Glen Walter Water Tower & Watermain Replacement

Schedule ‘B’ Municipal Class EA

Prepared For:

Township of South Glengarry

APRIL 2024

CREATING QUALITY SOLUTIONS TOGETHER

Ainley GROUP

GLEN WALTER WATER TOWER & WATERMAIN REPLACEMENT
SCHEDULE 'B' MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

PROJECT NO. 122083

Prepared For:

Township of South Glengarry

By:

Sharon Maddock, P.Eng., PMP

Checked By:

Mike Ainley, P.Eng., PMP

Ainley & Associates Ltd.
280 Pretty River Pkwy
Collingwood, ON L9Y 4J5
Tel: (705) 445-3451
E-mail: collingwood@ainleygroup.com

WWW.AINLEYGROUP.COM

DOCUMENT QUALITY REVIEW RECORD

Project Name: Glen Water Tower & Watermain Replacement **Project No.:** 122083

Client: Township of Glengarry

Document Title: Glen Walter Water Tower and Watermain Replacement Schedule 'B' Class Environmental Assessment

Review Stage: Notice of Filing of PFR

VERIFICATION & APPROVAL

Rev.	Prepared By (Name / Affiliation)	Date	Revision (Name / Affiliation)	Date
1.	Sharon Maddock, P.Eng., PMP (Ainley Group)	15-Feb-2024	Mike Ainley, P.Eng., PMP (Ainley Group)	29-Feb-2024
2.	Ainley Group	29-Feb-2024	Township of Glengarry	20-Mar-2024
3.	Ainley Group	8-Apr-2024	Township of Glengarry	

The above noted individuals have reviewed and commented on this document and are satisfied that the authors have addressed concerns raised.

Executive Summary

The Township of South Glengarry completed a Water and Wastewater Servicing Master Plan (Masterplan) for the Glen Walter Area in 2022 to serve the projected growth of the community until 2051. Following up on the Masterplan recommendations the Township is now undertaking a Schedule C Class Environmental Assessment (EA) to determine a preferred solution for expanding the Glen Walter Water Treatment Plant (WTP). In parallel to the WTP Expansion Class EA, the Township applied for and received funding under the Green Stream of the Investing in Canada Infrastructure Program to support the implementation of the following recommendations in the Masterplan:

- Rehabilitate Glen Walter's Water Treatment Plant reservoir and provide a new and elevated water storage tank with new pumps; and
- Replace 4,000 metres of Glen Walter's existing watermains with new 300 mm PVC pipes.

Although the Masterplan identified a general site for the new water storage tank, it did not finalize its height. Moreover, the Masterplan did not indicate if the tank can be filled by a branch from the existing (or upgraded) distribution system, nor did it recommend a pipe route to convey the treated flow into the new storage tank, finally, the masterplan did not quantify the new pumping capacity requirements. To address the above gaps the Township retained Ainley Group to complete a Schedule B Class EA prior to proceeding with design.

Class EA Process

The Class EA was approved under Ontario's Environmental Assessment Act and identifies the process by which municipal infrastructure projects are to be planned. The process identifies an approved procedure that classifies projects in terms of schedules based on varying environmental impact.

- **Exempt** – minimal adverse environmental impact; consider public notification
- **Eligible for Screening to Exempt** – may have minimal adverse environmental impact; requires completing an Archaeological Screening Process (ASP) to determine if exempt or Schedule B; consider additional public notification even if exempt
- **Schedule B** – potential for some adverse environmental effects, requires mandatory contact with public and review agencies
- **Schedule C** – potential for significant environmental effects, requires mandatory contact with public and review agencies, requires completion of Environmental Study Report (ESR)

Establishing new or expanding/replacing existing water storage facilities is defined as a Schedule B project under the Municipal Class Environmental Assessment document. A Schedule B project requires completion of Phases 1 & 2 of the Class EA process, which is generally comprised of the following tasks:

- Identify the problem/opportunity;
- Inventory the existing environment (physical, natural, social and economic);
- Develop alternative solutions to address the problem/opportunity;
- Evaluate proposed alternative solutions;
- Consult with the public, review agencies, relevant stakeholders;

- Select the Preferred Solution giving consideration to the evaluation and any feedback received through consultation;
- Establish mitigation measures to minimize potential environmental impacts;
- Document the process in a Project File Report (PFR);
- Issue a Notice of Completion followed by a 30-day review period; and
- Address and final comments and conclude the Class EA process.

For the most part, the Masterplan satisfies requirements of a Schedule B Class EA; however, the height of the new elevated tank and more specific site information was not provided. It was considered important to present the extra level of detail on the elevated tank to stakeholders prior to starting the design.

The project team for the Class EA consisted of members of the Township of South Glengarry and Ainley Group. The project team met on a number of occasions to discuss the project's progress and develop content for the PICs.

Public, review agency and Aboriginal community consultation is mandatory during the Schedule B planning process to allow for participation during the development and evaluation of the servicing alternatives. The public, review agencies and Aboriginal communities were contacted with two notices throughout the Class EA process. The notices were issued to inform the public of the following:

- Public Information Centre – May 3, 2023
- Study Completion – April 17, 2024

The comments and input received from the public, review agencies and Aboriginal communities were taken into consideration during the planning process.

Existing Conditions

The existing Glen Walter water system infrastructure includes:

- The Glen Walter Water Treatment Plant (WTP) located at 18352 County Road 2, Glen Walter, and operated under Ontario Drinking Water License #185-102. The WTP is a direct filtration plant with a rated capacity of 995 m^3 / MDD.
- Direct distribution of treated water from the WTP to the Glen Walter population through a distribution network made up of primarily PVC pipes with a small number of HDPE pipes. Pipe diameters range from 75mm to 300mm.

Future Conditions

The 2022 Masterplan forecasted a 3% population growth rate for Glen Walter over the next 30 years with a projected total population of 2,949. In the Masterplan, Option B established the water supply and treatment capacity would need to be expanded from the current 995 m^3 / MDD to 2,300 m^3 / MDD, assuming average per capita demand of 300 L/c/d and a maximum day factor of 2.0.

Updating of the WaterGEMS model analysis and WTP pump calculations resulted in a total storage capacity of 1,729 m^3 being needed, effectively the same as the 1,710 m^3 storage capacity identified in the EVB report for Option 2B. A new 52m high, 1,600m^3 elevated storage

tank will be provided. This is more than sufficient if the additional 230 m^3 storage at the WTP remains available. If the WTP storage is no longer available, the slight storage deficiency can be accommodated through emergency storage and/or supplemental fire-fighting (e.g. pumper trucks).

Problem/Opportunity Identification

The problem/opportunity statement that has been developed to rehabilitate the Glen Walter water assets is as follows:

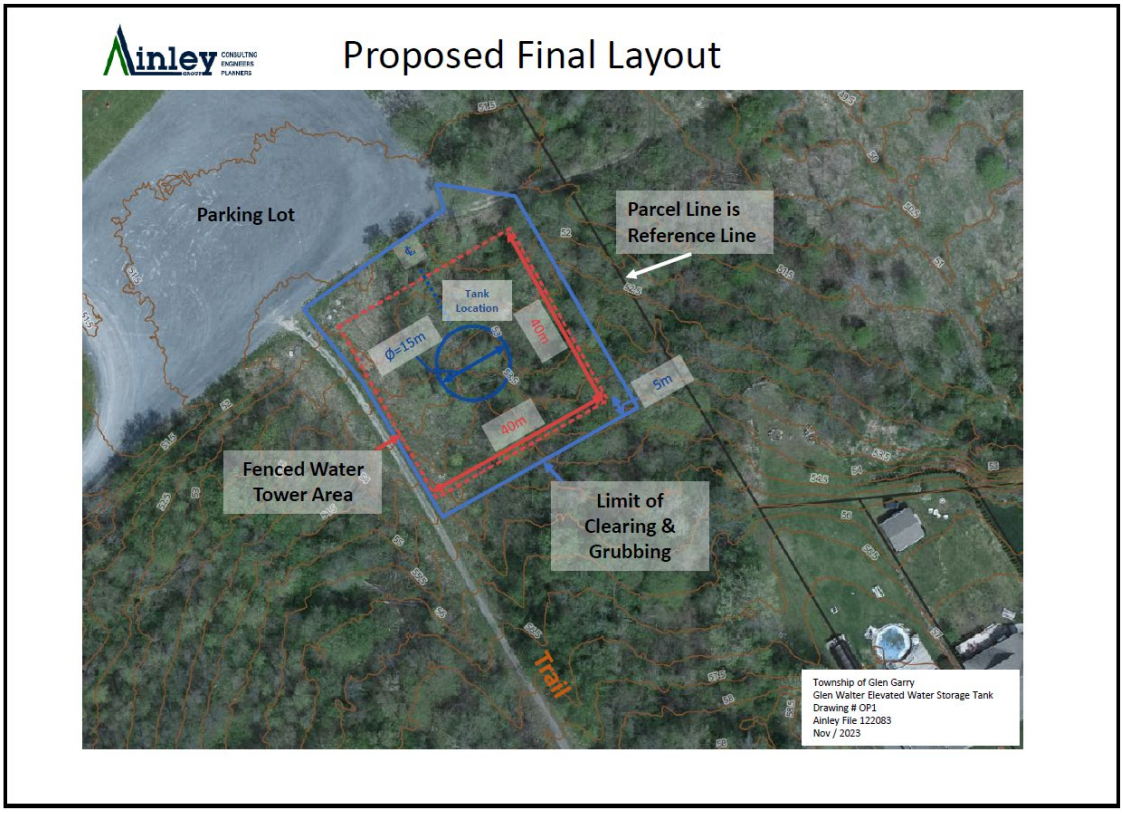
> "Identify and develop a preferred solution for a new, elevated water storage tank to be located at 6618 Glen Walter Park Road along with system improvements including new high-lift pumps at the WTP and replacement and/or looping of existing watermain to improve water supply security and access to potable water to the Glen Walter urban settlement area/community."

