# Appendix A

## Master Plan Reports

Glen Walter Area Water and Wastewater Master Servicing Plan
(EVB October 1, 2022)

Glen Walter Area Water & Wastewater Servicing Master Plan Update Draft Report
(WSP September 2018)

FINAL

# Glen Walter Area Water and Wastewater Master Servicing Plan

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Prepared for the Township of South Glengarry

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# 1 Introduction

## 1.1 Purpose

The Township of South Glengarry (Township) had retained the services of WSP Canada Inc. (WSP) to undertake a Water and Wastewater Master Servicing Plan for the Glen Walter Area. WSP prepared a draft document but prior to initiating the public consultation process, the Township retained EVB Engineering to review the recommendations and complete the environmental assessment process in accordance with the Municipal Engineers Association Publication *Municipal Class Environmental Assessment*.

Although EVB Engineering's evaluation and recommendations differ from those made in the WSP report, many of the sections and supporting studies in WSP's report remain relevant. The relevant sections from WSP's report will be referenced in this document and the report completed by WSP can be found in Appendix B.

## 1.2 Glen Walter Area

For the purpose of this study, the Glen Walter Area is defined by 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

Schedule A6a from the United Counties of Stormont, Dundas and Glengarry (SD&G) Official Plan is provided in Appendix A which delineates the Glen Walter Area as well as the current urban settlement boundary for the Glen Walter Service Area.

## 1.3 Background Information

WSP's Report (Appendix B) contains Technical Memorandum No. 2: Growth Scenarios, which provides the following growth prediction.

*Table 1 – Growth Prediction*

| GROWTH SCENARIO | NUMBER OF LOTS SERVICED | PROJECTED SERVICE POPULATION |
|---|---|---|
| **Existing (Water/Wastewater)** | 339 / 321 | 746 / 667 |
| **Within 5 Years[1]** | 684 | 1,505 |
| **Within 10 Years** | 781 | 1,719 |
| **Within 20 Years** | 941 | 2,071 |

1 Included municipal servicing of Sutherland Subdivision, Sapphire Hills Subdivision and Sabourin Subdivision within the next five years.

WSP's memo provided that the growth forecast was in line with the forecast completed in the Glen Walter Water and Wastewater Servicing Master Plan (TSH 2008). The resultant growth rate for a 20-year period is approximately 2% per year.

### 1.4 Urban Settlement Area

The boundaries of the Urban Settlement Area for Glen Walter were modified during the 2018 Amendments to the Official Plan. The Urban Settlement Area can be found on Schedule A6a in the Official Plan and is provided in Appendix A.

### 1.5 Historic Growth Rate

Although the Official Plan does not indicate significant growth for the Glen Walter Area, over the past five years there have been approximately 6-10 building permits issued every year for homes within the municipal serviced area, representing a growth rate of 1% per year. This growth rate is hindered because of the available capacity in the Glen Walter Water and Wastewater Treatment Systems. Should additional municipal servicing capacity be made available, the number of building permits is expected to increase.

### 1.6 Boundary Road Industrial Park Servicing

The Township had been in negotiations with the City of Cornwall to provide municipal servicing from the City of Cornwall to the properties on the East side of Boundary Road, that are within the Township of South Glengarry. An analysis was completed that demonstrated that it was the most cost-effective solution to have these properties serviced for water and wastewater from City of Cornwall rather than extend services from the Glen Walter facilities.

The City of Cornwall had provided the Township with a draft Shared Services Agreement. When the property owners on Boundary were approached with the approximate cost for obtaining municipal services, there was an overwhelming response against carrying the project forward.

Once the feedback from the majority of the property owners was against the provision of municipal water and wastewater services, the pursuit of providing municipal services to this area was removed from the scope of this assignment.

# 2 Environmental Assessment Process

Refer to Appendix B, Section 2 of the WSP Report.

# 3 Literature Review

Refer to Appendix B, Section 3 of the WSP Report.

# 4 Existing Infrastructure

## 4.1 Glen Walter Drinking Water System

### 4.1.1 Glen Walter Water Treatment Plant (WTP)

As per the description in the WSP Report, Section 4.2.1, the Glen Walter 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. Source water from the St. Lawrence River flows by gravity into the low lift pumping station. Low lift pumps transfer raw water to a flocculation tank. An in-line mixer combines coagulant with the raw source water prior to entering the flocculation tank. Following flocculation, the water is conveyed to two (2) pressure dual-media filters that operate in parallel. The filtered water is then directed to two (2) pressurized granular activated carbon filters to remove constituents associated with taste and odour. Finally, the treated water is dosed with chlorine before entering a storage reservoir from where it is pumped via high lift pumps to the distribution system. The WTP Treatment process design details are provided in Table 2.

*Table 2 – Glen Walter WTP Process Details*

| Process Component | Parameter | Design Value |
|---|---|---|
| **Intake Pipe** | Diameter<br>Length | 300mm<br>390m |
| **Pre-Chlorination** | Type<br>Chlorine Capacity | Sodium Hypochlorite<br>2 kg/d |
| **Low Lift Pumping Station** | Well Dimensions<br># of Pumps<br>Capacity of Pumps | 4.5 m (L) x 2.0 m (W) x 3.9m (D)<br>2 (1 duty / 1 standby)<br>11.52 L/s at 31.6m TDH |
| **Coagulation** | Type<br># Metering Pumps<br>Type of Metering Pumps<br>Metering Pump Capacity | Aluminum Sulphate (PAS-8)<br>2 (1 duty / 1 standby)<br>Diaphragm<br>3.8 L/hr |
| **Flocculation** | # of Tanks<br>Dimensions | 1<br>2.7m dia. X 3.5m height |
| **Pressure Filtration** | Type<br>Quantity<br>Dimensions (ea) | Multi-media Filters<br>2 (in parallel)<br>1.8m dia. X 2.7m height |
| **Activated Carbon Filters** | Type<br># of Tanks<br>Dimensions | Granular Activated Carbon<br>2 (in series)<br>2.6m dia x 3.2m height |
| **Post Chlorination** | At Clearwell Inlet<br>Type<br>Chlorine Capacity<br>At High Lift Well<br>Type<br>Chlorine Capacity | <br>Sodium Hypochlorite<br>2 kg/d<br><br>Sodium Hypochlorite<br>2 kg/d |
| **Storage Reservoir** | # of Reservoirs<br>Dimensions | 2 (in series)<br>15.3m (L) x 12.2m (W) x 3.9m (D) (North Cell)<br>5.1m (L) x 12.2m (W) x 3.9m (D) (South Cell) |

| Process Component | Parameter | Design Value |
|---|---|---|
| | Total Capacity | 623 $m^3$ |
| **High Lift Pumps** | Pump Well Dimensions<br>Pump Type<br># of Pumps<br>Capacity of Pumps | 2.3m (L) x 7.2m (W) x 3.9m (D)<br>Vertical Turbine<br>2 (1 duty / 1 standby)<br>16.44 L/s |

### 4.1.2 Water Distribution System

As per the description in Section 4.2.2 of the WSP Report, 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. Figure 1 illustrates the existing Glen Walter Water Distribution System.

### 4.1.3 Glen Walter WTP Performance

The following table provides a summary of flows from the Glen Walter WTP for the period of 2016 through 2020.

*Table 3 – Historic Flows from the Glen Walter WTP*

| Year | 2016 | 2017 | 2018 | 2019 | 2020 | Criteria |
|---|---|---|---|---|---|---|
| **Raw Water ADF ($m^3$/d)** | 438 | 486 | 572 | 583 | 650 | |
| **Raw Water MDF ($m^3$/d)** | 738 | 792 | 895 | 897 | 912 | 995 |
| **Treated Water ADF ($m^3$/d)** | 365 | 389 | 434 | 453 | 500 | |
| **Treated Water MDF ($m^3$/d)** | 539 | 522 | 652 | 638 | 587 | 995 |

Raw water flows are higher than treated water flows due to the use of water for backwashing the filters on site as well as the use of carrier water for chlorine addition prior to the raw water flow meter.

### 4.1.4 Uncommitted Reserve Capacity at the Glen Walter WTP

The uncommitted reserve hydraulic capacity of the water plant has been calculated based on the requirements of the Ministry of Environment (MOE) Procedure D-5-1 (April 2016):

$$C_U = C_R - \frac{[L \times F \times P]}{H}$$

Where:

$C_u$: uncommitted hydraulic reserve capacity ($m^3$/d)

$C_r$: hydraulic reserve capacity ($m^3$/d)

L: number of unconnected approved lots (committed)

P: existing connected population

H: number of households or residential connections

F: maximum daily flow per capita ($m^3$/capita/d) (water treatment plant). The MDF from 2016-2020 was reported as 897 $m^3$/d in the annual report.

The uncommitted reserve capacity at the Glen Walter WTP is calculated as follows:

Hydraulic reserve capacity:

$C_r$ = 995 $m^3$/d – 897 $m^3$/d

= 98 $m^3$/d

Theoretical max day water demand of committed residential lots not currently in service:

$\left[\frac{F \times P}{H}\right]$ = (897 $m^3$/d) / 440 lots = 2.04 $m^3$/d/lot

L = 73 committed lots

$\left[\frac{L \times F \times P}{H}\right]$ = 2.04 $m^3$/d/lot x 73 lots = 149 $m^3$/d

Uncommitted hydraulic reserve capacity at Glen Walter WTP:

$C_u$ = 98 $m^3$/d – 149 $m^3$/d

= Overcommitted **51 $m^3$/d or ~ 25 residential lots**

Therefore, the Glen Walter WTP capacity is over committed and growth outside of the committed capacity should be restricted.

## 4.2 Glen Walter Wastewater System

### 4.2.1 Glen Walter Wastewater Collection System

As per the description in Section 4.3.1 of the WSP Report, the collection system in the Glen Walter Service Area is comprised of a network of gravity sewers, forcemains, and sewage pumping stations. The collection system can be separated into two (2) main catchment areas: west of the WPCP and east of the WPCP. The east catchment area flows by gravity to the Raw Sewage Pumping Station (RSPS), located on the site of the

WPCP. The west catchment area conveys wastewater through a network of two pumping stations and forcemains combined with a gravity sewer that discharge to the RSPS.

The gravity sewers range in size from 200mm to 300mm while the forcemains range in size from 100mm to 150mm. All pipes are made of PVC. Figure 2 illustrates the existing Glen Walter Wastewater Collection System.

There are no designated combined sewers in the Glen Walter Service Area.

### 4.2.2 Sewage Pumping Stations

Excluding the RSPS, there are two (2) sewage pumping stations servicing the west catchment area.

*Table 4 – Sewage Pumping Stations*

| **Pumping Station** | **Yacht Blvd SPS #1** | **Bray St. PS #2** |
|---|---|---|
| **Location** | 6734/6736 Yacht Blvd | 6649 Bray Street |
| **Service Area** | All Sewage from Place St. Laurent is collected at the Yacht Blvd SPS and is transferred to the collection system which drains to the Bray Street SPS. | All Sewage from Place St. Laurent, Bray Street, and Purcell Street Flow to the Bray Street SPS and is transferred to the Gravity sewer on Lawrence Street which flows by gravity to the RSPS. |
| **# of Pumps** | 2 (1 duty / 1 Standby) | 2 (1 duty / 1 Standby) |
| **Pump Capacity** | 10 L/s @9.44m TDH[1] | 25 L/s @ 8.3m TDH |

1 Initial size of the pumps was 10 L/s. The station was designed to be upgraded to 18.8 L/s should the full development reach the originally proposed 170 lots.

### 4.2.3 Glen Walter Water Pollution Control Plant

As per the description in Section 4.3.2 of the WSP Report, the Glen Walter WPCP is a secondary treatment system based on an extended aeration process with UV disinfection and chemical addition for phosphorus removal. The Glen Walter WPCP has a rated capacity of 787 $m^3$/d and operates under Environmental Compliance Number 3-0464084-889.

Raw sewage is pumped from the Raw Sewage Pumping Station (PS #3) into the circular treatment system. The first stage of treatment occurs in an aerated tank for grit removal. Post grit removal, aluminum sulphate is dosed into the flow which enters the second stage of treatment which is the extended aeration tank. Mixed Liquor overflows a weir at the end of the aeration tank into the secondary clarifier, located in the middle of the circular treatment tank. Clarified effluent undergoes disinfection through a UV channel prior to

discharge, by gravity, to the outfall located in the St. Lawrence River. Settled sludge from the clarifier is transferred back to the aeration tank as return activated sludge or transferred to the aerobic digester as waste activated sludge. Stabilized sludge is hauled to the Lancaster WPCP for storage.

WPCP Treatment process design details are provided in Table 5.

*Table 5 - Glen Walter WPCP Process Component Details*

| Process Component | Parameter | Design Value |
|---|---|---|
| **Raw Sewage Pumping Station (PS#3)** | Pump Well Dimensions<br>Inlet<br>Pump Type<br># of Pumps<br>Capacity of Pumps | 3.3m (L) x 1.06m (W) x 5.5m (D)<br>Screening Basket<br>Submersible<br>2 (1 duty / 1 standby)<br>26.6 L/s |
| **Grit Removal** | Type<br>Quantity<br>Volume | Aerated Grit Tank<br>1<br>16.8 m3 |
| **Coagulant Addition** | Type<br>Pump Type<br># of Pumps | Aluminum Sulphate<br>Diaphragm<br>2 (1 duty / 1 standby) |
| **Biological Treatment** | Type<br>Total Volume | Extended Aeration<br>525 m3 |
| **Aeration System** | Diffuser Type<br>Blower Type<br># of Blowers<br>Blower Capacity | Coarse<br>Rotary Positive Displacement<br>2<br>340 L/s |
| **Secondary Clarifier** | Type<br># of Clarifiers<br>Total Surface Area<br>MDF Capacity | Circular<br>1<br>65.5 $m^2$<br>2,290 $m^3/d$ |
| **Disinfection** | Type<br># of Units<br>Peak Capacity | Ultraviolet<br>1<br>2,290 $m^3/d$ |
| **Outfall** | Diameter<br>Length | 300mm<br>375m |
| **Sludge Digester** | Type<br># of Units<br>Total Volume | Aerated<br>1<br>100 $m^3$ |

### 4.2.4 Glen Walter WPCP Performance

The following table provides a summary of flows from the Glen Walter WPCP for the period of 2016 through 2020.

*Table 6 - Historical Performance for the Glen Walter WPCP*

| Year | 2016 | 2017 | 2018 | 2019 | 2020 | Criteria |
|---|---|---|---|---|---|---|
| **ADF (m3/d)** | 626 | 786 | 727 | 782 | 700 | 787 |
| **MDF (m3/d)** | 1639 | 2037 | 1059 | 1144 | 1100 | |
| **Effluent BOD5** | 3.68 | 3.5 | 3.2 | 3.13 | 3.04 | 25 |
| **Effluent TSS** | 5.34 | 5.3 | 7.37 | 5.33 | 4.86 | 25 |
| **Effluent TP** | 0.25 | 0.24 | 0.24 | 0.16 | 0.22 | 0.86 |

### 4.2.5 Uncommitted Reserve Capacity at the Glen Walter WPCP

The uncommitted reserve hydraulic capacity of the wastewater plant has been calculated based on the requirements of the Ministry of Environment (MOE) Procedure D-5-1 (April 2016):

$$C_U = C_R - \frac{[L \times F \times P]}{H}$$

Where:

$C_u$: uncommitted hydraulic reserve capacity ($m^3/d$)

$C_r$: hydraulic reserve capacity ($m^3/d$)

L: number of unconnected approved lots (committed)

P: existing connected population

H: number of households or residential connections

F: maximum daily flow per capita ($m^3$/capita/d) (wastewater treatment plant) The five (5) year average daily flow at the WPCP is 724 $m^3/d$.

The uncommitted reserve capacity at the Glen Walter WPCP was calculated as follows:

Hydraulic reserve capacity:

$C_r$ = 787 $m^3/d$ – 724 $m^3/d$

= 63 $m^3/d$

Using the five-year average day flow (724 $m^3$/d) and the total number of existing sewage connections (424), the average day flow per connection is 1.708 $m^3$/d/lot. This is higher than the flowrate typically expects from new development, and is associated with the high volume of inflow and infiltration experienced with the system. To reflect the expected sewage flows more closely from the committed and future development, a theoretical sewage generation of future growth was used and is based on the typical design parameters of 3.5 persons per lot and a wastewater generation rate of 450 litres per person per day. Theoretical sewage generation for future growth associated with the committed residential lots not currently in service:

$\left[\frac{F \times P}{H}\right]$ = 0.450 $m^3$/person/d x 3.5 person/lot

= 1.575 $m^3$/d/lot

L = 73 committed lots

$\left[\frac{L \times F \times P}{H}\right]$ = 1.575 $m^3$/d/lot x 73 lots

= 115 $m^3$/d

Uncommitted hydraulic reserve capacity at Glen Walter WPCP:

$C_u$ = 63 $m^3$/d – 115 $m^3$/d

= Overcommitted **52 $m^3$/d or ~ 33 residential lots**

Therefore, the Glen Walter WPCP capacity is over committed and growth outside of the committed capacity should be restricted.

## 4.3 Privately Servicing Properties

Outside of the Glen Walter Core Area, most of the remaining study area is serviced with private wells and septic systems. Only Farlinger Point has been provided with municipal water service but maintains private wastewater servicing through individual septic beds.

In Section 4.4 of the WSP Report, they describe a door-to-door survey of private services in Farlinger Subdivision, Sutherland Subdivision, Bayview Estates and Sapphire Hill Estates.

The findings of their field investigation are contained in Section 4.4.9 of their report, and summarized as follows:

- Many residents would benefit from information regarding the care and maintenance of well and septic systems, including, but not limited to, information regarding:
    - Discharging sump pumps, rain gutters or storm drains away from septic systems;
    - Regular inspections of their septic system (every 3 to 5 years) and pump-out of their septic tanks when the sludge depth reaches 1/3 the depth of the septic tank;
    - The Eastern Ontario Health Unit recommends residents test their well water three (3) times per year (free analysis service if bottles are dropped off at EOHU office)
- The field investigation also identified seven (7) homes in Bayview Estates that have septic systems and their drinking water supply well less than the regulated minimum separation distance from each other.

# 5 Growth Forecast

In order to determine the required capacity of future municipal infrastructure, the service area and the projected growth within the delineated service area need to be identified. Figure 3 identified blocks of land that are available for development and the timeline that the Township expects development to occur.

## 5.1 Glen Walter Development Areas

As previously indicated in Section 1, the previous studies targeted a 2% growth rate and historic building permit issuance rates reflect a 1% growth rate in the Glen Walter Area. This growth rate is hindered by the uncommitted reserve capacity at both the Glen Walter Water Treatment Plant as well as the Glen Walter Water Pollution Control Plant.

It is believed that should capacity be made available to encourage growth within the Glen Walter Area, the growth rates will more closely reflect the building rates currently occurring in the Village of Long Sault, which is directly to the west of the City of Cornwall. Based on information obtained by the Township of South Stormont Planner, the current growth rate in Long Sault is approximately 3.2%.

To ensure capacity is available in infrastructure improvements in Glen Walter, flows related to growth will be basing on a growth rate of 3% for 30 years.

## 5.2 Growth Potential within Areas

As identified in the Technical Memorandum No. 1, where plans of subdivision exist for proposed subdivisions, the number of units were based on the plans and population estimates were based on 3.5 persons per lot.

Where plans of subdivision were not available, EVB utilized a combination of low-density housing (estate lot configuration) and high-density housing (urban development) based on the following assumptions.

*Table 7 – Population Growth Assumptions*

| Area for Development | Assumptions |
|---|---|
| **For Areas with Site Plan Approvals** | Persons per lot: 3.5 |
| **For High Density Developments** | Lots per Ha: 14.3<br>Persons per Ha: 50 |
| **For Low Density Developments** | Lots per Ha: 5.8<br>Persons per Ha: 20 |

Additionally, flows from these areas are based on the following assumptions:

*Table 8 – Water and Wastewater Design Rate Assumptions*

| Description | Design Rate |
|---|---|
| **Water Flow Per Person** | 350 L/capita/d |
| **Maximum Day Factor** | 2 |
| **Wastewater Flow Per Person** | 450 L/capita/d |
| **Inflow & Infiltration** | 90 L/cap/d |

# 6 Alternative Servicing Options

## 6.1 Alternative Servicing Options

There are three main options that need to be considered when evaluating the servicing of the Glen Walter system:

Option 1 – Maintain a Mix of Municipal and Private Services

Option 2 – Expansion of South Glengarry's Infrastructure

Option 2A – Expansion to Entire Area

Option 2B – Expansion to Expanded Service Area (New Development)

Option 3 – Obtain Services from City of Cornwall

## 6.2 Option 1 – Maintain a Mix of Municipal and Private Services

### 6.2.1 Description

As identified earlier, there is a mix of municipal and private servicing for the study area. Maintaining this configuration (status quo) is possible for the existing development within

the Glen Walter Area, however, this will have the following impact on the development of the Glen Walter Area:

a) Onsite sewage systems require larger lots and does not optimize land use and potential population densities;
b) Private servicing will restrict the type of development (i.e. residential and dry commercial only) preventing potential opportunities with commercial, industrial and institutional developments;
c) Fire protection services will not be expanded into the areas that remain on private services;
d) The capacity of both the Glen Walter WTP and Glen Walter WPCP cannot provide services beyond the existing committed capacity. (Growth in the serviced area is halted).

Option 1 is not recommended since 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 as noted in the Provincial Policy Statement.

The Glen Walter WTP and WPCP will need to be expanded to service the committed growth as well as infill within the settlement boundaries. The design population for Option 1 is based on current planned or approved subdivision that are proposed to be developed with municipal services as well as providing for infill within the Glen Walter Core area. The ultimate service population is shown in the following table.

*Table 9 – Option 1 Design Population*

| Area | Population |
|---|---|
| | Based on Infill |
| **Municipal Water/Wastewater Service** | 963 |
| **Existing Private Serviced Development** | 0 |
| **Approved Plans of Subdivision** | 252 |
| **Regional Growth (Infill)** | 124 |
| **TOTAL POPULATION** | 1,339 |
| **Growth Rate (within Serviced Area)** | 0.33% |

The design water and wastewater requirements for this population is presented in the following table.

*Table 10 – Option 1 Water and Wastewater Design Flows*

| System | Ultimate Capacity |
|---|---|
| **WTP (MDF)** | 1,175 |
| **WPCP (ADF)** | 989 |

Based on these design flows, the existing Glen Walter WTP and WPCP do not have the the capacity to meet the design daily flows and will require an expansion of both facilities.

### 6.2.2 Water Storage Requirements

As per the MECP's *Design Guidelines for Drinking-Water Systems*, the requirement for total treated water storage is based on the population and maximum daily flows within the water distribution system, and can be calculated as follows:

Total Treated Water Storage = A + B + C

Where: A = Fire storage
B = Equalization storage (25% of maximum day demand); and
C = Emergency storage (25% of A + B)

The water storage requirements were calculated for the various scenarios and are shown in the following table.

*Table 11 – Water Storage Requirements*

| Storage Requirements | 30-Year Projection |
|---|---|
| **Fire Water Storage** | 570 |
| **Equalization Storage** | 294 |
| **Emergency Storage** | 216 |
| **Total Required Storage** | **1,080** |
| **Available Storage at WTP** | 230 |
| **Minimum Additional Storage Required** | 850 |
| **Recommended Additional Storage** | **1,000** |

It is recommended that a slightly larger storage volume be provided, which will add nominal costs to the project at this point but will provide significant flexibility should the Township wish to expand the municipal water servicing in the future.

### 6.2.3 Water Distribution System

WSP completed a hydraulic model of the water distribution system. Through the use of the hydraulic model, it was determined that sections of the existing water distribution system were identified for rehabilitation to ensure that the water distribution system can support fire flows throughout the entire system.

### 6.2.4 Wastewater Collection System

WSP completed a hydraulic model of the wastewater collection system. Through the use of the hydraulic model, it was determined that sections of the existing wastewater collection system were identified for rehabilitation as they could not convey the peak sanitary sewage flows during a 100-year rain event.

### 6.2.5 Infrastructure Requirements for Option 1

Should Option 1 be selected as the preferred option, the following works are required to support the existing service area, including potential infill and committed plans of subdivision:

- The Glen Walter WTP will require an expansion to support the existing service area, the committed developments as well as the growth within the next 30-years (growth rate of 0.33%).
- Increase water storage on the system with an elevated tower that will provide sufficient storage to meet the MECP requirements for fire flows, equalization storage and emergency storage.
- Replacement of parts of the existing distribution system to ensure fire flows are achieved within the entire serviced area.
- Expansion of the Glen Walter Wastewater Treatment Plant is required to support the existing service area, the committed developments as well as the growth within the next 30-years (growth rate of 0.33%).
- Replacement of parts of the collection system to ensure the collection system is capable of carrying the 100-year design flows.

### 6.2.6 Cost Estimate

Based on the cost models developed in the Ontario Ministry of Public Infrastructure Renewal publication "Water and Wastewater Asset Cost Study", a total project cost estimate has been generated for the implementation of this solution.

*Table 12 – Opinion of Total Project Cost for Option 1*

| Opinion of Construction Cost | Option 1 |
|---|---|
| **Water Treatment** | $3,156,000 |
| **Water Storage** | $1,713,000 |
| **Linear Water** | $900,000 |
| **Wastewater Treatment** | $10,019,000 |
| **Linear Wastewater** | $400,000 |
| **CONSTRUCTION SUBTOTAL** | $16,188,000 |
| **Design/CA (15%)** | $2,428,000 |
| **Contingency (30%)** | $4,856,000 |
| **TOTAL ESTIMATED COST** | $23,472,000 |
| **Potential Funding (2/3)** | $15,648,000 |
| **Net Township Cost** | $7,824,000 |

## 6.3 Option 2 – Expansion of South Glengarry's Infrastructure

### 6.3.1 Description

The second servicing option considers the provision of municipal sewage and water services to the entire Glen Walter study area and includes major upgrades to the existing infrastructure as required to provide municipal services to all existing developments while creating capacity for future growth.

### 6.3.2 Option 2A - Phased Approach for Servicing the Entire Study Area

This option requires a multi-phased approach to expanding municipal servicing throughout the entire study area. This will be achieved by setting a 30-year and a 50-year goal for the expansion of services.

#### *30-Year Expansion*

The goal for Phase 1 is to provide both water and wastewater servicing for the Glen Walter Core Area, Farlinger Point (Area A), Sutherland Subdivision (Area B), Sapphire Hills (Area C), Bayview Estates (Area C), Place St. Laurent (Area D), Country Club Estates (Area E) and Boundary Road (Area T). In additional, capacity allocation will be made available in areas J, K, and L1. (Figure 4)

*Table 13 – 30 Year Population Requirements*

| Area | Population |
|---|---|
| **Municipal Water/Wastewater Service** | 963 |
| **Existing Privately Serviced Development** | 882 |
| **Approved Plans of Subdivision** | 417 |
| **Regional Growth** | 3,228 |
| **TOTAL POPULATION** | 5,490 |
| **Growth Rate** | 3% |

The goal for Phase 2 is to provide both water and wastewater servicing for the entire Glen Walter Study Area (Figure 5), including growth in Areas F1, F2, G1, G2, H, I, M, N, O, Q, R and S.

*Table 14 – 50 Year Population Requirements*

| Area | Population |
|---|---|
| **Municipal Water/Wastewater Service** | 963 |
| **Existing Privately Serviced Development** | 1,425 |
| **Approved Plans of Subdivision** | 568 |
| **Regional Growth** | 10,003 |
| **TOTAL POPULATION** | 12,959 |
| **Growth Rate** | 3.00% |

### 6.3.3 Option 2B – Expansion of the Municipal Service Boundaries

The goal for this phase is to provide both water and wastewater servicing for new developments fronting the existing Glen Walter Core Area, including infill within the Glen Walter Core and Farlinger Point (Area A), Place St. Laurent (Area D), and Country Club Estates (Area E). In additional development will be permitted in areas K and U. (Figure 6)

*Table 15 – Option 2B – 30 Year Population Requirements*

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

### 6.3.4 Option 2 – Water and Wastewater Treatment Facility Requirements

The design water and wastewater requirements for the population described in Option 2A and 2B are presented in the following table.

*Table 16 – Option 1 Water and Wastewater Design Flows*

| System | 2A (30-Years) | 2A (50-Years) | 2B (30-Years) |
|---|---|---|---|
| **WTP (MDF)** | 4,100 | 9,300 | 2,300 |
| **WPCP (ADF)** | 3,200 | 7,300 | 1,900 |

Based on these design flows, the existing Glen Walter WTP and WPCP do not have the the capacity to meet the design daily flows and will require an expansion of both facilities.

### 6.3.5 Option 2 – Water Storage Requirements

As per the MECP's *Design Guidelines for Drinking-Water Systems*, the requirement for total treated water storage is based on the population and maximum daily flows within the water distribution system, and can be calculated as follows:

Total Treated Water Storage = A + B + C

Where: A = Fire storage
B = Equalization storage (25% of maximum day demand); and
C = Emergency storage (25% of A + B)

The water storage requirements were calculated for the various scenarios and are shown in the following table.

*Table 17 – Option 2 - Water Storage Requirements*

| Storage Requirements | 2A (30-Years) | 2A (50-Years) | 2B (30-Years) |
|---|---|---|---|
| **Fire Water Storage** | 1,717 | 2,376 | 792 |
| **Equalization Storage** | 1,020 | 2,327 | 576 |
| **Emergency Storage** | 684 | 1,176 | 342 |
| **Total Required Storage** | **3,421** | **5,879** | **1,710** |
| **Available Storage at WTP** | 230 | 230 | 230 |
| **Minimum Additional Storage Required** | 3,191 | 5,649 | 1,480 |
| **Recommended Additional Storage** | 3,200 | 5,750 | 1,500 |

It is recommended that a larger storage volume be constructed, which will add nominal costs to the project at this point but will provide significant flexibility should the Township wish to expand the municipal water servicing in the future.

### 6.3.6 Linear Water Infrastructure Requirements

As previously discussed, the expansion of South Glengarry's infrastructure requires water storage, which is proposed to consist of an elevated storage tank in a location to be determined. 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 (Rae

Road East) 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.

### 6.3.7 Linear Wastewater Infrastructure Requirements

EVB Engineering reviewed the existing infrastructure, areas slated for future development, existing topography and information pertaining to proposed developments, and developed a conceptual servicing plan for Glen Walter seeking to minimize capital costs as well as operation and maintenance costs.

The use of gravity sewers was preferred where possible, however pumping stations could not be avoided due to the challenging topography of the area. The conceptual plan makes very little use of the existing infrastructure since the future flows at full development are significant and could not be accommodated by the existing infrastructure.

It is however important to note that interim servicing of new sanitary pumping stations is possible to some extent using existing infrastructure. For example, the forcemain from proposed SPS #6 (Edgewater Subdivision) is proposed to outlet to the gravity sewer on County Road 2, and a similar arrangement could be done for proposed SPS #4 (Country Club Estates) with its forcemain outletting to the existing gravity sewer on Purcell Road. As development occurs and flows increase, these forcemains would need to be extended to the wastewater treatment plant to avoid surcharging existing sewers.

The conceptual sanitary servicing plan for Glen Walter based on an expansion of South Glengarry's infrastructure is shown on Figure 4 (30-Year) and Figure 5 (50-year) and is discussed in greater detail in the following table. Note that all flows discussed below consist of maximum daily flows (MDF) with an allowance of 0.19 L/s/ha for infiltration and inflow and were based on the 50-year low-density scenario.

*Table 18 - Details of Sanitary Conceptual Plan (Expectation is for Developers to Pay for this Component)*

| Sanitary Pumping Station (SPS) | Servicing Areas | Description |
|---|---|---|
| SPS #1, Existing<br><br>Place St. Laurent | Existing: D, D3, D4, D5<br><br>Future: A, B | Extension of relatively deep gravity sewers along County Road 2 & easements to service Areas A (Farlinger Point) and B (Sutherland Subdivision).<br><br>Replacement of existing pumps from 10 L/s to 20.8 L/s, slightly exceeding original design flow of 18.8 L/s for the SPS but can easily be accommodated with the existing wet-well and new pumps. |
| SPS #2, Existing<br><br>Bray Street | Existing: SPS #1, northwest area of Glen Walter<br><br>Future: K | SPS was upgraded in 2021. |
| SPS #3, Existing<br><br>Wastewater Treatment Plant | Existing: Glen Walter<br><br>Future: A & B (SPS #1), R & S (SPS #8), O | A sewer extension along County Road 2 was proposed as part of the development of Area F (Edgewater Subdivision) to provide an outlet for the new forcemain and provide servicing to Area O (dwellings along County Road 2 and Sabourin Drive).<br><br>Pumps will need to be replaced at the RSPS to accommodate an additional 10.8 L/s from SPS #1, 4.2 L/s from SPS #8 and 2.1 L/s from Area O. |
| SPS #4, Proposed<br><br>Country Club Estates | Existing: n/a<br><br>Future: C1, C2, E, G1, G2, J, L, N, P, SPS #5 | Construction of deep gravity sewers and new large SPS to accommodate 98.7 L/s from Areas C1, C2, E, G1, G2, J, L, N, P and 58.4 L/s from SPS #5, for a total of 157.1 L/s, and new forcemain along Purcell Road and County Road 2 directly to the Glen Walter WPCP.<br><br>We understand a SPS is already proposed as part of the preliminary servicing report prepared as part of the draft plan submission for the development of Area E (Country Club Estates), hence the SPS could be designed to accommodate higher flows and/or deeper sewers. |
| SPS #5, Proposed<br><br>Boundary Road | Existing: n/a<br><br>Future: T | Construction of new 58.4 L/s SPS at the southeast limit of the Boundary Road area, gravity sewers as per the preferred option in the *Boundary Road Servicing Study* (EVB, 2017).<br><br>Construction of new forcemain to new gravity sewers on Tyotown Road, discharging into new SPS #4. |
| SPS #6, Proposed<br><br>Edgewater Subdivision | Existing: n/a<br><br>Future: F, M, SPS #7 | Construction of deep gravity sewers and new SPS to accommodate 20.1 L/s from Areas F and M and 49.3 L/s from SPS #7 (total = 69.4 L/s). |

| Sanitary Pumping Station (SPS) | Servicing Areas | Description |
|---|---|---|
| | | A SPS is already proposed as part of the development of Area F (Edgewater Subdivision), hence the SPS could be designed to accommodate higher flows. Its proposed depth appears sufficient.<br><br>It is expected that the forcemain will eventually have to be brought directly into the WPCP as development occurs and flows increase. |
| SPS #7, Proposed<br><br>Rae Road | Existing: n/a<br><br>Future: Q, I | Construction of gravity sewers and new SPS to accommodate 49.3 L/s from Areas Q and I. As can be seen, this also relies on a sewer in an easement to avoid unnecessarily deep sewers at the large hill at the intersection of Rae Road and Tyotown Road.<br><br>Forcemain from SPS #7 was taken to SPS #6 in order to minimize flows to SPS #4 and since a gravity sewer discharging to SPS #6 will be required in the south portion of area Q due to existing topography.<br><br>For phasing reasons, forcemain could instead be redirected to new gravity sewers on Tyotown Road, discharging to new SPS #4. |
| SPS #8, Proposed<br><br>Craig Road Subdivision | Existing: n/a<br><br>Future: R, S | Construction of gravity sewers and small SPS to accommodate low-lying Area R and S, and extension of the sanitary sewer along County Road 2.<br><br>Forcemain is proposed to discharge to the existing sanitary sewer along County Road 2 or to the sewer extension proposed for the development of Area F (Edgewater Subdivision). |

### 6.3.8 Cost Estimate

Based on the cost models developed in the Ontario Ministry of Public Infrastructure Renewal publication “Water and Wastewater Asset Cost Study”, a total project cost estimate has been generated for the implementation of this solution.

*Table 19 – Opinion of Total Project Cost for Option 1*

| Opinion of Construction Cost | Option 2A | | Option 2B |
|---|---|---|---|
| **Project Component** | 30-Year | 50-Year | 30-Year |
| **Water Treatment** | $22,892,000 | $17,792,000 | $15,823,000 |
| **Water Storage** | $3,825,000 | $3,161,000 | $2,312,000 |
| **Linear Water** | $3,100,000 | $3,100,000 | $3,100,000 |
| **Wastewater Treatment** | $27,072,000 | $26,610,000 | $17,137,000 |
| **Linear Wastewater** | $3,322,000 | $3,322,000 | $3,322,000 |
| **CONSTRUCTION SUBTOTAL** | $60,211,000 | $53,985,000 | $41,694,000 |
| **Design/CA (15%)** | $9,032,000 | $8,098,000 | $6,254,000 |
| **Contingency (30%)** | $18,063,000 | $16,196,000 | $12,508,000 |
| **TOTAL ESTIMATED COST** | $87,306,000 | $78,279,000 | $60,456,000 |
| **Potential Funding (2/3)** | $58,204,000 | $52,186,000 | $40,304,000 |
| **Net Township Cost** | $29,102,000 | $26,093,000 | $20,152,000 |

Please note that the costs for Option 2A – 50-Year Phase are an incremental cost to the Option 2A – 30-Year Phase.

## 6.4 Option 3 – Connection to Cornwall Infrastructure

The third option considered to provide municipal sewage and water services to the Glen Walter area consists of a connection to the City of Cornwall's infrastructure. As the City of Cornwall and the Township of South Glengarry failed to come to a suitable arrangement to supply municipal services from the City of Cornwall to the portion of South Glengarry on the East side of Boundary Road, the Township has chosen to stop exploring this opportunity with the City of Cornwall.

# 7 Evaluation of Alternative Solutions

## 7.1 Evaluation Approach

Utilizing the evaluation criteria prepared in conjunction with WSP (WSP Section 10.2), each of the servicing options will be evaluated in terms of their impacts on the natural, social, economic and technical criteria.

Following the application of the evaluation criteria, a preferred alternative will be identified for the future servicing of the study area.

## 7.2 Evaluation Criteria

EVB Engineering utilized the evaluation criteria prepared by WSP (WSP Table 10.1) for the evaluation of the servicing options.

*Table 20 – Evaluation Criteria*

| Category | Criteria | Description |
|---|---|---|
| **Natural Environment** | Surface Water and Groundwater Impacts | Impact on water quantity and water quality of receiving waters including the St. Lawrence River and area municipal drains as well as groundwater quality and quantity |
| | Impact on natural heritage features/vegetation | Impacts on terrestrial resources such as trees and other vegetation |
| **Social and Cultural Heritage** | Impact to development areas and private properties | Noise, traffic, odour and visual distraction impacts on residents resulting from construction and/or long-term operation of the facilities |
| | Compatibility with proposed land uses | Compatibility of official plan land use with proposed land use |
| **Economic Viability** | Capital Cost | Estimated capital cost |
| | Operating and Maintenance Costs | Estimated annual operating and maintenance costs |
| **Technical Sustainability** | Ease of Construction and Site Access | Ability to maintain the performance of the treatment process during construction |
| | Impact on operations during construction | Change to operational requirements and impact on operations |
| | Ease of integration with existing infrastructure and ability to expand in the future | Compatibility with existing infrastructure in terms of use of existing infrastructure |
| | Ease of operation | Change to operational requirements and complexity of operations |
| | Impact on vulnerability to future climate changes | Ability to address potential issues arising from climate change (peak wet weather flows) |

## 7.3 Evaluation of the Alternative Servicing Solutions

Table 21 provides a summary of the evaluation of the alternative servicing solutions.

