply from PW7/PW8, whether caused by issues with the wells or the connecting watermain, would require additional reductions of supply from PW5/PW6 due to the reduction in supply of low arsenic concentration water for blending. As a result, it is recommended that the Town immediately proceed with adding arsenic treatment to PW5/PW6 to avoid the need for any supply reductions from PW5/PW6 and to remove its supply rate dependence on blending water from PW7/PW8.

With the increased pumping rate achieved through the concurrent pumping of PW7/PW8, and pumping PW5/PW6 at its sustainable rate of 24.3 L/s (1458 L/min or 2100 m^3/day), the Town should have sufficient water supply to meet the maximum day flow for an estimated population of just 13,574. Based on the linear growth rate of 534 persons per year, as shown in **Figure 1,** this population would be reached in 2038, and additional water supply would be needed at this time. The only viable means of additional water supply is to develop a new groundwater supply well. Given that locating, permitting and developing a new well takes several years, it is recommended that the Town commence this process no later than 2033.

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