Water Storage Alternatives & Preferred Solutions

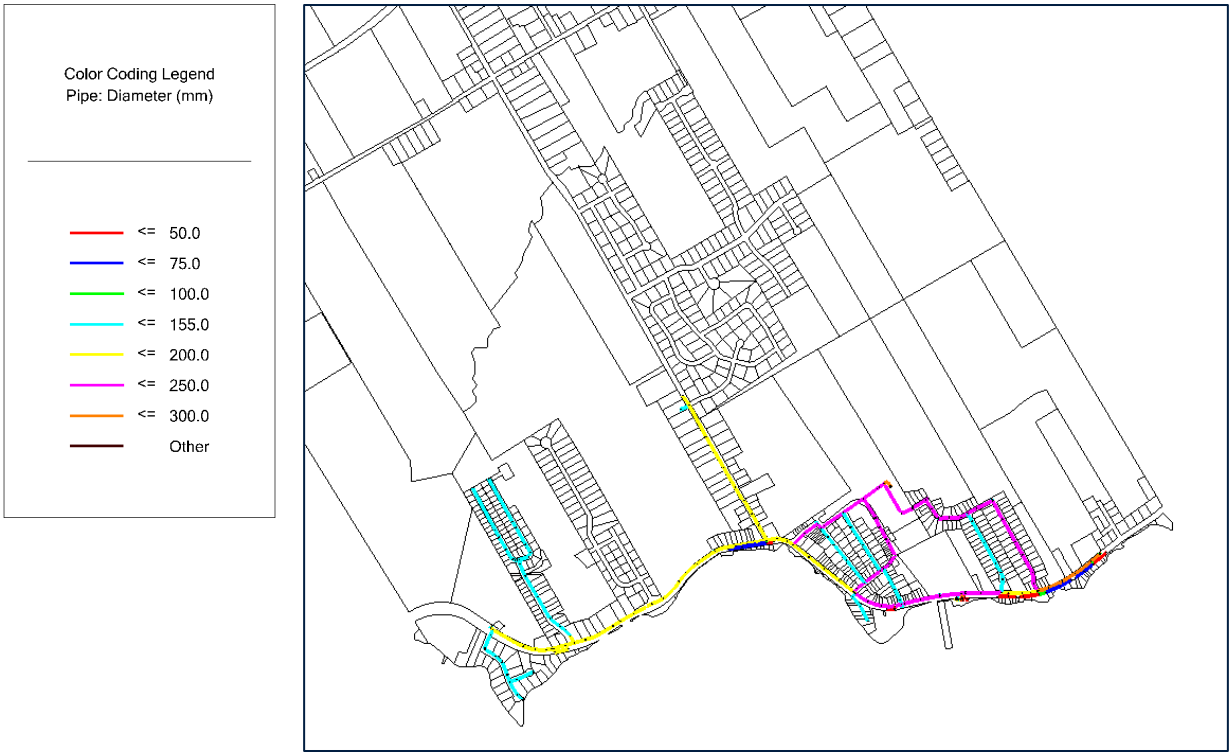
Four elevated water tower designs were initially listed, of which two made it to the short list. The following elevated water tower design alternatives were examined and evaluated to determine the best option for providing the 1,600 m^3 storage:

- Alternative 1 – Composite elevated water storage
- Alternative 2 – Composite glass-lined elevated water storage

Alternative 1 was identified as the preferred elevated storage alternative, to be located at 6618 Glen Walter Park Road as shown.



An updated hydraulic analysis identified the 2051 water distribution system including the necessary system improvements (watermain upsizing, extensions and looping), as shown.



The immediate watermain upsizing and extensions that will be included with the first phase of construction includes 932 metres total watermain on Kilkenny Crescent from 208m south of Glen Walter Park Road to Glen Walter Park Road, on Glen Walter Park Road from Kilkenny Crescent, east and then south to the water tower site and on Lana Drive from Page Drive, west and north connecting into the watermain on Glen Walter Park Road.

A Schedule C Class Environmental Assessment now underway in parallel with this Class EA will determine if the preferred solution to accommodate future water supply/treatment demands is to expand the existing Glen Walter WTP, or to decommission the Glen Walter WTP and negotiate supply of 2,300 m^3/d MDD from the City of Cornwall via a connection at County Road 2 and Boundary Road. The water model update confirms that either supply option can be accommodated with the same proposed water tower and watermain looping. All aspects of the water supply expansion will be covered under that Schedule C Class EA; therefore, consideration of increasing the high-lift pump capacity at the existing Glen Walter WTP is no longer necessary under this Schedule B Class EA. However, the existing high-lift pumps have reached the end of their life and need to be replaced with same-capacity pumps (like for like).

Table of Contents

Table of Equations

Table of Figures

Table of Tables

Appendices

1 Introduction

1.1 Background

The Township of South Glengarry (Township) completed a Water and Wastewater Servicing Master Plan (Masterplan) for the Glen Walter Area to serve the projected population growth by Year 2051 (EVB, January 2022). For water servicing, the Masterplan recommends the following key projects:

- Expansion of the Glen Walter Water Treatment Plant from 995 m^3/d to 2,300 m^3/d.
- Construction of a 1,500 m^3 elevated water storage tower.
- Replacement of some areas of the water distribution system to ensure that peak flows and fire flows can be conveyed through the system.

The Township is currently undertaking a Schedule 'C' Municipal Class Environmental Assessment (MCEA) to determine a preferred solution for expanding the Glen Walter Water Treatment Plant (WTP). In parallel to the WTP Expansion Schedule C MCEA, the Township applied and received funding in May 2022 under the Green Stream of the Investing in Canada Infrastructure Program to support the implementation of the following water assets as part of the recommendation in the Masterplan:

- Rehabilitate Glen Walter's Water Treatment Plant reservoir and provide a new and elevated water storage tank with new pumps; and
- Replace 4,000 metres of Glen Walter's existing watermains with new 300 mm PVC pipes.

The completion of this funded project will address critical health and safety issues and increase the access of potable water to the community. A condition of the funding is that the project is to be completed by October 31, 2026.

The Masterplan referenced an "all-pipe" hydraulic network water model (WSP, September 2018) using the program WaterGEMS by Bentley™, an industry standard software modelling program, to represent the existing Glen Walter water distribution system and water demands. The model was built using GIS data and other water servicing infrastructure information provided by the Township.

Based on the projected flow demands and fire flow requirements, a combination of pumping and storage is recommended in the Masterplan to adequately supply the system during maximum day demand and fire flow conditions.

Although the Masterplan identified a general site for the new water storage tank, it did not finalize the height of the tank. In addition, the Masterplan did not indicate if the tank could be filled by a branch from the existing (or upgraded) distribution system, nor did the Masterplan recommend a pipe route to convey the treated flow into the new storage tank, and it did not quantify the new pumping capacity requirements. Bridging the broad Masterplan preferred solution for water storage in Glen Walter and prior to proceeding to design, more detailed investigations at the project-specific level were required to fulfil the Class EA requirements of a Schedule B project.

Copies of the EVB January 2022 Water and Wastewater Master Servicing Plan and the WSP September 2018 Draft Water and Wastewater Servicing Master Plan Update are included in Appendix A.

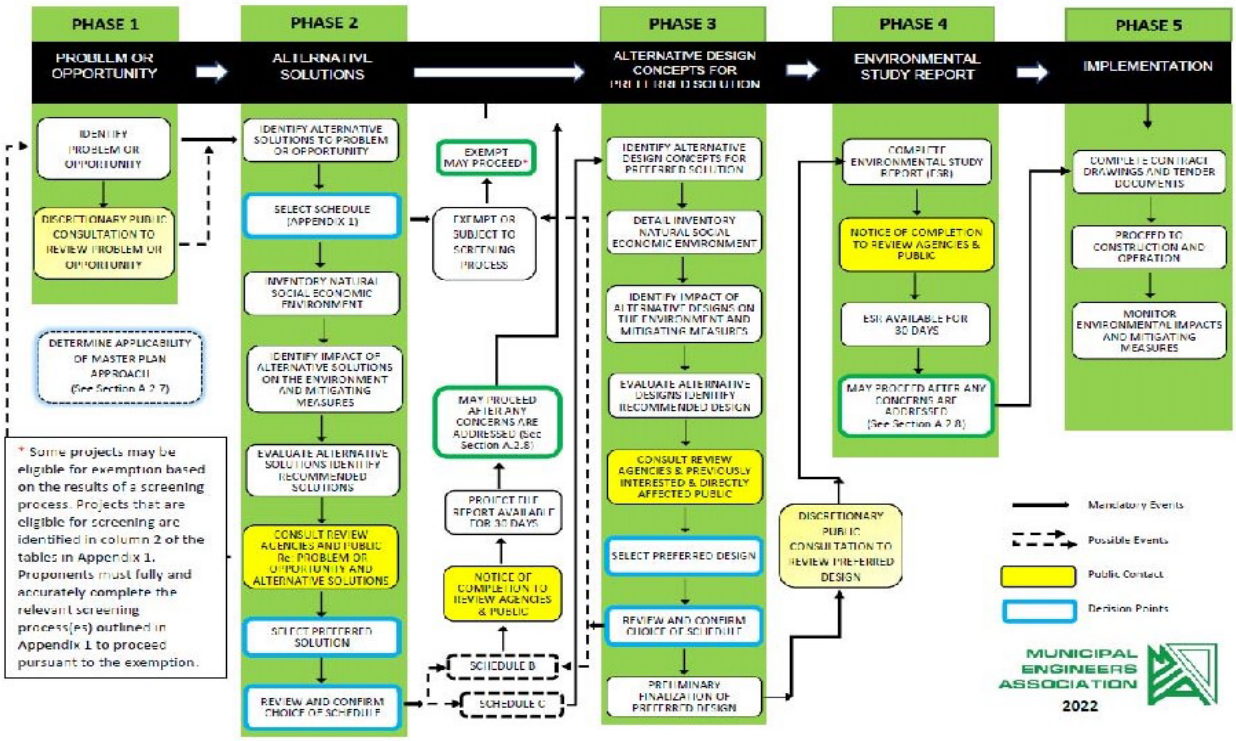
1.2 Class Environmental Assessment Process

The 2023 Municipal Class Environmental Assessment (MCEA) document, as published by the Municipal Engineers Association, outlines a planning process for municipalities to follow so as to complete infrastructure projects in an environmentally responsible manner and in accordance with the *Environmental Assessment Act* (*EA Act*). The MCEA process identifies an approved procedure that classifies projects in terms of schedules based on varying environmental impact as follows:

- **Exempt** – minimal adverse environmental impact; consider public notification
- **Eligible for Screening to Exempt** – may have minimal adverse environmental impact; requires completing an Archaeological Screening Process (ASP) to determine if exempt or Schedule B; consider additional public notification even if exempt
- **Schedule B** – potential for some adverse environmental effects, requires mandatory contact with public and review agencies
- **Schedule C** – potential for significant environmental effects, requires mandatory contact with public and review agencies, requires completion of Environmental Study Report (ESR)

Figure 1 illustrates the MCEA planning and design process.