Notes regarding construction cost estimate:

- Construction dollars are expressed in 2020$
- Although linear costs are shown in the table, some of these costs can be assumed by the developers of the vacant properties
- Linear costs are shown for service connections, water mains, wastewater sewers, and sewage forcemains within areas that are developed on private services which will be converted to municipal servicing. Infrastructure within undeveloped lots will be financed through the developers.
- Assumed sewer installation at 4-6m depth without rock removal.
- Excludes HST
- Assumed 2/3s funding from higher levels of government
- Assumed funding is not available for Capital Buy-in costs

*Table 21 – Evaluation of Servicing Alternatives*

| Evaluation Criteria | Option 1 – Status Quo | Option 2 – South Glengarry Servicing Extension |
|---|---|---|
| **Natural Environment** | | |
| • Surface water and groundwater impacts<br>• Impacts on natural heritage / vegetation | • Potential for tree removal for new water tower location and site for Glen Walter WPCP.<br>• Expansion of Glen Walter WPCP will improve effluent quality returned to St. Lawrence.<br>• Expanded WPCP will handle peak flows reducing bypass events.<br>• Potential requirement for dewatering during construction. | • Potential for tree removal for new water tower location and site for Glen Walter WPCP.<br>• Expansion of Glen Walter WPCP will improve effluent quality returned to St. Lawrence.<br>• Expanded WPCP will handle peak flows reducing bypass events.<br>• Potential requirement for dewatering during construction.<br>• Removal of private water and sewage systems will potentially improve groundwater quality in the area |
| **Social and Cultural Heritage** | | |
| • Impact to development areas and private properties<br>• Compatibility with proposed land uses | • Minimizes the area to which municipal water and wastewater services will be offered.<br>• Provides for fire flow within the service area.<br>• Dust and noise impacts should be controlled during construction.<br>• Less opportunity for expansion of services in the future.<br>• Private water and sewage system remain in use. | • Provides a long-term plan for the municipal servicing of the study area.<br>• Provides for fire flow within the entire study area.<br>• Dust and noise impacts should be controlled during construction.<br>• Removes private water and sewage systems from operation within the study area which will improve enjoyment of properties.<br>• Municipal services allows for higher intensity of development. |
| **Economic Implications** [1] | | |
| • Capital Cost | Capital Cost: $29,102,000 | Capital Cost: 2A (Phase 1) $87,306,000<br>2A (Phase 2) $78,279,000<br>2B $60,456,000 |
| **Technical Suitability** | | |
| • Ease of Construction and Site Access<br>• Impact on Operations During Construction<br>• Ease of Integration with Existing Infrastructure and ability to expand in the future | • Existing site is restrictive and new property acquisition may be required.<br>• New elevated water storage will allow for modifications on the treated water line from the WTP<br>• Schedule “C” EA required for WPCP works. | • Existing site is restrictive and new property acquisition will be required.<br>• New elevated water storage will allow for modifications on the treated water line from the WTP<br>• Schedule “C” EA required for WPCP works. |

| Evaluation Criteria | Option 1 – Status Quo | Option 2 – South Glengarry Servicing Extension |
|---|---|---|
| • Ease of Operation<br>• Impact on Vulnerability to Future Climate Change | • MECP approvals required for WPCP works and amendment to Drinking Water Works Permit for water storage.<br>• Improved redundancy within both water and wastewater systems.<br>• | • MECP approvals required for WPCP works and amendment to Drinking Water Works Permit for water storage.<br>• Improved redundancy within both water and wastewater systems. |

# 8 Identification of Preferred Alternative

## 8.1 Description of Preferred Alternative

The preferred option for the provision of water and wastewater servicing within the Study area is Option 2B: Expansion of the Municipal Services Boundaries. This option includes ensuring that there is capacity in the municipal water and wastewater systems to support growth within the following areas: infill within the Glen Walter Core and Farlinger Point (Area A), Place St. Laurent (Area D), and Country Club Estates (Area E). In addition, development will be permitted in areas K and U (refer to Figure 6). The development of these areas is expected to increase the service population within the municipal serviced area from just under 1,000 persons (2021) to just under 3,000 persons (2051).

The infrastructure required to implement this servicing plan includes:

- Expansion of the Glen Walter Water Treatment Plant from 995 $m^3$/d to 2,300 $m^3$/d;
- Construction of a new Glen Walter Wastewater Treatment Plant increasing the capacity from 787 $m^3$/d to 1,900 $m^3$/d;
- Construction of a 1,500 m3 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;
- Upgrades to the Place St. Laurent Sewage Pumping Station to support additional growth within its catchment area; and
- Replacement of some areas of the wastewater collection system to ensure that peak flows can be conveyed to the new Glen Walter Water Pollution Control Plant.

The next steps for the implementation of this project include:

Year 1

- Complete a Schedule “C” Environmental Assessment for the expansion of the Glen Walter Water Treatment Plant and Glen Walter Water Pollution Control Plant.
- As per initiatives that have already commenced, implement a leak detection and correction program to reduce the 50% water loss on the water distribution system. If water loss reduction efforts are successful, it may delay the timing for the expansion of the Glen Walter Water Treatment Plant.
- Advocate for funding from higher levels of government.

Year 2

- Implement the land acquisition requirements from the Schedule “C” EA.
- Advocate for funding from higher levels of government.

Year 3

- Initiate the Design of the Glen Walter Water Pollution Control Plant
- Advocate for funding from higher levels of government.

Year 4-5

- Construct the Glen Walter Water Pollution Control Plant
- Initiate the Design of the Glen Walter Water Treatment Plant

Year 5-6

- Construct the Glen Walter Water Treatment Plan

## 8.2 Public Consultation Requirements of the Environmental Assessment Process

As described in Section 2 of this report the preparation of a Master Plan must follow the requirements of the MEA's publication "Municipal Class Environmental Assessments". When this process is completed, in accordance with this process, Phases 1 and 2 of the EA process is complete and works that are categorized as Schedule A, A+ and B may proceed to implementation.

In order for this document to comply with the EA process, the public consultation component of the process must be completed. The public consultation requires two components:

- Public Notifications; and
- Public Information Centre.

### 8.2.1 Project Notifications

The notification requirements consist of three mandatory notices being circulated for including:

- Notice #1 – Public Consultation Centre #1
- Notice #2 – Public Consultation Centre #2
- Notice #3 – Notice of Study Completion

Copies of these notices are in Appendix C.

### 8.2.2 Public Information Centre

Public consultation is an integral component of the environmental assessment process, allowing the public and various governmental agencies an opportunity to provide input

into the selection of a preferred solution for the expansion of water and wastewater servicing within the Glen Walter Area.

Upon the onset of the project a list of entities (first nation groups and agencies) was developed and is provided in Appendix C.

*Public Information Centre #1*

The Public Information Centre #1 was advertised in the Glengarry News on June 17, 2020 as well as on the Township's website.

The virtual Public Information Centre was held on June 24, 2020 from the times of 6:00pm to 8:00pm. Presentation information was also made available through the Township website.

The presentation materials and comments sheets are included in Appendix C.

*Public Information Centre #2*

The Public Information Centre #2 was advertised in the Glengarry News on September 21, 2021 as well as on the Township's website.

The virtual Public Information Centre was held on September 28, 2021 from the times of 5:00pm to 7:00pm. Presentation information was also made available through the Township website.

The presentation materials and comments sheets are included in Appendix C.

### 8.2.3 Agency Consultation

A list of governmental and non-governmental agencies that were contacted about this project is provided in Appendix C.

## 8.3 Master Plan Filing

On November 24, 2021, the Township of South Glengarry issued a Study Completion for the project and have placed this document on public record for comment for 30-calendar days.

If concerns arise regarding this project, which cannot be resolved in discussion with the municipality, a person or party may request that the Minister of the Environment, Conservation and Parks to order a change in the project status and require a higher level of assessment under an individual Environmental Assessment process (referred to as a Part II Order). The Part II Order Request Form is available online on the Forms Repository Website (http://www.forms.ssb.gov.on.ca) by searching "Part II Order" or

"012-2206E" (the form number). Reasons must be provided for this request. Request must be received by the Minister within 30 calendar days of this Notice.

Minister Jeff Yurek
Minister of the Environment, Conservation and Parks
College Park 5th Floor, 777 Bay Street
Toronto, ON M7A 2J3

-and-

Director, Environmental Assessment and Permissions Branch
Ministry of the Environment, Conservation and Parks
Environmental Approvals Branch
135 St. Clair Avenue West, 1st Floor
Toronto, ON M4V 1P5

-and-

Sarah McDonald
General Manager of Infrastructure Services
Township of South Glengarry
6 Oak Street, Box 220, Lancaster, Ontario K0C 1N0
T: 613-347-1166
smcdonald@southglengarry.com

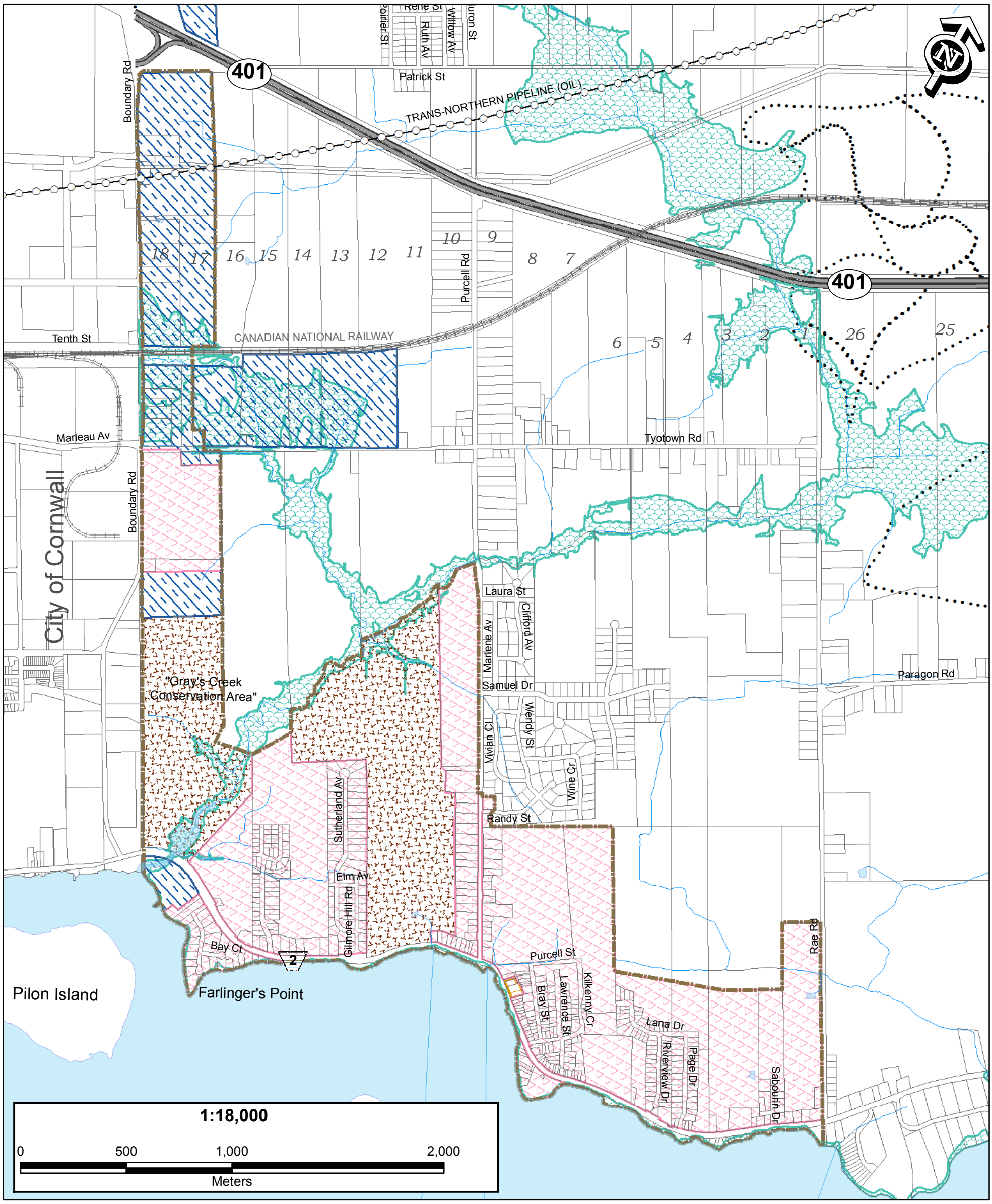
If there is no request received by January 8, 2022, the Township will proceed with the implementation of the recommendations from the Master Plan.

# APPENDIX A

## Figures

# SCHEDULE A6a

## Glen Walter




LEGEND

**Boundaries (Land Use Designation)**

- Urban Settlement Area
- Urban Service Limit

**Settlement Areas (Land Use Designation)**

- Residential District
- Commercial District
- Employment District
- Provincially Significant Wetland
- Salvage Yard District
- Major Open Space
- Airport District
- Special Land Use District (See Table 9.1.5 of the OP Text)

**Environmental Protection Lands (Constraint Overlay)**

- Regulatory Floodline
- Organic Soils
- Unstable Slope

**MOECC Identified Closed Waste Site (Approximate Location):**

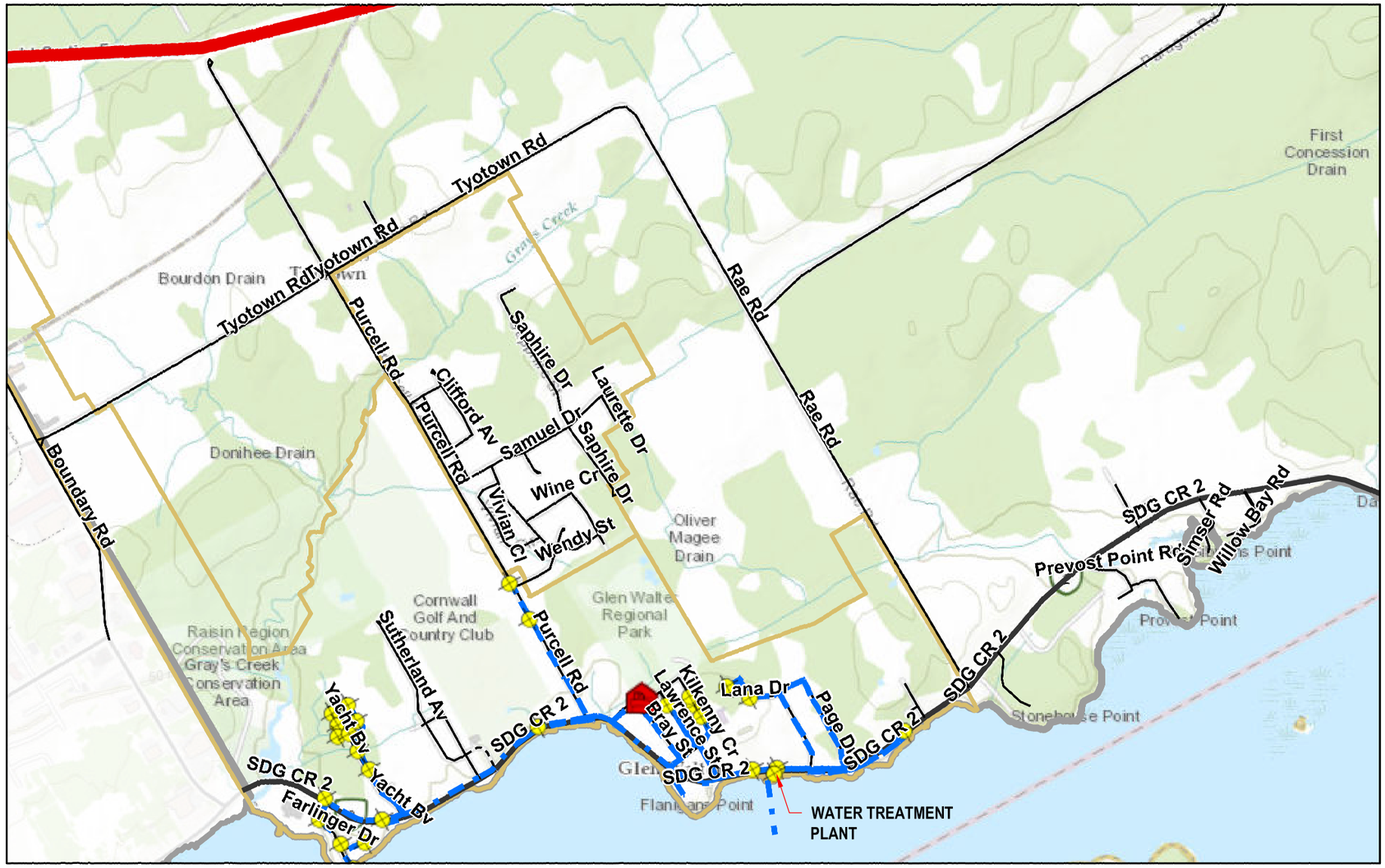
- Closed Waste Site

**Infrastructure**

- Communal Well
- Hospital
- Sewage Lagoon

Produced by the United Counties of Stormont, Dundas and Glengarry, Transportation and Planning Services with Data supplied under Licence by Members of the Ontario Geospatial Data Exchange

# Glen_Walter_Water




12/5/2019, 8:53:58 AM

Fire Hydrant — Fire Station — Water Line

Hydrant - Valve — Fire Station

0 0.2 0.4 0.8 mi

0 0.35 0.7 1.4 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, SDG

For informational purposes only. Data is representative of location of water and sewer assets but are not survey accurate. Remember to call before you dig by to locate underground utilities by contacting ON1Call 1-800-400-2255 .


EVB ENGINEERING
800 SECOND STREET WEST
CORNWALL, ONTARIO CANADA, K6J 1H6
TEL: 613-935-3775 | FAX: 613-935-6450
WEBSITE: EVBengineering.com


CLIENT: SOUTH GLENGARRY — Ontario's Celtic Heartland

PROJECT:

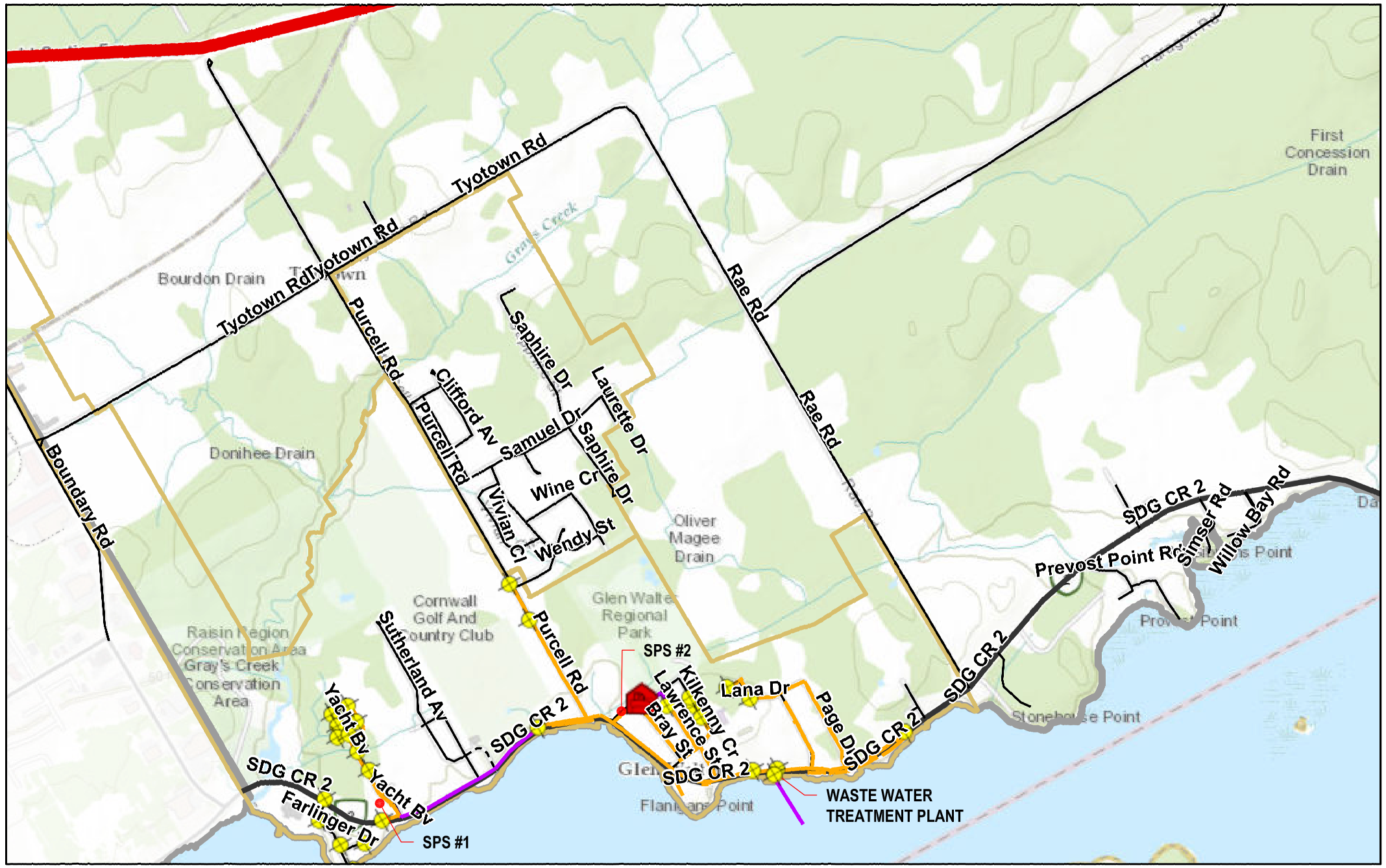
GLEN WALTER AREA
WATER AND WASTEWATER
MASTER SERVICING PLAN

TITLE:

GLEN WALTER
EXISTING WATER DISTRIBUTION
SYSTEM

| | |
|---|---|
| SCALE: N.T.S. | JOB NO: 19030 |
| DESIGNED BY: M.V. | DATE: 2020/05/01 |
| DRAWN BY: K.B.W. | DRAWING NO. FIG.1 |
| CHECKED BY: M.V. | |

# Glen_Walter_Wastewater




12/5/2019, 8:55:04 AM

Fire Hydrant

Hydrant - Valve

Fire Station

Fire Station

Sewer Line

Gravity

Forcemain

0 0.2 0.4 0.8 mi

0 0.35 0.7 1.4 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, SDG

For informational purposes only. Data is representative of location of water and sewer assets but are not survey accurate. Remember to call before you dig by to locate underground utilities by contacting ON1Call 1-800-400-2255 .


EVB ENGINEERING

800 SECOND STREET WEST
CORNWALL, ONTARIO CANADA, K6J 1H6
TEL: 613-935-3775 | FAX: 613-935-6450
WEBSITE: EVBengineering.com


CLIENT:

SOUTH GLENGARRY
Ontario's Celtic Heartland

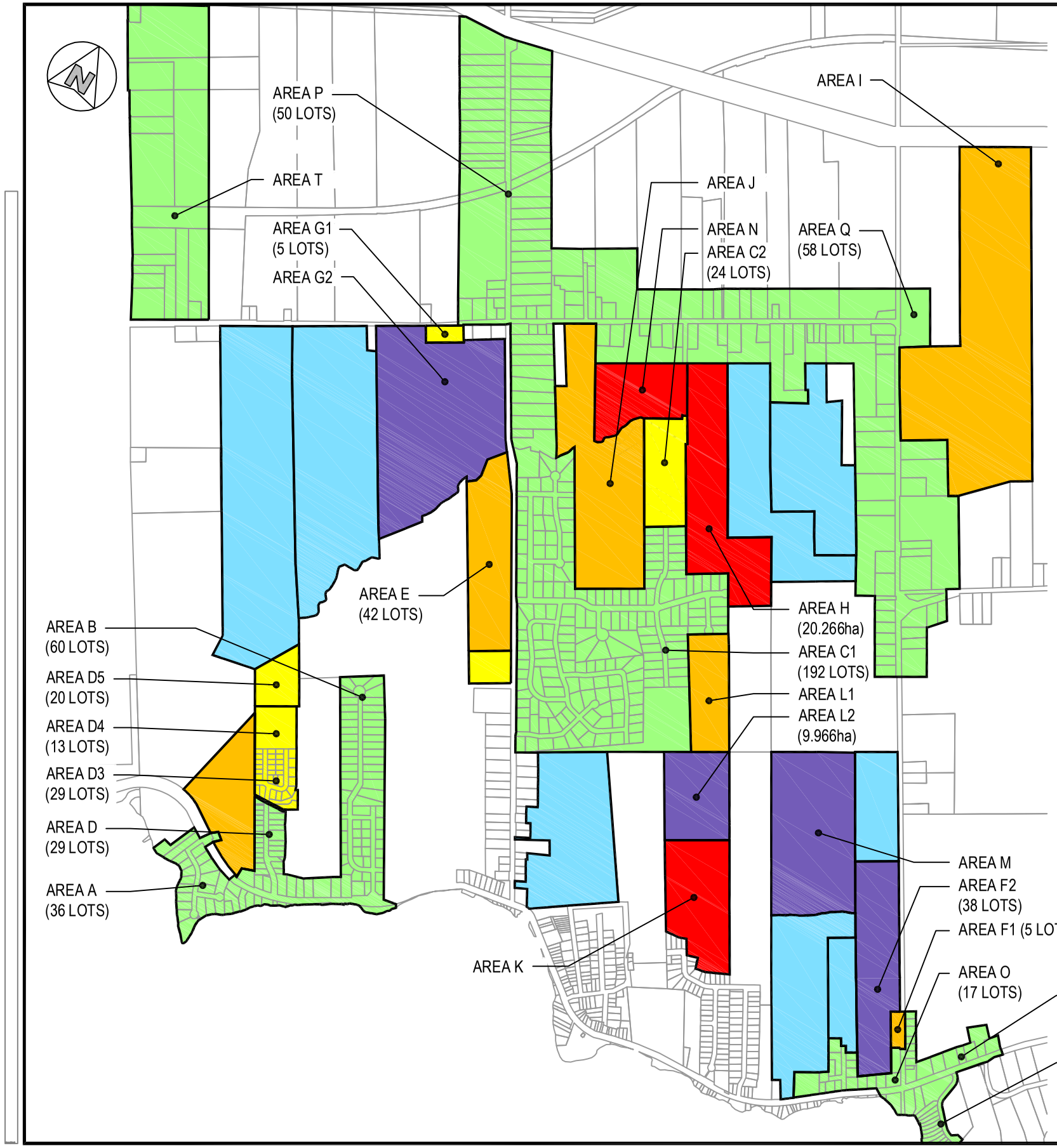
PROJECT:

GLEN WALTER AREA
WATER AND WASTEWATER
MASTER SERVICING PLAN

TITLE:

GLEN WALTER
EXISTING WASTE WATER
COLLECTION SYSTEM

| | |
|---|---|
| SCALE: N.T.S. | JOB NO: 19030 |
| DESIGNED BY: M.V. | DATE: 2020/05/01 |
| DRAWN BY: K.B.W. | DRAWING NO. FIG.2 |
| CHECKED BY: M.V. | |




| Area | DEVELOPMENT AREA | DESCRIPTION | STATUS |
|---|---|---|---|
| | Glen Walter Core | Serviced (W/WW) | Existing |
| Area A | Farlinger Point | Water Service Only | Existing |
| Area B | Sutherland Subdivision | Private Services | Existing |
| Area C1 | Sapphire Hills | Private Services | Existing |
| Area C2 | Sapphire Hills | Private Services | Existing |
| Area D | Place St. Lawrence | Serviced | Phase 1 |
| | Place St. Lawrence | Serviced | Phase 2 |
| Area D3 | Place St. Lawrence | Serviced | Phase 3 |
| Area D4 | Place St. Lawrence | Serviced | Phase 4 |
| Area D5 | Place St. Lawrence | Serviced | Phase 5 |
| Area E | Country Club Estates | Serviced | Undeveloped |
| Area F1 | Edgewater Subdivision | Undeveloped | Phase 1 |
| Area F2 | | | Phase 2 |
| Area G | Grant Subdivision | Private Services | Phase 1 |
| | | | Phase 2 |
| Area H | Area H | Unserviced | Undeveloped |
| Area I | Rae Rd North | Unserviced | Undeveloped |
| Area J | Area J | Unserviced | Undeveloped |
| Area K | Area K | Unserviced | Undeveloped |
| Area L1 | Area L | Unserviced | Undeveloped |
| Area L2 | | Unserviced | Undeveloped |
| Area M | Area M | Unserviced | Undeveloped |
| Area N | Area N | Unserviced | Undeveloped |
| Area O | Sabourin Subdivision | Private Services | Existing |
| Area P | Purcell North | Private Services | Existing |
| Area Q | Tyotown East | Private Services | Existing |
| Area R | Rae Rd East | Private Services | Existing |
| Area S | Craig Road Subdivision | Private Services | Existing |
| Area T | Boundary Rd Industrial | Private Services | Existing |
| Area U | Area U | Unserviced | Undeveloped |

## LEGEND

- EXISTING
- NEAR TERM (WITHIN 5 YEARS)
- MID TERM (WITHIN 10 YEARS)
- LONG TERM (WITHIN 30 YEARS)
- VERY LONG TERM (WITHIN 50 YEARS)
- BEYOND STUDY PERIOD (OVER 50 YEARS)

EVB ENGINEERING
800 SECOND STREET WEST
CORNWALL, ONTARIO CANADA, K6J 1H6
TEL: 613-935-3775 | FAX: 613-935-6450
WEBSITE: EVBengineering.com

CLIENT: SOUTH GLENGARRY — Ontario's Celtic Heartland

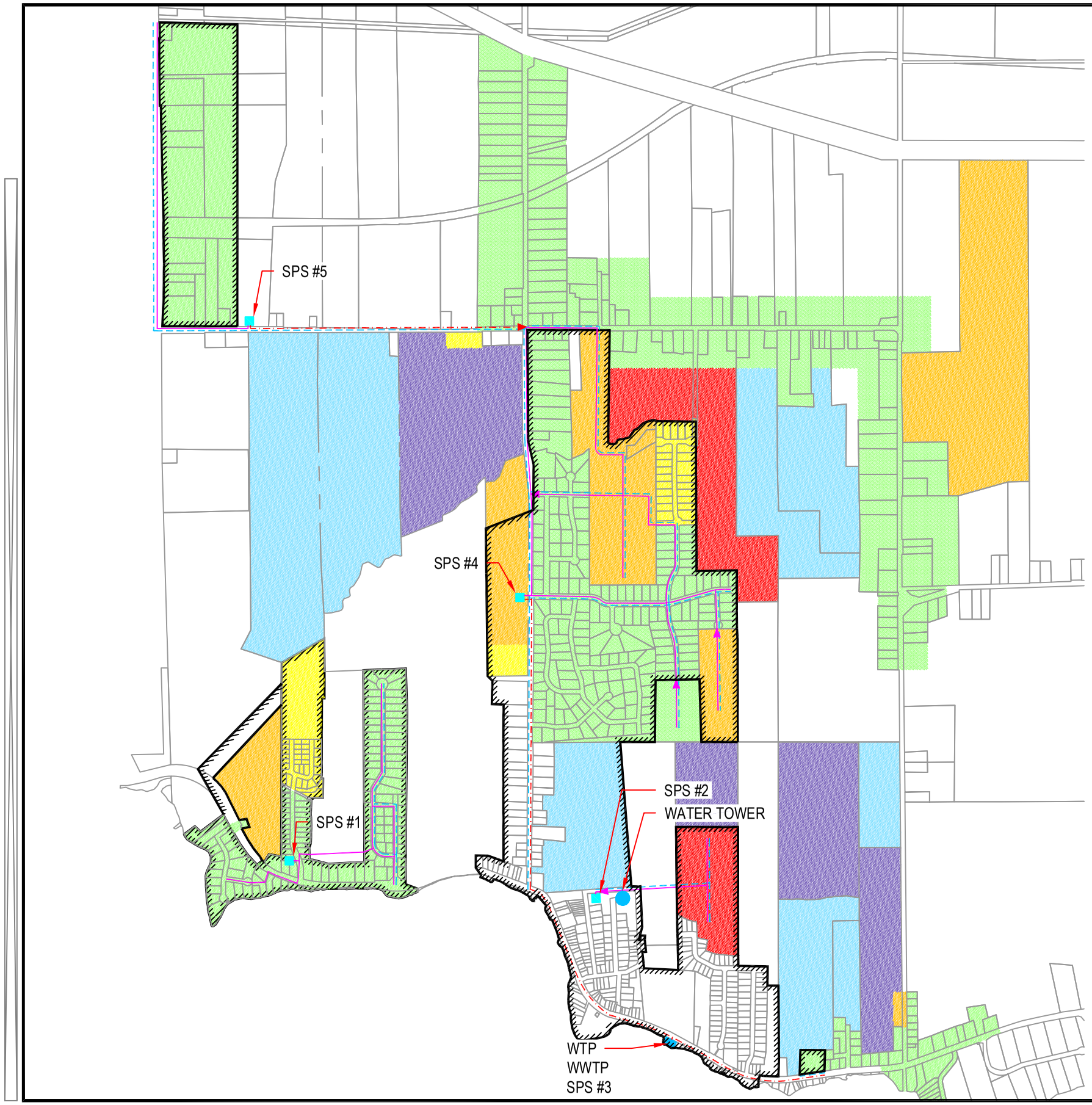
PROJECT:

GLEN WALTER AREA
WATER AND WASTEWATER
MASTER SERVICING PLAN

TITLE:

DEVELOPMENT AREAS
WITHIN THE STUDY AREA

| | |
|---|---|
| SCALE: 1:20,000 | JOB NO: 19030 |
| DESIGNED BY: M.V. | DATE: 2020/05/01 |
| DRAWN BY: K.B.W. | DRAWING NO. FIG.3 |
| CHECKED BY: M.V. | |




## LEGEND

- MUNICIPAL SERVICE AREA
- EXISTING
- NEAR TERM (WITHIN 5 YEARS)
- MID TERM (WITHIN 10 YEARS)
- LONG TERM (WITHIN 30 YEARS)
- VERY LONG TERM (WITHIN 50 YEARS)
- BEYOND STUDY PERIOD (OVER 50 YEARS)
- NEW GRAVITY SEWER
- NEW FORCEMAIN
- NEW WATERMAIN
- NEW SEWAGE PUMPING STATION

EVB ENGINEERING
800 SECOND STREET WEST
CORNWALL, ONTARIO CANADA, K6J 1H6
TEL: 613-935-3775 | FAX: 613-935-6450
WEBSITE: EVBengineering.com

CLIENT: SOUTH GLENGARRY — Ontario's Celtic Heartland

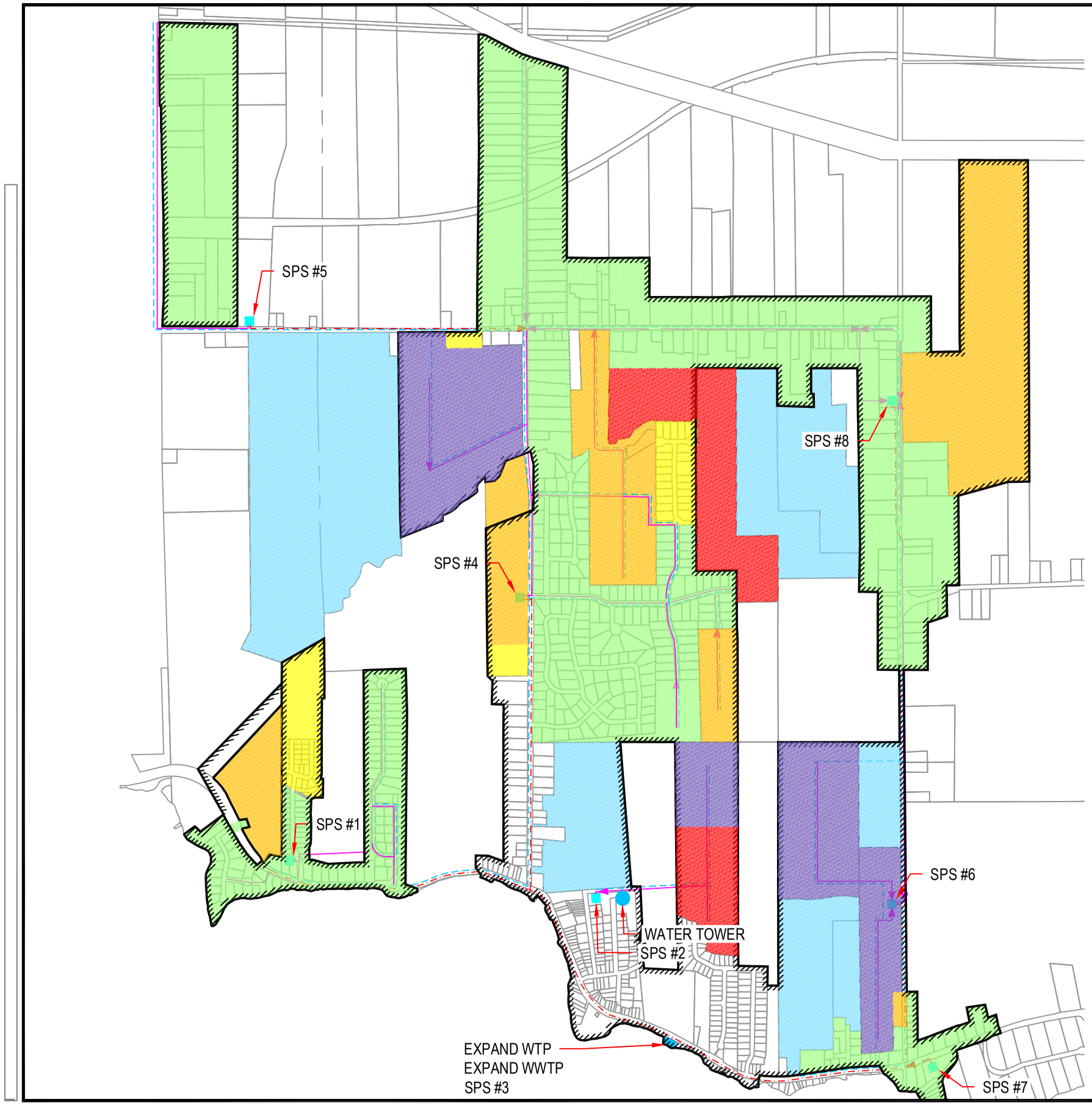
PROJECT:

# GLEN WALTER AREA WATER AND WASTEWATER MASTER SERVICING PLAN

TITLE:

## OPTION 2A SERVICING (30 YEARS)

| | |
|---|---|
| SCALE: 1:20,000 | JOB NO: 19030 |
| DESIGNED BY: M.V. | DATE: 2020/05/01 |
| DRAWN BY: K.B.W. | DRAWING NO. FIG.4 |
| CHECKED BY: M.V. | |




## LEGEND

- MUNICIPAL SERVICE AREA
- EXISTING
- NEAR TERM (WITHIN 5 YEARS)
- MID TERM (WITHIN 10 YEARS)
- LONG TERM (WITHIN 30 YEARS)
- VERY LONG TERM (WITHIN 50 YEARS)
- BEYOND STUDY PERIOD (OVER 50 YEARS)
- NEW GRAVITY SEWER
- NEW FORCEMAIN
- NEW WATERMAIN
- NEW SEWAGE PUMPING STATION

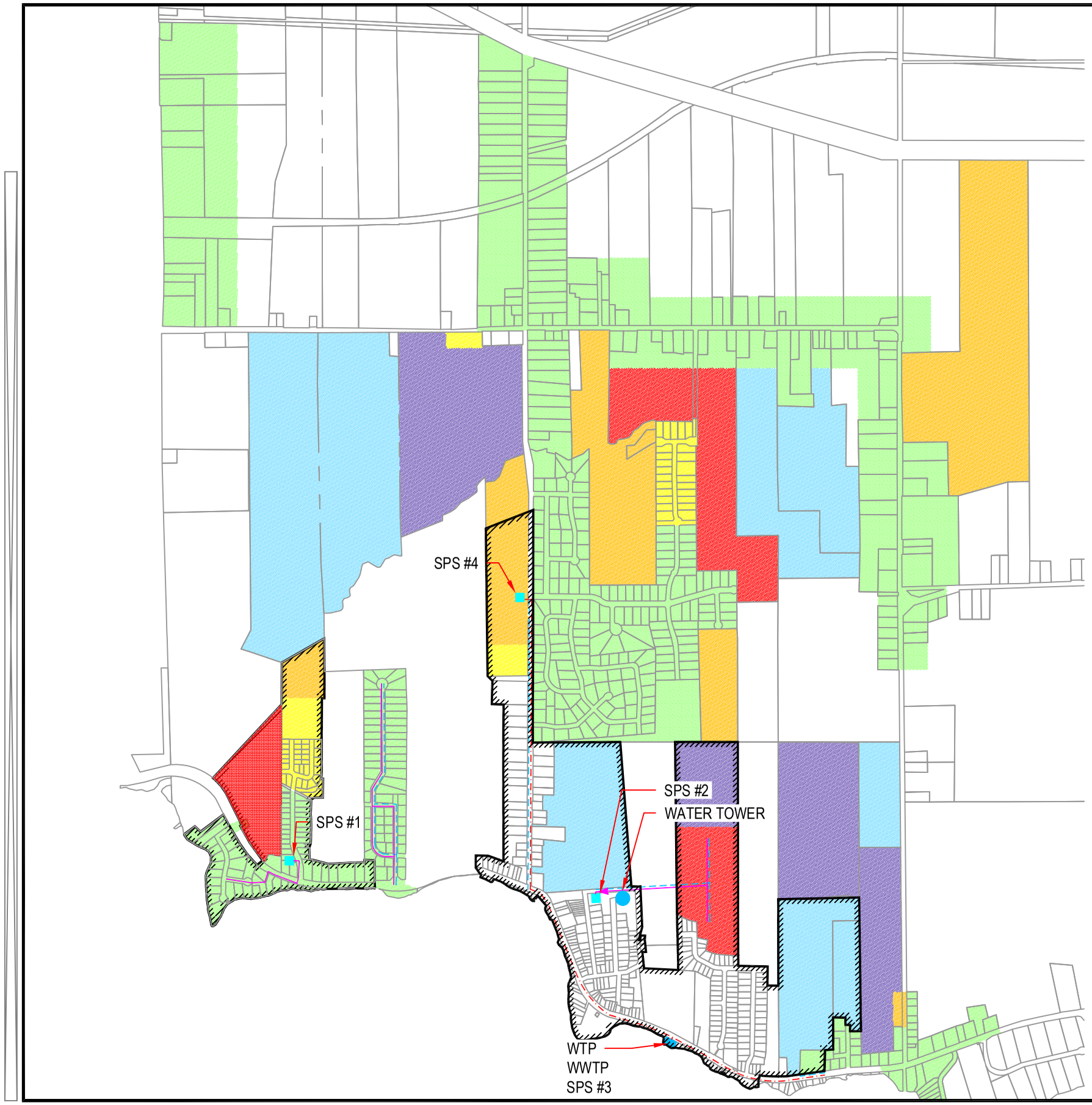
EVB ENGINEERING
800 SECOND STREET WEST
CORNWALL, ONTARIO CANADA, K6J 1H6
TEL: 613-935-3775 | FAX: 613-935-6450
WEBSITE: EVBengineering.com

CLIENT:
SOUTH GLENGARRY
Ontario's Celtic Heartland

PROJECT:
GLEN WALTER AREA
WATER AND WASTEWATER
MASTER SERVICING PLAN

TITLE:
OPTION 2A
SERVICING (50 YEARS)

| | |
|---|---|
| SCALE: 1:20,000 | JOB NO: 19030 |
| DESIGNED BY: M.V. | DATE: 2020/05/01 |
| DRAWN BY: K.B.W. | DRAWING NO. FIG.5 |
| CHECKED BY: M.V. | |




## LEGEND

- MUNICIPAL SERVICE AREA
- EXISTING
- NEAR TERM (WITHIN 5 YEARS)
- MID TERM (WITHIN 10 YEARS)
- LONG TERM (WITHIN 30 YEARS)
- VERY LONG TERM (WITHIN 50 YEARS)
- BEYOND STUDY PERIOD (OVER 50 YEARS)
- NEW GRAVITY SEWER
- NEW FORCEMAIN
- NEW WATERMAIN
- NEW SEWAGE PUMPING STATION

EVB ENGINEERING
800 SECOND STREET WEST
CORNWALL, ONTARIO CANADA, K6J 1H6
TEL: 613-935-3775 | FAX: 613-935-6450
WEBSITE: EVBengineering.com

CLIENT: SOUTH GLENGARRY — Ontario's Celtic Heartland

PROJECT:

# GLEN WALTER AREA WATER AND WASTEWATER MASTER SERVICING PLAN

TITLE:

## OPTION 2B (30 YEARS)

| | |
|---|---|
| SCALE: 1:20,000 | JOB NO: 19030 |
| DESIGNED BY: M.V. | DATE: 2020/05/01 |
| DRAWN BY: K.B.W. | DRAWING NO. |
| CHECKED BY: M.V. | FIG.6 |

# APPENDIX B

## WSP Water and Wastewater Master Servicing Plan (Draft)

# APPENDIX C

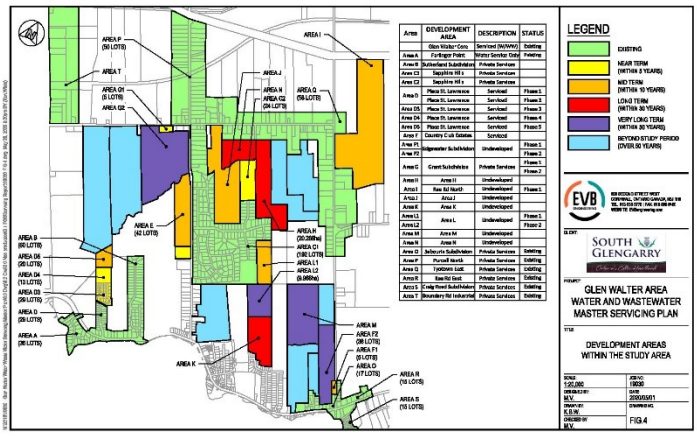
## Public Consultation

| First_name | Last_Name | Job_Title | Company | Address | City | Postal_Code | Phone | Email |
|---|---|---|---|---|---|---|---|---|
| **Municipality** | | | | | | | | |
| **Political Representation** | | | | | | | | |
| Eric | Duncan | MP | Member of Parliament | 691 Brockdale Ave, Unit C | Cornwall | K6J 5C6 | 613-937-3331 | Eric.Duncan@parl.gc.ca |
| Jim | McDonell | MPP | Member of Provincial Parliament | 120 Second Street West | Cornwall | K6J 1G5 | 613-933-6513 | jim.mcdonellco@pc.ola.org |
| **Provincial Government** | | | | | | | | |
| Jon | Orpana | Environmental Assessment Coordinator | MECP | 1259 Gardiners Road, Unit 1 | Kington | K7P 3J6 | 613-548-6917 | jon.orpana@ontario.ca |
| James | Mahoney | Manager (Acting) | MECP | 1259 Gardiners Road, Unit 1 | Kington | K7P 3J6 | 613-548-6902 | james.mahoney@ontario.ca |
| Michelle | Gordon | Water Inspector | MECP | 113 Amelia Street | Cornwall | K6H 3P1 | 613-933-0709 | michelle.gordon@ontario.ca |
| Scott | Lee | District Planner | MNR | 10 Campus Drive, P.O.Box 2002 | Kemptville | K0G 1J0 | 613-258-8470 | scott.lee@ontario.ca |
| Jonh | O'Neil | Rural Planner | OMAFRA | 59 Ministry Road, PO Box 2004 | Kemptville | K0G 1J0 | 613-258-8341 | john.o'neil@ontario.ca |
| Michael | Elms | Manager | Ministry of Municipal Affairs & Housing | Rockwood House, 8 Estate Lane | Kingston | K7M 9A8 | 613-545-2132 | michael.elms@ontario.ca |
| Joseph | Harvey | Heritage Planner | Ministry of Tourism | 401 Bay Street | Toronto | M7A 0A7 | 416-314-7643 | joseph.harvey@ontario.ca |
| Heather | Levecque | Director | Indigenous Relations | 9th Floor, 160 Bloor St. East | Toronto | M7A 2E6 | 416-325-7032 | heather.levecque@ontario.ca |
| **Federal Government** | | | | | | | | |
| Anjala | Puvananathan | Director | Canadian Environmental Assessment Agency | 55 St. Clair Avenue East, Rm 907 | Toronto | M4T 1M2 | 416-953-1575 | iaac.cear-rcee.aeic@canada.ca |
| Anne | Scotton | Regional Director General | Indigenous Affairs and Northern Developmen | 25 St. Clair Avenue East, 8th Fl | Toronto | M4T 1M2 | 416-973-1255 | anne.scotton@aadnc-aandc.gc.ca |
| | | Regional Manager | Transport Canada - Navigation Protection | 4900 Young St, 4th Floor | Toronto | M2N 6A5 | 5193831863 | nppont-ppnont@tc.gc.ca |
| | | | DFO -Fisheries Protection | | | | | fisheriesprotection@dfo-mpo.gc.ca |
| **Agencies** | | | | | | | | |
| Dr. Paul | Roumeliotis | Medical Officer of Health | Eastern Ontario Health Unit | 1000 Pitt Street | Cornwall | K6J 3X1 | 613-933-1375 | proumeliotis@eohu.ca |
| Lisa | Deslandes | Regulation Officer | RRCA | 18045 County Road #2, Box 429 | Cornwall | K6H 5T2 | 613-938-3611 | info@rrca.on.ca |
| Benjamin | de Haan | Director of Transportation and Planning Servic | United Counties of SDG | 26 Pitt Street | Cornwall | K6J 3P2 | 6139321515 | bdehaan@sdgcounties.ca |
| Vicky | Bennett | Real Estate Associate | Ontario Power Generation | 700 University Ave, 18th Fl | Toronto | m5G 1X6 | 416-592-2525 | vicky.bennett@opg.com |
| **First Nation Groups** | | | | | | | | |
| | | | Algonquin Anishinabeq Nation | 81 Kichi Mikan | Kitigan Zibi, Q | J9E 3C3 | 819-449-1225 | info@anishinabenation.ca |
| | | Consultation Intake Clerk | Metis Nation of Ontario Region | Suite 311 - 75 Sherbourne St | Toronto | M5A 2P9 | 416-977-9881 | consultations@metisnation.org |
| Abraham | Francis | Director | Mohawk Council of Akwesasne | PO Box 90 | Akwesasne, O | H0M 1A0 | 613-575-2250 | abraham.francis@akwesasne.ca |
| **Property Owners** | | | | | | | | |
| REFER TO SPREADSHEET PROVIDED BY CITY | | | | | | | | |

# Township of South Glengarry
# Glen Walter Area Water and Wastewater Servicing Master Plan
# Public Consultation Centre #1

## THE STUDY

The Township of South Glengarry is carrying out a study to determine infrastructure requirements for the Greater Glen Walter Area. This study is being conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment which is an approved process under the Environmental Assessment Act.




## WE WANT TO HEAR FROM YOU

Public consultation is a key component of this study. The proposed consultation plan provides for public consultation centres at two points in the study: early summer 2020 – to review the problem and late summer 2020 – to review alternative solutions. In addition there will be an opportunity to review the final Master Plan report.

The study area is as shown on the attached key plan. The first public consultation centre has been arranged to review and receive input from the public about the colletion of background information and identification of the problem:

Date: Wednesday June 24th, 2020

Time: 6:00pm – 8:00pm (Review of Boards at 6:00pm, 6:30pm, 7:00pm and 7:30pm)

Online: https://us04web.zoom.us/j/76200741414?pwd=M01CZWVmMmFpeUdwLzYyQ2tMS0xtdz09

For those individuals who are unable to link to the zoom meeting, display boards will be made available to the public on www.southglengarry.com, the Township's website, starting on June 24th, 2020.

Members of the public are encouraged to submit comments by July 8th, 2020. Comments can be submitted to the email address provided below.

## STUDY CONTACTS

All those with an interest in the study are urged to attend. If you have any questions or wish to be added to the study mailing list, please contact:


Ewen MacDonald
General Manager of Infrastructure Services
Township of South Glengarry
6 Oak Street, Box 220, Lancaster, Ontario K0C 1N0
T: 613-347-1166 ext. 228
emacdonald@southglengarry.com

Marco Vincelli
Project Manager
EVB Engineering
800 Second Street West, Cornwall, ON K6J5J9
T: 613-935-3775, x210
marco.vincelli@evbengineering.com


Issued June 5th, 2020

# Township of South Glengarry
# Glen Walter Area Water and Wastewater Master Servicing Plan
# Public Information Centre #2

## STUDY STATUS

The Township of South Glengarry is carrying out a study to determine infrastructure requirements for the Glen Walter Area. Based on the study findings to date and comments received from technical agencies and the public, a series of alternative solutions have been developed to address proposed water and wastewater infrastructure requirements.

## SECOND PUBLIC INFORMATION CENTRE

The first Public Consultation Centre was held on Wednesday June 24th, 2020 to introduce the study. As a result of comments received from the public, alternative solutions were developed and assessed in terms of their impacts on the area.

A second Public Consultation Centre has been arranged to review and receive input from the public about the alternative solutions, and the preliminary identification of a preferred Master Plan solution. The format of the Public Consultation Centre will be a virtual open house:

| | |
|---|---|
| Date: | September 28th, 2021 |
| Time: | 5:00pm to 7:00pm (Review of Boards at 5:00pm, 5:30pm, 6:00pm, and 6:30pm) |
| Link: | https://us02web.zoom.us/webinar/register/WN_eRwjQVQUSVGCl-1pcHXPzw |

If you are not available to attend the Public Consultation Centre you may request a PDF copy of the presentation boards from Kelli Campeau, Director of Corporate Services/Clerk at kcampeau@southglengarry.com.

STUDY CONTACTS

All those with an interest in the study are urged to attend. If you have any questions or wish to be added to the study mailing list, please contact:


Tim Mills
Chief Administrative Officer
Township of South Glengarry
6 Oak Street, Box 220, Lancaster, Ontario K0C1N0
T: 613-347-1166
tmills@southglengarry.com

Marco Vincelli
Project Manager
EVB Engineering
800 Second Street West, Cornwall, ON K6J5J9
T: 613-935-3775, x210
marco.vincelli@evbengineering.com

# Township of South Glengarry
# Glen Walter Area Water and Wastewater Master Servicing Plan
# NOTICE OF STUDY COMPLETION

**RECOMMENDED MASTER PLAN**

The Township of South Glengarry has prepared a Master Plan following Phase 1 and 2 of the Municipal Class Environmental Assessment.

Based on the study findngs and input from technical agencies and the public, the recommended Master Plan identifies the recommended infrastructure to serve the future water and wastewater needs for the Glen Walter Area. The main components are listed below. While the Master Plan addresses need and justification at a broad level, more detailed studies for Schedule C projects will be undertaken at a later date following the Muncipal Class EA process.

| TYPE OF PROJECT | STATUS |
|---|---|
| **Schedule B Projects** | |
| New Elevated Water Tower | • Proceed with the design and construction of the new wlwvated water tower. |
| Improvements to watermains | • Proceed as required. |
| Improvements to sewers | • Proceed as required. |
| **Schedule C Projects** | |
| Upgrades to the WWTP | • Proceed to a Schedule "C" EA for the expansion of the Glen Walter WWTP. |
| Upgrades to the WTP | • Proceed to a Schedule "C" EA for the expansion of the Glen Walter WWTP. |

The Master Plan is available at the Municipal Office.

Please forward any comments to the Study Contact by January 8, 2022. Thereafter, the Master Plan will be reviewed and revised taking into consideration the comments which are received from the public. The recommended Master Plan will be presented to Town Council for approval.

Sarah McDonald
General Manager - Infrastructure
Township of South Glengarry
6 Oak Street, Box 220, Lancaster, Ontario K0C 1N0
T: 613-347-1166
smcdonald@southglengarry.com

Marco Vincelli
Project Manager
EVB Engineering
800 Second Street West, Cornwall, ON K6J5J9
T: 613-935-3775, x210
marco.vincelli@evbengineering.com

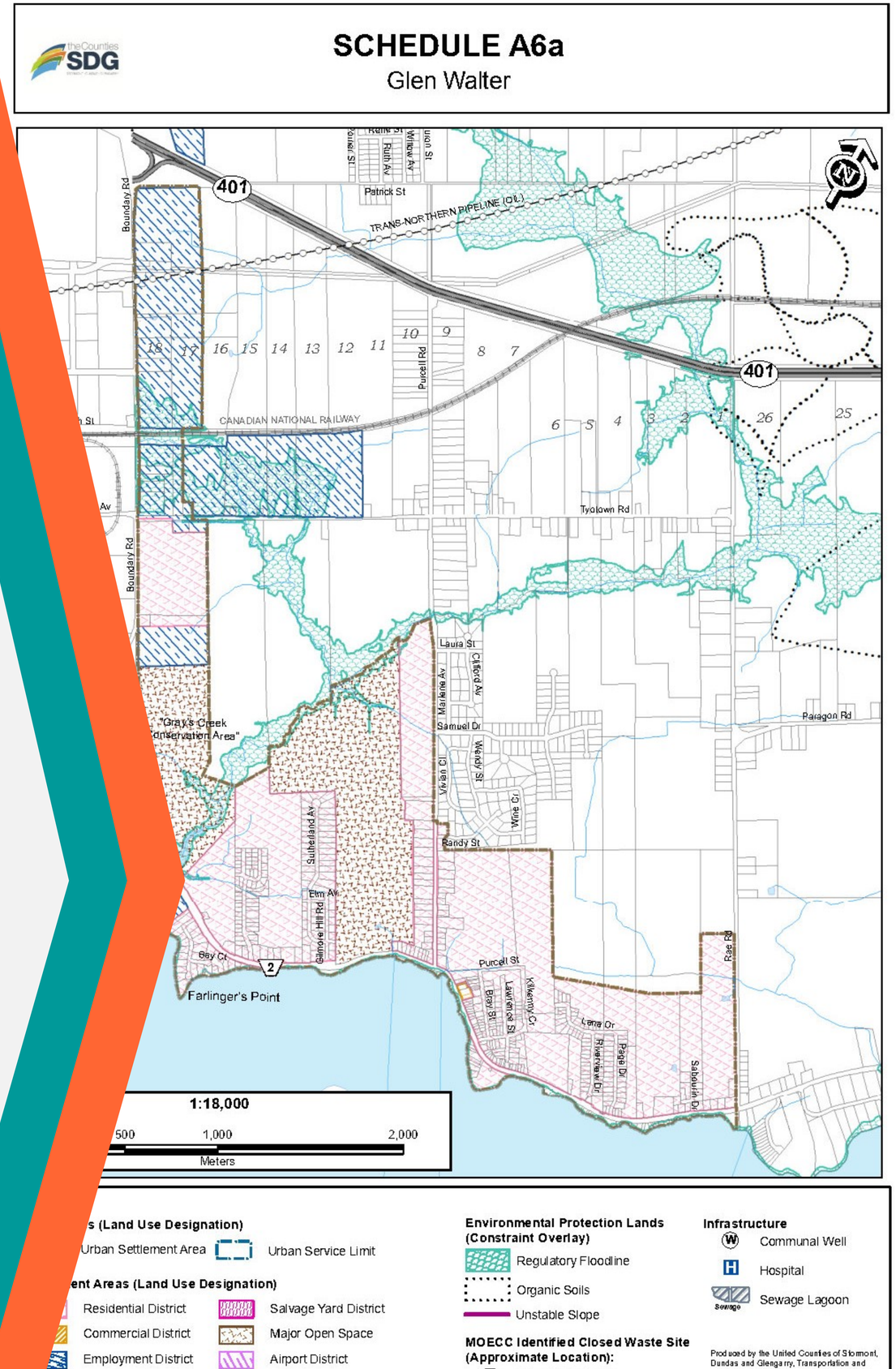
November 24, 2021

EVB ENGINEERING

# GLEN WALTER AREA WATER AND WASTEWATER SERVICING MASTER PLAN

## Public Information Centre #1

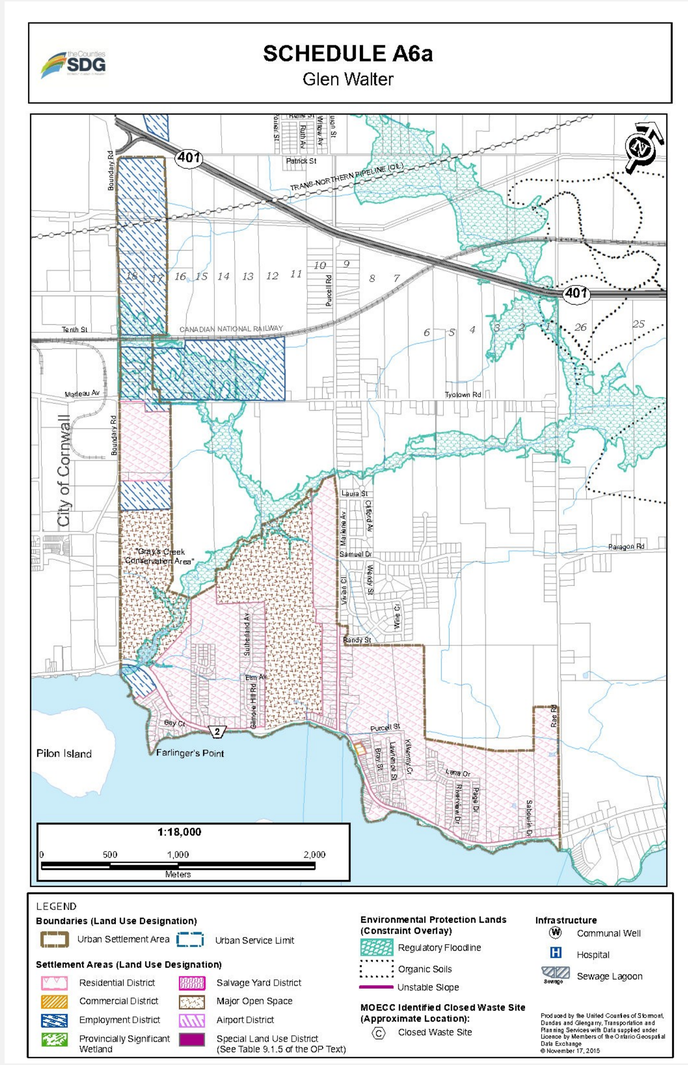
## June 24, 2020



# What is a Water and Wastewater Servicing Master Plan

The Water and Wastewater Servicing Master Plan is a long-term strategy to extend municipal water and wastewater services to support the growing Glen Walter Area.  The Master Plan will review the requirements to support the existing community and future developments following the environmental assessment planning process.

The Glen Walter Area is defined in the United Council of Stormont, Dundas and Glengarry Official Plan.



# Environmental Assessment Process

In Ontario, master plans are subject to the provisions of the Municipal Class Environmental Assessment. Key components of the Class EA process include:

- Consultation with the general public and agencies potentially affected by the proposed project;
- Consideration of a reasonable range of alternatives; and
- Documentation of the planning process.

Phase 1 of EA Process
DEFINE NEEDS
PIC #01

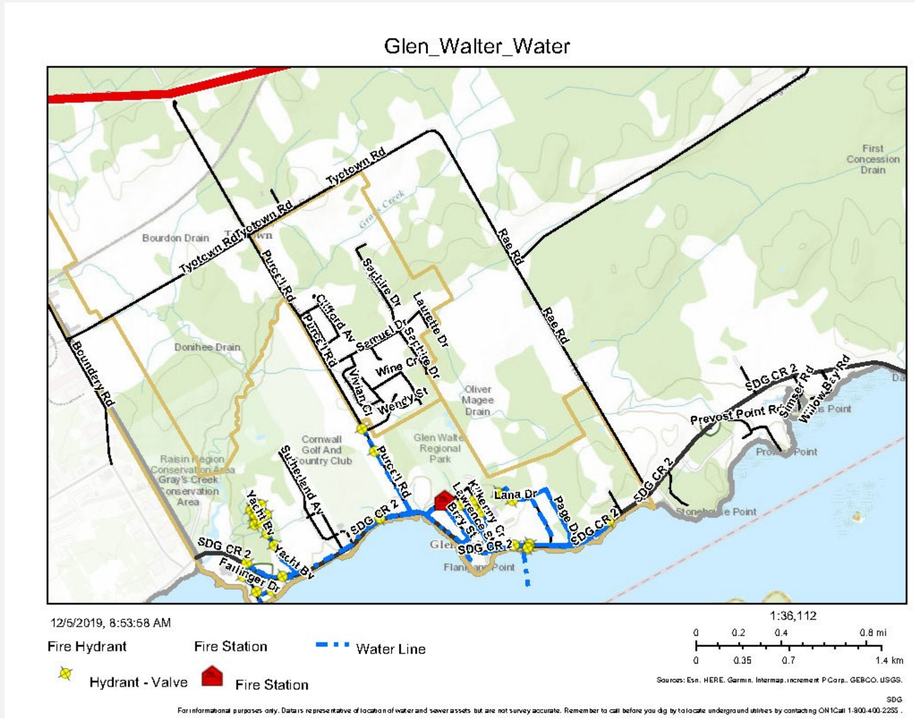
← We are here

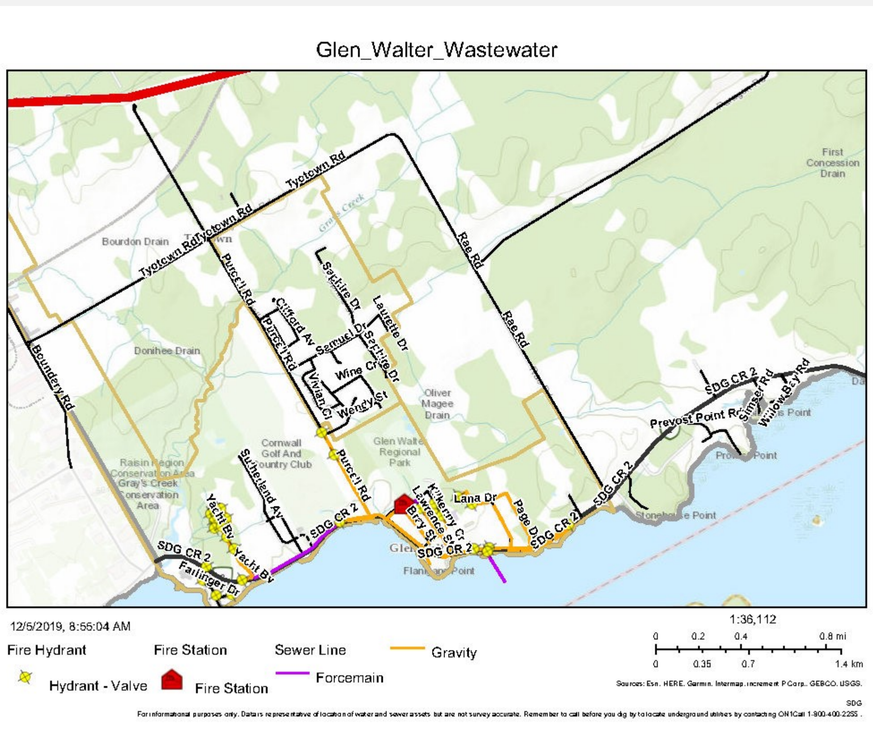
Phase 2 of EA Process
ALTERNATIVE SERVICING SOLUTIONS
PIC #02

Phase 3 of EA Process
PREPARE PLAN
30-Day Public Circulation

# State of Water and Wastewater Servicing

Municipal water and wastewater servicing is currently provided throughout the Glen Walter Core Area, Place St. Lawrence, and Farlinger Point (water only) and there is committed capacity to Country Club Estates as well as infill (new growth) within the Glen Walter Core Area.



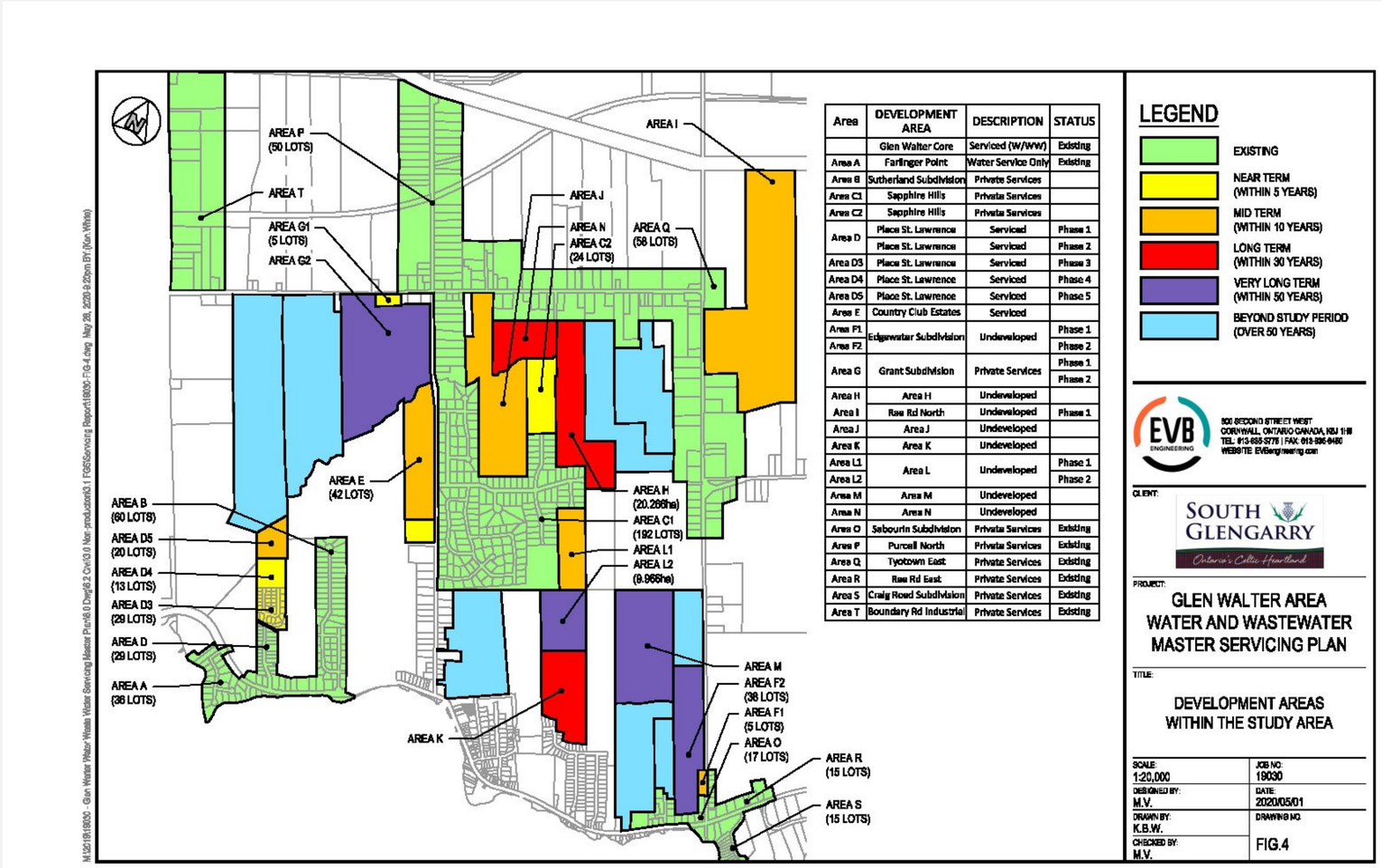

EVB ENGINEERING

# State of Water and Wastewater Servicing

- **Water Storage**
  - The Glen Walter Water Distribution System was not designed to provide fire protection
  - There is insufficient storage to offer fire protection services
  - There is no water storage within the water distribution system which limits the ability to conduct maintenance activities at the WTP (increases redundancy)
- **Glen Walter Water Treatment Plant**
  - Has capacity to support the committed growth as well as approximately 115 additional lots
  - Existing property restricts future expansions
- **Glen Walter Wastewater Treatment Plant**
  - Does not have capacity to support growth beyond current commitments
  - Existing property restricts future expansions

# Glen Walter Area

- Through consultation with the Township Planning Department, potential areas for development and a timeframe for those developments were prepared.




| Area | DEVELOPMENT AREA | DESCRIPTION | STATUS |
|---|---|---|---|
| | Glen Walter Core | Serviced (W/WW) | Existing |
| Area A | Farlinger Point | Water Service Only | Existing |
| Area B | Sutherland Subdivision | Private Services | |
| Area C1 | Sapphire Hills | Private Services | |
| Area C2 | Sapphire Hills | Private Services | |
| Area D | Place St. Lawrence | Serviced | Phase 1 |
| | Place St. Lawrence | Serviced | Phase 2 |
| Area D3 | Place St. Lawrence | Serviced | Phase 3 |
| Area D4 | Place St. Lawrence | Serviced | Phase 4 |
| Area D5 | Place St. Lawrence | Serviced | Phase 5 |
| Area E | Country Club Estates | Serviced | |
| Area F1 | Edgewater Subdivision | Undeveloped | Phase 1 |
| Area F2 | | | Phase 2 |
| Area G | Grant Subdivision | Private Services | Phase 1 |
| | | | Phase 2 |
| Area H | Area H | Undeveloped | |
| Area I | Raw Rd North | Undeveloped | Phase 1 |
| Area J | Area J | Undeveloped | |
| Area K | Area K | Undeveloped | |
| Area L1 | Area L | Undeveloped | Phase 1 |
| Area L2 | | | Phase 2 |
| Area M | Area M | Undeveloped | |
| Area N | Area N | Undeveloped | |
| Area O | Sebourin Subdivision | Private Services | Existing |
| Area P | Purcell North | Private Services | Existing |
| Area Q | Tyotown East | Private Services | Existing |
| Area R | Raw Rd East | Private Services | Existing |
| Area S | Craig Road Subdivision | Private Services | Existing |
| Area T | Boundary Rd Industrial | Private Services | Existing |

LEGEND

- EXISTING
- NEAR TERM (WITHIN 5 YEARS)
- MID TERM (WITHIN 10 YEARS)
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EVB ENGINEERING
800 SECOND STREET WEST
CORNWALL, ONTARIO CANADA, K6J 1H9
TEL: 613-935-2355 | FAX: 613-936-9480
WEBSITE: EVBengineering.com

CLIENT: SOUTH GLENGARRY – Ontario's Celtic Heartland

PROJECT: GLEN WALTER AREA WATER AND WASTEWATER MASTER SERVICING PLAN

TITLE: DEVELOPMENT AREAS WITHIN THE STUDY AREA

| | |
|---|---|
| SCALE: 1:20,000 | JOB NO: 19030 |
| DESIGNED BY: M.V. | DATE: 2020/05/01 |
| DRAWN BY: K.B.W. | DRAWING NO. FIG.4 |
| CHECKED BY: M.V. | |

M:\2019\19030 - Glen Walter Water Wastewater Water Servicing Master Plan\R6.0 Dwg\6.2 Civil\3.0 Non -production\3.1 FIGS\Servicing Report\19030- FIG-4.dwg May 28, 2020 9:20pm BY (Kim White)

EVB ENGINEERING

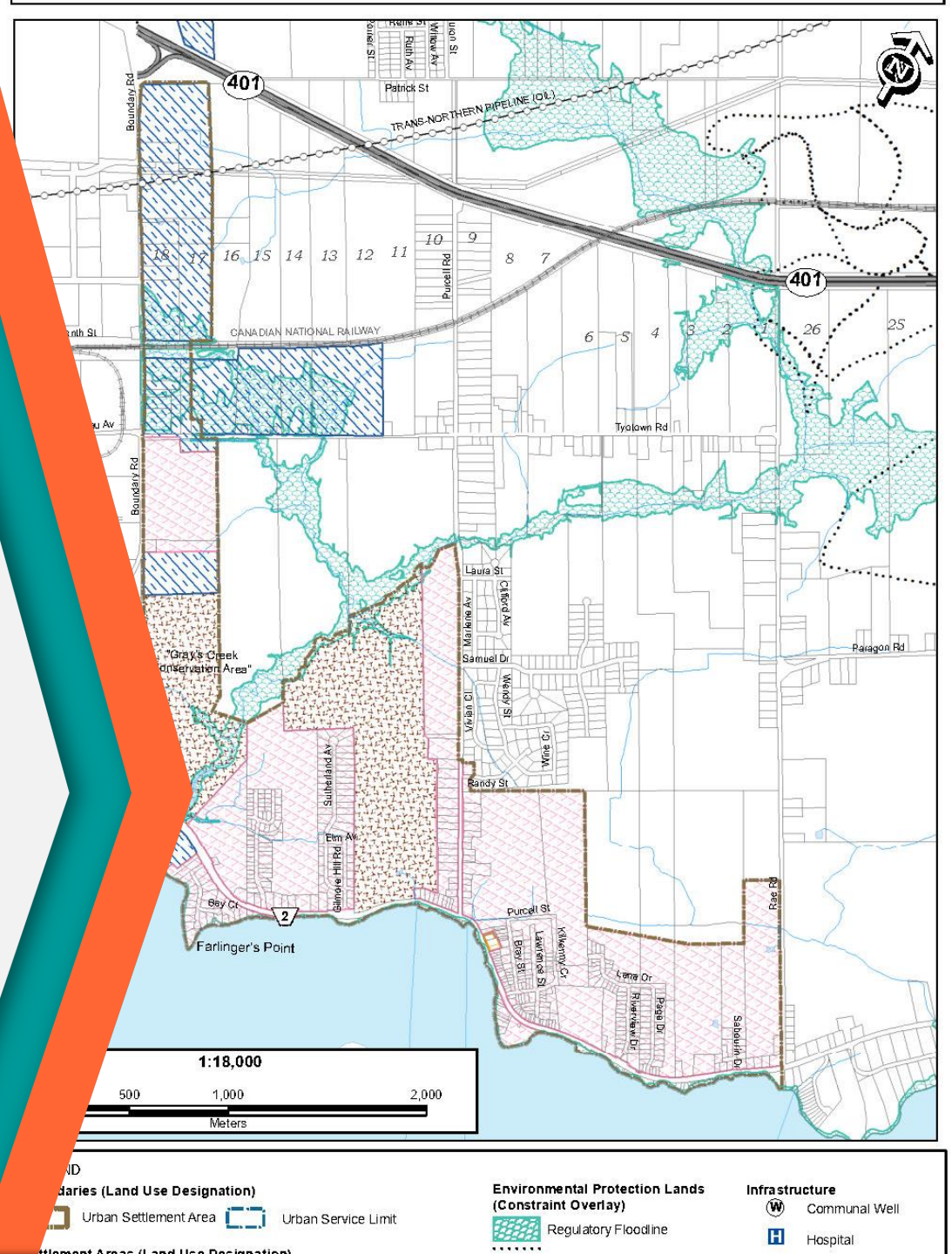
# Next Steps

- The Township will be developing strategies to extend services throughout the Glen Walter Area.
- The Township had conducted a short survey of private systems in 2019 and results will be shared with the public at Public Information Centre #2.
- There will be another Public Information Centre in August 2020.
- **WE WANT YOUR INPUT AND FEEDBACK**
  - Critical decisions on where and when to extend municipal servicing are dependent on feedback from the community and developers.
  - Comments can be submitted in writing at the Township Office or sent to emacdonald@southglengarry.com

# Glen Walter Area Water & Wastewater Servicing Master Plan

## Public Information Centre #2

September 28, 2021



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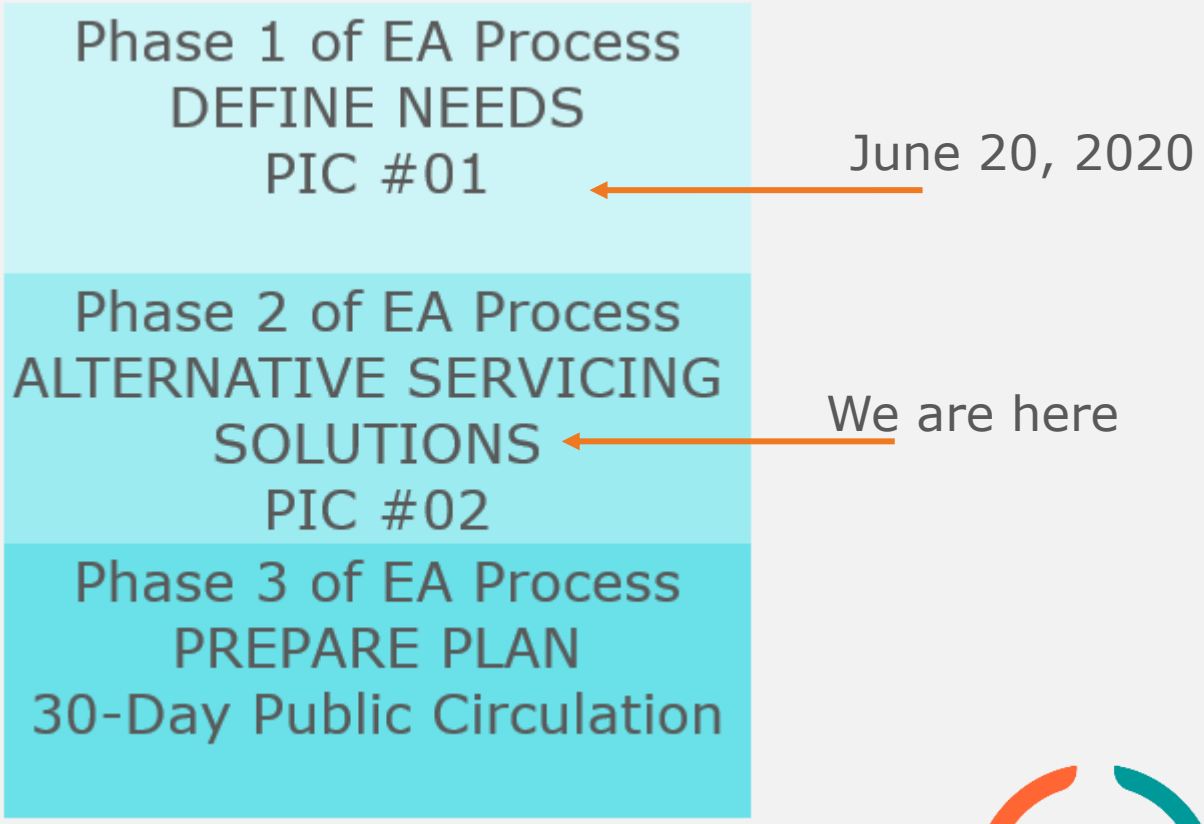
- Documentation of the planning process.