Figure 1: Municipal Class Environmental Assessment Flow Chart, March 2023



Establishing a new water storage facility is defined as a Schedule B project under the MCEA document. A Schedule B project requires completion of Phases 1 & 2 of the MCEA process as illustrated in Figure 1, which generally comprises the following tasks:

- Identify the problem/opportunity;

- Inventory the existing environment (physical, natural, social and economic);
- Develop alternative solutions to address the problem/opportunity;
- Evaluate proposed alternative solutions;
- Consult with the public, review agencies, relevant stakeholders;
- Select the Preferred Solution giving consideration to the evaluation and any feedback received through consultation;
- Establish mitigation measures to minimize potential environmental impacts;
- Document the process in a Project File Report (PFR);
- Issue a Notice of Completion followed by a 30-day review period; and
- Address any final comments and conclude the Class EA process.

Consultation is a key component of the MCEA process as it allows members of the public, Indigenous communities, and review agencies the opportunity to provide relevant information and feedback for consideration.

For the most part, the Masterplan already satisfies the requirements of a Schedule B MCEA; however, the height of the new elevated tank and more specific site information were not provided and it is considered important to present the extra level of detail prior to the start of design.

1.3 Objective of This Report

The objective of this report is to document the additional Schedule B MCEA planning process. This report confirms information previously provided in the Masterplan specific to water storage and distribution including the deficiencies affecting the project study area; the Problem/ Opportunity Statement to be addressed; and the existing conditions based on review of background documents and desk-top research. This information was used to identify the alternative solutions to be considered as well as criteria to evaluate these alternatives in Phase 2 of the MCEA process to demonstrate the decision-making process leading to the selection of the preferred solution. Decision-making criteria includes impacts on technical environment, natural environment, cultural and social environment and economic environment.

1.4 Previous Reports

Throughout this assessment background documents were reviewed to gain further knowledge on the existing conditions and make use of previous studies and assessment that have been conducted. A list of the reviewed background documents is contained herein:

- Official Plan for the United Counties of Stormont, Dundas and Glengarry (2017)
- EVB Engineering. (2022, Oct.) Glen Walter Area Water & Wastewater Servicing Master Plan Final Report. EVB Engineering, Cornwall.
- WSP Canada Inc. (2018, Sept.) Glen Walter Area Water & Wastewater Servicing Master Plan Update. Master Plan Update Draft Report. WSP, Kingston Office.
- Consolidated Appendices A-G for 2018 Master Plan Update including Technical Memorandum: Model Development and Calibration (2018)

- Lakeshore Hydrant Services Inc. Fire Flow Test Results (June 2017)
- Hydrant Areas Existing Spreadsheets
- Investing in Canada Infrastructure Program Application with Supporting Documentation (2021)

Copies of the following documents referenced in this Project File Document are provided in Appendix A:

- EVB Engineering. (2022, Oct.) Glen Walter Area Water & Wastewater Servicing Master Plan Final Report. EVB Engineering, Cornwall.
- WSP Canada Inc. (2018, Sept.) Glen Walter Area Water & Wastewater Servicing Master Plan Update. Technical Memorandum: Model Development and Calibration. WSP, Kingston Office.

1.5 Project Team

The project team involved in the completion of this Schedule B Class EA included the following:

Proponent: Township of South Glengarry

Prime Consultant: Ainley Group

Sub-consultant: Central Archaeology Group Inc.

2 Planning Policy and This Class EA

This section provides a brief discussion of various land use planning policies and principles to illustrate the consistency of this project in relation to provincial, regional and municipal planning goals.

2.1 Provincial Policy Statement (2020)

The *Provincial Policy Statement (2020)* provides policy direction relating to land use planning and development in Ontario. Section 3 of the *Planning Act* stipulates that all decisions affecting planning matters are to be consistent with the *Provincial Policy Statement (PPS)*. Policies applicable to this project include the following:

- Section 1.1.1e) "Healthy, livable and safe communities are sustained by promoting the integration of land use planning, growth management, transit-supportive development, intensification and infrastructure planning to achieve cost-effective development patterns, optimization of transit investments, and standards to minimize land consumption and servicing costs."
- Section 1.6.1 "Infrastructure and public service facilities shall be provided in an efficient manner that prepares for the impacts of a changing climate while accommodating projected needs."
- Section 1.6.6.2 "Municipal sewage services and municipal water services are the preferred form of servicing for settlement areas to support protection of the environment and minimize potential risks to human health and safety. Within settlement areas with existing municipal sewage services and municipal water services, intensification and redevelopment shall be promoted wherever feasible to optimize the use of the services."
- Section 2.1.1 "Natural features and areas shall be protected for the long term."

- Section 2.6.1 "Significant built heritage resources and significant cultural heritage landscapes shall be conserved."

As the current project followed a MCEA process consideration was given to the potential to impact the physical, natural, social, and economic environment prior to selection of the preferred solution. Various studies were completed to obtain a better understanding of the existing conditions of the study area so that impacts can be properly assessed and appropriate mitigation developed.

2.2 Safe Drinking Water Act (2002)

The *Safe Drinking Water Act, 2002* (SDWA) and the *Drinking Water System Regulation* (O. Reg. 170/03 as amended) regulate the treatment and distribution of drinking water matters, including the control and regulation of drinking water systems. Requirements for all the water systems within treatment and testing processes are specified under *the Drinking Water Systems Regulation (O. Reg. 170/03 as amended).*

2.3 Clean Water Act (2006)

The purpose of the *Clean Water Act ,2006 (CWA)* is to provide protection of municipal drinking water at the source and to safeguard human health and the environment. It aims to protect existing drinking and future drinking water sources. The CWA and its regulations ensure that municipal drinking water supplies such as the groundwater wells and the surface water intake at the Glen Walter water treatment plant are protected through prevention by the development of watershed-based source protection plans. The source protection plans identify vulnerable areas within each municipality and provide policies to address existing and future risks to municipal drinking water sources.

2.4 Official Plan for the United Counties of Stormont, Dundas and Glengarry (2017)

This Official Plan sets out goals and objectives for development in the County for the next 20 years (2017-2037) including regard for the social, economic, and natural environment of the County. This Plan establishes a policy-driven framework for land use planning for the County and its six municipalities. The Plan accentuates the best attributes and amenities of the County, fosters a progressive approach to community and economic development within an environmentally friendly context, provides for the wise use of renewable and non-renewable resources, and streamlines the planning approvals process.

The Official Plan was reviewed to ensure it is consistent with the 2014 Provincial Policy Statement. Policy changes were also made based on the completion of local Source Protection Plans, the 2016 Agricultural Resource Lands Assessment, and the 2016 Population and Growth Projections and Employment Lands study.

The County Official Plan is an upper tier Plan with detailed policies that reflect provincial, County and local interests. Local interests might also be articulated through Local Municipal Plans and Secondary Plans. Local Municipalities rely on the County Official Plan as a single tier Official Plan. The County Official Plan also contains guidance for more detailed policies for community development.

Local Municipalities are vital in implementing the County Official Plan through day-to-day decisions on planning applications, issuing building permits, construction of infrastructure, and

facilitating community economic development. Local Municipalities are responsible for development control by updating and/or adopting zoning by-laws to conform with the County Plan.

Local Municipalities also process and approve amendments to zoning by-laws in response to development applications, review and approve site plan control agreements, grant minor variances, grant permissions for non-conforming uses, administer subdivision and development agreements, and implement property standards. Local Municipalities may adopt other by-laws that implement and conform with the County Official Plan. Public works are also required to conform with the County Official Plan.

Municipalities are also responsible for processing amendments to local Official Plans which may result from development applications or as an initiative of a Local Municipality (e.g. secondary plan). These may also include amendments needed to bring local Official Plans into conformity with the County Plan. Any amendments to Local Plans are subject to approval by the County.

Section 2.2, of the County Official Plan outlines public services and infrastructure policies. In this section it is stated:

> "Efficient and cost-effective development is important to sustain the financial well-being of the province and municipalities over the long term. Ensuring financial viability of infrastructure and public service facilities is a key component of cost-effective development patterns. While most serviced areas have residual capacity, Morrisburg, Alexandria, and Glen Walter have significant limitations. Stormwater management facilities consist of a mix of piped services, infrastructure such as ponds and lot-level controls, and overland drainage.
>
> Many public service and infrastructure facilities will require strategic investment to improve/expand capacity to accommodate growth over the 20-year planning period. Development will be required to optimize the use of public services and infrastructure with sufficient residual or planned capacity and recapture capacity through retrofitting or other improvements.
>
> Focus will be on redevelopment, intensification, revitalization and contiguous development that best uses existing or planned infrastructure. Planned infrastructure may include the expansion of water and sewage treatment systems that are at capacity or close to capacity or to accommodate planned growth. This may also include new infrastructure in communities that are experiencing public health concerns."

2.5 The Eastern Ontario Water Resources Management Study (2000-2001)

The Eastern Ontario Water Resources Management Study (2000-2001) is a regional study that generated many valuable recommendations applicable to land use planning. The Source Water Protection Plan built on this work and provides more specific policies and recommendations for protecting surface and ground water resources. These studies will be used as the basis for protecting and, where applicable, revitalizing the health of groundwater and surface water resources (e.g., wellhead protection, water budgeting, surface wastewater discharge management, protection of vulnerable aquifers, nutrient management, water efficiency measures, well and septic tank maintenance).

2.6 Climate Change (2017)

The Ministry of the Environment, Conservation and Parks (MECP) document entitled "Considering Climate Change in the Environmental Assessment Process" (2017) provides guidance relating to the Ministry's expectations for considering climate change during the environmental assessment process. The Guide is now a part of the Environmental Assessment Program's Guides and Codes of Practice. The environmental assessment of proposed undertakings is to consider how a project might impact climate change and how climate change may impact a project.

3 Phase 1 – Problem or Opportunity

3.1 Problem/Opportunity Statement

The purpose of Phase 1 of the MCEA process is to develop a problem/opportunity statement that clearly identifies the issue, challenge, or opportunity that is being reviewed and addressed. The problem/opportunity statement that has been developed to rehabilitate the Glen Walter water assets is as follows:

> "Identify and develop a preferred solution for a new, elevated water storage tank to be located at 6618 Glen Walter Park Road along with system improvements including new high-lift pumps at the WTP and replacement and/or looping of existing watermain to improve water supply security and access to potable water to the Glen Walter urban settlement area/community."

3.2 Study Area

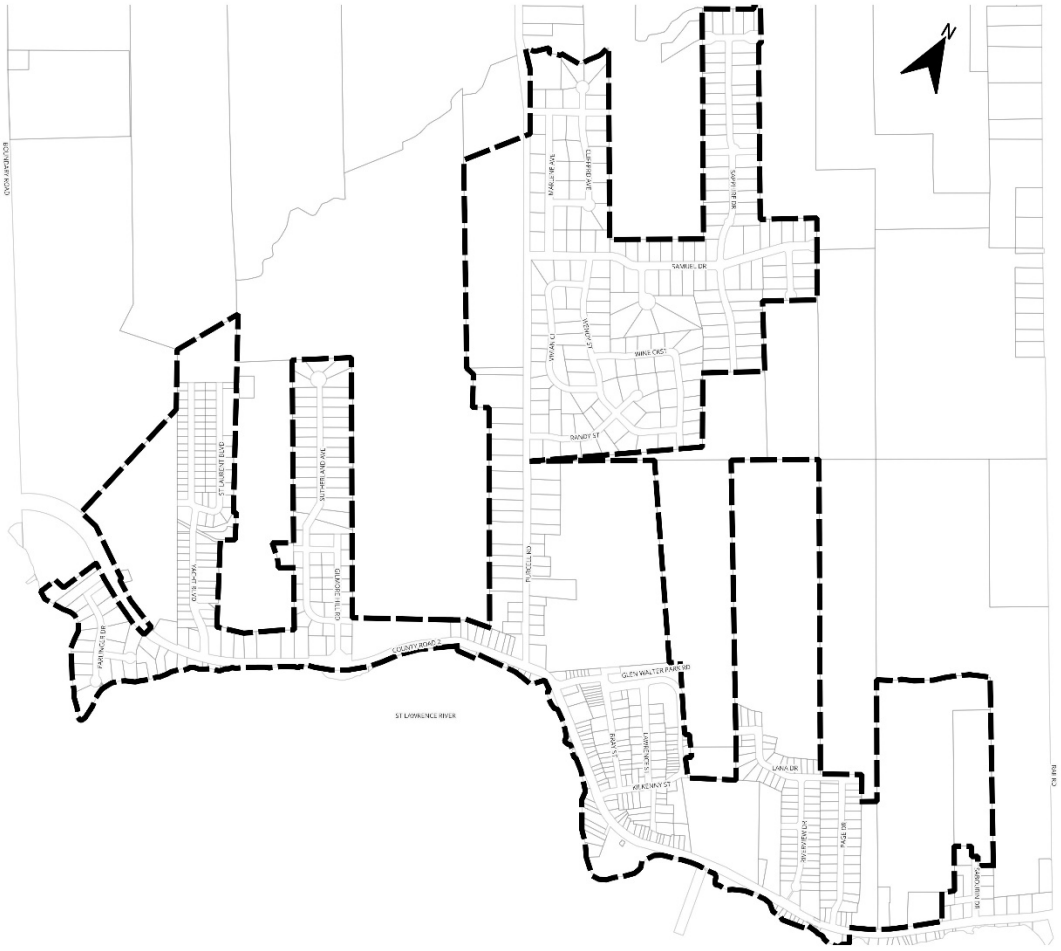
The community of Glen Walter is located in the southwest corner of the Township of South Glengarry. The Township is one of the municipalities comprising the United Counties of Stormont, Dundas and Glengarry in the southeast part of Ontario. Designated as one of 3 urban settlement areas within the Township, Glen Walter lies south of Highway 401, along the shore of the St. Lawrence River and adjacent to the City of Cornwall on its west perimeter. Urban Settlement Areas within the United Counties are communities with a diverse mix of land uses and full or partial municipal sewage and water services. These communities are the primary settlement areas for future development.

The study area, as defined in the 2022 EVB Masterplan encompasses the following borders:

- North Boundary: South Side of Highway 401 Right-Of-Way
- South Boundary: St. Lawrence River
- East Boundary: Rae Road
- West Boundary: Boundary Road

The area delineated to be serviced for projected population growth to the year 2051 is shown in Figure 2.

Figure 2: Area to be Serviced for Projected Growth to 2051



The area indicated in Figure 2 includes the existing serviced area shown in the October 2022 EVB Servicing Master Plan (and reproduced at the May 16, 2023 Public Information Centre), plus the additional expansion areas identified in Council Resolution 383-2022 (December 5, 2022). The Council resolution stipulates that the inclusion of the additional expansion areas (Bayview Estates, Sapphire Estates, and Fairway Estates) is subject to the overall design of the plants not being impacted if the desired 85% grant funding level is not achieved.

3.3 Existing Water System Infrastructure

3.3.1 Existing Water Supply and Treatment System

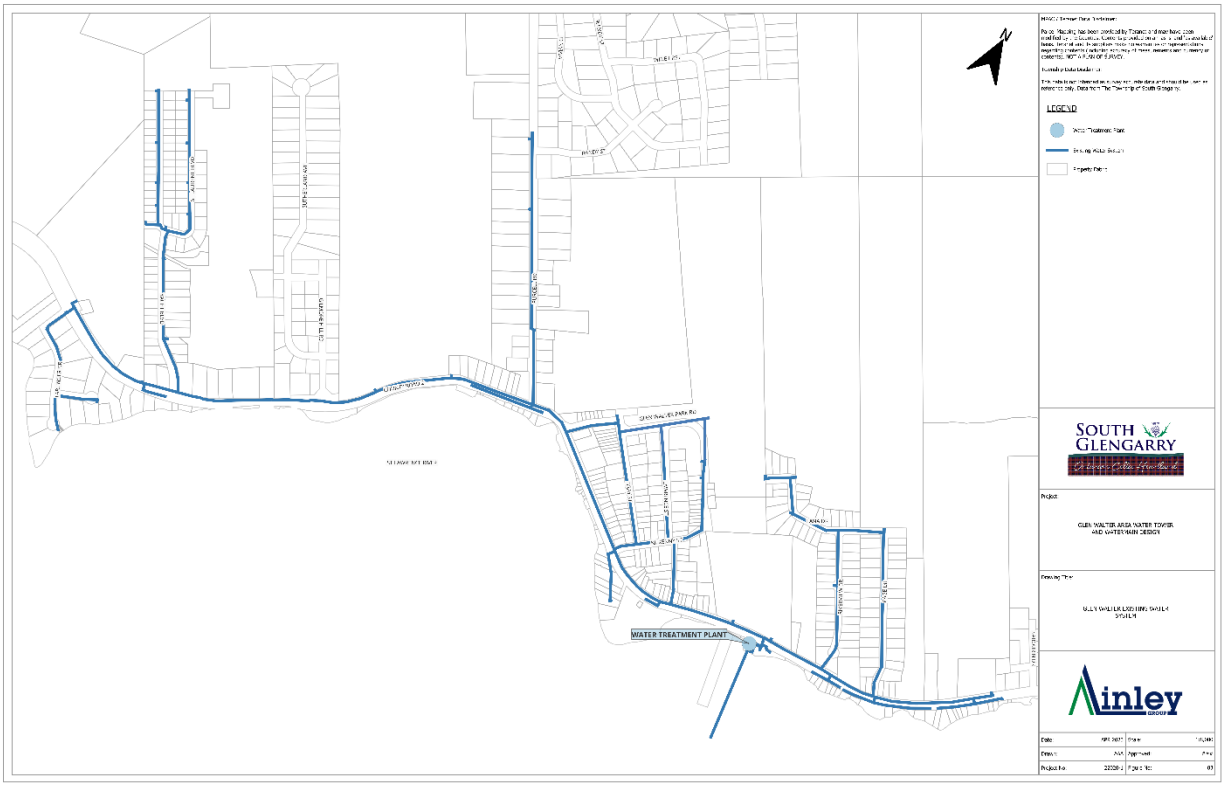
The Glen Walter Water Treatment Plant (WTP) is located at 18352 County Road 2, Glen Walter, and operates under Ontario Drinking Water License #185-102. The WTP is a direct filtration plant with a rated capacity of 995 m^3/d.

3.3.2 Existing Water Distribution System

Treated water from the Glen Water WTP is pumped directly into the distribution system, providing potable water to the Glen Walter population within the serviced area. There are no additional booster stations or storage tanks within the existing distribution system. The pipes that make up the distribution network are primarily PVC with a small number of HDPE pipes. Pipe diameters range from 75mm to 300mm.

The existing water system infrastructure is illustrated in Figure 3.

Figure 3: Existing Water System Infrastructure



3.4 Growth Projections

The growth forecasts used were taken primarily from the 2022 Masterplan, Option 2B – Expansion to Expanded Service Area (New Development). The following Table summarizes projections:

Table 1: Option 2B – 30 Year Population Requirements

Area	Population
Municipal Water Service	963
Approved Plans of Subdivision	252
Regional Growth	1,734
TOTAL POPULATION	2,949
Growth Rate	3 %

In accordance with calculations detailed in the Hydraulic Model Update Technical Memo (see Appendix C), the updated Option 2B servicing population is 3,062.

3.5 Future Water Demand

3.5.1 Water Supply and Treatment

Based on the 30-year population projections for Option B, the Masterplan established that the water supply and treatment capacity must be expanded from the current 995 m^3/d MDD to 2,300 m^3/d MDD, assuming average per capita demand of 350 L/c/d and a maximum day factor of 2.0.

3.5.2 Water Storage

The Masterplan determined a storage requirement of 1,500 m^3 (in addition to the 230m^3 available at the WTP).

3.5.3 Water Distribution

3.5.3.1 Summary of Masterplan Recommendations

The recommendations of the Masterplan were as follows:

> "Upgrades to the existing watermains and an expansion of the infrastructure will also be required to service existing and future development.
>
> Generally, the water distribution system is expected to consist of trunk watermains from the Glen Walter WTP to the elevated storage tank, and along the major roadways (County Road 2 & Purcell Road) as required to provide sufficient domestic and firefighting flows from the elevated storage tank to areas located within the limit of the Glen Walter area, such as Area I (future development on Rae Road North) and Area F & M (Edgewater Subdivision). Smaller watermains would be installed within new and existing developments to provide servicing to all properties.
>
> The need for trunk watermains in Glen Walter's ultimate development area is exacerbated by cost inefficiencies related to installation of long watermain loops through areas not slated for development. For example, it may not be cost-efficient to construct a watermain loop between the east limit of Area C1 (Sapphire Hills) and the south limit of Area Q if development does not occur alongside the watermain loop. This loop would however be beneficial to provide system redundancy and possibly decrease the diameter of trunk watermains.
>
> A more detailed analysis consisting of water modeling of the entire collection system would be needed to review the benefits of loops in conjunction with alternative locations for the elevated storage tank.
>
> Upgrades to the pumps at the Glen Walter WTP would also be required to supply the necessary flows from the Glen Walter WTP to the elevated storage tank."