# State of Water and Wastewater Servicing

- **Water Storage**
  - The Glen Walter Water Distribution System was not designed to provide fire protection
  - There is insufficient storage to offer fire protection services
  - There is no water storage within the water distribution system which limits the ability to conduct maintenance activities at the WTP (increases redundancy)
- **Glen Walter Water Treatment Plant**
  - Has limited potential to support additional growth
  - Existing property restricts future expansions
- **Glen Walter Wastewater Treatment Plant**
  - Does not have capacity to support growth beyond current commitments
  - Existing property restricts future expansions

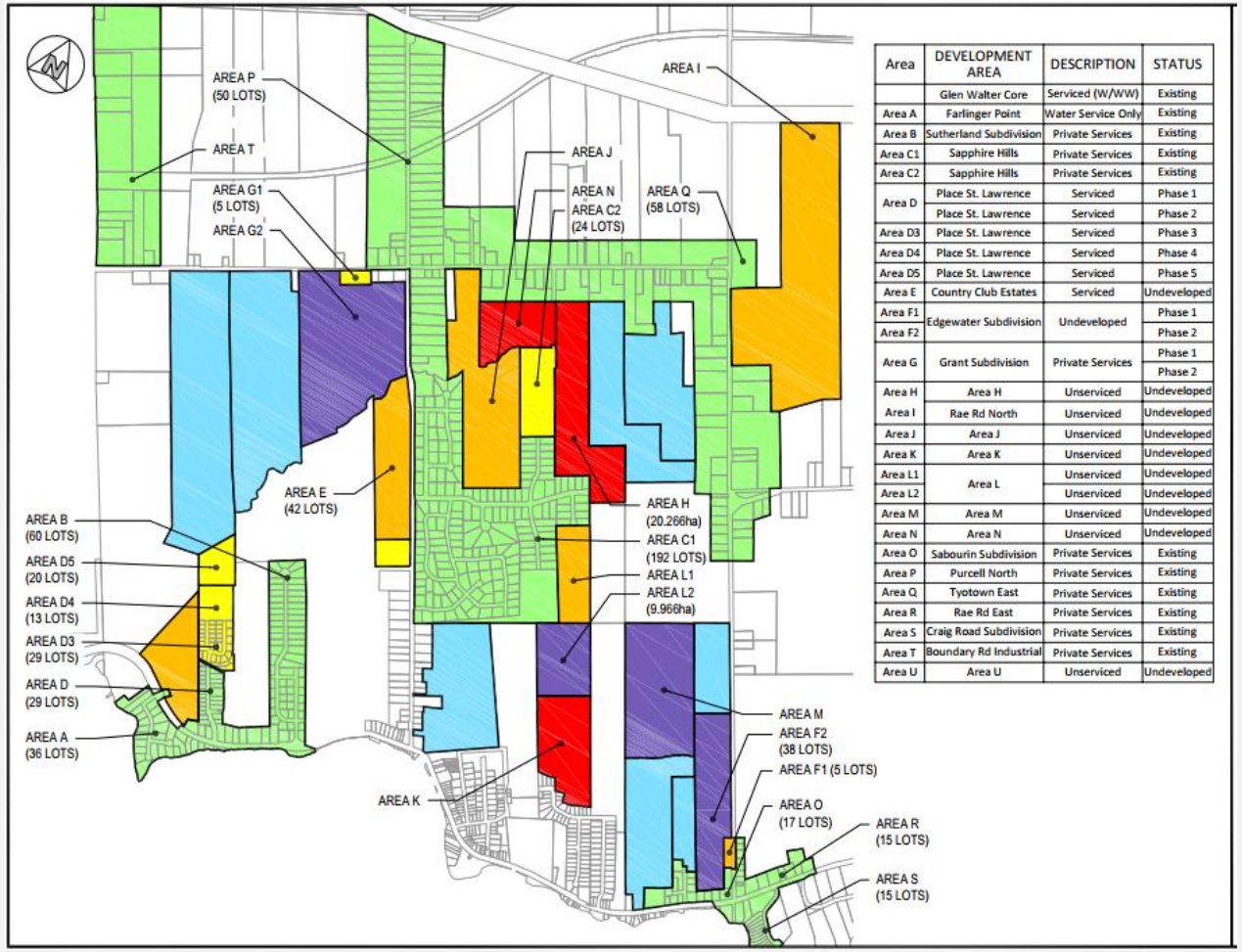
EVB ENGINEERING

# Glen Walter Water and Wastewater Servicing Master Plan

## Objective

- Develop a preferred strategy to provide water and wastewater services to the Glen Walter Community.
- Meet the requirements of the Environmental Assessment Act.

## Study Area

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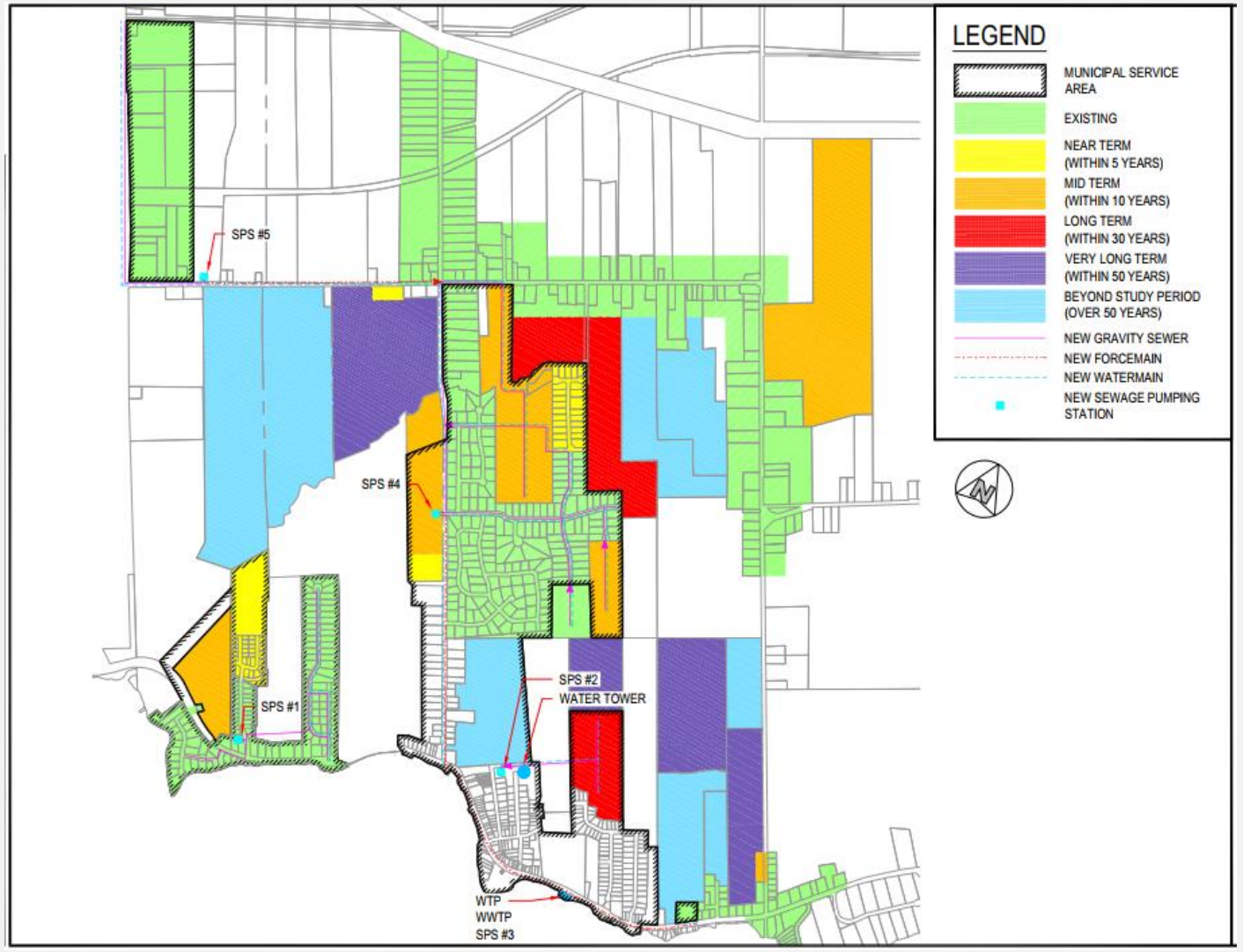
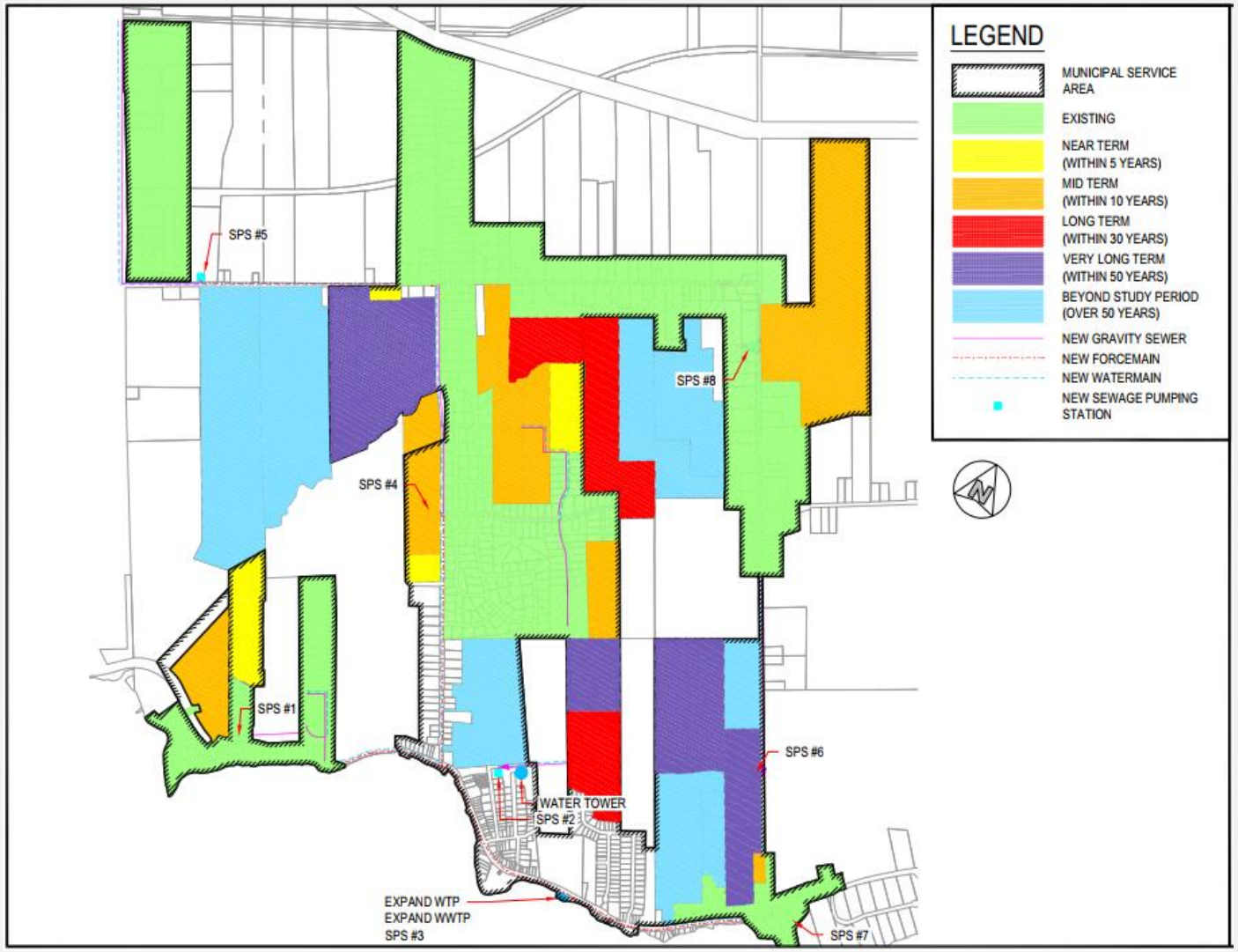
| Area C2 | Sapphire Hills | Private Services | Existing |
| Area D | Place St. Lawrence | Serviced | Phase 1 |
| | Place St. Lawrence | Serviced | Phase 2 |
| Area D3 | Place St. Lawrence | Serviced | Phase 3 |
| Area D4 | Place St. Lawrence | Serviced | Phase 4 |
| Area D5 | Place St. Lawrence | Serviced | Phase 5 |
| Area E | Country Club Estates | Serviced | Undeveloped |
| Area F1 | Edgewater Subdivision | Undeveloped | Phase 1 |
| Area F2 | | | Phase 2 |
| Area G | Grant Subdivision | Private Services | Phase 1 |
| | | | Phase 2 |
| Area H | Area H | Unserviced | Undeveloped |
| Area I | Rae Rd North | Unserviced | Undeveloped |
| Area J | Area J | Unserviced | Undeveloped |
| Area K | Area K | Unserviced | Undeveloped |
| Area L1 | Area L | Unserviced | Undeveloped |
| Area L2 | | Unserviced | Undeveloped |
| Area M | Area M | Unserviced | Undeveloped |
| Area N | Area N | Unserviced | Undeveloped |
| Area O | Sabourin Subdivision | Private Services | Existing |
| Area P | Purcell North | Private Services | Existing |
| Area Q | Tyotown East | Private Services | Existing |
| Area R | Rae Rd East | Private Services | Existing |
| Area S | Craig Road Subdivision | Private Services | Existing |
| Area T | Boundary Rd Industrial | Private Services | Existing |
| Area U | Area U | Unserviced | Undeveloped |

# Potential 30-Year Servicing Plan



# Potential 50-Year Servicing Plan



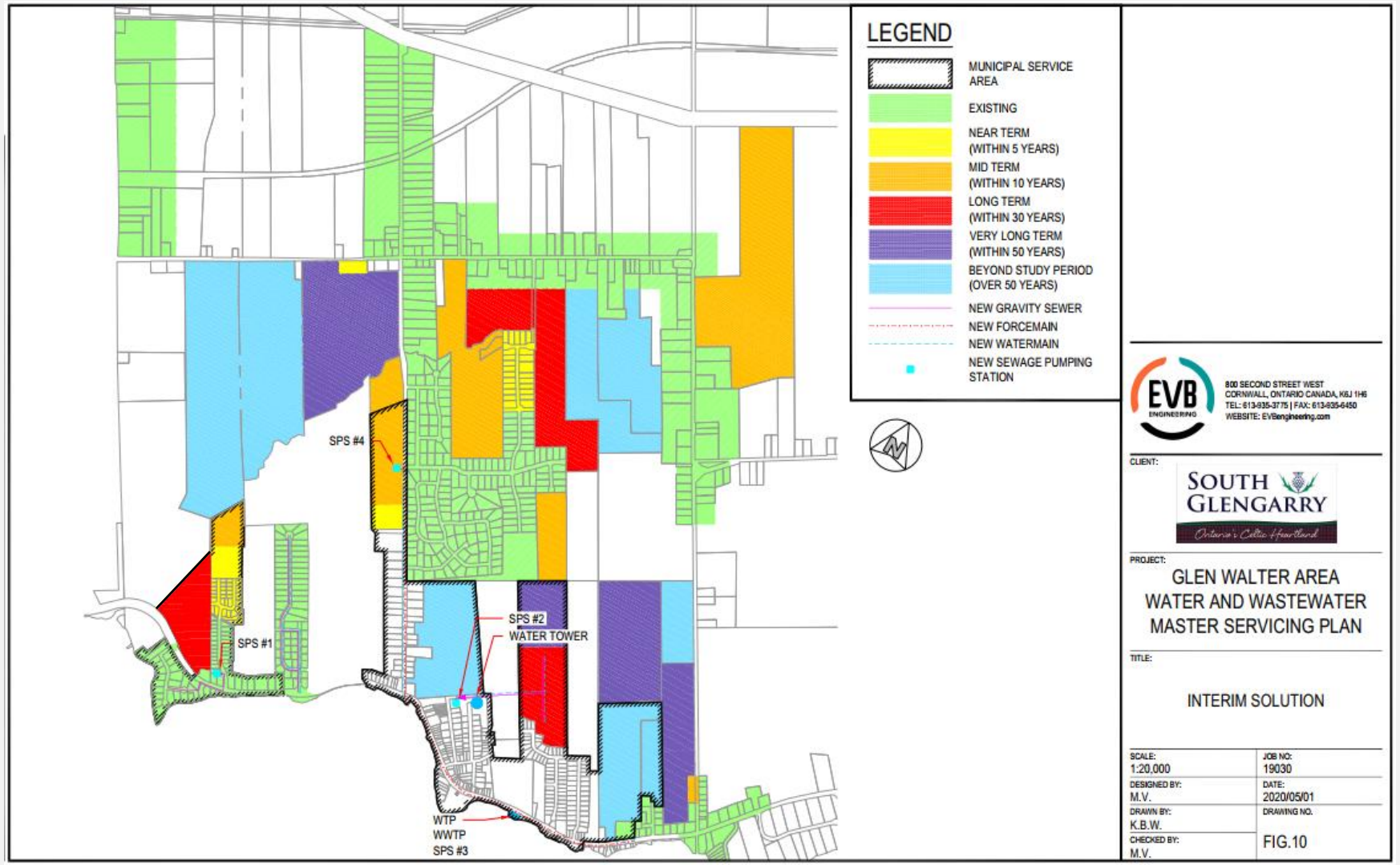
# Evaluation of 50-Year Servicing Plan

- Too expensive
- Concern for resistance from areas that are currently on private services
- Plan surpassed a reasonable growth rate for the area

Results:

- Refocus on development of properties abutting Glen Walter core

# Proposed Extension of Municipal Services




EVB ENGINEERING

# Population Growth

## Growth Rate Comparison with Neighbors

- Glen Walter – 10 units per year of 1% per year
- Long Sault – 41 units per year or 3.2 % per year

| Growth Component | Units | | Population |
|---|---|---|---|
| Current | 440 | | 963 |
| Committed | 72 | | 252 |
| | | | |
| 2021 | 512 | | 1215 |
| Growth Rate | Units | Units/year | Term = 30 |
| 3.0% | 1,243 | 27 | 2,949 |

# Within the Water Distribution System and Wastewater Collection System

- Water Storage = Fire Storage + Equalization Storage + Emergency Storage
  - Fire Storage is based on population serviced
  - Equalization Storage = 25% of the MDF
  - Emergency Storage = 25% of (Fire Storage + Equalization Storage)
- Some existing watermains will need to be increased in diameter to permit flows
- Some sanitary sewers will need to be increased in diameter to permit flows

| Component | Total Cost |
|---|---|
| Water Storage (1,900 $m^3$) | $2,689,000 |
| Water Distribution | $3,100,000 |
| Wastewater Collection | $3,322,000 |

EVB ENGINEERING

# Water and Wastewater Treatment Plant Cost

- Existing Site not large enough for expansion of both water and wastewater treatment plants
  - Require land acquisition for expansion of one of the services
- Water Treatment Plant expansion required
- Wastewater Treatment Plant expansion required

| Infrastructure | Total Cost |
|---|---|
| Water Treatment Plant | $17,072,000 |
| Wastewater Treatment Plant | $18,537,000 |

EVB ENGINEERING

# Total Servicing Cost

Based on a 30-year debenture at 2.32% interest, annual payments for existing residential lots would be:

| Total Project | Total Cost | Cost per Lot | Annual Cost |
|---|---|---|---|
| 3.0% Growth | $44,720,000 | $36,790 | $1,715.83 |

The Township is seeking funding for the water tower and some watermain expansion ($5M) which could receive 73% funding. The Township will continue to lobby for 66% or more funding for the remainder of the project costs.

| Component | Cost per Lot | Annual Cost |
|---|---|---|
| 3% Blended | $11,738 | $547.43 |

EVB ENGINEERING

# Status Quo

If system prohibits growth on municipal services:

- No additional connections are permitted with Glen Walter
- A water tower is still required to provide fire flows and maintain pressure in the system
- Some watermains will need to be upgraded to permit fire flows
- Some sewers will need to be upgraded.
- The mechanical and electrical systems in the Wastewater Treatment Plant will need capital replacement within the next 10 years as the equipment reaches the end of its design service life
- The concrete in the Wastewater Treatment Plant will need rehabilitation within the next 30 years as it reaches the end of its design service life

| | Total Cost | Cost per Lot | Annual Cost |
|---|---|---|---|
| Without Funding | $23,472,500 | $53,346.59 | $2,488.00 |
| With Funding | $7,280,700 | $16,546.93 | $771.71 |

EVB ENGINEERING

# Glen Walter Water and Wastewater Master Plan
# Next Steps

1. Publish Master Servicing Plan
2. Publish Notice of Completion
3. Initiate Schedule “C” EA for Plant Expansion
4. Apply for ICIP Funding and Initiate Design of Elevated Storage Tower and Watermain Replacement

**Ministry of Heritage, Sport, Tourism and Culture Industries**

Programs and Services Branch
401 Bay Street, Suite 1700
Toronto, ON M7A 0A7
Tel: 416.314.7133

**Ministère des Industries du Patrimoine, du Sport, du Tourisme et de la Culture**

Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto, ON M7A 0A7
Tél: 416.314.7133

Ontario

June 26th 2020 EMAIL ONLY

Ewan MacDonald
General Manager of Infrastructure Services
Township of South Glengarry
6 Oak Street, Box 220
Lancaster, ON K0C 1N0
emacdonald@southglengarry.com

| | | |
|---|---|---|
| **MHSTCI File** | **:** | **0012617** |
| **Proponent** | **:** | **Township of South Glengarry** |
| **Subject** | **:** | **Notice of Public Consultation Centre – Municipal Class EA** |
| **Project** | **:** | **Glen Walter Area Water and Wastewater Servicing Master Plan** |
| **Location** | **:** | **Township of South Glengarry** |

---

Dear Ewan MacDonald:

Thank you for providing the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) with the Notice of Commencement for this project. MHSTCI's interest in this Master Plan project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- archaeological resources (including land and marine)
- built heritage resources (including bridges and monuments)
- cultural heritage landscapes

Under the Municipal Class Environmental Assessment (EA) process, the proponent is required to determine a project's potential impact on cultural heritage resources. A Master Plan project at minimum will address Phases 1 and 2 of the Municipal Class EA process.

Developing and reviewing inventories of known and potential cultural heritage resources within the study area can identify specific resources that may play a significant role in guiding the evaluation of alternatives for individual EA's completed as part of the Master Plan and any subsequent project-driven EAs.

Please note that technical cultural heritage studies will need to be completed for any Schedule B and C Municipal Class EA projects deemed complete as part of the selected master planning approach. The findings and recommendations of these technical cultural heritage studies will inform the evaluation and selection of preferred alternatives for any Municipal Class EA's completed as part of the Master Plan and subsequent project-driven Municipal Class EAs.

**Project Summary**
The Township of South Glengarry is carrying out a study to determine infrastructure requirements for the Greater Glen Walter Area. This study is being conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment which is an approved process under the Environmental Assessment Act.

**Identifying Cultural Heritage Resources**
While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to these communities. Municipal Heritage Committees, historical societies and other local heritage organizations may also have knowledge that contributes to the identification of cultural heritage resources.

**Archaeological Resources**
This Master Plan project may impact archaeological resources therefore the screening checklists developed by MHSTCI: *Criteria for Evaluating Archaeological Potential* and *Criteria for Evaluating Marine Archaeological Potential* should be completed. A Stage 1 archaeological assessment may need to be completed to determine whether archaeological assessments will be needed for subsequent project-driven Municipal Class EAs.

In addition, archaeological assessments are required for any Municipal Class EA's completed as part of the selected master planning approach. Archeological assessments are to be undertaken by an archaeologist licensed under the Ontario Heritage Act and submitted for MHSTCI review prior to the issue of a notice of completion or any ground disturbing activities.

**Built Heritage and Cultural Heritage Landscapes**
A Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment will be undertaken for the entire study area during the Master Plan process to inform if technical cultural heritage studies will be needed for Municipal Class EA's completed as part of the selected Master Plan approach and any subsequent project-driven Municipal Class EAs. This report should;

1. Identify existing baseline cultural heritage conditions within the study area. The report will include a historical summary of the development of the study area and will identify all known or potential built heritage resources and cultural heritage landscapes in the study area. MHSTCI has developed screening criteria that may assist with this exercise: *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes*.

2. Identify preliminary project-specific impacts on the known and potential built heritage resources and cultural heritage landscapes that have been identified. The report should include a description of anticipated impact to each known or potential built heritage resources or cultural heritage landscape that has been identified.

3. Propose and recommend measures to avoid or mitigate potential negative impacts to known or potential cultural heritage resources. The proposed mitigation measures are to inform the next steps of project planning and design.

Technical cultural heritage studies are to be undertaken by a qualified person who has expertise, recent experience, and knowledge relevant to the type of cultural heritage resources being considered and the nature of the activity being proposed.

The findings of the above-mentioned studies should be summarized as part of the Master Plan discussion of existing conditions, preliminary impact assessment and future commitments.

**Environmental Assessment Reporting**
All technical cultural heritage studies and their recommendations are to be addressed and incorporated into Master Plan projects. Please advise MHSTCI whether any technical heritage studies are required to be completed for this Master Plan project and provide them to MHSTCI before issuing a Notice of Completion.

Thank you for consulting MHSTCI on this project. Please continue to do so through the Master Plan process and contact the Kimberly Livingstone for any questions or clarification.

Sincerely,

Joseph Harvey
On behalf of

Kimberly Livingstone
Heritage Planner (A)
Heritage Planning Unit
Kimberly.Livingstone@ontario.ca

Copied to: Marco Vincelli, Project Manager, EVB Engineering

**Ministry of the Environment, Conservation and Parks**

Environmental Assessment Branch

1st Floor
135 St. Clair Avenue W
Toronto ON M4V 1P5
**Tel.**: 416 314-8001
**Fax.**: 416 314-8452

**Ministère de l'Environnement, de la Protection de la nature et des Parcs**

Direction des évaluations environnementales

Rez-de-chaussée
135, avenue St. Clair Ouest
Toronto ON M4V 1P5
**Tél.** : 416 314-8001
**Téléc.** : 416 314-8452

**By email only**

July 8, 2020

Township of South Glengarry
6 Oak Street
Box 220
Lancaster, ON K0C 1N0

Attention: Mr. Ewen Macdonald, General Manager of Infrastructure Services
emacdonald@southglengarry.com

Dear: Mr. Macdonald,

Re: Township of South Glengarry, Glen Walter Area Water and Wastewater Servicing Master Plan Notice of Commencement

Thank you for the Notice of Study Commencement provided by email on June 22, 2020. The notice indicates that the Township of South Glengarry is carrying out this study to determine infrastructure requirements for the Greater Glen Walter Area. Additionally, this study is being undertaken in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment which is an approved process under the Environmental Assessment Act.

Here are MECP preliminary comments on the project. Please consider these comments as you proceed through the Class EA process. The comments are grouped under these headings:

- Class EA process,
- MECP technical review issues,
- Aboriginal consultation

Class Environmental Assessment Process

*Notification*

As the Regional EA Coordinator for this project, I will be responsible for circulating project notices and information to MECP reviewers and coordinating the MECP response during the Class EA process. I am also the mandatory contact for all notices issued for the project.

Preferred methods of correspondence are email for notices (pdf), and one hard copy and one copy on a memory stick for reports (such as the Project File report). It is helpful to provide scanned copies of the notices as they appear in newspapers, and confirm the dates of publication.

Please contact:

Jon Orpana, Environmental Assessment Coordinator
Ministry of the Environment, Conservation and Parks
1259 Gardiners Road
P.O. Box 22032
Kingston, Ontario
K7M 8S5
email: jon.orpana@ontario.ca

Please ensure that the Notice of Completion states that Part II Order requests should be addressed in writing to:

Minister Jeff Yurek
Ministry of Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
minister.mecp@ontario.ca

and

Director, Environmental Assessment and Permissions Branch
Ministry of Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5
enviropermissions@ontario.ca

The notice should also state that a Part II Order Request Form must be used to request a Part II Order. The Part II Order Request Form is available online on the Forms Repository Website (http://www.forms.ssb.gov.on.ca) by searching “Part II Order” or “012-2206E” (the form number).

*Master Plan Process*

The Master Plan process is discussed in section A.2.7 and Appendix 4 of the Class EA. Appendix 4 of the Class EA sets out different approaches that could be followed, and includes sample notices. It is preferable to determine the Master Plan approach at an early stage of the process, so that the public and commenting agencies are aware of future commenting opportunities, appeal mechanisms, and additional work needed for individual projects in the plan.

For example, the proponent will need to decide whether the final notice of study completion for the Master Plan will also serve as a final notice of completion for some or all of the schedule B projects identified in the Master Plan. In this case, the notice should list the specific schedule B projects and include a statement informing the public that they have a right to request a Part II Order for the specified projects (approach # 2).

Alternatively, if the proponent has determined that additional EA work and public consultation is needed before the schedule B and C projects are deemed to be completed, and the Master Plan simply provides the framework for future decisions, then the Master Plan is not subject to Part II Order requests, and the notice would not include a statement about the Part II Order mechanism (approach # 1, sample notice # 3).

Approach # 4 involves integrating the Master Plan with a planning approval such as an Official Plan or a comprehensive Official Plan Amendment. With this approach, the Master Plan must meet the requirements set out in Section A.2.9 of the Municipal Class EA.

The proponent should be aware that copies of notices must be provided to the Director of this ministry's Environmental Approvals Branch, with a brief summary of how the Master Plan followed the Class EA requirements. This information is required to be sent to EAB for tracking purposes, to monitor the effectiveness of the Master Plan approach at MEANoticesEAAB@ontario.ca.

The Master Plan document should clearly define the projects which will be carried out under the Master Plan, the appropriate schedule for each project, future documentation or studies that will be needed, and future public consultation opportunities for each project or class of projects. The Master Plan should also explain the appeal mechanisms for the projects in the plan (for example, opportunities to request a Part II Order at a later date, appeal to LPAT if integration with a Planning Act approval is proposed). We recommend that the Master Plan include a chart which summarizes the above information.

As the Master Plan is intended to satisfy Phases 1 and 2 of the Municipal Class EA process, the Master Plan should evaluate alternatives and identify impacts to the environment. The description and evaluation of alternatives should be completed in sufficient detail to allow any reviewer to understand the advantages and disadvantages of each alternative and the rationale for selecting the preferred alternative. The Master Plan may also identify technical studies that will be carried out in future as the individual projects within the Master Plan are further developed.

*Consultation with Review Agencies*

In addition to public consultation, consultation with review agencies is an important component of the Class EA process. Please ensure that you contact review agencies directly to determine their interest in the project at the Notice of Commencement stage.

The MECP Regional office is a mandatory contact for all notices. In addition, other ministries and agencies that may have an interest in the project are listed in section A.3.6 and Appendices 3 and 7. The provincial ministries that are most often involved in Class EA project review include the Ministry of Municipal Affairs (for example, expansion of settlement boundaries, consistency with Growth Plan), Ministry of Natural Resources and Forestry (for example, significant wetlands), and Ministry of Tourism, Culture and Sport (for example, cultural heritage or archaeological resources).

The Master Plan should consider any impacts to servicing policies for the area. For example, the Province does not support growth on partial services. In addition, expansion of settlement boundaries may have implications for the Official Plan. We recommend that the local Ministry of Municipal Affairs Municipal Services Office be included in the government review agency consultation list for this project.

The final report should include information on correspondence with review agencies, issues raised by reviewers, and how these issues will be addressed. This could include technical studies or other information, and commitments to obtain specific approvals or permits.

We normally recommend that intermediate reports or Technical Memoranda, be prepared and circulated for comment before the final Report is prepared. This is not a requirement of the Municipal Class Environmental Assessment (Class EA) process; however, it can ensure that consultation with review agencies is carried out in an effective way and that technical comments are received from agencies before the report is finalized.

<u>MECP Technical Review</u>

This Ministry's technical review of infrastructure projects could consider:

- problems identified during MECP inspections of the existing facilities,

- impacts to the receiving water body due to increased volumes of sewage treatment plant effluent,
- impacts to source protection areas,
- quality of the drinking water source,
- potential to impact wells during operation of an expanded municipal water supply,
- impacts to groundwater and surface water due to construction (i.e. dewatering of trenches during installation of sewers and watermains, control of erosion and sedimentation, construction and/or dredging at outfall or intake locations),
- potential for encountering landfill sites, contaminated soil, contaminated sediment or groundwater during construction,
- management of excess materials, waste, contaminated soil and groundwater during construction,
- noise and air quality impacts to nearby residents or planned subdivisions,
- information on inflow and infiltration to the sewage collection system and remedial measures under consideration,
- information on the available capacity at sewage or water treatment plants to service design population,
- proposed water and sewage service areas,
- consideration to species at risk at a high level recognizing that SAR will be addressed on a project specific level at a later date.

These environmental issues, and appropriate mitigation measures, should be addressed during the Class EA process.

We recommend that you contact this office as soon as possible during the environmental assessment process if you become aware of:

- contaminated sites in the study area or influence area of the project,
- a source water protection vulnerable area in the vicinity of the project, or
- issues that are contentious to the general public.

*Water Resources*

For a new or expanded water supply from a groundwater source, please submit a hydrogeological assessment as part of the Class EA process. Taking more than 50,000 litres a day from a lake, river, stream or groundwater source for a water supply requires a Permit to Take Water.

Impacts to surface water due to increased volumes or concentrations of sewage effluent should be evaluated as soon in the Municipal Class EA process as possible. A site-specific receiving water assessment must be conducted to determine the effluent requirements based on the waste assimilative capacity of the receiver. The site-specific effluent requirements derived from the receiving water assessment must be compared to provincial guidelines for effluent discharge (MOE procedure F-5-1: *Determination of Treatment Requirements for Municipal and Private Sewage Treatment Works*

*Discharging to Surface Waters*), and the most stringent criteria will apply. The receiving stream assessment, including background water quality and flow data, must be provided to MECP by the proponent.

If construction involves taking, dewatering, storage or diversion of water in excess of 50,000 litres per day, the activity may be required to be registered on the Environmental Activity and Sector Registry (EASR) or may require a Permit To Take Water. The process to be used depends on the source of the water, the quantity of water taken, and the type of construction activity. EASR requirements for water takings for construction dewatering are prescribed in Ontario Regulation 63/16 under the Environmental Protection Act. The Permit To Take Water requirements are prescribed in Section 34, Ontario Water Resources Act.

Guidance on nearshore construction and dredging may be obtained from the following MECP guidelines:

- *B-6 Guidelines for Evaluating Construction Activities Impacting on Water Resources,*
- *Evaluating Construction Activities Impacting on Water Resources, Part III A, Part III B, and Part III C* (dredging handbook) and accompanying *Appendix A Provincial Sediment Quality Guidelines,*
- *Guidelines for Identifying, Assessing and Managing Contaminated Sediments in Ontario: An Integrated Approach.*

*Source Protection*

Proponents undertaking a Municipal Class EA project must identify early in the process whether a project is occurring within a source water protection vulnerable area. This must be clearly documented in a Master Plan, Project File report or Environmental Study Report. If the project is occurring in a vulnerable area, then there may be policies in the local Source Protection Plan (SPP) that need to be addressed (requirements under the Clean Water Act). The proponent should contact and consult with the appropriate Conservation Authority/Source Protection Authority (CA/SPA) to discuss potential considerations and policies in the SPP that apply to the project.