3.5.3.2 Additional Recommendations Following Water Model Update

A re-analysis of the Bentley WaterGEMS hydraulic model prepared by WSP in their 2018 report, and on which is based EVB's 2022 Masterplan's Option 2B – Expansion to Expanded Service Area (New Development), resulted in the following specific additional recommendations:

- Provide a 52m high, 1,600 m^3 water tower (WT) in the area.

- Provide improvements to the existing distribution system watermain as shown in Figure 4 and Table 2 (the water tower can be connected to the distribution system via the extended Glen Walter Park Road and Lana Drive watermains).

Figure 4: Existing Water System Infrastructure with Improvements

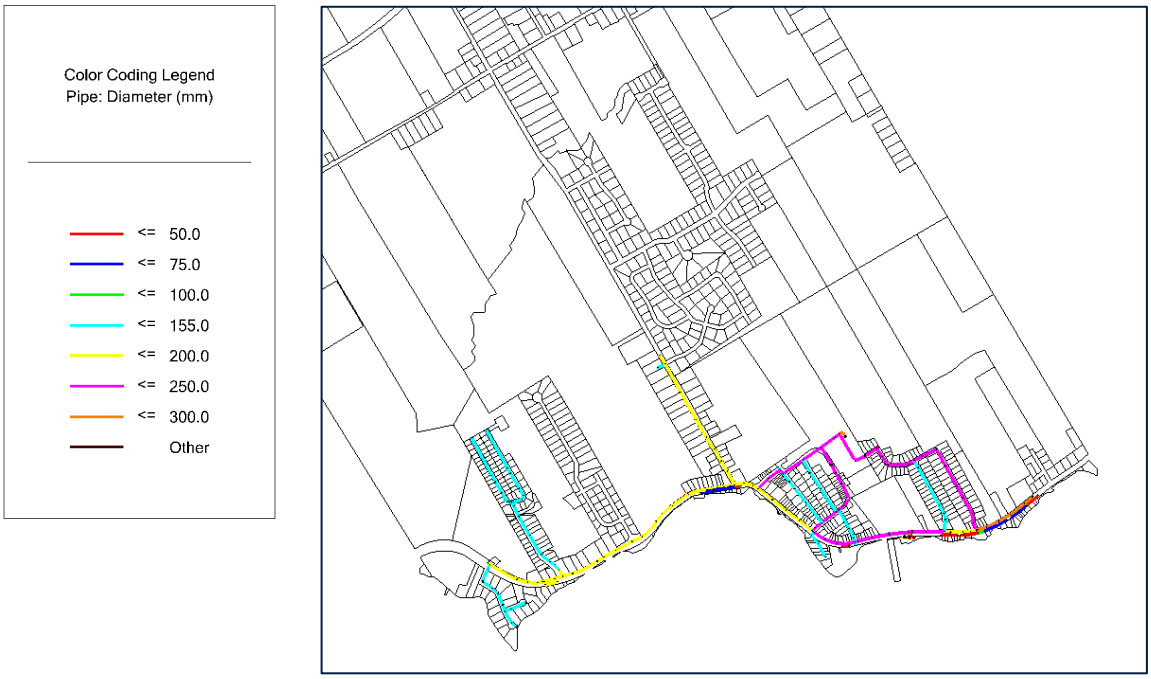


Table 2: Phasing of Watermain Improvements

Street	From	To	Diameter (mm)	Length (m)	Phasing
Lana Dr.	Existing 250mm stub	Glen Walter Park Rd, 104m east of Kilkenny Cres.	250	211	Immediate
Lana Dr.	Page Dr	Riverview Dr.	Twin existing 150mm or replace with 250mm	126	Immediate
Lana Dr	Riverview Dr	Existing 250mm on Lana Dr.	Twin existing 150mm or replace with 250mm	236	Immediate
Glen Walter Park Rd.*	County Road 2	Bray St	Twin existing 150mm or replace with 250mm	147	Future
Bray St.*	Glen Walter Park Rd	Glen Walter Park Rd	Twin existing 150mm or	26	Future

Street	From	To	Diameter (mm)	Length (m)	Phasing
			replace with 250mm		
Glen Walter Park Rd*	Bray St.	Lawrence St	Twin existing 150mm or replace with 250mm	122	Future
Glen Walter Park Rd*	Lawrence St	Kilkenny Cres	Twin existing 150mm or replace with 250mm	111	Future
Glen Walter Park Rd	Kilkenny Cres	104m east of Kilkenny Cres	Twin existing 150mm or replace with 250mm	104	Immediate
Glen Walter Park Rd	104m east of Kilkenny Cres	East on Glen Walter Park Rd, then south to Elevated Tank site	300	47	Immediate
Kilkenny Cres	208 south of Glen Walter Park Rd	Glen Walter Park Rd	Twin existing 150mm or replace with 250mm	208	Immediate
Place St. Laurent	Phase 6 looping	St. Laurent Blvd to Yacht Blvd	150	345	Near-term (by Developer)
St Laurent Blvd to Sutherland Ave Looping	St Laurent Blvd	Sutherland Ave	150	291	Future

*For future conditions to the north (Sapphire Court, Coral Dr. East and Ruby Drive), with an expanded WTP in its current location, the model indicates that Fire Flow of 38 L/s at 140 kPa cannot be achieved without the upsizing of the existing watermain on Glen Walter Park Road. This is marginal at 36 L/s yet still deficient. However, it is recommended that the portion of watermain upsizing identified on Glen Walter Park Road between County Road 2 and Kilkenny Crescent be deferred until servicing of the Sapphire Court, Coral Dr. East and Ruby Drive area is imminent and/or the Municipal Class Environmental Assessment for the Water Treatment Plant is completed. At that time, water distribution system dynamics can be reassessed and appropriate design considerations be made.

Either increase the Glen Walter WTP capacity to 2,300 m^3/d MDD (including adding a third high-lift pump or replacing the two existing high-lift pumps with larger pumps) OR decommission the Glen Walter WTP and negotiate supply of 2,300 m^3/d MDD from the City of Cornwall via a connection at County Road 2 and Boundary Road. The Schedule C Class Environmental Assessment now underway in parallel with this Class EA to determine a preferred solution for expanding the Glen Walter water supply is considering both options. The water model update confirms that either supply option can be accommodated with the same proposed water tower and watermain improvements. All aspects of the water supply expansion will be covered under that Schedule C Class EA; therefore, consideration of increasing the high-lift pump capacity at

the existing Glen Walter WTP is no longer necessary under this Schedule B Class EA. However, the existing high-lift pumps have reached the end of their life and need to be replaced with same-capacity pumps (like for like).

The summary of the updated hydraulic model analysis in included in Appendix C.

3.5.4 Updated Water Storage

The MECP guidelines recommend storage capacity based on the following formula:

Equation 1: Storage Capacity Equation

$$\text{Storage} = A + B + C$$

Where,

A = Fire Storage

B = Equalization Storage – 25% of MDD

C = Emergency Storage – 25% of (A + B)

3.5.4.1 Updated Fire Storage

Fire protection is a municipal responsibility and there are several means for determining the requirements, including methods outlined in the Fire Underwriters Survey and Ontario Building Code. The municipality may also choose to forgo fire protection by way of the drinking-water distribution system altogether.

Historically, small municipalities in Ontario have used the Ministry MECP guidelines to calculate fire flows and storage for the residential population. Using this method and assuming a 2051 population of 3,062, the residential fire flow would be 111 L/s for 2 hours, representing fire storage (A) of 799 m^3. Details as to the updated water storage calculations can be found in Appendix C.

It is important to also consider any fire flow requirements for institutional/commercial/industrial (ICI) users, which includes users such as schools, shopping plazas, etc. The fire flow and associated storage requirements could exceed the general fire flows and storage calculated by population; however, at its discretion, procedures can be implemented by the municipality to provide additional fire flow, when necessary, via other means.

The Township of South Glengarry Municipal Standards (2009) requires that all water distribution system design conform to MECP guidelines. Due to its proximity to the St. Lawrence River, additional fire fighting requirements for ICI users (such as the Al-Rashid Islamic Institute) can be supplied by the use of pumper trucks, which have a plentiful supply of water nearby.

3.5.4.2 Updated Total Storage

Using the MECP formula for storage capacity results in a total required storage (A+B+C) of 1,729 m^3, effectively the same as the 1,710 m^3 storage capacity identified in the EVB report for Option 2B. A new 1,600m^3 elevated storage tank will be provided. This is more than sufficient if the additional 230 m^3 storage at the WTP remains available. If the WTP storage is no longer available, the slight storage deficiency can be accommodated through emergency storage and/or supplemental fire fighting (e.g. pumper trucks).

4 Phase 2 – Alternative Solutions

4.1 Water Storage Alternatives

The Masterplan already established the provision of elevated storage to provide sustainable water storage for future population growth and reliably provide fire flows with adequate system pressure to the existing population of Glen Walter.

4.1.1 Elevated Storage (Water Tower)

Elevated tanks provide water at or above the required system pressure. Elevated tanks generally have higher upfront capital costs; however, no pumping is necessary, reducing annual operation and maintenance costs. There are several types of elevated storage:

- Spheroid
- Multi-column
- Composite
- Composite glass-lined

Figure 5: Types of Elevated Storage

Spheroid	Multi-Column	Composite	Composite Glass-Lined

4.1.1.1 Spheroid

Spheroid elevated storage consists of an elevated spherical water storage tank supported by a single circular support pedestal with a flared conical base. They have a relatively small base and the design allows for a reduced surface area when compared to other elevated storage options. However, their small support pedestal does not allow for interior access. In addition, the parameters under which spheroid water towers are generally more cost-effective are limited and therefore there are currently no local manufacturers of this type of elevated storage. Therefore, spheroid elevated storage has been eliminated as a viable option.