Please include a section in the report on Source Water Protection. Specifically, it should discuss whether or not the project is located in a vulnerable area or changes or creates new vulnerable areas, and provide applicable details about the area. If located in a vulnerable area, proponents should document whether any project activities are a prescribed drinking water threat and thus pose a risk to drinking water (please consult with the appropriate CA/SPA). Where an activity poses a risk to drinking water, the proponent must document and discuss in the report how the project adheres to or has regard to applicable policies in the local SPP. If creating or changing a vulnerable area, proponents should document whether any existing uses or activities may potentially be affected by the implementation of source protection policies. This section should then

be used to inform and should be reflected in other sections of the report, such as the identification of net positive/ negative effects of alternatives, mitigation measures, evaluation of alternatives etc. Even if the project activities in a vulnerable area are deemed to not to be a drinking water risk, there may be other policies that apply, so consultation with the local CA/SPA is important.

*Contaminated Sites and Waste Management*

The proponent should consider the potential that the project may be constructed in an area of contamination. If an area of contamination is present, the EA should determine the appropriate management of contaminated soil, sediment and groundwater as well as consider health and safety measures.

Waste, including contaminated soil, must be managed in accordance with MECP standards. The *Environmental Protection Act* (EPA) and Regulation 347 require waste to be classified and disposed of appropriately. When determining the waste category, the proponent must ensure compliance with Schedule 4 of Regulation 347.

Where the removal and movement of soils is required for the project, we recommend that you refer to the MECP document *Management of Excess Soil – A Guide for Best Management Practices*.

We recommend that the proponent consider development of an Excess Materials Management Plan for identification, assessment, excavation, conveyance, treatment, staging, grading and/or off-site disposal/re-use of soils and aggregates generated within the study area during construction.

The Waste Disposal Site Inventory, dated June 1991, may be helpful in identifying the locations of open and closed waste disposal sites in Ontario.

*Consultation with First Nation and Métis Communities*

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before you can proceed with this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the process.

Your proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty

to consult is triggered in relation to your proposed project**, the MECP is delegating the procedural aspects of rights-based consultation to you through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information you have provided to date and the Crown`s preliminary assessment you are required to consult with the following Aboriginal communities who have been identified as potentially affected by your proposed project:

- **Mohawk Council of Akwesasne**
- **MNO Ottawa Métis Council – please cc Métis Nation of Ontario (MNO) on any correspondence going to the council**

Steps that you may need to take in relation to Aboriginal consultation for your proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process" which can be found at the following link:

https://www.ontario.ca/document/consultation-ontarios-environmental-assessment-process

Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments

You must contact the Director of Environmental Assessment and Permissions Branch under the following circumstances subsequent to initial discussions with the communities identified by MECP:

- Aboriginal or treaty rights impacts are identified to you by the communities
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right
- Consultation has reached an impasse
- A Part II Order request or elevation request is expected

The Director can be notified by email, mail or fax using the information provided below:

| | |
|---|---|
| **Email:** | enviropermissions@ontario.ca<br>Subject: Potential Duty to Consult |
| **Fax:** | 416-314-8452 |
| **Address:** | Environmental Assessment and Permissions Branch<br>135 St. Clair Avenue West, 1st Floor<br>Toronto, ON, M4V 1P5 |

The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play should additional steps and activities be required.

Regards,

Jon K. Orpana
Environmental Planner & Environmental Assessment Coordinator
Ministry of the Environment, Conservation and Parks
Kingston Regional Office
PO Box 22032, 1259 Gardiners Road
Kingston, Ontario
K7M 8S5

Phone: (613) 548-6918
Fax: (613) 548-6908
Email: jon.orpana@ontario.ca

ec: Marco Vincelli, Project Manager, EVB Engineering, Cornwall, ON
marco.vincelli@evbengineering.com

Michael Seguin, Area Supervisor, Ministry of the Environment, Conservation and Parks, Cornwall Area Office
Michael.seguin@ontario.ca

**Ministry of Heritage, Sport, Tourism and Culture Industries**

Programs and Services Branch
400 University Ave, 5th Flr
Toronto, ON M7A 2R9
Tel: 437.522.6582

**Ministère des Industries du Patrimoine, du Sport, du Tourisme et de la Culture**

Direction des programmes et des services
400, av. University, 5e étage
Toronto, ON M7A 2R9
Tél: 437.522.6582

Ontario

January 6, 2022 EMAIL ONLY

Marco Vincelli, P. Eng.
Vice-President, EVB Engineering
Marco.Vincelli@evbengineering.com

| | | |
|---|---|---|
| **MHSTCI File** | **:** | **0012617** |
| **Proponent** | **:** | **Township of South Glengarry** |
| **Subject** | **:** | **Notice of Completion** |
| **Project** | **:** | **Glen Walter Water and Wastewater Master Servicing Plan** |
| **Location** | **:** | **South Glengarry, Ontario** |

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Dear Marco Vincelli:

Thank you for providing the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) with the Notice of Completion for the above-referenced project. MHSTCI's interest in this Environmental Assessment (EA) project relates to its mandate of conserving Ontario's cultural heritage.

**Project Summary**
The *Glen Walter Water and Wastewater Servicing Master Plan* is a long-term strategy to extend municipal water and wastewater services to support the growing Glen Walter Area. The Master Plan will review the requirements to support the existing community and future developments following the environmental assessment planning process. The Glen Walter Area is defined in defined by the following borders: South Side of Highway 401 Right-Of-Way (North boundary), St. Lawrence River (South boundary), Rae Road (East boundary), Boundary Road (West boundary).

**Comments**
We have reviewed the Glen Walter Water and Wastewater Master Servicing Plan dated November 23, 2021 prepared by EVB Engineering and have the following comments and recommendations:

- We understand that the Master Servicing Plan addresses need and justification at a broad level, and that more detailed studies will be undertaken at a later date as part of future MCEA. However, the Plan should describe the cultural heritage component of the environment and indicate which projects (regardless of Schedule) will need further technical cultural heritage studies.
    - This Master Plan project may impact archaeological resources therefore the screening checklists developed by MHSTCI: *Criteria for Evaluating Archaeological Potential* and *Criteria for Evaluating Marine Archaeological Potential* should be completed.
    - Existing baseline cultural heritage conditions within the study area should be identified. MHSTCI has developed screening criteria that may assist with this exercise: *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes*.
- At this time, the Schedule B projects (new elevated water tower, improvements to watermains and sewers) may require a Stage 1 Archaeological Assessment if the project

areas meet the criteria for archaeological potential. These project areas will require a Cultural Heritage Report.

- A Stage 1 archaeological assessment is to be undertaken by an archaeologist licensed under the Ontario Heritage Act and submitted for MHSTCI review prior to the issue of a notice of completion or any ground disturbing activities.
- A Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment will be undertaken for the entire project area during the planning phase and will be summarized in the EA Report.
- Technical cultural heritage studies are to be undertaken by a qualified person who has expertise, recent experience, and knowledge relevant to the type of cultural heritage resources being considered and the nature of the activity being proposed.

The findings of the above-mentioned studies should be summarized as part of the Master Plan discussion of existing conditions, preliminary impact assessment and future commitments.

For more information on Archaeological Assessment and Cultural Heritage Report requirements, please review the MHSTCI letter dated June 26, 2020.

Thank you for consulting MHSTCI on this. If you have any questions or require clarification, do not hesitate to contact me.

Regards,

Sincerely,

Jack Mallon
Heritage Planner
Jack.Mallon @Ontario.ca

Copied to:

Karla Barboza, Team Lead, Heritage Planning, MHSTCI – karla.barboza@ontario.ca
Jon Orpana, Environmental Resource Planner & EA Coordinator, MECP – jon.orpana@ontario.ca

# GLEN WALTER AREA WATER & WASTEWATER SERVICING MASTER PLAN UPDATE

## MASTER PLAN UPDATE REPORT

TOWNSHIP OF SOUTH GLENGARRY

DRAFT REPORT

PROJECT NO.: 161-15076
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# 1 INTRODUCTION

The Township of South Glengarry (Township) has retained WSP Canada Inc. (WSP) to undertake a Water and Wastewater Master Plan Update for the Glen Walter Area. The objective of the Master Plan Update is to develop a preferred strategy to provide water and wastewater services in the Glen Walter community from 2017 to 2037. The Master Plan Update is being conducted in accordance with the requirements set out in the Municipal Class Environmental Assessment (Class EA) document (Municipal Engineers Association, 2015).

The conclusions and recommendations provided in this Master Plan Update Report will help the Township to prepare a Capital Plan and to identify additional investigation and planning requirements. It should be noted that the scope of the project did not include an assessment of repair, rehabilitation or replacement needs related to infrastructure assets reaching the end of their expected service lives.

## 1.1 STUDY AREA

The study area for the Master Plan includes within the geographical boundaries of the Glen Walter Area as shown in Figure 1.1. The Glen Walter Study Area is bounded by Boundary Road (City of Cornwall) to the west, Tyotown Road to the north, Rae Road to the east, and the St. Lawrence River to the south. The study area includes communities with municipal water and wastewater servicing, communities with municipal water servicing only, communities with private water and septic services, as well as potential growth areas.

## 1.2 SCOPE OF THE MASTER PLAN

Master Plans are long range plans, which integrate infrastructure requirements for existing and future land use with environmental assessment planning principles. These plans examine an infrastructure system(s) or group of related projects in order to outline a framework for planning for subsequent projects and/or developments (Municipal Engineers Association, 2015).

The following are distinguishing features of Master Plans (Municipal Engineers Association, 2015):

1. The scope of Master Plans is broad and usually includes an analysis of the system in order to outline a framework for future works and developments. Master Plans are not typically undertaken to address a site-specific problem.
2. Master Plans typically recommend a set of works which are distributed geographically throughout the study area and which are to be implemented over an extended period of time. Master Plans provide the context for the implementation of the specific projects, which make up the plan and satisfy, as a minimum, Phases 1 and 2 of the Class EA process. Notwithstanding that these works may be implemented as separate projects, collectively these works are part of a larger management system. Master Plan studies in essence conclude with a set of preferred alternatives and, therefore, by their nature, Master Plans will limit the scope of alternatives, which can be considered at the implementation stage.

This Water and Wastewater Servicing Master Plan documents existing conditions, forecasts infrastructure needs to service growth, and evaluates alternative servicing strategies to define the preferred solution. The Master Plan evaluates infrastructure needs in 5- and 10-year increments starting in 2017 and ending in 2037.

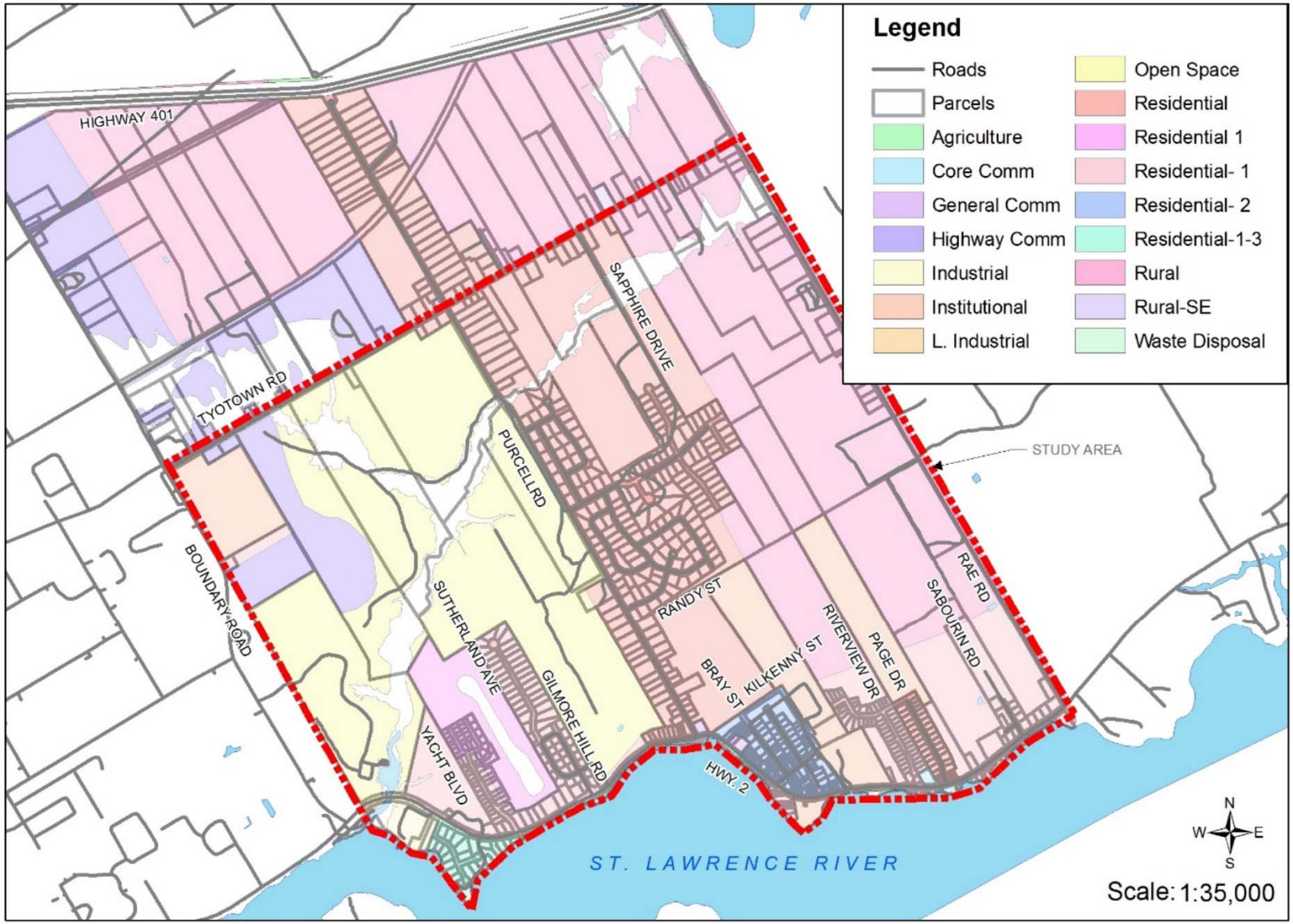



**Figure 1.1 Study Area**

# 2 ENVIRONMENTAL ASSESSMENT PROCESS

## 2.1 ENVIRONMENTAL ASSESSMENT ACT

The Ontario Environmental Assessment Act (EAA) and the associated Codes of Practice require proponents to examine and document the environmental effects that might result from major projects or activities.

The Act defines the environment broadly as:

1. Air, land or water
2. Plant and animal life, including man
3. Social, economic and cultural conditions that influence the life of man or a community
4. Any building, structure, machine or other device or thing made by man
5. Any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities
6. Any part or combination of the foregoing and the interrelationships between any two or more of them.

The purpose of the Act is the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management of the environment in the Province (RSO1990, c. 18, s.2).

## 2.2 PRINCIPLES OF ENVIRONMENTAL PLANNING

The EAA sets a framework for a systematic, rational and replicable environmental planning process that is based on five (5) key principles, as follows:

- Consultation with affected parties - Consultation with the public and government review agencies is an integral part of the planning process and allows the proponent to identify and address concerns cooperatively before final decisions are made. Consultation should begin as early as possible in the planning process.
- Consideration of a reasonable range of alternatives - Alternatives to include functionally different solutions to the proposed undertaking as well as alternative methods of implementing the preferred solution. The “do nothing” alternative must also be considered.
- Identification and consideration of the effects of each alternative on all aspects of the environment - This includes the natural, social, cultural, technical, and economic environments.
- Systematic evaluation of alternatives in terms of their advantages and disadvantages, to determine their net environmental effects - The evaluation shall increase in the level of detail as the study moves from the evaluation of alternatives to the proposed undertaking to the evaluation of alternative methods.
- Provision of clean and complete documentation of the planning process followed – This will allow traceability of decision-making with respect to the project. The planning process must be documented in such a way that it may be repeated with similar results.

## 2.3 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

To meet the requirements of the EAA, this project is being conducted in accordance with the Class Environmental Assessment (Class EA) process. The requirements for undertaking a Class EA are described in the document Municipal Class Environmental Assessment (MCEA) prepared by the Municipal Engineers Association (MEA) (October 2000, as amended in 2007, 2011, & 2015).

The Class EA planning process requires the integration of sound engineering judgement, prudent long-term planning and protection of all aspects of the environment (natural, social, economic and cultural). This includes consultation with the public and affected agencies, to obtain comments and input, to ensure regulatory compliance and ultimately achieve acceptance for the preferred alternative.

The overall result of the Class EA process is the identification of a preferred solution which results in minimal impact on the environment.

Class Environmental Assessments were approved by the Minister of the Environment in 1987 for municipal projects having predictable and preventable impacts. The Class EA streamlines the planning and approvals process for municipal infrastructure projects (including water and wastewater projects) which display the following important characteristics in common:

- Recurring
- Similar in nature
- Usually limited in scale
- Predictable range of environmental effects
- Responsive to mitigation measures

The Class EA document applies to a group of projects which are approved under the Environmental Assessment Act, provided they are planned for according to the requirements of the Class EA. The specific requirements of the Class EA document depend on the type of project, its complexity and the significance of potential environmental impacts.

The MCEA document (Municipal Engineers Association, 2015), outlines the procedures to be followed to satisfy Class EA requirements for water, wastewater and road projects. The process includes five (5) phases:

- Phase 1: Problem Definition
- Phase 2: Identification and Evaluation of Alternative Solutions to Determine a Preferred Solution
- Phase 3: Examination of Alternative Methods of Implementation of the Preferred Solution
- Phase 4: Documentation of the Planning, Design and Consultation Process
- Phase 5: Implementation and Monitoring

Public and agency consultation are integral to the Class EA planning process. Projects subject to the Class EA process are classified into four possible “Schedules” depending on the degree of expected impacts. It is important to note that the Schedule assigned to a particular project is proponent-driven. For example, if a project has been designated as Schedule A, the proponent can decide to comply with the requirements of a Schedule B or C of the MEA process based on the magnitude of anticipated impacts or the special public and agency consultation requirements specific to that particular project.

Agreements made or commitments given by the proponent to affected agencies or the public during the screening process must be followed through and implemented, otherwise the Class EA approval will not be granted. If an affected agency or the public has a concern that cannot be resolved by discussion and negotiation with the proponent, then they can request a proponent to comply with Part II of the EAA. Through issuance of a Part II Order, Schedule “B” and Schedule “C” projects may be elevated to an individual Class EA, requiring the proponent to comply with Part II of the EA Act. Schedule “B” projects could also be elevated to a Schedule “C”.

The Class EA process flowchart is provided in Figure 2.1.

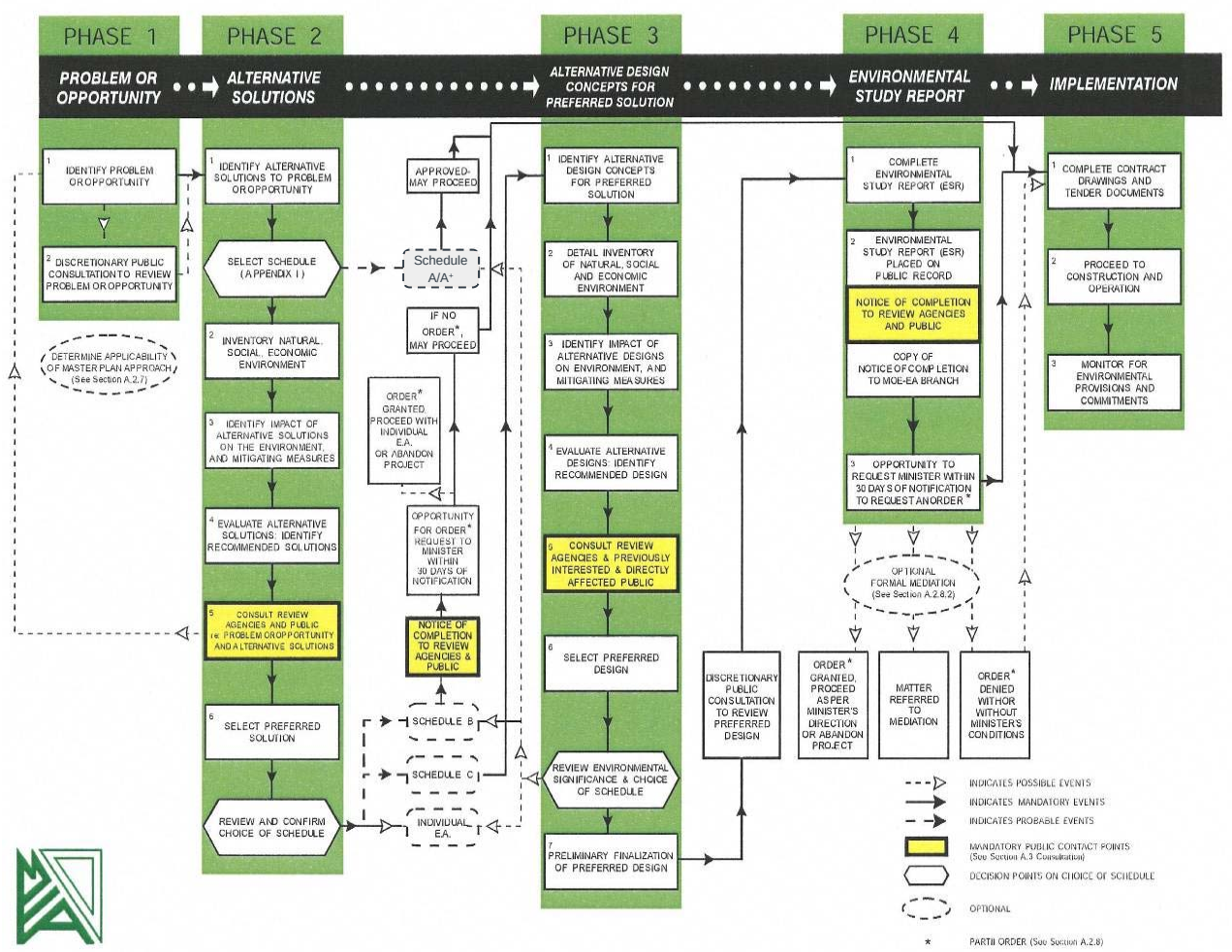



**Figure 2.1 Municipal Class EA Process (Municipal Class EA Document, October 2000, as amended in 2015)**

### *SCHEDULE A PROJECTS*

Schedule A projects are minor, operational and maintenance activities and are pre-approved without the need for further assessment. Projects with this designation are typically limited in scale and have minimal adverse environmental impacts. Examples of Schedule A projects include expansion of waterworks to connect to an existing system. This type of project is pre-approved and the proponent may proceed without following the procedures set out in any other part of the Class EA process.

### *SCHEDULE A+ PROJECTS*

Schedule A+ projects were introduced by MEA in 2007. Similar to Schedule A, these projects are also pre-approved. However, the main difference is that for Schedule A+ projects, the public must be advised prior to the project implementation. Examples of Schedule A+ projects include upgrades to a water treatment plant up to its existing rated capacity where no land acquisition is required; and the establishment, extension or enlargement of a sewage collection system and all necessary works to connect the system to an existing sewage or natural drainage outlet, provided all such facilities are in either an existing road allowance or an existing utility corridor, including the use of trenchless technology for water crossings.

### *SCHEDULE B PROJECTS*

Schedule B projects generally include improvements and minor expansions to existing facilities where there is potential for some adverse environmental impacts. These projects require screening of alternatives for their environmental impacts and completion of Phases 1 and 2 of the Class EA planning process. If outstanding issues remain after the public review period, any party may request that the Minister of the Environment consider a Part II Order (also known as elevating the project to a Schedule C or an Individual EA).

Provided no significant impacts are identified and no requests for a Part II order to a Schedule C or Individual Environmental Assessment are received, Schedule B projects are approved and may proceed directly to implementation. Examples include construction of new water storage facilities and water/wastewater conveyance facilities (pumping stations), among others.

### *SCHEDULE C PROJECTS*

Schedule C projects generally include the construction of new facilities and major expansions to existing facilities. These projects are typically more complex and have the potential for significant environmental effects. As a result, they proceed under full planning and documentation procedures and satisfy all five phases of the Class EA planning process. Phase 3 involves the assessment of alternative methods of carrying out the project, as well as public consultation on the preferred conceptual design. Phase 4 normally includes the preparation of an Environmental Study Report which is filed for public review. Provided no significant impacts are identified and no requests for Part II Order or elevating to an Individual Environmental Assessment are received, Schedule C projects are then approved and may proceed to Phase 5: implementation. Some examples of a Schedule C projects are construction of a new water system including water supply and distribution system and expansion of a wastewater treatment facility.

## 2.4 MASTER PLANNING

While the planning and design process described herein is a process by which municipalities may plan municipal works on a project by project basis, the MCEA process allows for cases when it is beneficial to begin the planning process by considering a group of related projects, or an overall system (e.g. water, wastewater and/or roads network) or a number of integrated systems (e.g. infrastructure master plan) prior to dealing with project specific issues. By planning in this way, the need and justification for individual projects and the associated broader context are better defined.

Master Plans are long range plans which examine infrastructure systems or groups of related projects to outline a framework for planning of subsequent projects and/or developments.

The following are distinguishing features of Master Plans:

1. Their scope is broad and usually includes a system-level analysis to outline a framework for future works. Master Plans are typically not focused on a site-specific problem.
2. Master Plans typically recommend a set of works which are distributed geographically throughout the study area and which are to be implemented over an extended period of time.
3. Master Plans provide the context for the implementation of specific projects which make up the plan and satisfy, as a minimum, Phases 1 and 2 of the Class EA process. Notwithstanding that these works may be implemented as separate projects, collectively these works are part of a larger management system. Master Plan studies in essence conclude with a set of preferred alternatives and, therefore, by their nature, Master Plans limit the scope of alternatives which can be considered at the implementation stage.

The MCEA document (Appendix 4) outlines several approaches to conducting Master Plans.

Approach # 1 was adopted for the completion of this Master Plan. This process involves the preparation of a Master Plan document at the end of Phases 1 and 2 of the MCEA process, and is done at a level of detail which would require more investigation at the project-specific level to fulfill the requirements for the specific Schedule B and C projects identified within the Master Plan. The Master Plan document is made available for public comment prior to being approved by the municipality.

The Master Plan will become the basis for future investigations for specific Schedule B and C projects identified within it. Schedule B projects would require the filing of a Project File for review while Schedule C projects would have to fulfill Phases 3 and 4 prior to filing an Environmental Study Report for public review.

# 3 LITERATURE REVIEW

## 3.1 FEDERAL LEGISLATION

### 3.1.1 CANADA WATER ACT (1985)

The Canada Water Act, passed in 1970 and revised in 1985, provides management of water resources in Canada. The purpose of the Act is to provide a framework for cooperation with the provinces and territories regarding research, planning, and implementation of programs linked to water use, conservation, and development. The federal government has outlined regulations under the Canada Water Act including policies for fisheries, navigation and the conduct of external affairs.

### 3.1.2 FISHERIES ACT (1985)

The Fisheries Act contains habitat and pollution protection provisions which are necessary for all levels of government and the public. Subsection 35(1) of this Act states “no person shall carry out any work or undertaking that results in the harmful alteration, disruption or destruction (HADD) of fish habitat” unless authorized by the Minister of Fisheries and Oceans Canada. A subsection 35(2) Fisheries Act authorization may be issued when adverse effects cannot be avoided.

### 3.1.3 CANADIAN ENVIRONMENTAL PROTECTION ACT (1999)

The Canadian Environmental Protection Act is intended to provide for the protection and conservation of the natural environment, by controlling discharges to air, land, and water. Regulations made under the Act propose limits on what can be discharged to the environment and allow for fines and other penalties when unauthorized discharges occur. This Act affects how a community can dispose of materials and approach its construction activities to ensure that there are no harmful effects on the environment.

### 3.1.4 WASTEWATER SYSTEMS EFFLUENT REGULATIONS (2012)

The Wastewater Systems Effluent Regulations address the largest point source of pollution in Canadian waters. The purpose of the regulations is to reduce the threats to fish, fish habitat and human health by decreasing the amount of harmful substances deposited into waters from wastewater effluent. The regulations set national effluent quality standards that are achievable through secondary wastewater treatment. Wastewater systems that

do not meet the effluent quality standards must upgrade to secondary treatment. The effluent quality standards are as follows:

- Average carbonaceous biochemical oxygen demand ($cBOD_5$) concentration must not exceed 25 mg/L;
- Average total suspended solids (TSS) concentration must not exceed 25 mg/L;
- Average total residual chlorine (TRC) concentration must not exceed 0.02 mg/L; and
- Average unionized ammonia concentration must not exceed 1.25 mg N/L.

The Glen Walter Water Pollution Control Plant (WPCP) is a secondary treatment facility with effluent limits that meet, at a minimum, the above listed effluent concentration standards. Accordingly, the Glen Walter WPCP is currently meeting the Wastewater Systems Effluent Regulations. These regulations will be referenced in the development and evaluation of wastewater treatment alternative solutions for the projected service population.

## 3.2 PROVINCIAL REGULATORY REQUIREMENTS

### 3.2.1 THE PLANNING ACT (1990)

The Planning Act establishes the mechanisms and rules for land use planning in Ontario, outlining how land uses may be controlled, and who may control them. The Act sets the basis for the preparation of Official Plans and planning policies for future development, and it provides municipalities with local autonomy to make decisions and streamline the planning process. The Act empowers local citizens to provide their input to their municipal council and, where permitted, to appeal decisions to the Ontario Municipal Board. Through the Act, the Province issues Provincial Policy Statements and plans.

### 3.2.2 ONTARIO WATER RESOURCES ACT (1990)

The Ontario Water Resources Act was passed for the purpose of conservation, protection, and management of Ontario waters. The act identifies requirements for water works, including wells, and sewage works in relation to planning, design, siting, public notification and consultation, establishment, insurance, facilities, staffing, operation, maintenance, monitoring, and record-keeping. The Act is a general water management statute which applies to both groundwater and surface water. This Act specifies the requirements that the community must satisfy in order for the provincial government to grant approval for establishing, altering, extending, or replacing water and wastewater system components.

### 3.2.3 ONTARIO PLANNING AND DEVELOPMENT ACT (1994)

The Ontario Planning and Development Act establishes the general approach by which the Minister of Municipal Affairs and Housing may cause for Development Plans to be undertaken for development planning areas. Development Plans for development planning areas. The Development Plans may include policies for economic, social and physical development with respect to the following:

- The distribution and density of population within the development area;
- The location of employment areas;
- The identification of land use areas;
- The management of land and water resources;
- The control of all forms of pollution of the natural environment;
- The location and development of servicing communication and transportation systems; and
- The development and maintenance of educational, cultural, recreational, health and other social facilities.

There can also be policies relating to the financing and programming of public development projects as well as capital works and policies to coordinate planning and development among municipalities or planning boards within an area or within separate areas, among other considerations.

In many respects, a Development Plan under the Ontario Planning and Development Act is similar to an Official Plan under the Planning Act. The primary differences are:

1. The Province is the authority for both undertaking and approving the Development Plan; and
2. The legislative requirements for the preparation and approval of a Development Plan are unique to the Ontario Planning and Development Act.

### 3.2.4 MOE GUIDELINE F-5 (1994)

The Ontario Ministry of the Environment (MOE) (now Ministry of Environment, Conservation and Parks (MECP)) requires that municipal and private sewage treatment works, outfall structures and emergency overflow facilities be located designed, constructed and operated so as to minimize pollution of receiving waters and interference with water uses.

The primary purpose of Guideline F-5 is to describe the levels of treatment required for municipal and private sewage treatment works discharging to surface waters. This Guideline is supported by the following Procedures:

1. Procedure F-5-1: Determination of Treatment Requirements for Municipal and Private Sewage Treatment Works Discharging to Surface Waters
2. Procedure F-5-2: Relaxation of Normal Level of Treatment for Municipal and Private Sewage Treatment Works Discharging to Surface Waters
3. Procedure F-5-3: Derivation of Sewage Treatment Works Effluent Requirements for the Incorporation of Effluent Requirements into Certificates of Approval for New or Expanded Sewage Treatment Works
4. Procedure F-5-4: Effluent Disinfection Requirements for Sewage Works Discharging to Surface Waters
5. Procedure F-5-5: Determination of Treatment Requirements for Municipal and Private Combined and Partially Separated Sewer Systems

Guideline F-5 states that the level of treatment for new or expanded sewage treatment works must be in accordance with Procedures F-5-1 and F-5-2. Effluent requirements, including both waste loadings and concentrations, must be derived in accordance with Procedure F-5-3 or those established in the Wastewater System Effluent Regulations (See Section 2.1.4), whichever are stricter.

### 3.2.5 MOE PROCEDURE D-5 (1996)

The primary purpose of D-5 is to guide municipal planning for sewage and water servicing. It describes an approach for municipal planning for sewage and water services to ensure an acceptable quantity and quality of water supply and the proper collection, treatment and disposal of sewage wastewater for development. It is consistent with the Provincial goal to manage growth and change to foster communities that are socially, economically, environmentally, and culturally healthy, and that make efficient use of land, new and existing infrastructure and public service facilities.

1. Procedure D-5-1: Calculating and reporting uncommitted reserve capacity at sewage and water treatment plants
2. Procedure D-5-2: Application of Municipal responsibility for communal sewage and water services
3. Procedure D-5-3: Servicing options statement
4. Procedure D-5-4: Technical guidelines for individual on-site sewage systems: Water Quality impact risk
5. Procedure D-5-5: Technical Guidelines for Private Wells; Water supply assessment

Procedure D-5-1 is used to ensure that sanitary flow generation from approved development applications will not exceed the design capacity of the sewage treatment plant(s). To ensure that capacity is not exceeded it is necessary to determine what uncommitted reserve capacity is available based on historic flows and existing development.

### 3.2.6 SAFE DRINKING WATER ACT (2002)

The Safe Drinking Water Act is in place to provide protection for human health and prevent drinking water health hazards. The Act controls and regulates drinking water systems and drinking water testing. Regulations made under the Act, such as Regulation 268/03 – Ontario Drinking Water Quality Standards, stipulate detailed requirements regarding drinking water systems, testing services, drinking water quality standards, certification of drinking water system operators and drinking water quality analysts and compliance and enforcement. This Act specifies the quality of the drinking water that any community is responsible for producing and delivering as well as how the area's drinking water treatment systems must be operated and managed.

### 3.2.7 PLACES TO GROW ACT (2005)

The Places to Grow Act provides a framework for the Provincial government to coordinate planning and decision-making for long-term growth and infrastructure renewal in Ontario. It gives the Province the authority to designate geographical growth areas, and to develop growth plans in collaboration with local officials and stakeholders to meet specific needs across the Province. Growth plans developed under the Places to Grow Act integrate and build upon other initiatives such as the Greenbelt Plan, the Niagara Escarpment Plan, the Provincial Policy Statement, the Planning Act, municipal infrastructure planning, and source water protection planning. Growth plans may include population projections and allocations, policies, goals and criteria relating to issues such as intensification and density, land supply, expansions and amendments to urban boundaries, location of industry and commerce, protection of sensitive and significant lands (including agricultural lands and water resources), infrastructure development, affordable housing and community design.

Municipalities are required to bring their official plans into conformity with the growth plan for their area. Decisions made under the Planning Act and Condominium Act are also required to conform to applicable growth plans.

### 3.2.8 CLEAN WATER ACT (2006)

Ontario's Clean Water Act is intended to ensure that communities are able to protect their municipal drinking water supplies through the development of collaborative, locally driven, science-based protection plans (source water protection plans). The Act requires that local communities evaluate existing and potential threats to their water source(s) and subsequently implement the required actions to reduce or eliminate these threats. The community can use this information to make choices about the size and locations of water and wastewater servicing elements (e.g. treatment plants, pumping stations, transmission mains, and collection mains).

### 3.2.9 SAFEGUARDING AND SUSTAINING ONTARIO'S WATER ACT (2007)

The Province of Ontario passed the Safeguarding and Sustaining Ontario's Water Act to enable implementation of the Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement and other amendments to the Permit to Take Water program.

The principles of the Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement include the Premiers of Ontario and Quebec and the Governors of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin. This agreement recognizes the following:

- The water of the Basin are a shared public treasure and the parties to the Agreement have a shared duty to protect, conserve and manage the waters;
- Conserving and restoring the waters and water dependent natural resources of the Basin will improve them; and
- Continued sustainable, accessible and adequate water supplies for the people and economy of the Basin are important.

### 3.2.10 ENVIRONMENTAL ASSESSMENT ACT (2010)

The Ontario Environmental Assessment Act and the associated Codes of Practice require proponents to examine and document the environmental effects that might result from major projects or activities. The purpose of the Act is the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management of the environment in the Province (RSO1990, c. 18, s.2).

The Act sets a structure for a systematic, rational, and replicable environmental planning process that is based on five (5) key principles, as follows:

- Consultation with affected parties: Consultation with the public and government review agencies is an integral part of the planning process. Consultation allows the proponent to identify and address concerns cooperatively before final decisions are made. Consultation should begin as early as possible in the planning process.
- Consideration of a reasonable range of alternatives: Alternatives to include functionally different solutions to the proposed undertaking as well as alternative methods of implementing the preferred solution. The “do nothing” alternative must also be considered.
- Identification and consideration of the effects of each alternative on all aspects of the environment: This includes the natural, social, cultural, technical, and economic environments.
- Systematic evaluation of alternatives in terms of their advantages and disadvantages, to determine their net environmental effects: The evaluation shall increase in the level of detail as the Study moves from the evaluation of alternatives to the proposed undertaking to the evaluation of alternative methods.
- Provision of clear and complete documentation of the planning process followed: This will allow traceability of decision-making with respect to the project. The planning process must be documented in such a way that it may be repeated with similar results.

### 3.2.11 PROVINCIAL POLICY STATEMENT (2014)

The Provincial Policy Statement (PPS) is an integral part of Ontario’s planning system. The PPS sets policy direction on matters of provincial interest related to land use planning, growth management, environmental protection and public health and safety while aiming to provide a stronger policy structure that guides communities in Ontario toward a higher quality of life and a better long-term future.

The PPS establishes the various municipalities’ roles in planning for growth, intensification and redevelopment. New settlement area policies will only permit expansions where it is demonstrated that opportunities for growth are not available through intensification, redevelopment or in designated areas. The PPS also requires municipalities to co–ordinate and provide direction on policies with cross municipal boundaries, such as natural heritage systems and resource management. The PPS provides the basis or context for all Provincial Plans and Municipal Official Plans.

The PPS outlines policies and policy reviews related to water, sewage and storm water infrastructure planning. These policies are based on addressing long-term population projections while creating sustainable, reliable and financially feasible resources for the Province.

### 3.2.12 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT (2015)

The Municipal Class Environmental Assessment document (October 2000, as amended in 2015) prepared by the Municipal Engineers Association (MEA) outlines the requirements for undertaking a Class Environmental Assessment (Class EA). The purpose of the document is to provide a process by which to account for preventable and predictable impacts of infrastructure projects.

The Class EA planning process requires the integration of sound engineering judgment, sensible long-term planning, and protection of all aspects of the environment (natural, social, economic and cultural). This includes

consultation with the public and affected agencies to obtain comments and input, to ensure regulatory compliance and ultimately achieve acceptance for the preferred alternative.

The Class EA document applies to a group of projects that are approved under the Environmental Assessment Act that are also planned for according to the requirements of the Class EA. The specific requirements of the Class EA depend on the type of project, its complexity and the significance of potential environmental impacts. The Municipal Class Environmental Assessment (MCEA) document outlines the procedures to be followed to satisfy Class EA requirements for water and wastewater projects. The process includes five (5) phases:

- Phase 1: Problem Definition
- Phase 2: Identification and Evaluation of Alternative Solutions to Determine a Preferred Solution
- Phase 3: Examination of Alternative Methods of Implementation of the Preferred Solution
- Phase 4: Documentation of the Planning, Design, and Consultation Process
- Phase 5: Implementation and Monitoring

The overall result of the Class EA process is the identification of a preferred solution which results in minimal impact on the environment. A summary of the Class EA process is illustrated in Figure 2.1.