4.1.1.2 Multi-Column

Multi-column elevated storage is a traditional design that has been used for over 100 years. It consists of an elevated water storage tank that is supported by a series of support columns and cross braces. This type of storage has no interior to the support braces resulting in exterior

access to the tower, which most new designs have eliminated. While capital costs are still competitive for elevated storage less than 4,000 m^3, the aesthetics, safety issues associated with exterior access and extra maintenance requirements and costs involved with scheduled recoating of the steel support columns in addition to the steel reservoir make this option less desirable than the composite and composite glass-lined alternatives. Therefore, multi-column storage has been eliminated as a viable option.

4.1.1.3 Composite

Composite elevated water storage is a more modern design, comprised of an elevated water storage tank supported by a large diameter steel-reinforced concrete support tower that extends vertically from a steel-reinforced concrete foundation. This style of elevated storage is the most common and typically economical because the design utilizes the valuable strength characteristics of each material. Maintenance costs are also reduced when compared to other traditional types of storage because only the tank portion of the tower requires coating. This style of tank has a life expectancy of 80 years.

Composite elevated tanks require repainting of both the inside and outside of the tank on a 20 year basis. At 20 years and 60 years no paint removal is necessary. The coating is placed on top of the existing coating of the tank. At 40 years a full removal and recoating of the tank is required. The costs of repainting are high; however, with new technologies and coating materials the cost of repainting has been reduced in recent years. Some cost reduction techniques include using newer coatings that are easier to remove and non-scafolding techniques during recoating.

This was considered a viable option and was short-listed for further evaluation.

4.1.1.4 Composite Glass-Lined

The newest type of elevated storage that is being used for municipal potable water storage is a glass-lined bolted tank. This type of tank is composed of a bolted steel tank with factory applied glass-fused-to-steel coating. This type of construction has the least maintenance because it never requires repainting and requires minimal upkeep over its service life (replacement of cathode protection bars). If the tank does become damaged individual panels can be replaced which additionally reduces maintenance costs. This type of tank has a reduced construction time because the tank is constructed of factory-coated panels that do not require on site welding. A top-down construction approach of the tank allows for it to be constructed in remote and environmentally sensitive areas.

Glass-lined elevated water tanks are a newer form of construction. There are currently no specific standards developed for this style of elevated tank. A combination of standards is being used which may not completely cover all aspects of the product. Since these tanks are a newer form of construction the estimated life expectancy varies between different manufacturers and there is not a sufficient database to establish an industry-wide standard. In general research suggests that the bolted design reduces the life span of this type of elevated tank to approximately 40 years. At 40 years, the glass lined panels can be replaced on the same pedestal which would result in a large cost to be incurred by the municipality. This style of tank is also more susceptible to damage caused by seismic activity, wind and ice due to the bolted construction when compared to welded tanks. Glass lined bolted tanks are accessed from the outside which creates additional risks when compared to traditional composite tanks that are accessed through the interior of the pedestal. The structural design of a glass lined elevated tank does not allow for interior access.

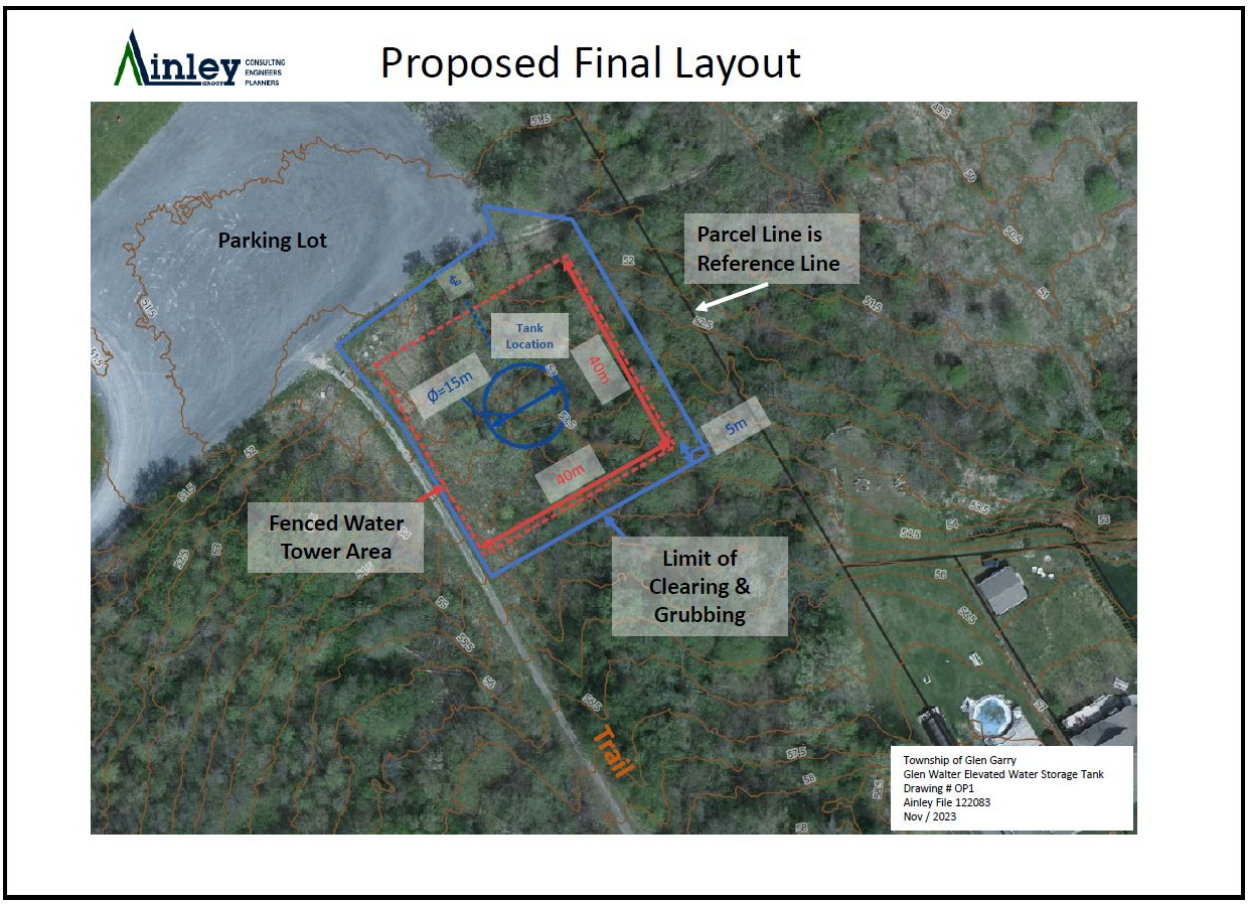
Composite elevated glass lined tanks are similar to traditional composite elevated tanks with a steel-reinforced concrete support tower and foundation; however, instead of a traditional steel water storage tank; a glass-lined tank is used. Due to the materials used in this style of construction, glass lined elevated tank panels are less versatile than traditional welded panels, resulting in the need for a larger diameter pedestal. Most installations also require a "double-column" for support due to the wider base of the steel tank.

This was considered a viable option and was short-listed for further evaluation.

4.2 Site

It is estimated that up to 0.5 ha site is required to accommodate an elevated water storage tank. The Township of South Glengarry owns an 18.8 ha parcel of land at 6618 Glen Walter Park Road that was selected in the Masterplan to be where the new water storage would be located. The proposed location on the site is shown on Figure 6.

Figure 6: Proposed Water Tower Site at 6618 Glen Walter Park Road



4.3 Short List of Alternative Solutions

4.3.1 Short-Listed Alternative Solutions

The short-listed alternative solutions carried forward for further evaluation were:

- Alternative 1 – Composite Elevated Storage

- Alternative 2 – Composite Glass-Lined Elevated Storage

Regardless of the type of elevated storage, the water storage will be located at the site determined in the Masterplan, 6618 Glen Walter Park Road (Assessment Parcel 010100601072500).

4.3.2 Elevated Storage Screening

Both alternatives offer unique design characteristics able to provide the necessary storage. Alternative 1 provides the current, most frequently implemented option while Alternative 2 provides a more recent product which potentially eliminates the need to periodically inspect and restore the protective coating.

4.3.2.1 Elevated Water Storage Alternatives Cost Comparison

Capital costs and operation and maintenance costs were estimated over an 80-year life span of both elevated storage tank alternatives. An 80-year life span was used in the analysis as it represents the longest lifespan of the two alternatives. Estimates are based on quotes provided by industry manufacturers of composite welded and glass lined tanks. Additional operation and maintenance costs not included by the manufacturers were calculated based on similar, recently completed projects. A summary of the analysis is provided in Table 3.

Table 3: Cost Comparison of Elevated Water Storage Alternatives

	Alternative 1	Alternative 2
Capital Cost [1, 2]	$6,750,000	$7,150,000
Operation and Maintenance Costs [2]	$1,050,000	$1,100,000
Major Maintenance Costs [2]	$4,800,000	$4,950,000
Total Cost	**$12,600,000**	**$13,200,000**

1. The capital cost includes just the cost of the water tower. Additional costs may result if additional features (not included in the price) are included with the water tower construction.
2. Costs were provided by Landmark Structures. The quotes provided are included in Appendix D.

The cost analysis was prepared for comparative purposes. The capital costs are in 2023 dollars and represent the upfront costs including tank construction and engineering costs. The annual operation and maintenance costs represent the totalized yearly costs over the next 80 years ($13,000 - $14,000 per year) including hydro, diesel generator operation, site maintenance, equipment maintenance, labour and trucks. Each of the elevated facilities will result in the same general maintenance costs as the designs of each tank result in the same upkeep requirements. Major maintenance cost represents maintenance that is not completed yearly and includes repainting every 20 years for the welded composite tank or replacement of the glass lined panels every 40 years for the glass lined tanks. Operation and maintenance costs, including major maintenance costs, are in 2023 dollars with no allowance included for interest and inflation.

4.3.2.2 Evaluation of Elevated Water Storage Alternatives

To assess the two alternatives a criteria assessment table was developed rating each alternative as best, moderate or worst for the various criteria. Numbers associated with each rating are: Worst = 1, Moderate = 2 and Best = 3. The total value was obtained by summing all

of the criteria ratings shown in Table 3. The criteria incorporate the advantages and disadvantages of each type of elevated storage as well as the costs associated with each of the alternatives.

Table 4: Evaluation of Elevated Water Storage Alternatives

Criteria	Alternative 1 Composite	Alternative 2 Composite Glass-lined
Land Requirement	3	3
Construction Time	2	3
Maintenance	2	3
Aesthetics	3	2
Opportunity to Create Landmark	3	2
Security of Supply	3	3
Water Quality [1]	6	6
Access to Storage [1]	6	2
Capital Cost [1]	6	6
Long Term O&M/Lifecycle Cost	3	3
Normal O&M Cost	3	3
Total	**40**	**37**

1. Double weighting is applied because these criteria are considered of higher importance resulting in ratings of: Worst = 2, Moderate = 4 and Best = 6.

From the evaluation completed Alternative 1 emerged as the best alternative with the highest score of 40. The cost evaluations have been adjusted slightly from the May 16, 2023 PIC for both alternatives based on more refined estimates provided by Landmark since the PIC.

4.4 Recommended Solution, Impacts and Mitigating Measures

4.4.1 Recommended Solution

The recommended solution is construction of a 1,600 m^3 52m high elevated storage tank at 6618 Glen Walter Park Road as shown on Figure 6. The top water level in the tower will be 51m above the ground and the tower will occupy a site footprint of approximately 40m by 40m.

4.4.2 Recommended Solution Site Assessments

Site specific assessments were completed to determine if the preferred site was viable for the proposed works.

4.4.2.1 Cultural Heritage and Archaeological Assessments

The following Ministry of Citizenship and Multiculturism checklists were completed for the preferred water tower site:

- Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes
- Criteria for Evaluating Marine Archaeological Potential
- Criteria for Evaluating Archaeological Potential

The first two checklists identified that the site does not exhibit any potential for built heritage resources or cultural heritage landscapes, nor does it exhibit any marine archaeological potential. The Criteria for Evaluating Archaeological Potential checklist flagged the site as requiring archaeological assessment, due to its proximity (<300 m) to a water source. A comprehensive Stage 1/2 Archaeological Assessment was completed by Central Archaeology Group Inc. (CAGI) for the study area, which includes the preferred site. The assessment consisted of reviewing a variety of documents including historic settlement maps, property geography, history, land titles and ownership records, previous archaeological fieldwork, and current land condition to determine the archaeological potential of the Study Area.

The Stage 1 review identified elevated potential for the recovery of archaeologically significant materials within the study area. The physical attributes of the project area suggest that it has the potential to harbour cultural materials related to pre-and post-contact First Nations and Euro-Canadian settlement in the region. A subsequent Stage 2 Archaeological Assessment was identified as necessary for all undisturbed land in the footprint of the preferred site.

A property survey involving test pits was conducted as the project area was situated within a secondary growth treelot. No cultural materials were recovered during the assessment.

Copies of the completed checklists and the archaeological assessment report can be found in Appendix E.

4.4.2.2 Natural Environment

A Natural Heritage Study (NHS) as appended in Appendix F was completed to inventory and assess all natural heritage features within the study area, including a review for Species at Risk (SAR). The scope of work for the NHS included the following items:

- Field investigations by Ainley Group to review natural heritage features including:
  - Surface water features.
  - SAR.
  - Migratory and breeding birds.
  - Terrestrial inventory of vegetation, including occurrence of Butternut trees.
- Documentation of natural heritage inventories, identification of potential constraints, and
- Identification of potential impacts resulting from the water tower development and recommendation of mitigation measures that should be implemented to minimize these potential impacts.

The following field survey protocols were completed to assess and document the presence of vegetative, wildlife, migratory and breeding birds within the study area. During the field survey, emphasis was placed on SAR with the potential to occur within the study area. Field surveys for respective ecological features were completed in accordance with the following methodology:

4.4.2.2.1 Vegetation

Vegetation field survey for species composition was completed within the study area on May 28, June 5, and September 6, 2023.

4.4.2.2.2 Migratory and Breeding Birds

Surveys of breeding birds were completed according to the protocol developed by the *Ontario Breeding Bird Atlas* (OBBA, 2001), including both point counts and incidental observations. The following is a general list of the guidelines that were followed:

- Point counts undertaken for five-minute intervals.
- Representative locations in different habitats were selected for point count surveys.
- Point count locations were established so as to prevent duplicate counts.
- Incidental site observations were also recorded.
- At least two site visits were completed between May 24 and July 10, with all initial visits completed by the third week in June.
- Surveys were completed on May 28, and June 5, 2023.

Any breeding bird observations were noted along with locational information of the sighting.

4.4.2.2.3 Wildlife

Observations of wildlife (turtles, amphibians, birds, snakes, mammals) were recorded during the field visits on May 28, June 5, and September 6, 2023. Any wildlife observations (tracks, scat, burrows, etc.) were noted along with locational information of the sighting. Specific attention was given to the evaluation for the presence of SAR during the field visits, including SAR turtles, birds, and vegetation.

Based on the review of background information, and field visits completed in May, June, and September, 2023, natural heritage features were identified within proximity to the Glen Walter Water Tower study area including unevaluated wetlands and potential habitat for SAR. Five (5) Endangered or Threatened Species at Risk; Little Brown Bat, Northern Myotis, Tri-colored Bat, Eastern Small-footed Myotis, and Butternut were identified with potential to be impacted within the project limits. Potential impacts to these species and their core habitat are anticipated to be low provided appropriate mitigation measures are employed.

An unevaluated wetland is also present on the subject property. While this feature is currently not regulated by Raisin Region Conservation Authority, mitigation measures (i.e. 15 m vegetated setback) are recommended for incorporation in the water tower design. Mitigation measures for the protection of natural heritage features, including those mentioned above, are described in detail in the Natural Heritage Report, provided in Appendix F.

4.4.2.3 Subsurface Soils

Subsurface conditions for the preferred site and surrounding area have been established based on desktop review of available information, and these are found in Appendix G. A site-specific geotechnical and/or hydrogeological investigation shall be completed during detailed design to confirm subsurface conditions.

Well records in the immediate area of the proposed water tower were reviewed to assess the anticipated soil conditions and to comment on the suitability of the subsoils regarding a potential

building site for the proposed water tower. Four well records were available for review and, based upon these, anticipated soil conditions in the region of the proposed site are as follows:

- Sandy Glacial Till, (Ranging from Surface to 6.0 m) over
- Gravelly Glacial Till (Ranging from 3.6 m, 17.4 m, although Well 2300020 indicated 33.6 m), over
- Limestone Bedrock

The materials were generally found to be consistent with that presented within reports by Chapmad and Putnam (1984) and Ontario Geological Survey (2003).

4.4.3 Summary of Impacts and Mitigation Measures

The environmental impacts and mitigation measures for the recommended solution are summarized in Table 5. Copies of the completed Archaeological and Cultural Heritage Environment Checklists can be found in Appendix E.

Table 5: Environmental Impact and Mitigation Measures for Recommended Solution

Criteria	Potential Impact	Mitigation
Land Use Planning		
Existing Land Use	The water tower will be located in land currently designated Institutional (IN).	No mitigation required. The current land use zoning allows construction of a water tower
Proposed/Potential Land Use	There is potential to rezone some of the existing property as residential; the water tower site will take up some of this land.	The site size will be limited to that necessary to construct, access and maintain the water tower.
Natural Environment		
Surface Water/ Drainage	Drainage issues are not anticipated given the site topography.	Site will be designed to drain satisfactorily.
Groundwater	Potential for dewatering during construction	Geotechnical/hydrogeological investigation to confirm dewatering requirement
Ground Stability	Potential for unstable subgrade to support water tower structure	Geotechnical investigation to confirm foundation requirements
Natural Heritage, Species Protection, Trees/Habitat	▪ Water tower construction, may result in the release of sediment into the adjacent natural features, particularly during rain events. ▪ Construction activities may result in contamination of adjacent natural features due to fuel spillage. ▪ Construction activities will result in the removal of vegetation for	▪ During construction, silt fence will be placed to reduce the potential for sediment transport. ▪ During construction refueling will be carried out in a controlled manner, at least 30m from a watercourse. In addition, an emergency spill response kit will be on site at all times. In the event that a spill occurs, proper containment, clean up and reporting, in accordance with

Criteria	Potential Impact	Mitigation
	the water tower and ancillary work. ▪ Construction activities and vegetation removal can potentially impact wildlife and bird migration, including the following identified Species at Risk; Little Brown Bat, Northern Myotis, Tri-colored Bat, Eastern Small-footed Myotis, and Butternut trees (1 butternut tree has been identified as likely to be harmed/killed).	provincial requirements, will be undertaken. ▪ Vegetation removal will be limited to the extent possible. Only trees and other vegetation that require clearing to accommodate the water tower (and any related ancillaries) will be removed. Appropriate tree felling and grubbing procedures will be utilized to minimize impacts on surrounding vegetation. A vegetated buffer of 15m will be provided. ▪ Best efforts will be employed to avoid vegetation removal from April 15 to September 30 (covers both the migratory bird breeding period and the active season for bats). Registration of the identified butternut tree with MNRF has been completed; compensation plantings will be undertaken.
Social Environment		
Residential Impact	Improves pressures and security and safety to existing serviced residents; allows for removal of private water systems for currently un-serviced existing homes, improving enjoyment of property.	Positive impact - no mitigation required.
Traffic Impact	There will be little impact on traffic. Township operators will need to attend the tower for maintenance.	Negligible impact - no mitigation required.
Visibility of Water Tower	The water tower will be a visible feature to residents.	The water tower will be designed to be an attractive landmark for both residents and visitors.
Archaeological and Cultural Heritage Environment		
Archaeological Impact	Potential for impact on archaeological features.	▪ A Marine Archeological Screening Process was completed, which determined there is little to no potential for marine archaeological impact – no mitigation required. ▪ An Archaeological Screening Process (ASP), followed by a

Criteria	Potential Impact	Mitigation
		Stage 1 & 2 Archaeological Assessment was completed – no cultural materials were recovered; therefore, there is little to no potential for archaeological impact. Nevertheless, in the event that any archaeological remains are encountered during subsequent construction and development activities, the excavator will promptly notify the consultant, archaeologist, approval authority, and the Cultural Programs Unit of the MCM.
Cultural Heritage Impact	Potential for impact on cultural/ heritage features	A Cultural Heritage Screening was completed, which determined there is little to no potential for cultural/heritage impact
Supporting County/Township Policies	Will improve/expand capacity to accommodate growth which is required to optimize the use of public services and infrastructure.	Positive impact – no mitigation required.
Technical Considerations		
Site Servicing (Power, Water)	The water tower will require power and connections to the water distribution system.	The necessary power and connections will be provided.
Adequate Size	Will not fully address storage requirements if undersized; potential water quality and staleness issues if too large.	▪ The water tower will be sized for the design population based on a combination of existing demands and Ministry guidelines, and will be operated such that there is sufficient turnover to prevent staleness. ▪ Existing procedures for fire protection will remain in place as back-up in case a fire event exceeds the capacity.
Tank Hydraulics Performance	▪ In conjunction with system pumping and water distribution improvements (larger watermain and/or looping), provides a long-term plan for reliable water supply including improved pressures and fire-fighting flows	Positive impact – no mitigation required.