The Glen Walter Area Water and Wastewater Master Plan Update project will fulfill the requirements of the Municipal Class EA process.

## 3.3 RELEVANT TOWNSHIP OF SOUTH GLENGARRY STUDIES

### 3.3.1 WATER PLANNING AND FEASIBILITY STUDY – COMMUNITY OF GLEN WALTER (2003)

The Water Planning and Feasibility Study for the Community of Glen Walter was completed in February 2003 by Stantec to provide a high-level analysis of the water infrastructure required to service various development possibilities in Glen Walter. The report identifies a variety of options available to the Township to allow for growth and expansion, and included estimated costs for the development alternatives associated with different water service level scenarios. A summary of key study findings are as follows:

- Significant capital infrastructure cost savings can be realized through water reduction associated with installation of water meters.
- The additional cost associated with adding water pumping at the Glen Walter Water Treatment Plant (WTP) is between 2% and 10% of the total cost to expand the WTP (varies depending on development).
- The additional cost associated with construction of an elevated storage tank is between 60% and 70% of the total cost to expand the WTP (varies depending on development).
- An overall cost saving may be realized if both fire pumping and elevated storage are pursued.
- To accommodate wastewater servicing of residents on private septic systems, it may be necessary to extend the sanitary collection system and expand the existing WPCP capacity. Alternatively, identify and reduce I/I in the collection system.
- Capital costs associated with extending and/or repairing the collection system should be considered in determining servicing costs associated with future developments.

### 3.3.2 INFRASTRUCTURE CAPITAL PLANNING STUDY (2008)

The Infrastructure Capital Master Plan, developed by TSH in 2008, was an investigation and analysis of the municipality's infrastructure system over a 20 to 25 year design horizon. The Plan consisted of an assessment of the current physical condition, an analysis of the system's ability to meet the current and long-term performance

requirements, and a determination of when system upgrades would be required. The Study concluded that all the communities, except for Glen Walter Wastewater Treatment Plant, have adequate reserve capacity. However, the process machinery equipment and associated accessories at the Glen Walter Water and Wastewater Treatment facilities are nearing their design life period.

### 3.3.3 GLEN WALTER WATER AND WASTEWATER TREATMENT SYSTEMS, ENVIRONMENTAL STUDY REPORT (2008)

The Glen Walter Water and Wastewater Treatment Systems Environmental Study Report (ESR) was developed by TSH in 2008 and documents the process and findings of the Municipal Class Environmental Assessment (Class EA) study. The ESR described the existing water and sewage servicing systems, identified problems and opportunities, defined alternative solutions to address the problems, evaluates the alternative solutions and identifies a preliminary preferred solution.

The recommendations of the Class EA as presented in the ESR are as follows:

- Expand the existing Glen Walter Water Treatment Plant (WTP) on the existing site.
- Re-rate the Glen Walter Water Pollution Control Plant (WPCP) to increase the approved average day flow;
- On-going review / update of the Master Plan to account for new developments;
- Monitor private well water quality and private septic system performance; and
- Continue flow monitoring program to identify sources of inflow and infiltration (I/I) in the wastewater collection system and reduce extraneous flows where possible.

### 3.3.4 GLEN WALTER WATER POLLUTION CONTROL PLANT RE-RATING (2009)

In 2009, AECOM initiated a study on behalf of the Township to evaluate the potential of re-rating the Glen Walter Water Pollution Control Plant (WPCP). Historical operating data was reviewed and it was concluded that with the addition of UV for disinfection and chemical addition for phosphorus precipitation the facility could treat flows in excess of the existing rated capacity while meeting the proposed effluent requirements. The recommendations of the study are as follows:

- Installation of a chemical addition (aluminum sulphate) system for the precipitation of phosphorus.
- Installation of a UV disinfection unit for inactivation of harmful bacteria.
- Re-rating of the Glen Walter WPCP from 525 $m^3$/d to 625 $m^3$/d.

On October 27, 2009, the MOE (now MECP) issued an amendment to C of A Number 3-0464-84-889 (Notice No. 2), increasing the ADF rated capacity of the Glen Walter WPCP to 625 $m^3$/d.

### 3.3.5 TOWNSHIP OF SOUTH GLENGARRY - ECONOMIC DEVELOPMENT STRATEGIC ACTION PLAN (2013)

The Economic Development Strategic Action Plan for the Township of South Glengarry is based on an analysis of the United Counties of Stormont, Dundas and Glengarry's Economic Development Strategic Action Plan (June 2012), the Economic Development Strategic Action Plan sub-plans for North and South Dundas and the economic development components from the South Glengarry 2007-2010 Strategic Plan. The Township focuses on its key sectors: agriculture, logistics/distribution, tourism, high-end residential development and small businesses/home-based businesses.

The Economic Development Strategic Action Plan Program will include increasing investment readiness and attraction, fostering entrepreneurship, business attraction, retention and expansion, developing a friendly community image, communication with the community and increasing positive marketing and visual identity. Ongoing support for economic development includes evaluating and aligning the Plan to ensure that focus actions

remain relevant to the strategic vision, supporting Counties-wide economic development initiatives, continued investment attraction and business retention among other main goals.

### 3.3.6 POPULATION AND GROWTH PROJECTIONS – UNITED COUNTIES OF STORMONT, DUNDAS, AND GLENGARRY (2013)

The Population and Growth Projections report was prepared by Hemson Consulting Ltd and details growth outlook, land supply, capacity analysis and settlement area boundary revisions for the United Counties of Stormont, Dundas and Glengarry which includes the Township of South Glengarry. The report analysed previous population, migration and employment trends to complete a population and demographic analysis which extended from 2011 to 2031. A summary of relevant planning forecast information for the Township of South Glengarry as presented in the report is as follows:

- Total occupied households increase of 300 from 5,200 in 2011 to 5,500 in 2031.
- Total population increase from 13,820 persons in 2011 to 13,870 persons in 2031.
- Significant portions of the Glen Walter Area are proposed to be re-designated to rural district.

### 3.3.7 GLEN WALTER WPCP PLANT RE-RATING (2015)

In 2015, the MECP approved an ADF re-rating of the Glen Walter WPCP from 625 $m^3$/d to 787 $m^3$/d. The application for this ECA Amendment provided justifications for a re-rating of the facility. To evaluate the WPCP performance, the raw wastewater and effluent flow and quality data were analysed. An assessment of the hydraulic and biological treatment capacity of the aeration tank was conducted using BioWin™ modelling to identify the ADF at which the facility could maintain compliance with the proposed effluent criteria. It was also determined through a desktop assessment that at the proposed ADF of 787 $m^3$/d, the secondary clarifier would continue to operate within the MOE Design Guidelines.

On March 23, 2015, the MECP issued an amendment to ECA Number 3-0464-84-889 (Notice No. 3) increasing the ADF rated capacity of the Glen Walter WPCP to 787 $m^3$/d.

### 3.3.8 UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY OFFICIAL PLAN (2016)

The Official Plan for the United Counties of Stormont, Dundas and Glengarry is a document that provides planning goals and policies that direct:

1. Economic development within an environmentally friendly context
2. The wise use of renewable and non-renewable resources
3. Future growth, development and intensification
4. Necessary supporting infrastructure

The Planning Act requires that all municipalities adopt an Official Plan that complies with the Provincial Policy Statement. The Official Plan's purpose is to guide development in the County until 2037 and will be reviewed ten (10) years after it comes into effect and five (5) years thereafter. There are nine (9) main sections:

1. Preamble
2. Purpose and Basis
3. Community Growth and Settlement
4. Public Services and Infrastructure
5. Resource Management
6. Public Health and Safety
7. Heritage
8. Implementation
9. Special Land Use Districts

### 3.3.9 WATER TREATMENT PLANT ANNUAL REPORTS (2014-2016)

The Township of South Glengarry submitted Glen Walter WTP Annual Operating Reports to the MECP for the operational period from 2014 to 2016. The WTP annual reports summarize raw and treated water average day flow (ADF), maximum day flow (MDF), and quality data as well as chemical usage.

The 2014, 2015, and 2016 Annual Performance Reports for the Glen Walter WTP concluded that the facility was operated in compliance. Furthermore, all treated water inorganic and organic parameters were shown to be below their exceedance limits.

### 3.3.10 WATER POLLUTION CONTROL PLANT ANNUAL REPORTS (2015-2017)

The Township of South Glengarry submitted Glen Walter WPCP Annual Operating Reports to the MECP for the operational period from 2015 to 2017. The Annual Reports summarize effluent water quality, analytical test results, maintenance operations, and relevant activities of the WPCP.

According to the 2015, 2016, and 2017 Glen Walter WPCP Annual Reports, the facility operated at 74%, 79%, and 100% of its rated ADF capacity of 787 $m^3/d$, respectively. Based on the effluent sample results presented in the Annual Reports, the facility remained in compliance with its ECA throughout the review period.

### 3.3.11 GIS DATA

GIS information and layers were obtained from the Township for use throughout the Master Planning process. The main categories of data that were provided are summarized in Table 3.1.

**Table 3.1 Summary of Provided GIS Data**

| DATA CATEGORY | DESCRIPTION |
|---|---|
| South Glengarry Infrastructure Layers | Physical overview of the Township including parcels, roads, water and sanitary infrastructure |
| South Glengarry Zoning Layers | Specific zoning according to the zoning by-law |
| Stormont Dundas Glengarry Base Layers | Variety of layers such as civic address points and power, oil and gas lines according to the SDG Official Plan |
| Stormont Dundas Glengarry Planning Layers | Overview of the United Counties of Stormont, Dundas and Glengarry through commercial, rural and employment districts, open space, woodlands and waterfront areas according to the SDG Official Plan |
| Ministry of Natural Resources Data Layers | Topographical information such as contours, floodplains and watercourses, geographic lot fabric and significant ecological areas, including information from the Ontario Hydro Network |
| Other Base Layers | Includes Teranet Parcel fabric |

# 4 EXISTING CONDITIONS

## 4.1 SERVICE POPULATION

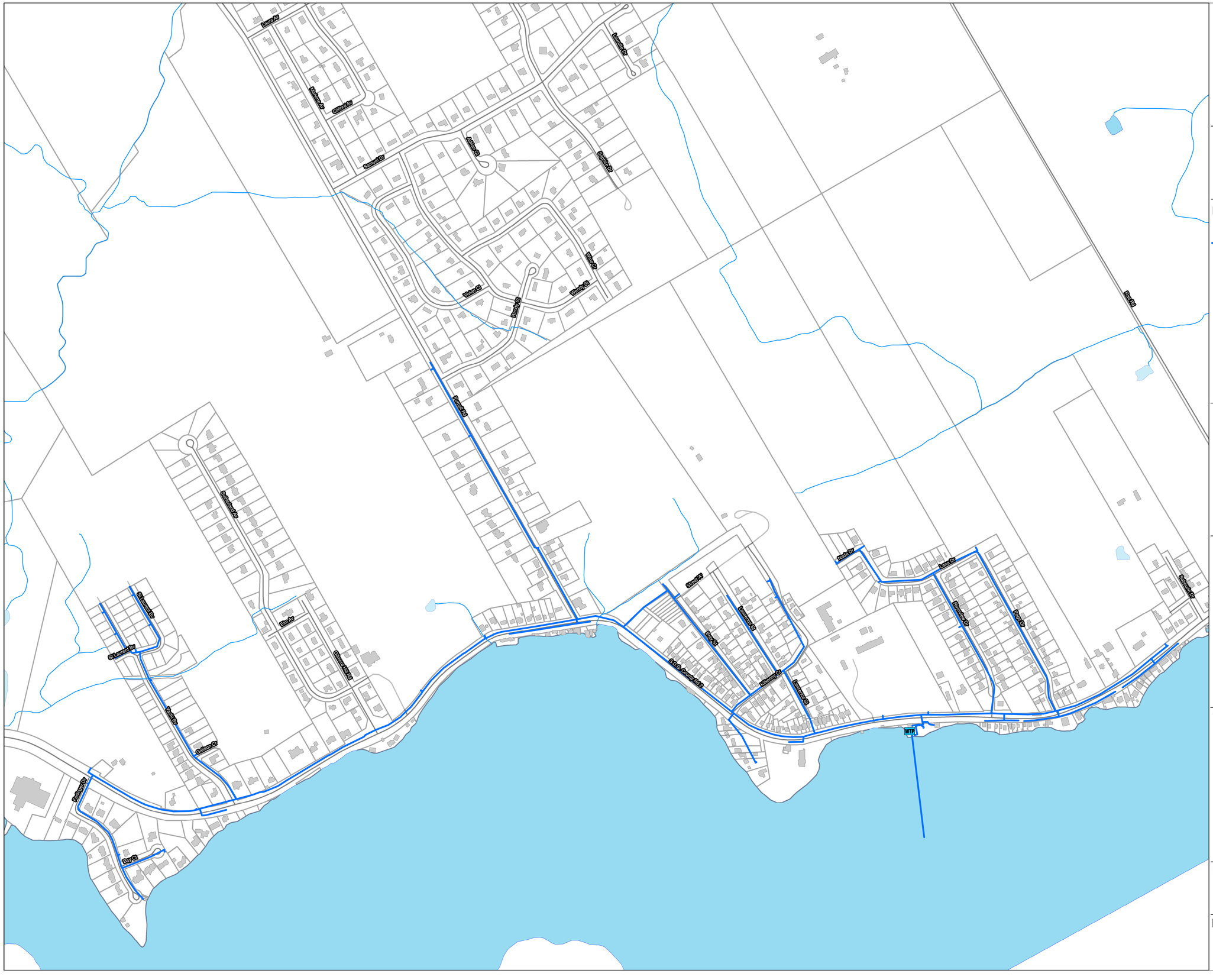
A portion of the Glen Walter area is serviced by Township (municipal) water and wastewater however, not all of the areas connected to the water system are connected to the wastewater system as shown in Figure 4.1 and Figure 4.2. The remaining areas are serviced by private wells and septic systems.

### *4.1.1 POPULATION ESTIMATES FROM PREVIOUS STUDIES*

A review of available information regarding the population estimates for the Township of South Glengarry and, in particular, the Glen Walter area was conducted. The following studies/reports were reviewed:

1. Township of South Glengarry 2016 Census Profile (Stats Canada, 2017)
2. Population and Growth Projections – United Counties of Stormont, Dundas, and Glengarry (Hemson, 2013)
3. Township of South Glengarry 2011 Census Profile (Stats Canada, 2012)
4. Glen Walter Area Water and Wastewater Servicing Master Plan (TSH, 2008)
5. Water Planning and Feasibility Study – Community of Glen Walter (Stantec, 2003)

A brief summary of each study can be found in Section 3.3 of this report. Table 4.1 and Table 4.2 present summaries of the population estimates found in each information source, where the highlighted rows indicate estimates of future population.

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TOWNSHIP OF
SOUTH GLENGARRY
6 OAK STREET
LANCASTER, ONTARIO
K0C 1N0

**Legend**

- WTP — Water Treatment Plant
- Water Lines

Scale:

1:6,000

N
W E
S

0 170 340 680 Meters

Project:

GLEN WALTER AREA WATER AND WASTEWATER MASTER SERVICING PLAN

TOWNSHIP OF SOUTH GLENGARRY

Title:

LOTS CURRENTLY RECEIVING WATER SERVICING

| Project No.: | Date: | |
|---|---|---|
| 161-15076-00 | Oct. 2017 | |
| Drawn By: | Checked By: | Figure No.: |
| HH | CF | 4.1 |


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K0C 1N0

Project:

GLEN WALTER AREA WATER AND WASTEWATER MASTER SERVICING PLAN

TOWNSHIP OF SOUTH GLENGARRY

Title:

LOTS CURRENTLY RECEIVING WASTEWATER SERVICING

| Project No.: | Date: |
|---|---|
| 161-15076-00 | AUGUST 2018 |

| Drawn By: | Checked By: | Figure No.: |
|---|---|---|
| MF | CF | 4.2 |

**Table 4.1 Summary of Population Estimates for the Township of South Glengarry**

| SOURCE | YEAR | ESTIMATED POPULATION |
|---|---|---|
| 2016 Census Profile (2017) | 2016 | 13,150 |
| Population and Growth Projections (2013) | 2011 | 13,800[(1)] |
| | 2031 | 13,900 |
| 2011 Census Profile (2012) | 2011 | 13,162 |

1 Census data from 2011, including undercount. An undercount accounts for error in the census data and/or residences that were not accounted for. The undercount is a calculated value to estimate the population associated with such errors.

**Table 4.2 Summary of Population Estimates for the Glen Walter Area**

| SOURCE | YEAR | ASSUMED POPULATION DENSITY | TOTAL POPULATION | WATER SERVICED POPULATION | SANITARY SERVICED POPULATION |
|---|---|---|---|---|---|
| Glen Walter WPCP Re-rating Study (2009) | 2009 | 2.69 persons/unit | - | - | 897 |
| Glen Walter Area Water and Wastewater Servicing Master Plan (2008) | 2006 | 2.6 persons/unit | 1,500 | 895 | 830 |
| | 2011 | 2.6 persons/unit | - | 1,038 | 962 |
| | 2021 | 2.6 persons/unit | - | 1,394 | 1,293 |
| | 2026 | 2.6 persons/unit | 1,830 | 1,616 | 1,499 |
| | 2031 | 2.6 persons/unit | - | 1,874 | 1,738 |
| | 2036 | 2.6 persons/unit | - | 2,172 | 2,015 |
| Water Planning and Feasibility Study (2003) | 2003 | 2.94 persons/unit | - | 650 | 588 |

Based on the findings presented in the Population and Growth Projections report, the population of South Glengarry was anticipated to increase by 100 or 0.7% between 2011 and 2031. However, it is noted from Table 4.1 that according to Census data, the population of the Township of South Glengarry decreased by 0.1% between 2011 and 2016. Generally, previous studies have suggested that no growth occurred in the Township between 2011 and 2016 and very little growth has been projected between 2011 and 2031.

The projected Glen Walter area population estimates from the Glen Walter WPCP Re-rating Study, the Glen Walter Area Water and Wastewater Servicing Master Plan, and the Water Planning and Feasibility Study as presented in Table 4.2 suggest that between 2003, 2006, and 2009, a significant increase in the Glen Walter water and sanitary service population. Furthermore, despite the significant differences in assumed population density the estimated serviced population in the Master Plan and WPCP Re-rating Studies is much greater than that in the Water Planning and Feasibility Study.

### 4.1.2 CURRENT SERVICE POPULATION

The existing water and wastewater systems currently service most of the properties bordering the St. Lawrence River in the southern Glen Walter area, as shown in Figure 4.1 and Figure 4.2, respectively. The figures identify lots that currently receive servicing and delineate the locations of existing water and wastewater infrastructure. Generally, the service area is the same for both water and wastewater with the exception of a few lots in the southwest portion of the Glen Walter area. These areas currently receive water servicing only.

A review of water meter billing data was conducted and each water meter was classified as belonging to a residential or institutional, commercial, and industrial (ICI) development; or identified as a zero meter. For the purposes of this study, zero meters are:

- water meters located at fully developed lots that are not recognized in the billing records (could include lots consuming water that have not been assigned a water meter); or
- water meters that do not report any water consumption because either no water is consumed by that lot or because consumed water is inaccurately measured as zero by the assigned meter.

**RESIDENTIAL POPULATION**

To determine the current residential service population, water consumption records for the Glen Walter area from 2016 were reviewed to identify the number of active residential water meters being billed and Township Planning staff were consulted to establish a representative population density. The residential water meter data was analyzed to remove any duplications and identify any "zero meters". Once the data was reviewed and analyzed, it was determined that the total number of residential lots receiving water servicing in the study area was the sum of the total number of residential water meters and the total number of zero meters (it was verified that all of the identified zero meters represented residential lots).

To determine the number of residential lots provided with wastewater servicing, the number of known lots in the southwest area of Glen Walter that are not currently receiving wastewater servicing were subtracted from the total number of residential lots receiving water servicing.

It was concluded that approximately 339 residential lots currently receive municipal water servicing and 303 residential lots receive wastewater servicing. Township Planning staff advised that a population density of 2.2 people per lot would provide a reasonable estimate for the Glen Walter area. Accordingly, the estimated existing water and wastewater serviced populations that will be applied to this Master Plan Update Study are 746 and 667, respectively.

**OTHER SERVICING**

Once the residential water meters were identified, the remaining water meters from the 2016 billing records were assumed to be representative of institutional, commercial, and industrial (ICI) users. There is a total of 14 ICI water meters:

- Five (5) institutional water meters;
- Six (6) commercial water meters;
- One (1) industrial water meter; and
- One (1) water meter associated with the Glen Walter WTP/WPCP property.

## 4.2 MUNICIPAL DRINKING WATER SYSTEM OVERVIEW

Drinking water in the Community of Glen Walter is supplied either by private wells or by the Township via the Glen Walter Water Treatment Plant (WTP) and distribution system. The Glen Walter water distribution and treatment systems are comprised of the Glen Walter WTP and a series of watermains with diameters between 75mm and 300mm in size.

### *4.2.1 WATER TREATMENT PLANT*

The Glen Walter WTP is located at 18352 County Road 2 in the Township of South Glengarry 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. Source water is retrieved from the St. Lawrence River and pumped to a flocculation tank via a low lift pumping chamber, where pre-chlorination occurs. An in-line mixer combines coagulant with the raw source water prior to entering the flocculation tank. Following flocculation, the water is conveyed to two (2) pressure dual-media filters

that operate in parallel. The water is then directed to two (2) pressurized granular activated carbon filters to remove constituents associated with bad taste and odour. Finally, the treated water is dosed with chlorine before entering a storage reservoir from where it is pumped via high lift pumps to the distribution system. WTP Treatment process design details are provided in Table 4.3.

**Table 4.3 Glen Walter WTP Process Component Details**

| PROCESS COMPONENT | PARAMETER | DESIGN VALUE |
|---|---|---|
| Intake Pipe | Diameter<br>Length | 300mm<br>390 m |
| Pre-chlorination | Type<br>Chlorinator Capacity | Chlorine gas<br>2 kg/d |
| Low Lift Pumping | Wet Well Dimensions<br>Quantity of Pumps<br>Capacity of Pump (each) | 4.5 m length x 2.0 m wide x 3.9 m depth<br>2 (1 duty, 1 standby)<br>11.52 L/s at 31.6 m TDH |
| Coagulation | Type<br>Quantity of Metering Pumps<br>Type of Metering Pumps<br>Capacity of Metering Pumps | Aluminum Sulphate (Pas-8)<br>2 (1 duty, 1 standby)<br>Diaphragm<br>3.8 L/hr and 18.9 L/hr |
| Mixing | Type<br>Dimensions | In-line, static mixer<br>100mm diameter x 400mm length |
| Flocculation | Quantity of Tanks<br>Dimensions | 1<br>2.7 m diameter x 3.5 m height |
| Pressure Filtration | Type<br>Quantity<br>Dimensions (each) | Multi-media pressure filters<br>2 (in parallel)<br>1.8 m diameter x 2.7 m height |
| Activated Carbon Filtration | Type<br>Quantity<br>Dimensions (each) | Granular activated carbon<br>2 (in series)<br>2.6 m diameter x 3.2 m height |
| Disinfection | Type<br>Quantity of Chlorinators<br>Capacity of Chlorinators | Sodium hypochlorite<br>2<br>4.6 kg/d (post-chlorination at reservoir inlet)<br>1.3 kg/d (final chlorination at high lift pump well) |
| Storage Reservoir | Quantity of Cells<br>Dimensions<br><br>Total Capacity | 2 (in series)<br>15.3 m length x 12.2 m wide x 3.9 m depth (north cell)<br>5.1 m length x 12.2 m wide x 3.9 m depth (south cell)<br>623 $m^3$ |
| High Lift Pumping | Pump Well Dimensions<br>Pump Type<br>Quantity of Pumps<br>Capacity of Pumps (each) | 2.3 m length x 7.2 m wide x 3.9 m depth<br>Vertical turbine<br>2 (1 duty, 1 standby)<br>16.44 L/s at 52.27 m TDH |

### 4.2.2 WATER DISTRIBUTION SYSTEM

Treated water from the Glen Walter WTP is pumped directly into the distribution system, providing potable drinking water to the Glen Walter population residing along County Road 2 from Farlinger Drive to west of Sabourin Drive, as well as select subdivisions connected to County Road 2, as shown in Figure 4.3 The existing distribution system does not have any booster stations or storage tanks. The pipes that make up the distribution network are primarily of PVC material, with a small number of pipes made of HDPE. Pipe diameters range from 75 mm to 300 mm.

The current water distribution system does not provide adequate fire flow capacity.

### 4.2.3 GLEN WALTER WTP SOURCE AND TREATED WATER DATA

The Glen Walter WTP Annual Operating Reports for the operational period from 2014 to 2016 were reviewed. The WTP annual reports summarize raw and treated water average day flow (ADF), maximum day flow (MDF), and quality data as well as chemical usage.

The 2014, 2015, and 2016 Annual Performance Reports for the Glen Walter WTP concluded that the facility was operated in compliance with provincial regulations. Furthermore, all treated water inorganic and organic parameters were shown to be below their exceedance limits. Table 4.4 summarizes key operating data that demonstrate the complexities of the Glen Walter WTP as presented in the Glen Walter Annual Reports from 2014 to 2016 as well as the Certificate of Approval (C of A) or Ontario Drinking Water Standard (ODWS) criteria for comparison.

**Table 4.4 Glen Walter WTP Operating Data Summary (2014-2016 Annual Reports)**

| PARAMETER | 2014 | 2015 | 2016 | COMPLIANCE CRITERIA |
|---|---|---|---|---|
| **Raw Source Water** | | | | |
| ADF ($m^3/d$) | 452 | 470 | 438 | - |
| MDF ($m^3/d$) | 673 | 611 | 556 | - |
| **Treated Water** | | | | |
| ADF ($m^3/d$) | 381 | 395 | 365 | - |
| MDF ($m^3/d$) | 550 | 453 | 439 | 995 (C of A) |
| Minimum Free Chlorine Residual (mg/L) | 0.96 | 0.79 | 0.51 | - |
| Average Turbidity (NTU) | 0.11 | 0.10 | 0.10 | 5* (ODWS) |
| Average Colour (TCU) | 0.01 | 0.04 | 0.17 | 5* (ODWS) |
| Average Aluminum (mg/L) | 0.03 | 0.05 | 0.05 | 0.1 (ODWS) |
| Trihalomethanes (THMs) (mg/L) | 0.0375 | 0.396 | 0.423 | 0.10 (ODWS) |

* Aesthetic parameter

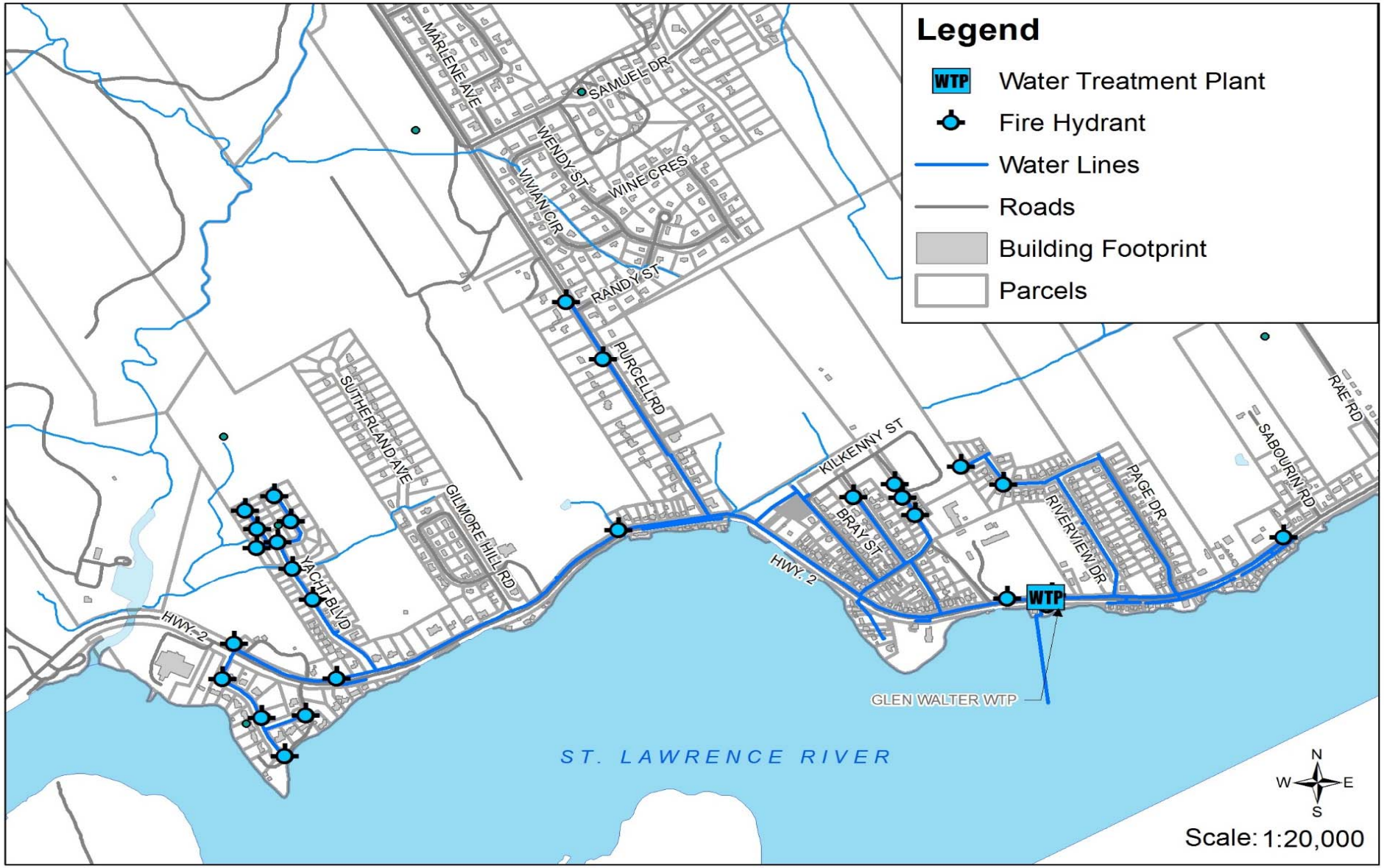



**Figure 4.3 Water Treatment and Distribution Systems**

### 4.2.4 MUNICIPAL WATER PRODUCTION AND CONSUMPTION DATA

Water production and consumption (billing) data from the year 2016 for Glen Walter was provided by the Township. It is observed that the sum of water consumption measured from all water meters is less than the total water produced and supplied from the Glen Walter WTP. This is a result of water losses and other non-metered uses.

A summary of the water production and consumption data as well as non-revenue water estimates are provided in Table 4.5. It should be noted that the "water loss" value incorporates some uncertainty since it is based on a water balance. A detailed description of the water balance process is provided in **Appendix A**.

**Table 4.5 2016 Water Production, Consumption and Non-Revenue Data**

| SERVICE AREA | TOTAL WATER PRODUCED ($M^3$/YEAR) | TOTAL NO. OF WATER METERS | TOTAL METERED VOLUME ($M^3$/YEAR) | TOTAL NON-REVENUE WATER ($M^3$/YEAR) | PERCENTAGE OF TOTAL PRODUCED |
|---|---|---|---|---|---|
| Residential Billed | - | 325 | 54,643 | - | 41% |
| ICI | - | 14 | 10,744 | - | 8% |
| Zero Meters | - | 14 | - | 2,330 (1) | 2% |
| Water Loss | - | - | - | 65,735 | 49% |
| Total | 133,452 | 353 | 65,387 | 68,065 | 100% |

1 Estimated value, assuming average comsumption.

### 4.2.5 HYDRANT FLOW TEST DATA

Hydrant flow tests are the primary data source used to characterise the real-world water distribution system performance to support water model calibration. Lakeshore Hydrant Services Ltd. conducted four (4) hydrant flow tests at the boundaries of the network to gather pressure and flow data on June 15, 2017. The hydrant flow test data is provided in **Appendix A**.

## 4.3 MUNICIPAL WASTEWATER SYSTEM OVERVIEW

Wastewater servicing in the Community of Glen Walter is provided either by private septic systems or by the Township via the Glen Walter Wastewater Pollution Control Plant (WPCP) and collection system. The Glen Walter wastewater collection and treatment systems are comprised of gravity sewers, forcemains, two (2) pumping stations (PSs), and a the Glen Walter WPCP which outlets treated effluent to the St. Lawrence River.

### 4.3.1 WASTEWATER COLLECTION SYSTEM

#### LINEAR INFRASTRUCTURE

The collection system of the Community of Glen Walter is comprised of a network of gravity sewers, forcemains, and wet well pump stations. As the construction of these elements spanned over a period of time, the age of the constructed system also varies. The collection system can be separated into two (2) main catchment areas; west of the WPCP and east of the WPCP. The east catchment area flows by gravity to the raw sewage PS on the WPCP site, while the west catchment area conveys wastewater through a network of pumping stations, forcemains, and gravity sewers to the raw sewage PS and ultimately to the Glen Walter WPCP.

Pipe sizes for gravity sewers range in size from 200 mm to 300 mm and 100 mm to150 mm for forcemains and all pipes are made of PVC. The year of construction of this linear infrastructure ranges from 1988 to 2004. The Geographical Information System (GIS), as provided by the Township, was the primary source of this information and was verified by as-built drawings and WSP field review. Due to the incomplete state of the as-built information and access restrictions, information such as year of construction, size, and age for some pipes are unknown.

There are no designated combined sewers in the Community of Glen Walter, as the developments within the community are exclusively rural cross-sections with roadside ditches and storm sewers.

## PUMP STATIONS

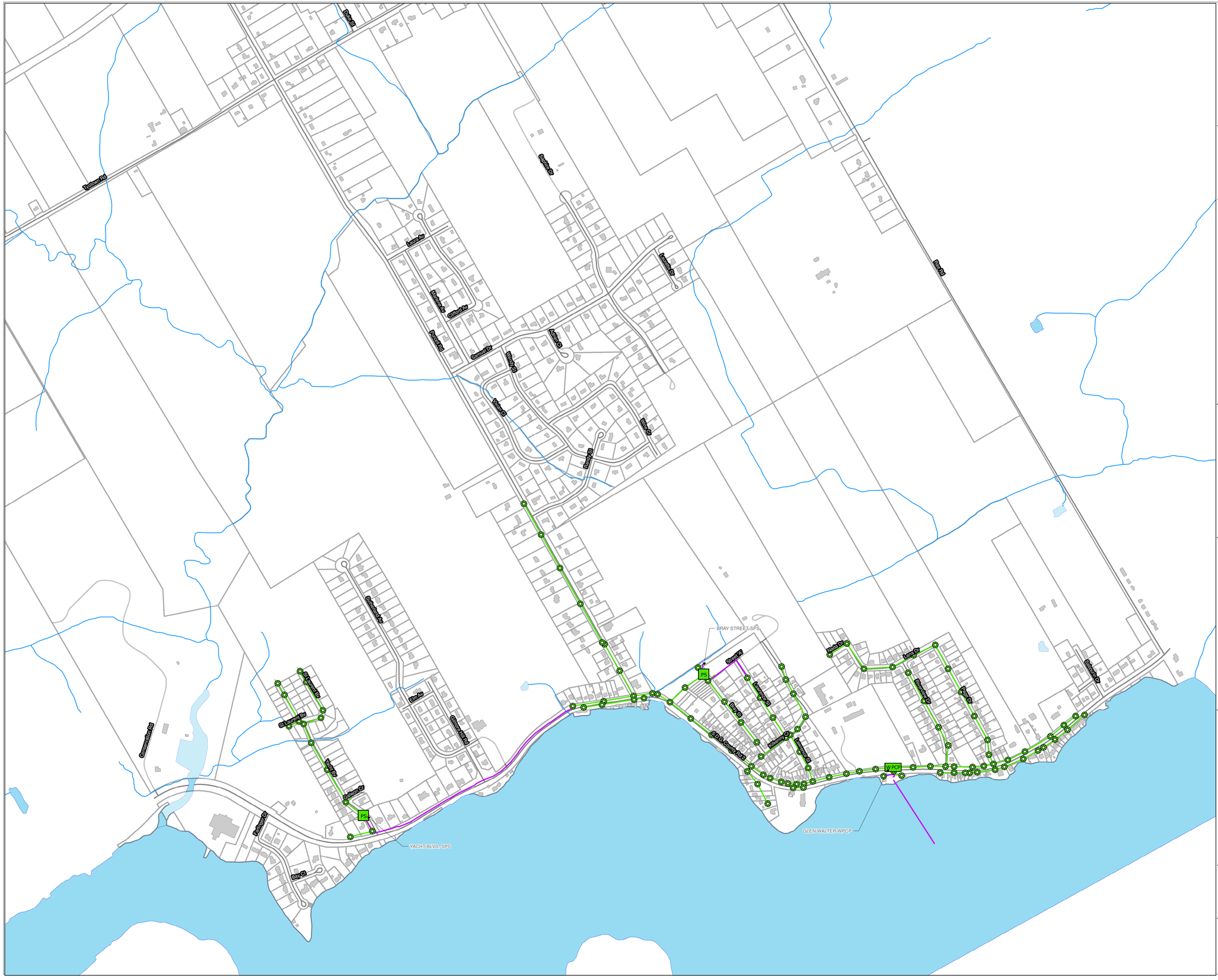
Due to the topographic and geotechnical conditions of the Township, PSs were constructed to overcome conveyance challenges. There are two (2) PSs in Glen Walter, one (1) at the northwest end of Bray Street and the other near the intersection of Yacht Boulevard and Highway 2. The Yacht Blvd PS pumps the collected wastewater from the west-most side of Glen Walter to a gravity sewer that discharges to the Bray St. PS. The Bray St. PS then pumps the wastewater to a gravity sewer along Lawrence Street and to a raw sewage PS located on the WPCP site. The raw sewage PS then pumps the raw wastewater to the Glen Walter WPCP for treatment. A summary of PS characteristics is provided in Table 4.6. Figure 4.4 illustrates the location of the PSs.

The Bray St. PS consists of an underground wet well equipped with two (2) submersible pumps, each with a rated capacity of 8.3 L/s at a TDH of 8.3 m. The PS has an ultrasonic level controller with the following water level control activations: base – 42.93 m, common stop – 43.43 m, start lead – 43.88 m, and alarm – 44.185 m. The PS outlet is a 100mm diameter forcemain that conveys raw wastewater from the PS to a gravity sewer manhole on Bray St. The wet well is equipped with a 200mm overflow outlet in the event of capacity exceedance which discharges to a ditch located at the north edge of the site. This PS has a documented history of sewer back-up and flow capacity exceedance in 2017 and early 2018.

The Yacht Blvd. PS has a wet well equipped with two (2) submersible pumps, one (1) duty, one (1) standby. The PS is equipped with level control for the following set-points: base – 42.86 m, pump stop – 43.26 m, duty pump start – 43.86 m, stand-by pump start – 44.16 m, and high water alarm – 44.26 m. The capacity of this PS is unknown.