Criteria	Potential Impact	Mitigation
	for existing and future developments. ▪ The water tower will be 48 m high; at this height the tank can fill via a connection to the distribution system (instead of a dedicated transmission main from the WTP) while making the water supply to the service population more reliable.	
Access to Site	Access to the water tower site must be provided.	The water tower will be located near the parking lot for the park, reducing the extent of access road required.
Economic Considerations		
Cost	▪ Capital = $6,750,000 (water tower) ▪ O&M = $1,050,000 (over 80-year life) ▪ Major Maintenance = $4,800,000 (over 80-year life)	The Township received funding $3,645,968 under the Green Stream of the Investing in Canada Infrastructure Program in support of the capital cost of this project.
Commercial/ Industrial Impact	Improved system pressures and water quality (reduction of dead ends)	Positive impact – no mitigation required.

5 Climate Change

5.1 General

As per the MECP guidance document referenced in Section 2.6, the project's potential impacts to climate change and how climate change may impact the project were considered. Climate change concerns generally relate to the increased concentration of greenhouse gases in the atmosphere, which can result in a rise in the global mean surface temperature. Increased temperatures worldwide are creating changes in climate that is resulting in extreme weather events.

There are two approaches to address climate change. These include reducing a project's impact on climate change (climate change mitigation) and increasing the local ecosystem's resilience to climate change (climate change adaptation). This section of the report will discuss the aforementioned aspects in relation to this project utilizing a qualitative approach.

5.2 Potential for Project to Impact Climate Change

The proposed undertaking is considered to be a small-scale project with regard to the construction footprint. There will be a marginal increase in hydroelectric power requirements to operate equipment but the related impacts to climate change are considered to be minimal. In addition, chemicals (for re-chlorination, dichlorination) will require occasional truck deliveries to the site. However, the impact to climate change is, again, considered to be minimal.

5.3 Potential for Climate Change to Impact this Project

Climate change has the potential to result in increased storm events (number and intensity) that can lead to issues accessing the water tower for routine operation and maintenance and potentially increased risk of damage to the facility. Current standards take into consideration the impacts of climate change and the project will be designed and constructed to these standards.

6 Permits and Approvals

During detailed design permits and approvals will need to be acquired from the following agencies:

- **Ministry of Environment, Conservation and Parks (MECP):** A Permit to Take Water under the Ontario Water Resources Act (OWRA) may be required. A Permit to Take Water is required for any water takings that exceed 50,000 Litres per day, except for certain water taking activities that have been prescribed by the Water Taking EASR Regulation – O. Reg. 63/16. These prescribed water-taking activities require registration in the Environmental Activity and Sector Registry (EASR) instead of a Permit to Take Water. The geotechnical/ hydrogeological investigation will confirm whether or not construction dewatering is required.
- **Ministry of Environment, Conservation and Parks (MECP):** Following detailed design the Drinking Water Works Permit (DWWP) will need to be amended to include the water tower.
- **Township of Glengarry:** A building permit and site plan approval will need to be acquired for construction of the project.

7 Stakeholder Consultation

Consultation is a key component of the MCEA process. In developing the Masterplan comprehensive consultation was carried out and helped inform general aspects of this project. Building upon the stakeholder consultation during the Masterplan, for this project additional Public Information Centre (PIC) and Notice of Study Completion were included prior to design. The PIC allowed the extra level of detail about the new elevated water storage tank to be presented to stakeholders.

The stakeholders were contacted two times with different notices during this project:

- Notice of Public Information Centre (PIC) issued on May 3, 2023; and
- Notice of Study Completion on April 17, 2024.

The review agencies that were contacted directly are shown in Table 5.

Table 6: List of Review Agencies Contacted During MCEA Process

Category	Agency
Provincial and Federal Agencies	▪ Indigenous Affairs and Northern Development ▪ Ministry of Agriculture Food and Rural Affairs ▪ Indigenous Services Canada Ontario Region ▪ Ministry of Environment, Conservation & Parks ▪ Impact Assessment Agency of Canada ▪ Ministry of Municipal Affairs and Housing ▪ Indigenous Affairs/Indigenous Relations Branch

Category	Agency
	▪ Ministry of Natural Resources and Forestry ▪ Ministry of Citizenship & Multiculturalism ▪ Infrastructure Canada
Municipalities and Services	▪ Eastern Ontario Health Unit ▪ Raisin Region Conservation Authority ▪ United Counties of Stormont, Dundas and Glengarry ▪ Ontario Power Corporation
Indigenous Communities and Agencies	▪ Algonquin Anishinabeg Nation ▪ Metis Nation of Ontario Region ▪ Mohawk Council of Akwesasne

7.1 Masterplan Consultation

During the Masterplan process the public, review agencies, and Indigenous communities were consulted on three occasions:

- PIC #1 on June 24, 2020.
- PIC #2 on September 28, 2021.
- Notice of Completion on November 24, 2021.

This consultation documentation can be found in the Masterplan "Appendix C" documentation, attached in this report as Appendix A.

7.2 Glen Walter New Water Tower Additional Consultation

The PIC was held on May 16, 2023 to allow additional public and agency consultation about details of the new elevated water tank. The PIC was held from 2:00 – 4:00 pm and 5:30 – 7:30 pm at the Glen Walter Fire Station located at 6650 Bray Street. The public were informed of this PIC by a notice published two consecutive weeks in the Glengarry News and Seaway Valley News during the first and second weeks of May, 2023. In addition, the Township distributed the notice on May 8, 2023 electronically to 195 emails registered to the municipality's direct notification system within the Glen Walter Water/Wastewater system zone. The review agencies and Indigenous stakeholders were directly sent copies of the Notice of Public Information Centre during the first week of May, 2023.

The information provided at this PIC included a summary of the project background, an overview of the MCEA process, identification and evaluation of the project alternatives, and the recommended solution. There were 31 attendees. The PIC gave stakeholders an opportunity to get questions and concerns answered and allowed the project team to further understand the community needs with respect to this project. The PIC advertisement, attendance sign in sheet and PIC boards are attached in Appendix H.

Comments were received starting from May 3, 2023 until May 30, 2023. All of the comments and responses were incorporated into the report. A summary of the comments and responses, along with copies of the full comment sheets and responses, are also attached in Appendix H.

7.3 Study Completion Consultation

To inform the public of the study completion, a notice was published in the Standard Freeholder and Cornwall Seaway Valley News during the third and fourth weeks of April, 2024. The Notice was also sent directly to residents that previously indicated they would like to stay informed throughout the project. The review agencies and Indigenous communities contacted for this project were also sent the notice to inform them about the study completion. A copy of the notice is attached as Appendix I.

Following the notification of the study completion the Project File document was made available to the public for a 30-day review period. During the review period the public, review agencies and Aboriginal communities were encouraged to review the document and advise with the study team of any outstanding issues.

8 Selection of Preferred Solution

Following the Notice of Completion of the Project File Report and subsequent feedback from the public, review agencies and Indigenous communities, it is anticipated that the Recommended Solution will be confirmed as the Preferred Solution.

9 Summary of Work

The work scheduled to be completed in the first phase of this project includes:

- Construction of a 52m high, 1,600 m^3 composite elevated tank at 6618 Glen Walter Park Road
- Replacement of high-lift pumps at water treatment plant
- 932 metres of new watermain / watermain replacement
  - Lana Drive from Page Drive to elevated tank site
  - Glen Walter Park Road from Kilkenny Crescent to elevated tank site
  - 208m south of Kilkenny Crescent to Glen Walter Park Road

The following represents scheduling of the watermain improvements needed to service the 2051 population:

Table 7: Phasing of Watermain Improvements

Street	From	To	Diameter (mm)	Length (m)	Phasing
Lana Dr.	Existing 250mm stub	Glen Walter Park Rd, 104m east of Kilkenny Cres.	250	211	Immediate
Lana Dr.	Page Dr	Riverview Dr.	Twin existing 150mm or replace with 250mm	126	Immediate

Street	From	To	Diameter (mm)	Length (m)	Phasing
Lana Dr	Riverview Dr	Existing 250mm on Lana Dr.	Twin existing 150mm or replace with 250mm	236	Immediate
Glen Walter Park Rd.*	County Road 2	Bray St	Twin existing 150mm or replace with 250mm	147	Future
Bray St.*	Glen Walter Park Rd	Glen Walter Park Rd	Twin existing 150mm or replace with 250mm	26	Future
Glen Walter Park Rd*	Bray St.	Lawrence St	Twin existing 150mm or replace with 250mm	122	Future
Glen Walter Park Rd*	Lawrence St	Kilkenny Cres	Twin existing 150mm or replace with 250mm	111	Future
Glen Walter Park Rd	Kilkenny Cres	104m east of Kilkenny Cres	Twin existing 150mm or replace with 250mm	104	Immediate
Glen Walter Park Rd	104m east of Kilkenny Cres	East on Glen Walter Park Rd, then south to Elevated Tank site	300	47	Immediate
Kilkenny Cres	208 south of Glen Walter Park Rd	Glen Walter Park Rd	Twin existing 150mm or replace with 250mm	208	Immediate
Place St. Laurent	Phase 6 looping	St. Laurent Blvd to Yacht Blvd	150	345	Near-term (by Developer)
St Laurent Blvd to Sutherland Ave Looping	St Laurent Blvd	Sutherland Ave	150	291	Future

*For future conditions to the north (Sapphire Court, Coral Dr. East and Ruby Drive), with an expanded WTP in its current location, the model indicates that Fire Flow of 38 L/s at 140 kPa cannot be achieved without the upsizing of the existing watermain on Glen Walter Park Road. This is marginal at 36 L/s yet still deficient. However, it is recommended that the portion of watermain upsizing identified on Glen Walter Park Road between County Road 2 and Kilkenny Crescent be deferred until servicing of the Sapphire Court, Coral Dr. East and Ruby Drive area is imminent and/or the Municipal Class Environmental Assessment for the Water Treatment Plant is completed. At that time, water distribution system dynamics can be reassessed and appropriate design considerations be made.