**Table 4.6 Pumping Station Information**

| FACILITY | LOCATION | ECA NO. | AS-BUILTS | SCADA FLOW DATA | PUMP DETAILS |
|---|---|---|---|---|---|
| Bray St. PS | 6649 Bray St. | 3-0464-84-889 | No | No | Yes |
| Yacht Blvd. PS | Between 6734 and 6736 Yacht Blvd. | - | Yes | No | Yes |
| Glen Walter WPCP Raw Sewage PS | 18352 Hwy 2 | 3-0464-84-889 | Yes | Yes | Yes |

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## Legend

- PS — Pumping Station; Pumping Station
- WPCP — Water Pollution Control Plant
- Sanitaray Manhole
- Sanitary Sewer
- Forcemain
- Creek
- Building Footprint
- River

Scale:

1:8,022

N
W E
S

0 230 460 920 Meters

Project:

GLEN WALTER AREA WATER AND WASTEWATER MASTER SERVICING PLAN

TOWNSHIP OF SOUTH GLENGARRY

Title:

WASTEWATER COLLECTION AND TREATMENT SYSTEMS

| Project No.: | Date: |
|---|---|
| 161-15076-00 | AUGUST 2018 |

| Drawn By: | Checked By: | Figure No.: |
|---|---|---|
| MF | CF | 4.4 |

### 4.3.2 WASTEWATER TREATMENT SYSTEM

The Glen Walter WPCP is an extended aeration facility with UV disinfection and chemical addition for phosphorus removal. Secondary treatment and sludge storage are provided within a circular structure as shown in Figure 4.5

The WPCP has an ADF rated capacity of 787 $m^3$/d and operates under ECA Number 3-0464-84-889.

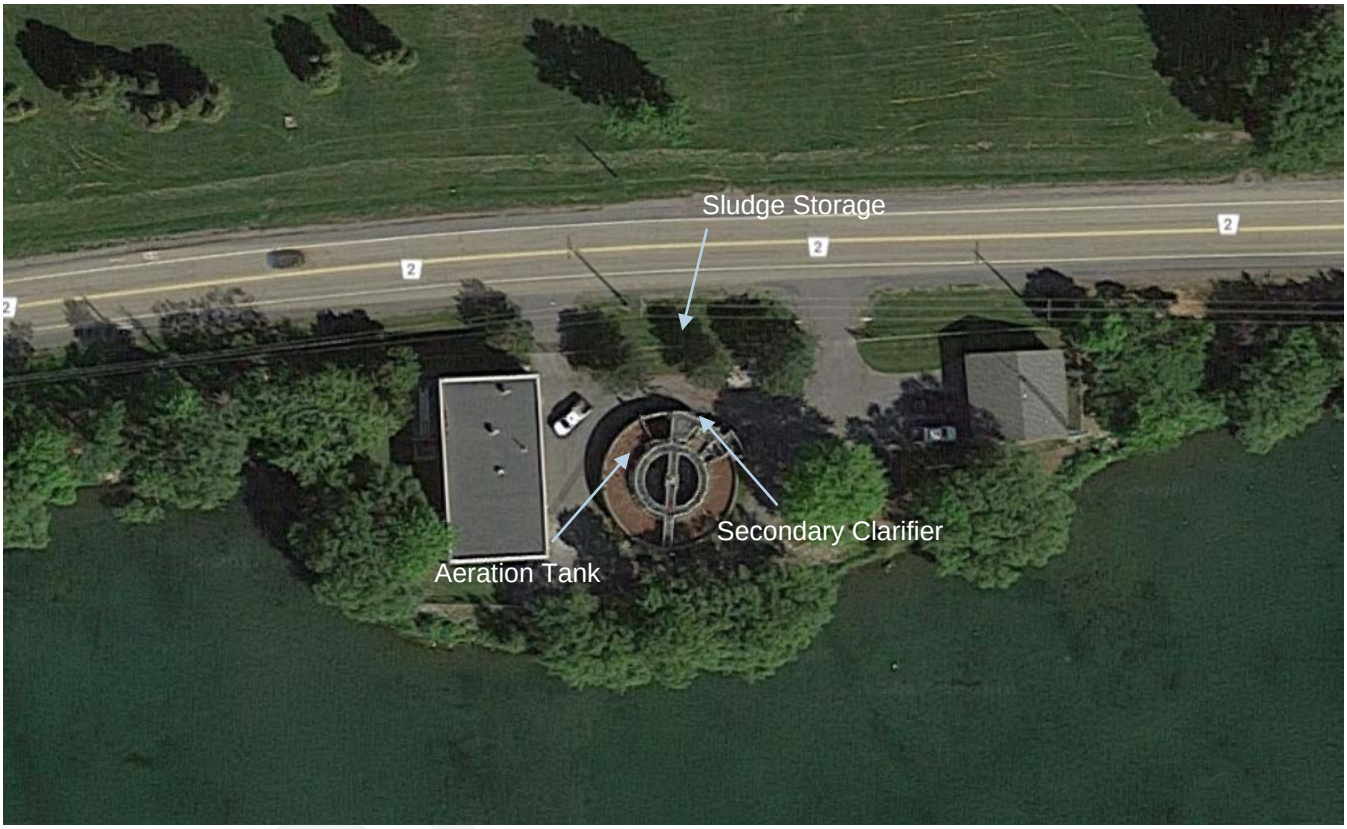



**Figure 4.5 Glen Walter WPCP Aerial View**

Raw wastewater enters the WPCP and flows through an aerated tank for grit removal. The degritted wastewater is dosed with aluminum sulphate (alum) and then undergoes biological treatment in the aeration tank followed by solids separation in the secondary clarifier. Settled sludge is pumped out of the secondary clarifier and either returned to the aeration tank or transferred to the sludge storage tank. Secondary effluent undergoes UV disinfection and is then discharged through the outfall to the St. Lawrence River. WPCP treatment process design details per ECA Number 3-0464-84-889 are provided in Table 4.7.

**Table 4.7 Glen Walter WPCP Process Component Details**

| PROCESS COMPONENT | PARAMETER | DESIGN VALUE |
|---|---|---|
| Grit Removal | Type<br>Quantity<br>Volume | Aerated grit tank<br>1<br>16.8 $m^3$ |
| Chemical Addition | Type<br>Addition Location | Aluminum Sulphate<br>Prior to aeration tanks |
| Biological Treatment | Type<br>Number of Tanks<br>Total Volume | Extended aeration<br>2<br>525 $m^3$ |
| Aeration | Diffuser Type<br>Type of Blowers<br>Quantity of Blowers<br>Blower Capacity (each) | Coarse<br>Rotary positive displacement<br>2<br>340 L/s |
| Secondary Clarification | Type<br>Number of Tanks<br>Total Surface Area<br>MDF Capacity | Circular<br>1<br>65.6 $m^2$<br>2,296 $m^3$/d |
| Disinfection | Type<br>Dimensions<br>Peak Flow Capacity | Ultraviolet (UV)<br>100 mm diameter x 400 mm length<br>2,290 $m^3$/d |
| Sludge Holding Tank | Type<br>Number of Tanks<br>Storage volume | Aerated<br>1<br>100 $m^3$ |
| Outfall | Diameter<br>Length | 300 mm<br>375 m |

The effluent objectives and limits for the Glen Walter WPCP are presented in Table 4.8. Composite samples of final effluent are collected weekly and analyzed for carbonaceous biological oxygen demand ($cBOD_5$), total suspended solids (TSS), total phosphorus (TP), total ammonia nitrogen (TAN), and *E. coli*. The monthly average of the sample results is compared to the effluent criteria shown in Table 4.8 to determine compliance (monthly geometric mean for *E. coli*).

**Table 4.8 Glen Walter WPCP Effluent Criteria**

| PARAMETER | EFFLUENT OBJECTIVE | EFFLUENT LIMIT | |
|---|---|---|---|
| | | CONCENTRATION | WASTE LOADING |
| $cBOD_5$ | 15.0 mg/L | 25.0 mg/L | 19.7 kg/d |
| TSS | 15.0 mg/L | 25.0 mg/L | 19.7 kg/d |
| TP | 0.32 mg/L | 0.64 mg/L | 0.50 kg/d |
| TAN<br>Summer (May 1 to September 30)<br>Winter (October 1 to April 30) | <br>2.0 mg/L<br>4.0 mg/L | <br>4.0 mg/L<br>8.0 mg/L | <br>3.2 kg/d<br>6.3 kg/d |
| *E. coli* | 100 organisms/100mL | 200 organisms/100mL | - |

### 4.3.3 WASTEWATER GENERATION AND QUALITY DATA

The Glen Walter WPCP Annual Operating Reports for the operational period from 2015 to 2017 were reviewed. The Annual Reports summarize effluent water quality, analytical test results, maintenance operations, and relevant activities of the WPCP.

According to the 2015, 2016, and 2017 Glen Walter WPCP Annual Reports, the facility operated at 74%, 79%, and 100% of its rated ADF capacity of 787 $m^3/d$, respectively. Township Operations staff have noted that peak flows were difficult to manage during extreme wet weather conditions experienced in 2017 and early 2018.

Based on the effluent sample results presented in the Annual Reports, the facility remained in compliance with its ECA throughout the review period. Table 4.9 summarizes key operating data presented in the Glen Walter Annual Reports from 2015 to 2017.

**Table 4.9 Glen Walter WPCP Operating Data Summary (2015-2017 Annual Reports)**

| PARAMETER | 2015 | 2016 | 2017 | COMPLIANCE LIMIT | EFFLUENT OBJECTIVE |
|---|---|---|---|---|---|
| **Raw Wastewater** | | | | | |
| ADF ($m^3/d$) | 585 | 626 | 786 | 787 | - |
| MDF ($m^3/d$) | 1,282 | 1,639 | 2,037 | - | - (1) |
| **Effluent** | | | | | |
| Average $cBOD_5$ (mg/L) | 3.16 | 3.68 | 3.50 | 25.0 | 15.0 |
| Average $cBOD_5$ (kg/d) | 1.78 | 2.25 | 2.78 | 15.63 | - |
| Average TSS (mg/L) | 3.63 | 5.34 | 5.30 | 25.0 | 15.0 |
| Average TSS (kg/d) | 2.16 | 3.35 | 4.39 | 15.63 | - |
| Average TP (mg/L) | 0.22 | 0.25 | 0.24 | 0.86 | 0.32 |
| Average TP (kg/d) | 0.12 | 0.14 | 0.18 | 0.54 | - |
| Average $N\text{-}NH_3$ (mg/L) | | | | | |
| Summer (May 1 to September 30) | 0.15 | 0.13 | 0.05 | 4.0 | 2.0 |
| Winter (October 1 to April 30) | 0.70 | 0.07 | 0.03 | 8.0 | 4.0 |
| Average $N\text{-}NH_3$ (kg/d) | | | | | |
| Summer (May 1 to September 30) | 0.30 | 0.06 | 0.05 | 3.2 | - |
| Winter (October 1 to April 30) | 0.08 | 0.06 | 0.03 | 6.3 | - |
| *E. coli* Geometric Mean (organisms/100mL) | 2.6 | 3.9 | 3.5 | 200 | 100 |

1 Although the Glen Walter WPCP ECA does not identify a rated influent peak flow capacity, the grit tank is designed for a peak flow of 26.6 L/s (2,298 $m^3/d$), the clarifier is designed for a peak flow of 2,296 $m^3/d$, and the UV disinfection system was designed for a peak flow of 2,290 $m^3/d$.

### 4.3.4 SEWER FLOW MONITORING DATA

A comprehensive sewer system flow monitoring program was conducted in 2017 as part of this study. Additional information on this program can be found in Section 5.6 and **Appendix A**.

## 4.4 PRIVATE WELL & SEPTIC SYSTEMS FIELD INVESTIGATION

In August and September of 2017, WSP conducted a field investigation program that included:

1. A door-to-door survey to collect information regarding physical and performance attributes of private well and septic systems; and
2. Sampling of private well systems to assess water quality.

The goal of the door-to-door survey was to gain an understanding of the existing conditions of private systems. The sampling program was conducted to better understand the quality of drinking water being consumed by residents with private wells in the study area. The information collected during the field investigation is used in the development and evaluation of alternative solutions for the Township's future servicing needs.

### *4.4.1 FIELD INVESTIGATION OVERVIEW*

**PURPOSE**

The purposes of conducting the door-to-door survey and well sampling program were to:

- gather information pertaining to the existing condition of private water and septic systems, in select subdivisions within the study area;
- analyse the results for indications of potential health, safety, and/or environmental concerns that may exist within these systems; and
- support development and evaluation of alternative solutions and consideration as to whether or not the investigated subdivisions should be provided with municipal water and wastewater servicing.

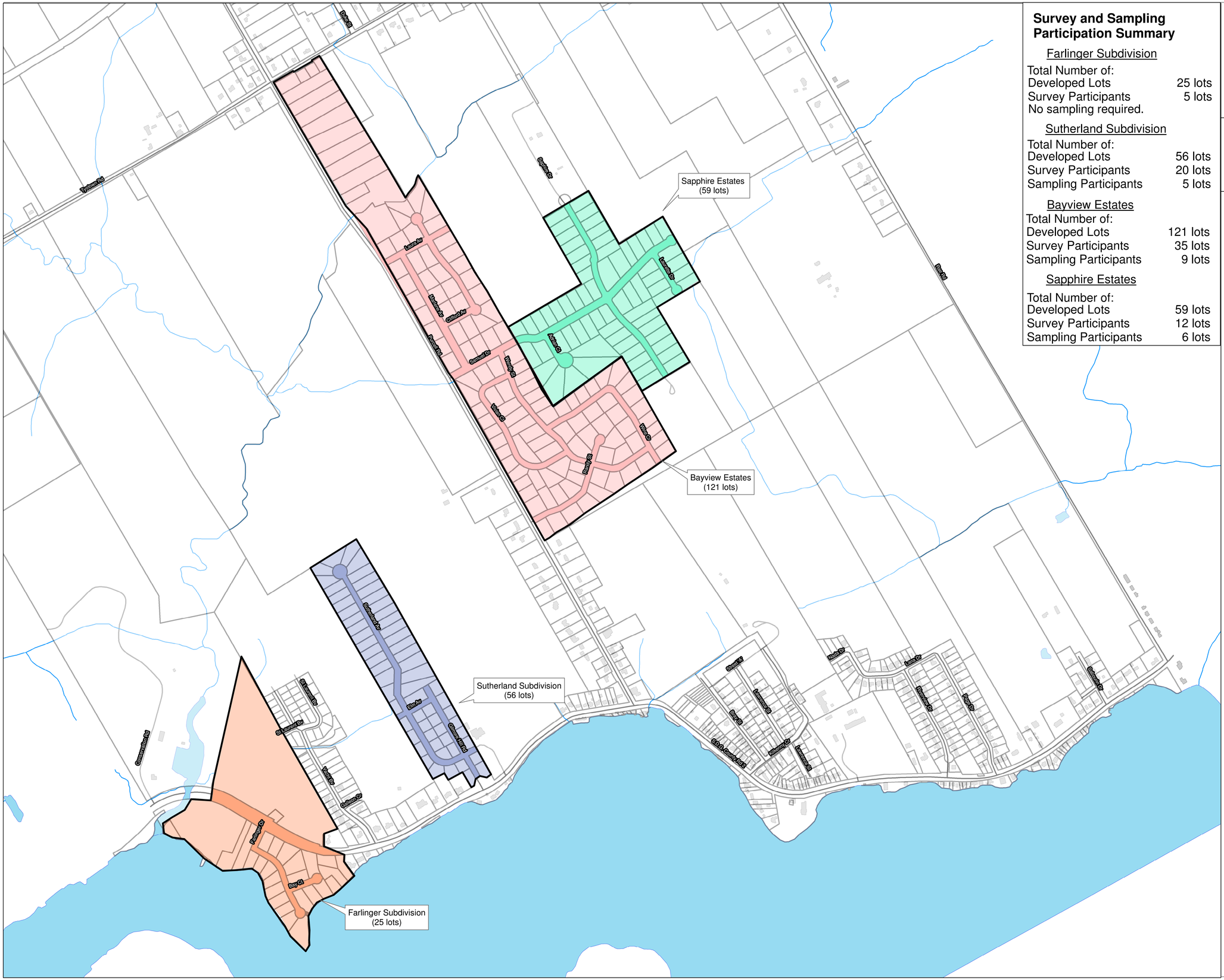
**AREAS INVESTIGATED**

Subdivisions in Glen Walter were included in the field investigation program if they satisfied the following criteria:

1. Area does not currently have both municipal water and wastewater servicing.
2. Area is dense and does not include isolated lots.
3. Area is located adjacent to municipal water and wastewater infrastructure.

The following four (4) subdivisions met the criteria above and were included in the field investigation program. The location and extents of each subdivision included in the field program are illustrated in Figure 4.6.

- **Farlinger Subdivision** - Municipal water and private septic systems;
- **Sutherland Subdivision** - Private well and private septic systems;
- **Bayview Estates** - Private well and private septic systems; and
- **Sapphire Hills Estates** - Private well and private septic systems.




## Survey and Sampling Participation Summary

**Farlinger Subdivision**

| Total Number of: | |
|---|---|
| Developed Lots | 25 lots |
| Survey Participants | 5 lots |
| No sampling required. | |

**Sutherland Subdivision**

| Total Number of: | |
|---|---|
| Developed Lots | 56 lots |
| Survey Participants | 20 lots |
| Sampling Participants | 5 lots |

**Bayview Estates**

| Total Number of: | |
|---|---|
| Developed Lots | 121 lots |
| Survey Participants | 35 lots |
| Sampling Participants | 9 lots |

**Sapphire Estates**

| Total Number of: | |
|---|---|
| Developed Lots | 59 lots |
| Survey Participants | 12 lots |
| Sampling Participants | 6 lots |


1224 GARDINERS RD, SUITE 201
KINGSTON, ONTARIO,
CANADA, K7P 0G2
WWW.WSPGROUP.COM

TOWNSHIP OF
SOUTH GLENGARRY
6 OAK STREET
LANCASTER, ONTARIO
K0C 1N0


**Legend**

**Field Survey Areas**

- Bayview Estates
- Farlinger Subdivision
- Sapphire Estates
- Sutherland Subdivision

Scale:
1:8,000

N
W E
S

0 225 450 900 Meters

Project:

GLEN WALTER AREA WATER AND WASTEWATER MASTER SERVICING PLAN

TOWNSHIP OF SOUTH GLENGARRY

Title:

SURVEY AND WATER QUALITY SAMPLING LOCATIONS

| Project No.: | Date: |
|---|---|
| 161-15076-00 | Oct. 2017 |

| Drawn By: | Checked By: | Figure No.: |
|---|---|---|
| MH | DS | 4.6 |

## 4.4.2 SURVEY AND SAMPLING PROCEDURE AND METHODOLOGY

A door-to-door survey was conducted for residences with private water and/or septic systems located within the Farlinger, Sutherland, Bayview Estates, and Sapphire Hills Estates subdivisions. The intention of the door-to-door survey was to create an inventory of private residential water wells and septic systems within these areas. The purpose of the inventory is to understand existing conditions and utilize the information to guide decision-making during the Class EA process.

A survey was delivered by hand to each developed lot in the Sutherland, Bayview Estates, and Sapphire Hills Estates subdivisions on August 24th, 2017 and to the Farlinger subdivision on August 31st, 2017. The survey packages included a list of questions for residents to complete and a unique sketch of their property on which residents could provide additional information regarding their water and/or septic systems. An example of the letter and survey are provided in **Appendix B**. During survey delivery, the purpose of the Master Plan Study and the field investigation were described to the residents. They were also encouraged to participate in the survey and provided the opportunity to ask questions and express comments.

On August 31st, 2017, a door-to-door survey and private well water sampling of the Sutherland, Bayview Estates, and Sapphire Hills Estates subdivisions was conducted. On September 7th, 2017, a door-to-door survey of the Farlinger subdivision was conducted, during which time the Master Plan Study and survey purpose was explained to residents, and if not available for an in-person discussion, the survey package provided residents with details for digital submission of completed surveys, providing residents with the opportunity to complete the survey at a time convenient for them. The survey questionnaire was developed to collect the following information:

- Well and septic system physical and performance details (e.g. type, age, performance issues (if any), etc.);
- Sump pump discharge location;
- Water sampling history;
- Water treatment system description; and
- Interest in participating in a well water sampling program.

Well water samples were collected from residences where the owner provided permission. Samples were collected following a project specific Sampling Protocol which provided field staff with a procedure that mitigates sample contamination and outlines safety measures.

A breakdown of the survey responses can be found in **Appendix B.**

## 4.4.3 SURVEY RESPONSE SUMMARY

A total of 259 residences on private services were identified in the targeted subdivisions and a survey package was distributed to each. Of the 259, 70 surveys were filled out and returned for inclusion in this study representing a response rate of 27%.

Table 4.10 presents the number and percentage of survey responses received for each subdivision included in the investigation. The results show that response rate within each subdivision ranged from 20%-38%.

**Table 4.10 Response Rate by Subdivision**

| SUBDIVISION | NO. OF SURVEYS DISTRIBUTED | NO. OF SURVEY RESPONSES RECEIVED | RESPONSE RATE |
|---|---|---|---|
| Farlinger | 25 | 5 | 20% |
| Bayview Estates | 119 | 32 | 27% |
| Sapphire Estates | 59 | 12 | 20% |
| Sutherland | 56 | 21 | 38% |
| OVERALL | 259 | 70 | 27% |

### 4.4.4 LIMITATIONS OF ANALYSIS

This Technical Memorandum presents an analysis of compiled survey response data and water sampling results. The collected information is summarized herein. However, the following limitations to the accuracy of the data / information and analysis exist:

- It is assumed that submitted survey responses are true and accurate to the best of the submitter's knowledge.
- The amount of data was limited to the responses received and further not all residents who submitted a survey responded to every question. This analysis includes only the responses received for each question. Accordingly, well and septic system information associated with approximately 73% of the residences in the targeted area was not available and are therefore not included in this analysis.
- Hydrological and hydrogeological conditions were not reviewed or considered as part of this assessment.
- Dimensional information for separation between well and septic systems was estimated based on information marked by respondents on sketches included in the survey. The sketches were overlaid onto an orthophoto and distances were estimated using Google Maps.

WSP did not conduct further investigation to determine if other potential risks to wells exist on the subject properties. Conclusions presented in this report should not be construed as legal advice and represent the best technical judgement of WSP staff based on the available information. The conclusions are based on the site conditions as observed and understood by residents at their respective residences. The extent of the limited area depends on the soil and groundwater conditions, as well as the history of the site reflecting natural, construction and other activities. Due to the nature of the investigation and the limited data available, WSP cannot warrant against undiscovered environmental liabilities or adverse impacts off site.

### 4.4.5 SEPTIC SYSTEM

#### SEPTIC PERFORMANCE ISSUES

As part of the door-to-door survey, residents were asked if their existing septic system was functioning properly. In the survey responses, residents indicated either that their system is working properly (94% of responses) or that they did not know if their septic system was working properly (6% of responses). None of the received surveys indicated systems that were not performing properly.

#### AGE OF SEPTIC SYSTEMS

The age of septic systems throughout the subdivisions varied significantly. Table 4.11 presents the distribution of septic systems by age for each reviewed subdivision.

**Table 4.11 Septic System Age as a Percentage of Responses Received**

| | NUMBER OF RESPONSES RECEIVED (PERCENTAGE OF SUBDIVISION TOTAL) | | | | |
|---|---|---|---|---|---|
| **AGE OF SEPTIC SYSTEM** | **FARLINGER** | **BAYVIEW ESTATES** | **SAPPHIRE ESTATES** | **SUTHERLAND** | **OVERALL** |
| < 15 years | 4 (80%) | 3 (12%) | 11 (92%) | 9 (45%) | 27 (43%) |
| 15-24 years | 1 (20%) | 2 (8%) | 1 (8%) | 3 (15%) | 7 (11%) |
| 25-34 years | 0 (0%) | 18 (69%) | 0 (0%) | 5 (25%) | 23 (37%) |
| 35-40 years | 0 (0%) | 2 (8%) | 0 (0%) | 1 (5%) | 3 (5%) |
| > 40 years | 0 (0%) | 1 (4%) | 0 (0%) | 2 (10%) | 3 (5%) |
| Sub-total | 5 (100%) | 26 (100%) | 12 (100%) | 20 (100%) | 63 (100%) |
| No Response Provided(1) | 0 | 6 | 0 | 1 | 7 |
| TOTAL | 5 | 32 | 12 | 21 | 70 |

1 Number of surveys received that did not include a response regarding septic system age.

According to the Government of Ontario document, “Septic Smart!” the approximate lifespan of residential septic systems ranges from 15 to 40 years; however, industry standards range from 25 to 40 years. Based on the survey responses presented in Table 4.11, 43% of the results indicate septic systems that are less than 15 years in age and 54% are less than 25 years in age. Only 5% of the results identified systems that are more than 40 years.

It is observed that the Farlinger and Sapphire Estates Subdivisions have the newest systems with ages ranging from 2 to 17 years. Bayview Estates appears to have the oldest septic systems, most of which are between 25 and 30 years old. The Sutherland Subdivision shows the greatest variation in terms of system age, with results ranging from 2 to 53 years. It is suspected that the large range is due to gaps in development and may also represent replacement septic systems installed in recent years. The southern portion of Sutherland Subdivision has been established for a significant amount of time, while the northern portion is currently undergoing new development of lots.

The 5% of respondents that own septic systems older than 40 years, indicated that their systems are working and did not identify any problems. Further, all respondents who completed the questions regarding whether or not their system was working indicated “yes” and none of the respondents identified problems with their systems in the space on the survey provided for this purpose.

#### SEPTIC PUMPING FREQUENCY

The emptying or pumping of a septic system is a routine maintenance activity to remove solids build-up in the system. The survey asked how often residents empty their systems. The Septic Smart! document recommends that residential septic tanks be emptied every 3 to 5 years. Table 4.12 presents a breakdown of the results received. It appears that most residents across all four (4) subdivisions pump their septic systems once every 1-6 years. However, there were several residents that either did not know if their septic tank had been emptied or had never pumped their septic tank. It should be noted that owners of newly constructed homes in these developments are included in this category and it is unlikely that there has been a need to empty these systems due to the short duration of use. Owners of new homes are included under “no response”.

**Table 4.12 Septic System Pumping Frequency**

| SUBDIVISION | 1-3 YEARS | 4-6 YEARS | 7-10 YEARS | NO RESPONSE OR NEVER | TOTAL |
|---|---|---|---|---|---|
| Farlinger | 0 (0%) | 3 (100%) | 0 (0%) | 2 | 5 |
| Bayview Estates | 15 (58%) | 10 (38%) | 1 (4%) | 6 | 32 |
| Sapphire Estates | 4 (40%) | 5 (50%) | 1 (10%) | 2 | 12 |
| Sutherland | 8 (50%) | 8 (50%) | 0 (0%) | 5 | 21 |
| TOTAL | 27 (49%) | 26 (47%) | 2 (4%) | 15 | 70 |

Of the respondents who answered this question, 94% empty their septic tanks every 1 to 5 years. This represents good septic system maintenance. Where a response indicated as “unknown” or “No Response”, the survey often provided a reason such as new ownership. A detailed review of the survey responses indicates that only two (2) residences have septic systems that are not emptied on a regular basis.

## *4.4.6 WELL SUPPLY AND SYSTEM*

### PHYSICAL CHARACTERISTICS

Farlinger Subdivision is serviced with municipal water and is therefore not included in this section.

#### TYPE OF TREATMENT

The survey inquired whether homes had private water treatment systems. Most of responses received indicated that residents have softeners. In addition to softeners, some homeowners noted additional treatment systems

such as ultraviolet (UV) disinfection, reverse osmosis (RO), and iron removal. Table 4.13 shows the survey results for households with water softeners and Table 4.14 presents the survey results for other/additional treatment systems.

**Table 4.13 Water Softening Treatment**

| SUBDIVISION | SOFTENER | NO SOFTENER | NO RESPONSE | TOTAL |
|---|---|---|---|---|
| Bayview Estates | 25 (89%) | 3 (11%) | 4 | 32 |
| Sapphire Estates | 10 (91%) | 1 (9%) | 1 | 12 |
| Sutherland | 19 (95%) | 1 (5%) | 0 | 20 |
| OVERALL | 54 (92%) | 5 (8%) | 5 | 64 |

**Table 4.14 Additional Water Treatment Systems**

| SUBDIVISION | UV | IRON REMOVAL | RO | OTHER | NONE | NO RESPONSE | TOTAL |
|---|---|---|---|---|---|---|---|
| Bayview Estates | 2 | 5 | 2 | 0 | 3 | 4 | 16 |
| Sapphire Estates | 1 | 2 | 3 | 0 | 0 | 1 | 7 |
| Sutherland | 4 | 1 | 1 | 1 | 0 | 1 | 8 |
| OVERALL | 7 | 8 | 6 | 1 | 3 | 6 | 31 |

## SEPARATION BETWEEN SEPTIC SYSTEMS AND WELLS

Each survey included a blank address-specific lot template with instructions for residents to sketch the locations of their well and septic systems. This information was reviewed with particular attention to the distance between the private wells and the septic system and is summarized in Table 4.15.

**Table 4.15 Well Proximity to Septic System**

| SUBDIVISION | < 15 m | 15-20 m | 21-30 m | > 30 m | NO RESPONSE | TOTAL |
|---|---|---|---|---|---|---|
| Bayview Estates | 5 (19%) | 16 (59%) | 6 (22%) | 0 (0%) | 5 | 32 |
| Sapphire Estates | 0 (0%) | 1 (10%) | 7 (70%) | 2 (20%) | 2 | 12 |
| Sutherland | 0 (0%) | 6 (43%) | 5 (36%) | 3 (21%) | 7 | 21 |
| Overall | 5 (11%) | 19 (40%) | 18 (38%) | 5 (11%) | 14 | 65 |

Ontario Building Code (OBC) - Part 8 mandates that septic systems and wells have a minimum separation distance based on well type and the specific components of the septic systems. For wells with a watertight casing to a depth of at least 6.0 m, the minimum distance between treatment units/distribution piping and wells is 15.0 m. Based on the collected data, five (5) residents who participated in the survey, all located in the Bayview Estates Subdivision, appear to have septic systems within a 15.0 m clearance of their drilled wells. Per OBC, for any other type of well that does not have a watertight casing (i.e. dug wells), the minimum distance between distribution piping and wells is 30.0 m. It was found that two (2) properties within Bayview Estates have dug wells and appear to have less than 30.0 m of separation between their respective distribution piping and wells. Therefore, seven (7) residences do not appear to meet Building Code requirements and there is potential for cross-contamination of well water.

The separation distance between neighbouring wells and septic systems was not considered in the analysis. It should be noted that the well to septic system distances were estimated based on sketches provided with submitted surveys and using Google Maps, increasing the opportunity for error. Accordingly, for the noted seven (7) residences, it is recommended that the Township advise the home owners of this finding and suggest that the owner further investigate to confirm well to septic system distances.

#### PREVIOUS SAMPLING

The Bayview Estates Subdivision survey results indicated that 79% respondents have done previous testing of their well water, 9% have not, and 12% did not provide a response. The Sapphire Estates Subdivision survey results indicated that 75% respondents have done previous testing of their well water while 25% have not. The Sutherland Subdivision, a near split ratio between those who had sampled (55%) and those who had not (45%) was observed.

According to the Eastern Ontario Health Unit website, it is recommended that homeowners on private well systems sample their well water for bacteriologic contamination at least three (3) times a year (Eastern Ontario Health Unit, 2017). Based on the data collected from the door-to-door surveys, many residents are not sampling their drinking water and submitting for testing at the recommended frequency.

### 4.4.7 STORMWATER OUTLET CHARACTERISTICS

#### SUMP PUMP OUTLET

The door-to-door survey included questions regarding sump pumps and associated discharges. These questions were aimed at identifying homes that are discharging ground and storm water into their septic system, which increases the risk of exceeding the capacity of the septic system.

Based on the responses most homeowners had sump pumps. Of the ones who do, most appear to outlet onto their lawns or directly into the roadside ditch. However, three (3) responses from Bayview Estates and one (1) from Sutherland Subdivision indicated that they have sump pumps partially or completely discharging to their septic systems.

#### RAIN GUTTER OUTLET

The survey included a question on the presence of rain gutters and their discharge locations. This question was also intended to identify homes that are discharging storm water into their septic system.

Most surveyed homeowners reported having rain gutters, most of which were noted to outlet onto the lawn surface or directly into the roadside ditch. 17% of residents stated that they either did not have rain gutters and/or did not state where their rain gutters discharge.

### 4.4.8 WATER QUALITY SAMPLING

#### SAMPLING PROTOCOL

As part of the field program, sampling of residential wells was conducted to better understand the quality of drinking water being consumed by residents receiving water from private wells. Wells included in the sampling program were selected based on survey responses from residents who volunteered and provided permission to collect a sample. A sampling protocol was developed to ensure consistency and accuracy in the collection of well samples. The sampling protocol is included in **Appendix B**.

## SAMPLING DISTRIBUTION

A total of 19 private wells were sampled with the permission of the owners. The distribution of sampled wells was spread evenly across the selected subdivisions with five (5) wells sampled in the Sutherland subdivision, eight (8) in Bayview Estates, and six (6) in Sapphire Estates.

## SAMPLE RESULTS

All samples were collected from household taps that represent water that had undergone treatment such as filtering, disinfection, water softening and/or reverse osmosis, if additional treatment was provided. Samples were analyzed by Caduceon Environmental Laboratories, an accredited laboratory, for the following parameters:

- Total Coliforms (including *E. coli*)
- Heterotrophic Plate Count (HPC)
- Hardness
- Alkalinity
- pH
- Total Dissolved Solids (TDS)
- Chloride
- Nitrite
- Nitrate
- Sulphate
- Iron
- Manganese
- Sodium

The sample analysis results are presented in Table 4.16**,** along with the corresponding Ontario Drinking Water Quality Standard (ODWQS) for each tested parameter. Bolded values indicate an exceedance of the ODWS.

**Table 4.16 Private Well Sample Results**

| PARAMETER | UNITS | ODWQS | SUTHERLAND SUBDIVISION | | | | | BAYVIEW ESTATES SUBDIVISION | | | | | | | | SAPPHIRE ESTATES SUBDIVISION | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample No. | - | - | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| Total Coliforms | cfu/100mL | non-detect (MAC) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Heterotrophic Plate Count | cfu/mL | 500 | < 2 | < 2 | < 2 | < 2 | 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | 58 | 4 | < 2 | < 2 | < 2 | < 2 | 10 | 4 |
| Hardness (as $CaCO_3$) | mg/L | 80-100 (OG) | **16** | **389** | **637** | **3** | **4** | **464** | **281** | **562** | **351** | **139** | **321** | **< 1** | **1** | **< 1** | **19** | **31** | **301** | **< 1** | **17** |
| Alkalinity($CaCO_3$) to pH 4.5 | mg/L | 30-500 (OG) | - | 268 | 186 | 262 | 363 | 325 | 239 | 410 | 282 | 309 | 294 | 310 | 297 | 237 | 280 | 306 | 280 | 300 | 478 |
| pH @25°C | - | 6.5-8.5 (OG) | 7.73 | 7.97 | 7.9 | 8.11 | 7.65 | 7.97 | 8.07 | 7.91 | 7.99 | 7.94 | 7.94 | 8.03 | 8 | 8.02 | 8.13 | 7.98 | 7.99 | 8.05 | 7.75 |
| Total Dissolved Solids | mg/L | 500 (AO) | **1,474** | 392 | **766** | **966** | 470 | **568** | 310 | **602** | **545** | **710** | 408 | **525** | **556** | **545** | 400 | **596** | 331 | 462 | **749** |
| Chloride | mg/L | 250 (AO) | 84.5 | 25.8 | 71 | 216 | 33.7 | 116 | 20.1 | 45.5 | 120 | 166 | 109 | 82.2 | 105 | 36.7 | 15.9 | 111 | 13.7 | 50.5 | 117 |
| Nitrite (N) | mg/L | 1 (MAC) | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Nitrate (N) | mg/L | 10 (MAC) | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | 1.6 | < 0.1 | 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | 0.8 |
| Sulphate | mg/L | 500 (AO) | **811** | 74 | 377 | 187 | 46 | 42 | 33 | 114 | 38 | 54 | 45 | 51 | 45 | 171 | 68 | < 1 | 38 | 48 | 59 |
| Iron | mg/L | 0.3 (AO) | < 0.005 | 0.284 | **0.441** | 0.033 | 0.005 | **1.63** | **0.392** | **4.21** | **0.606** | < 0.005 | **0.852** | 0.051 | 0.018 | < 0.005 | 0.068 | 0.044 | 0.247 | < 0.005 | < 0.005 |
| Manganese | mg/L | 0.05 (AO) | < 0.001 | 0.025 | 0.014 | < 0.001 | 0.002 | **0.084** | 0.036 | **0.116** | **0.059** | 0.011 | **0.062** | 0.001 | 0.001 | < 0.001 | 0.002 | 0.003 | 0.04 | < 0.001 | 0.007 |
| Sodium | mg/L | 200 (AO) | **645** | 20.7 | 75.8 | **404** | **228** | 59.8 | 30.2 | 42.3 | 90.4 | **240** | 98.8 | **240** | **245** | **244** | 185 | **257** | 31.8 | **218** | **334** |

**Abbreviations:**

ODWQS – Ontario Drinking Water Quality Standard
MAC – maximum acceptable concentration
AO – aesthetic objective
OG – operational guideline

## DISCUSSION

The following discussion on drinking water quality pertains to the Ministry of the Environment Ontario Drinking Water Quality Standards (ODWQS), revised 2006. There are three (3) types of standards:

- Aesthetic Objectives (AO)
- Operational Guidelines (OG)
- Interim and Maximum Acceptable Concentrations (IMAC and MAC)

The aesthetic objectives apply to parameters that affect the taste, odour and appearance of water. Operational guidelines are intended to ensure efficiency in water treatment processes for municipal and communal systems. Interim and maximum acceptable concentrations apply to parameters with the potential to affect human health. Parameters that exceed aesthetic objectives and operational guidelines are not considered to represent a threat to human health.

### HEALTH RELATED PARAMETERS

The analytical results indicate that there were no exceedances with regard to the tested health-related parameters, as per the ODWQS. All sample results for total coliforms, nitrite, and nitrate met the MAC.

### OPERATIONAL AND AESTHETIC PARAMETERS

Water hardness was reported as being outside the ODWQS AO range of 80-100 mg/L as $CaCO_3$ at all sampled residences. Hard water is common is overburden aquifers in southern Ontario. Water hardness is caused by the presence of certain dissolved ions, such as calcium, magnesium; strontium, iron, barium, and manganese. Water softening is a common treatment method for hard water.

Nine (9) of the 19 samples collected returned hardness results that are significantly higher than the AO, with results ranging from 139 mg/L to as high as 637 mg/L. Hard water can be observed when a considerable amount of soap is required to produce a lather. Consequences of hard water include scaling of hot water pipes, boilers and other household appliances. Of the nine (9) households that returned lab analysis results indicating hard water, three (3) identified the presence and use of a softener. However, two (2) of these samples were collected from an outdoor tap. It is possible that water from an outdoor tap may not undergo water softening treatment and accordingly, the results would be representative of water prior to water softening, rather than softened water used for consumption. Alternatively, the high water hardness may indicate low functioning water softeners or indicate potential opportunities to improve maintenance of softeners (e.g. ensuring salt is refilled as necessary).

The remaining ten (10) samples were reported as having hardness results significantly lower than the lower range value of 80 mg/L. The results ranged from less than 1 mg/L to 31 mg/L and are classified as “soft” water. Water softening can result in the addition of high levels of sodium to the water. Most of the surveys received from the residents with soft water indicated that water softening was used as a treatment system within that household while the remaining did not comment on whether or not a water softener was in use. A trend with respect to individual subdivisions was not observed.

Of the 19 samples collected, 12 exceeded the ODWQS of 500 mg/L for TDS. Generally, these exceedances were spread quite evenly amongst the subdivisions from which samples were collected. The level of TDS indicates the presence of inorganic substances dissolved in the tested water. The principal constituents of TDS are chloride, sulphates, calcium, magnesium, and bicarbonates. The impact of high TDS is directly related to the constituents present in the water. However, excessive hardness, taste, and mineral deposition / corrosion are common properties of highly mineralized water. The palatability of drinking water with a TDS of less than 500 mg/L is generally considered to be good.

All but one (1) of the sodium concentration results were reported to be above the warning levels of 20 mg/L for the portion of the general population on sodium restricted diets. Sodium is a naturally occurring non-health related parameter. Sodium does not have a toxic effect on humans. However, sodium may be problematic for individuals suffering from hypertension and high blood pressure. Most of the sodium concentration results exceeded the AO of 200 mg/L. It is anticipated that the use of water softeners has resulted in elevated sodium in the drinking water from private water systems.

Four (4) of the eight (8) private well households that were sampled in the Bayview Estates Subdivision returned manganese results that exceeded the ODWQS, while the sampled households in the Sutherland and Sapphire Estates Subdivisions resulted in manganese concentrations that meet the AO.

Parameters that yielded results that consistently conformed to the respective ODWQS value were alkalinity, pH, and chloride. A detailed summary of the water quality at each sample location is presented in Table 4.17.

**Table 4.17 Detailed Summary of Private Well Water Quality Results Analysis**

| SUBDIVISION | SAMPLE NO. | COMMENTARY ON WATER QUALITY RESULTS |
|---|---|---|
| Sutherland | 01 | – Water softener employed, resulting in very soft water. High concentration of sodium could be a result of water softening.<br>– Very high TDS concentration exceeding the ODWQS. This could be a result of the very high concentration of sulphate (811 mg/L) and potentially the presence of other minerals. |
| | 02 | – Very hard water.<br>– All other parameters are reported to be within the ODWQS. |
| | 03 | – Sample collected from an outdoor tap which may not be representative of treated water.<br>– Exceptionally hard water, beyond what is considered acceptable for domestic use (500+ mg/L).<br>– High in TDS, which may be associated with water hardness and high iron concentration. |
| | 04 | – Extremely soft water and very high sodium concentrations, likely resulting from use of a water softener.<br>– Water is very high in TDS. |
| | 05 | – Water softener in use, which is likely resulting in extremely soft water and a minor exceedance of the ODWQS for sodium.<br>– Implementation of a reverse osmosis system is likely the reason for lower TDS than other households. |
| Bayview Estates | 06 | – Sample collected from an outdoor tap which may not be representative of treated water. It is not known what treatment is applied at this household, if any.<br>– Extremely hard water which may be a result of extremely high concentration of iron and high concentration of manganese.<br>– TDS slightly exceeds ODWQS value. |
| | 07 | – Sample collected from an outdoor tap which may not be representative of treated water. It is not known what treatment is applied at this household, if any.<br>– Very hard water, potentially resulting from the presence of iron which exceeds the ODWQS.<br>– All other parameters are reported to be within the ODWQS. |
| | 08 | – Sample collected from an outdoor tap which may not be representative of treated water. It is not known what treatment is applied at this household, if any.<br>– Exceptionally hard water which may be a result of extremely high concentrations of iron (4.21 mg/L) and manganese (0.116 mg/L).<br>– TDS exceeds ODWQS value. |
| | 09 | – Sample collected from an outdoor tap which may not be representative of treated water. Water treatment noted to include water softening and UV disinfection.<br>– Very hard water, potentially resulting from the presence of a very high iron concentration.<br>– Manganese and TDS slightly exceed the ODWQS. |
| | 10 | – Minor exceedance of ODWQS for hardness. Unknown if treatment systems are employed.<br>– Minor exceedance of sodium ODWQS.<br>– Significant exceedance of TDS ODWQS. |

| SUBDIVISION | SAMPLE NO. | COMMENTARY ON WATER QUALITY RESULTS |
|---|---|---|
| | 11 | – Very hard water despite use of a water softener, potentially resulting from the presence of a very high iron concentration.<br>– Manganese slightly exceeds the ODWQS. |
| | 12 | – Exceptionally soft water due to the use of a water softener with minor exceedance of the ODWQS for sodium concentrations, likely associated with use of the water softener.<br>– Slight exceedance of ODWQS with respect to TDS. |
| | 13 | – Exceptionally soft water with a slight exceedance of the ODWQS for sodium concentrations, potentially associated with use of a water softener.<br>– Minor exceedance of ODWQS with respect to TDS. |
| | 14 | – Exceptionally soft water due to the use of a water softener with minor exceedance of the ODWQS for sodium concentrations, likely associated with use of the water softener.<br>– Slight exceedance of ODWQS with respect to TDS. |
| Sapphire Estates | 15 | – Exceptionally soft water, likely resulting from known use of a water softener.<br>– All other parameters are reported to be within the ODWQS, including sodium. |
| | 16 | – Very soft water due to the use of a water softener with an exceedance of the ODWQS for sodium concentrations, likely associated with use of the water softener.<br>– Observed exceedance of ODWQS for TDS. |
| | 17 | – Sample collected from an outdoor tap which may not be representative of treated water. It is unknown if treatment systems are employed.<br>– Very hard water that exceeds the ODWQS.<br>– All other parameters are reported to be within the ODWQS. |
| | 18 | – Exceptionally soft water with a very slight exceedance of the ODWQS for sodium, potentially associated with use of a water softener.<br>– All other parameters are reported to be within the ODWQS. |
| | 19 | – Water softener resulting in very soft water and an exceedance of the ODWQS for sodium.<br>– Known use of a reverse osmosis system however TDS is extremely high.<br>– All other parameters are reported to be within the ODWQS. |

### 4.4.9 FINDINGS AND RECOMMENDATIONS

Overall, private septic and well systems in the Glen Walter area appear to be performing well. However, based on some of the survey responses, residents may benefit from information regarding care and maintenance of well and septic systems. A few opportunities to improve existing systems and systems maintenance were identified:

- Residents with sump pumps, rain gutters, or storm drains discharging to septic systems are advised to divert these discharges away from the septic system to extend the system lifespan.
- Inspect septic systems regularly (about every 3 to 5 years) and have the septic tank cleaned out when the sludge depth in the tank is about a third full.
- The Eastern Ontario Health Unit recommends that residents test their well water three (3) times per year (bacteriological testing is free through the Eastern Ontario Health Unit).

The Township could consider providing owners of private well and septic systems with reading material or information sessions to educate or remind the public of standard care and maintenance procedures to protect against contamination and extend the life of their existing systems.

Further, it is recommended that the seven (7) homes in the Bayview Estates identified to have septic and well systems located less than the regulated minimum distances from each other be further investigated by the owners to confirm these distances and take corrective measures, as required.

Based on the findings of this field investigation, municipal servicing of the Bayview Estates, Sapphire Estates, Sutherland, and Farlinger Subdivisions is not required for the purpose of upgrading failing private well and septic systems, as existing conditions appear to be satisfactory.

# 5 FUTURE REQUIREMENTS

## 5.1 GROWTH SCENARIOS

In preparation for anticipated future population growth in the Glen Walter area, this study will consider several growth scenarios to allow the Township to phase water and wastewater servicing improvements over the 20-year study horizon. The following growth scenarios have been developed for this Master Plan Update Study:

1. Existing Township Servicing – considers areas currently being serviced by the Township
2. Existing + Area D – considers areas currently being serviced by the Township, infilling, and Area D (as shown in Figure 5.1)
3. Near-Term Growth – considers infilling and development anticipated in the next 5 years (includes Area D)
4. Mid-Term Growth – considers development anticipated in the next 6 to 10 years
5. Long-Term Growth – considers development anticipated in the next 11 to 20 years

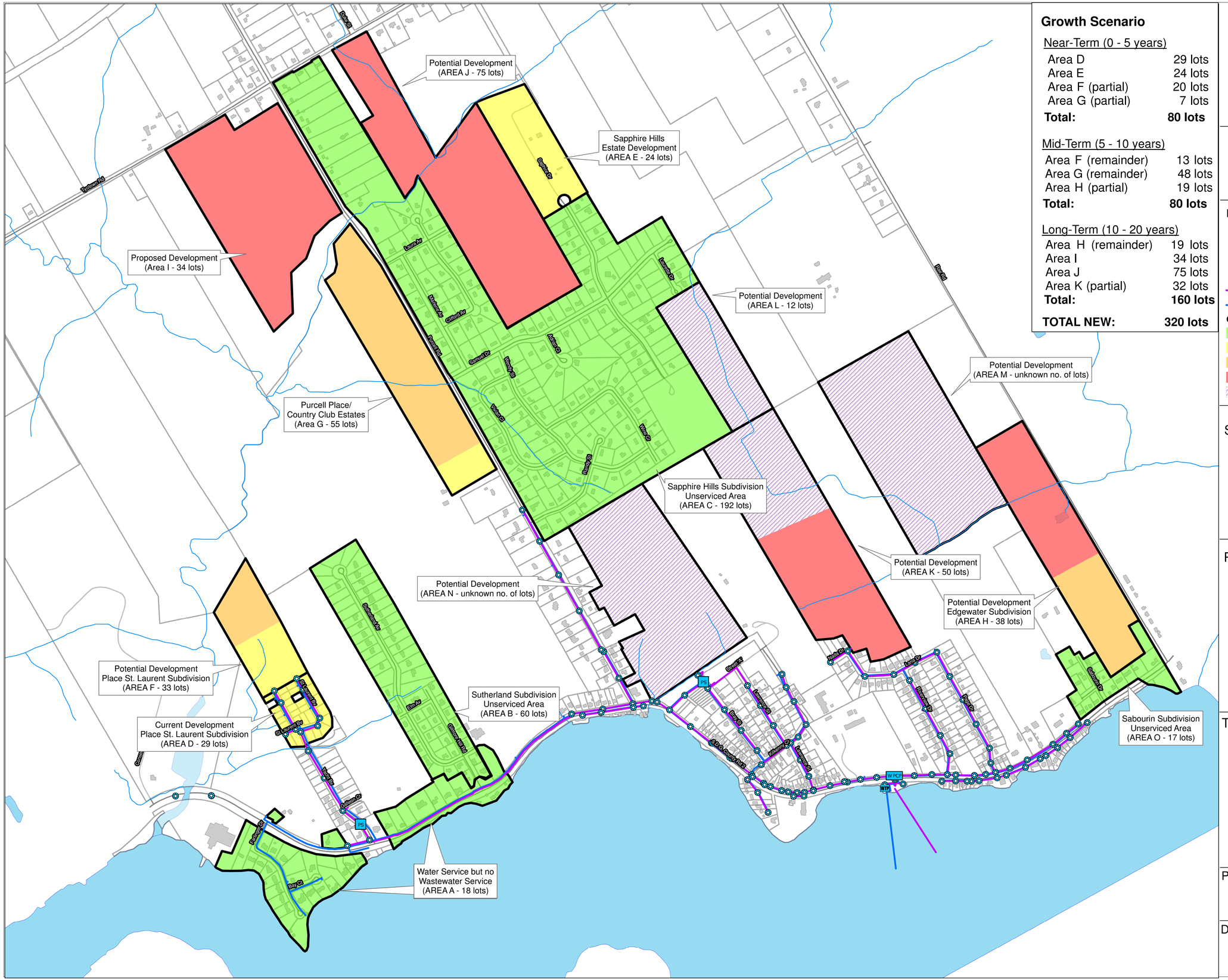
WSP collaborated with the Township's Planning staff to estimate areas of growth for each growth scenario and the number of lots anticipated for servicing in each of the new development areas. Township Planning staff estimated that a maximum of 20 residential lots would be developed each year, identified new development areas for consideration (anticipated, approved, and under construction), and advised as to when each development would require tie-in to the water and wastewater systems. The timing was expressed as Near-Term (0 – 5 years), Mid-Term (5 – 10 years) and Long-Term (10 – 20 years) relative to the base year of 2017. A summary of the growth scenarios developed based on this guidance is presented in Table 5.1.

**Table 5.1 Estimated Number of New Serviced Lots for Each Growth Scenario**

| GROWTH SCENARIO | NUMBER OF POTENTIAL INFILL LOTS & NEW CONNECTIONS (1) | NUMBER OF POTENTIAL SERVICED LOTS IN NEW DEVELOPMENTS | TOTAL NUMBER OF POTENTIAL NEW LOTS TO BE SERVICED |
|---|---|---|---|
| Existing | - | 339 | - |
| Existing + Area D | 43 | 0 | 43 |
| Near-Term (0 – 5 years) | 303 (2) | 80 | 383 (2) |
| Mid-Term (5 – 10 years) | 17 | 80 | 97 |
| Long-Term (10 – 20 years) | - | 160 | 160 |

1. Includes existing lots that are not currently connected to the Township's water and/or wastewater servicing systems.
2. Includes 36 lots in the southwest area of Glen Walter that have water servicing, but require wastewater servicing.

Figure 5.1 presents existing lots that are unserviced by Township water and wastewater (private wells and/or septic systems) as well as anticipated new developments and illustrates the growth scenarios under which each development is slated to require connection. Figure 5.1 also shows developments that are anticipated to require servicing in the "very long term". These developments are expected to occur beyond the 20-year study period for this Master Plan Update and are therefore not included in the scope of this study, however should be considered in the development of design concepts subsequent to this Master Plan, if appropriate.




## Growth Scenario

**Near-Term (0 - 5 years)**

| | |
|---|---|
| Area D | 29 lots |
| Area E | 24 lots |
| Area F (partial) | 20 lots |
| Area G (partial) | 7 lots |
| **Total:** | **80 lots** |

**Mid-Term (5 - 10 years)**

| | |
|---|---|
| Area F (remainder) | 13 lots |
| Area G (remainder) | 48 lots |
| Area H (partial) | 19 lots |
| **Total:** | **80 lots** |

**Long-Term (10 - 20 years)**

| | |
|---|---|
| Area H (remainder) | 19 lots |
| Area I | 34 lots |
| Area J | 75 lots |
| Area K (partial) | 32 lots |
| **Total:** | **160 lots** |

**TOTAL NEW:** **320 lots**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TOWNSHIP OF
SOUTH GLENGARRY
6 OAK STREET
LANCASTER, ONTARIO
K0C 1N0


## Legend

- WTP — Water Treatment Plant
- PS — Pumping Station; Pumping Station
- WPCP — Water Pollution Control Plant
- Manhole Catchbasin
- Sewer Lines
- Water Lines

**Growth Scenario**

- Already Developed
- Near-Term
- Mid-Term
- Long-Term
- Very Long-Term

Scale:

1:8,000

N W E S

0 225 450 900 Meters

Project:

GLEN WALTER AREA WATER AND WASTEWATER MASTER SERVICING PLAN

TOWNSHIP OF SOUTH GLENGARRY

Title:

GROWTH SCENARIOS

| Project No.: | Date: |
|---|---|
| 161-15076-00 | Oct. 2017 |

| Drawn By: | Checked By: | Figure No.: |
|---|---|---|
| HH | CF | 5.1 |

It has should be noted that the existing water distribution and wastewater collection networks have recently been extended to Area D (refer to Figure 5.1). Since the infrastructure is already in place, the Township will be required to provide municipal servicing to this area. Accordingly, the "Existing + Area D" growth scenario was developed to account for this unique condition. The Existing + Area D growth scenario includes the existing service population, infill lots within the already serviced area, and Area D.

Table 5.2 presents a summary of information for each development area illustrated in Figure 5.1. Areas that have been classified as "very long term" are greyed out indicating they are beyond the scope of this study.

**Table 5.2 Development Area Information**

| DEVELOPMENT AREA | DESCRIPTION | GROWTH SCENARIO | NUMBER OF EXISTING LOTS | NUMBER OF NEW DEVELOPMENT LOTS |
|---|---|---|---|---|
| Area A [(1)] | Fully developed area with water servicing only | Near-term | 36 | - |
| Area B – Sutherland Subdivision | Fully developed area, unserviced | Near-term | 60 | - |
| Area C – Sapphire Hills Subdivision | Fully developed area, unserviced | Near-term | 192 | - |
| Area D – Place St. Laurent Subdivision | Currently being developed, existing water / wastewater servicing | Existing + Area D Near-term | 2 | 27 |
| Area E – Sapphire Hills Estate | Recently registered, construction to begin in the near-term | Near-term | - | 24 |
| Area F – Place St. Laurent Subdivision (Potential Lots) | Draft plan approved | Near-term | - | 20 |
| | | Mid-term | - | 13 |
| Area G – Purcell Place / Country Club Estates | Draft plan approved | Near-term | - | 7 |
| | | Mid-term | - | 48 |
| Area H – Edgewater Subdivision | Draft plan approved | Mid-term | - | 19 |
| | | Long-term | - | 19 |
| Area I – Dr. Gatien Subdivision | Potential development | Long-term | - | 34 |
| Area J – Unnamed | Potential development | Long-term | - | 75 |
| Area K – Unnamed | Potential development | Long-term | - | 32 |
| | | Very-long term | - | 18 |
| Area L – Unnamed | Potential development | Very-long term | - | 12 |
| Area M – Unnamed | Potential development | Very-long term | - | Unknown |
| Area N – Unnamed | Potential development | Very-long term | - | Unknown |
| Area O – Sabourin Subdivision | Fully developed area, unserviced | Mid-term | 17 | - |

1 Area A currently has water servicing. Wastewater servicing for Area A will be considered within the near-term.

For the purposes of this Master Plan Update Study, it is assumed that all future developed lots as shown in Table 5.2 will be classified as residential use. It should be noted, however, that some commercial lots may be developed in Area I. A summary of the projected service population for each growth scenario is presented in Table 5.3. Based on the available information, it is assumed that the population density for all future growth scenarios will be consistent with the current estimated population density of 2.2 persons/lot.

**Table 5.3 Service Population Projections for Each Growth Scenario**

| GROWTH SCENARIO | POPULATION OF EXISTING LOTS TO BE CONNECTED | NEW DEVELOPMENT POPULATION | PROJECTED TOTAL SERVICE POPULATION |
|---|---|---|---|
| Existing | | | |
| Water Servicing | - | - | 746 |
| Wastewater Servicing | - | - | 667 |
| Existing + Area D | | | |
| Water Servicing | 30 | 60 | 836 |
| Wastewater Servicing | 30 | 59 | 756 |
| Near-Term (0 – 5 years) | | | |
| Water Servicing | 583 | 176 | 1,505 |
| Wastewater Servicing | 662 | 176 | 1,505 |
| Mid-Term (5 – 10 years) | 38 | 176 | 1,719 |
| Long-Term (10 – 20 years) | - | 352 | 2,071 |

The overall projected service population of 2,071 persons to 2037 agrees with the population projection developed as part of the Glen Walter Water and Wastewater Servicing Master Plan (2008).

Township Planning staff were consulted to identify future developments in the Glen Walter area that would require municipal water and wastewater servicing a different time periods throughout the study planning horizon of 20 years. Based on the planning information provided, growth scenarios were developed to understand the growth anticipated at various phases of the study period. A summary of the growth scenarios developed for use in this Master Plan Update Study is presented in Table 5.4.

**Table 5.4 Summary of Growth Scenarios**

| GROWTH SCENARIO | NUMBER OF LOTS SERVICED | PROJECTED SERVICE POPULATION |
|---|---|---|
| Existing | | |
| Water Servicing | 339 | 746 |
| Wastewater Servicing | 321 | 667 |
| Existing + Area D | | |
| Water Servicing | 380 | 836 |
| Wastewater Servicing | 361 | 756 |
| Near-Term (0 – 5 years) | 684 | 1,505 |
| Mid-Term (5 – 10 years) | 781 | 1,719 |
| Long-Term (10 – 20 years) | 941 | 2,071 |

# 5.2 DESIGN CRITERIA

## 5.2.1 UNIT WATER DEMANDS

The water demand criteria adopted for this Master Plan Study are summarized in Table 5.5. These criteria are based on historical values of water consumption in the system during the 2016 review period and recommendations from the Design Guidelines for Drinking-Water Systems (MOE, 2008).

**Table 5.5 Unit Water Demand Design Values**

| PARAMETER | MOE DESIGN GUIDELINES VALUE | HISTORICAL VALUE (2016) | SELECTED DESIGN VALUE |
|---|---|---|---|
| Residential Water Consumption Rate | 270-450 L/cap/d | 488 L/cap/d (1)<br>239 L/cap/d (2) | 350 L/cap/d |
| Maximum Day Peaking Factor<br>Population 500 – 1,000<br>Population 1,001 – 2,000<br>Population 2,001 – 3,000 | <br>2.75<br>2.50<br>2.25 | 2.2 (3) | 2.2 |
| Peak Hour Factor | 2.85 | - | 2.85 |
| Water Loss | - | 186 $m^3$/d | 186 $m^3$/d (4) |

1 Based on 2016 water production from the Glen Walter WTP of 133,452 $m^3$/year and a current service population of 746. The high water consumption rate is primarily attributed to water loss in the system, which accounts for 51% of the total water produced at the Glen Walter WTP.

2 Based on 2016 water meter billing records, the total metered water is 65,387 $m^3$/year for the current service population of 746, therefore the water consumption rate in Glen Walter was 239 L/cap/d.

3 The maximum day demand peak factor is based on billed water only (i.e. maximum day water produced minus non-revenue water (water loss of 186 $m^3$/d) divided by average billed water).

4 Assumes water loss will be maintained, as future piping is anticipated to be “tight” and not allow leakage.

Maximum day and peak hour demands are obtained by multiplying the average day demand by the corresponding peaking factors.

For the purposes of this Master Plan, a fire flow requirement of 100 L/s for exposure distances of less than 3m was adopted corresponding to the value recommended in the *Fire Underwriters Survey (FUS)* “*Water Supply for Public Fire Protection”* document (FUS, 1999, Part II, Note J). The corresponding fire duration is two (2) hours.

## 5.2.2 UNIT WASTEWATER GENERATION RATES

The wastewater generation criteria adopted for this Master Plan Study are summarized in Table 5.6. These criteria are based on historical values of wastewater generation in the system during the 2017 flow monitoring review period. During this period WSP compared observed flows with the reported annual reported WPCP values for the months of May, June and July. Recommended design values were then compared to the Design Guidelines for Sewage Systems (MOE, 2008).

**Table 5.6 Unit Wastewater Generation Design Values**

| PARAMETER | MOE DESIGN GUIDELINES VALUE | HISTORICAL VALUE (2017) | SELECTED DESIGN VALUE |
|---|---|---|---|
| Residential Wastewater Generation Rate | 270-450 L/cap/d | 438 L/cap/d [1] | 450 L/cap/d |
| Maximum Day Flow Peaking Factor | 2.0[2] | 1.6 | 2.78 |
| Peak Hour Flow Factor | 4.0 | - | 4.0 |

1 Based on 2017 flow monitoring program (May-July), Glen Walter WPCP annual reporting and a current service population of 667.

2 Based on Harmon Peaking Factor (MOE, 2008) and a service population of 667.

Maximum day and peak hour flows are obtained by multiplying the average day flow by the corresponding peaking factors.

## 5.3 WATER: LEVEL OF SERVICE CRITERIA

The following design criteria were used to forecast future requirements for the water and wastewater systems. The design criteria are based on historical water demands and wastewater flows, where applicable, or on MOE Design Guidelines.

### *5.3.1 WATER TREATMENT*

#### MUNICIPAL SERVICING

Water treatment plants provide treated water to their respective distribution systems from untreated sources (lakes, wells, streams, etc.) through a variety of treatment processes. Water treatment facilities must be designed in accordance with the *Procedure for Disinfection of Drinking Water in Ontario* (Ontario, 2006). Drinking water treatment systems that obtain water from a surface water or groundwater under direct influence (GUDI) well supply must achieve an overall performance providing as a minimum a 2-log (99%) removal or inactivation of *Cryptosporidium* oocysts, 3-log (99.9%) removal or inactivation of *Giardia* cysts, and 4-log (99.99%) removal or inactivation of viruses prior to the water being delivered to the first customer. At a minimum, 0.5-log removal or inactivation of *Giardia* cysts, and 2-log removal or inactivation of viruses must be provided through disinfection, while the remaining removal may be achieved through filtration or other equivalent treatment processes.

The MOE Design Guidelines for Drinking-Water Systems (MOE, 2008) indicates that plant capacity should be greater or equal to the maximum day with an allowance for water need for plant use. Additionally, water treatment plants should be designed for a minimum of 10 years (20 years preferred). Accordingly, the MOE Design Guidelines (MOE, 2008) criterion will be adopted as the Level of Service (LOS) required for this study. The LOS refers to an acceptable servicing requirement to satisfy design criteria selected for the study or as prescribed by the MECP which account for acceptable servicing risk and meet industry standards.

#### PRIVATE WELLS

According to the findings of the door-to-door survey as described in Section 4.4.1, municipal servicing of lots currently not connected to the Township's water system is not urgently required as the existing condition of the private services appears to be satisfactory. Through the private well system field investigation program, it has been determined that servicing of existing and proposed/approved subdivisions with current private well systems would not need to be considered further for municipal servicing in this Master Plan Study. This is largely due to preference expressed by residents in these areas to maintain their current private systems, as well as the financial implications of providing municipal water servicing to these areas. Further, new developments in the growth areas are being designed for private wells on each lot. It is understood that studies completed in the

planning of these developments have indicated favourable geotechnical and hydrogeological conditions for wells in these areas.

### 5.3.2 BOOSTER PUMPING

Pumping stations are rated based on their firm capacity. If sufficient floating storage is available in a specific pressure district, the MECP defines firm capacity as the capacity of the station with the largest pump out of service. If there is insufficient or no floating storage, firm capacity is defined as the capacity with the two (2) largest pump out of service (MOE, 2008). The Township's system does not have any booster stations.

Pumping stations must be designed to provide peak hour or maximum day plus fire demands (whichever are greater) for each pressure district, if no floating storage is available. If sufficient floating storage is available, then the pumping station only needs to be designed to provide maximum day demands.

### 5.3.3 TREATED WATER STORAGE

A water storage facility will need to be designed such that it will provide sufficient pressure to the water distribution system when in use. A water storage facility needs to provide sufficient pressure to the water distribution system when in use. LOS design criteria for fire-fighting capability in the Glen Walter area is:

- A flow of 100 L/s, based on the suggested required fire flow in the "Water Supply for Public Fire Protection" (Fire Underwriters Survey, 1999, Part II, Note J) for exposure distances of less than 3m; and
- A minimum distribution system pressure under maximum day demand plus fire flow conditions of 140 kPa.

The function of the water storage facility will be to provide continuity of supply, maintain system pressure, and meet critical water demands during fire flow and emergency conditions. The MOE Design Guidelines for Drinking-Water Systems (MOE, 2008) provides the following formula for calculating the required water storage:

$$Total\ Treated\ Water\ Storage\ Requirements = A + B + C$$

Where: A = Fire Storage
B = Equalization Storage (25% of Maximum Day Demand)
C = Emergency Storage (25% of A+B)

Fire storage is the product of the maximum fire flow required in the system and the corresponding fire duration of two (2) hours. When the system can supply more than just the maximum day demand but less than the peak demand as is the case in Glen Walter, the fire storage requirements can be determined using the following formula:

$$A = (Peak\ Demand - Pumping\ Station\ Installed\ Capacity) \times Fire\ Duration$$

Where: Peak demand is the greater of the peak hour demand and the maximum day plus fire demand

Floating storage should be designed such that the elevation of the equalization volume (B) is able to maintain a minimum pressure of 275 kPa (40 psi) in the system under peak hour flow conditions. The fire (A) and emergency (C) volumes should be at elevations that sustain 275 kPa (40 psi) during peak hour demand conditions, and 140 kPa (20 psi) under the maximum day plus fire flow condition (MOE, 2008).

### 5.3.1 DISTRIBUTION

Distribution systems convey treated water from the treatment plants and booster stations to the location of the water demand. Watermains are to be sized to carry the greater of the maximum day plus fire flow or peak hour demand. A summary of applicable design criteria as outlined in the MOE Design Guidelines for Waterworks (MOE, 2008) is presented in Table 5.7.

**Table 5.7 Level of Service Design Criteria (MOE Design Guidelines, 2008)**

| PARAMETER | MOE DESIGN GUIDELINES VALUE | HISTORICAL VALUE (2016) | SELECTED DESIGN VALUE |
|---|---|---|---|
| Residential Water Consumption Rate | 270-450 L/cap/d | 488 L/cap/d (1) | 350 L/cap/d |
| Fire Flow Requirements<br>Population 500 – 1,000<br>Population 1,000<br>Population 1,500<br>Population 2,000 | <br>38 L/s<br>64 L/s<br>79 L/s<br>95 L/s | <br>-<br>-<br>-<br>- | <br>38 L/s<br>64 L/s<br>79 L/s<br>95 L/s |
| Maximum Day Peaking Factors<br>Population 500 – 1,000<br>Population 1,001 – 2,000<br>Population 2,001 – 3,000 | <br>2.75<br>2.50<br>2.25 | 2.2 | 2.2 |
| Minimum Distribution System Pressure Under MDD+FF Conditions | 140 kPa<br>(20 psi) | 140 kPa<br>(20 psi) | 140 kPa<br>(20 psi) |
| Normal Operating Pressure Under ADD Conditions | 350 – 480 kPa<br>(50 – 70 psi) | 275 – 480 kPa<br>(40 – 70 psi) | 350 – 480 kPa<br>(50 – 70 psi) |
| Minimum Operating Pressure Under ADD Conditions | 275 kPa<br>(40 psi) | 275 kPa<br>(40 psi) | 275 kPa<br>(40 psi) |
| Maximum Distribution System Pressure | 700 kPa<br>(100 psi) | N/A | 700 kPa<br>(100 psi) |

1 Based on 2016 water production from the Glen Walter WTP of 133,452 $m^3$/year and a current service population of 746. The high water consumption rate is primarily attributed to water loss in the system, which accounts for 51% of the total water produced at the Glen Walter WTP. Based on 2016 water meter billing records, the water comsumption rate in Glen Walter was 208 L/cap/d.

## 5.4 WASTEWATER: LEVEL OF SERVICE CRITERIA

The level of service being provided by the wastewater infrastructure should be evaluated for both dry and wet weather events. There are two (2) considerations when assigning the overall level of service; the hydraulic condition occurring in the infrastructure and the scenario during which this hydraulic condition occurs.

### *5.4.1 GRAVITY SEWERS*

Sanitary sewer systems should be designed with the objective of conveying all the flows to be treated at the sewage treatment plant. Overflows within the sanitary sewer systems should be designed for emergency and unavoidable conditions only (MOE, 2008). The MOE also recommends that gravity sewers be designed to less than 100% full under normal conditions. During large rain events, trunk sewers may become surcharged. Allowing these sewers to surcharge provides storage capacity thereby reducing by-pass volume however, this increase in the elevation of the hydraulic grade line in the sewer may have adverse effects depending on site-specific factors. The increase in the elevation of the hydraulic grade line is a result of capacity limitations resulting in bottlenecks and backup of the system. The two (2) primary considerations are the amount of surcharging (elevation of hydraulic grade line) and the elevation of hydraulic grade line relative to adjacent finished ground. The identified LOS is based on satisfying the MOE Design Guidelines (MOE, 2008) for gravity sewers and maximizing storage capacity while minimizing the risk of basement flooding. Table 5.8 presents the hydraulic condition criteria for gravity sewers and Table 5.9 presents the LOS for gravity sewers to be used in this study.

**Table 5.8 Gravity Sewers Hydraulic Condition**

| FLOW CONDITION | SEWERS HYDRAULIC CONDITION CLASSIFICATION | | |
|---|---|---|---|
| | FAIR | MODERATE | SEVERE |
| Dry Weather | Flow < 85% of pipe capacity | Flow > 85% of pipe capacity | Flow > 85% of pipe capacity |
| Wet Weather (up to and including 100yr return event) | HGL < 0.3m above pipe obvert and > 2 m below finished ground | HGL < 0.3m above pipe obvert and > 2 m below finished ground | HGL within 2 m of finished ground |

**Table 5.9 Gravity Sewers Level of Service**

| PARAMETER | SEWERS LOS CLASSIFICATION | | |
|---|---|---|---|
| | GOOD | REVIEW | GAP |
| Facility Level of Service | Hydraulic grade line (HGL) from the 100yr storm is more than 2 m below the finished ground<br>Dry weather flow is less than the sewer capacity | Hydraulic grade line (HGL) from the 25yr storm flows and larger, is within 2 m of the finished ground<br>HGL from the 10yr storm flows and larger, is between 0.3m of the obvert of the pipe and 2m of the finished ground<br>Dry weather flows > 85% of the sewer capacity but < 99% of the sewer capacity | HGL from the 10yrs storm flows and smaller, is within 2 m of the finished ground<br>Cannot convey the dry weather flows without surcharging. |

### *5.4.1 PUMPING STATIONS*

The MECP requires that sanitary sewer systems be able to pump the design peak instantaneous flow (Procedure F-5-5). Pumping stations that service combined sewer systems are required to have a capacity sufficient to pump all the dry weather flow plus 90% of the volume resulting from the design wet weather flow for an average year. The MECP does not specify a design storm, therefore a review of other Master Plans was completed for comparison and is presented in Table 5.10.

**Table 5.10 Sanitary Pumping Station Design Storm Review**

| MUNICIPALITY | DESIGN STORM |
|---|---|
| Kingston | 1:10yr |
| Cambridge | 1:25yr |
| Region of Peel | 1:5yr |
| Sudbury | 1:2yr |
| Guelph | 1:25yr |

The 10yr storm was selected as this is in line with other Master Plans and would be sufficient to satisfy the MECP requirements regarding wet weather flows.

The flows experienced at sanitary pump stations and in the respective forcemains during both the existing and future flow conditions will be evaluated. The purpose of this evaluation is to identify where capacity limitations are causing bottlenecks and backups of the system.

Multiple flow conditions were applied to each growth scenario using the hydraulic model. The flow conditions analyzed included the dry weather as well as multiple return periods for wet weather events ranging from the 2yr to 100yr design storm. The recommended sanitary pump station level of service for this Master Plan Study is outlined in Table 5.11 and Table 5.12.

**Table 5.11 Sanitary Pump Station Hydraulic Condition**

| WEATHER SCENARIO | HYDRAULIC PUMP STATION CONDITION CLASSIFICATION | | |
|---|---|---|---|
| | FAIR | MODERATE | SEVERE |
| Dry Weather and Wet Weather (up to and including 10yr return event) | Measured flow < 85% of firm capacity | Measured flow > 85% of firm capacity and < 100% of firm capacity | Measured flow > 100% of firm capacity |
| Wet Weather (above 10yr up to 100yr return event) | Measured flow < peak capacity and no bypass at the station | Measured flow > peak capacity and bypass at the station | Measured flow > peak capacity and local flooding |

**Table 5.12 Sanitary Pump Station Recommended Level of Service**

| PARAMETER | PUMP STATION LOS CLASSIFICATION | | |
|---|---|---|---|
| | GOOD | REVIEW | GAP |
| Pump Station Level of Service | Dry weather flows and 10yr storm flows are less than the pumping stations firm capacity | 10yr storm flows are greater than the firm but less than the peak capacity | 10yr storm flows are greater than the pumping station peak capacity |

## 5.4.2 FORCEMAINS

In addition to the pumping requirements, the MECP also provides design standards for forcemains. At design pumping rates, a cleansing velocity of at least 0.6 m/s should be maintained. At peak flow, the maximum velocity should be limited to 3 m/s. Consideration also needs to be made for air/vacuum relief valves as well as the operating pressure in the forcemain.

The recommended criteria for evaluating the LOS was limited to the velocity in the forcemain. Considering operating pressures and requirements for air and vacuum relief valves require further hydraulic analysis beyond the scope of this Master Plan Study. The recommended forcemain level of service for this Master Plan Study is outlined in Table 5.13 and Table 5.14.

**Table 5.13 Sanitary Forcemain Hydraulic Condition**

| PARAMETER | FORCEMAIN CONDITION CLASSIFICATION | | |
|---|---|---|---|
| | FAIR | MODERATE | SEVERE |
| Hydraulic Condition of Forcemain | Velocity < 3 m/s | Velocity > 2 m/s | Velocity > 3 m/s |

**Table 5.14 Sanitary Forcemain Recommended Level of Service**

| PARAMETER | FORCEMAIN LOS CLASSIFICAITON | | |
|---|---|---|---|
| | GOOD | MONITOR | GAP |
| Level of Service | Velocity in pipe is less than 2 m/s | Velocity in pipe is greater than 2 m/s and less than 3 m/s | Velocity in pipe is greater than 3 m/s |

## 5.4.3 WASTEWATER TREATMENT

### TREATMENT PROCESSES

The MECP requires that treatment process units at wastewater treatment plants be sized based on various design parameters. Table 5.15 details the process design basis required by the MECP.

**Table 5.15 WPCP Design Basis Requirements (MOE Design Guidelines for Sewage Works, 2008)**

| UNIT PROCESS | DESIGN BASIS |
|---|---|
| Sewage Pumping Stations | Design Peak Instantaneous Flow |
| Screening | Design Peak Instantaneous Flow |
| Grit Removal | Design Peak Hourly Flow, Peak Hourly Grit Loading |
| Primary Sedimentation | Design Peak Daily Flow |
| Aeration (without nitrification) | Average Daily $BOD_5$ Loading (based on Design Average Daily Flow) |
| Aeration (with nitrification) | Average Daily $BOD_5$ loading (based on Design Average Daily Flow), Peak Daily TKN Loading (based on Design Peak Daily Flow) |
| Secondary Sedimentation | Design Peak Hourly Flow, Peak Daily Solids Loading |
| Sludge Return for Activated Sludge | 50% to 200 % of Design Average Daily Flow |
| Disinfection | Design Peak Hourly Flow |
| Effluent Filtration | Design Peak Hourly Flow |
| Outfall Sewer | Design Peak Instantaneous Flow |
| Sludge Treatment (Digestion and Dewatering) | Maximum Monthly Mass Loading and Flow Rates |

The MECP indicates a sewage treatment plant should be able to treat the flows of sewage generated within buildings serviced by the sewer system exclusive of any extraneous flows (i.e. the average daily flow). The MOE Design Guidelines (MOE, 2008) also indicates that “during wet weather, the minimum level of treatment required for flows above the dry weather flows from combined sewer system is primary treatment.”

Therefore, based on the above MECP criteria, the recommended LOS for wastewater treatment plants is to provide full treatment to all average daily flow. Additionally, based on the identified MECP criteria, MECP Procedure F-5-5 (i.e. 90% of the wet weather flow) the level of service for wet weather flows is to provide primary treatment, as a minimum, up to and including the 10yr storm.

### EFFLUENT CRITERIA

Should an expansion of the Glen Walter WPCP be necessary and additional capacity be required to accommodate the design flows, the MECP will need to approve the proposed upgrade design and may adjust the current effluent requirements. As part of the 2008 Glen Walter Water and Wastewater Treatment Systems Class

EA, an assimilative capacity assessment of the St. Lawrence River in the vicinity of the Glen Walter WPCP outfall was conducted and effluent objectives and limits were proposed for an ADF of 1,050 $m^3$/d and approved by the MECP. These effluent objectives and limits are presented in Table 5.16.

**Table 5.16 Glen Walter WPCP MECP Approved Effluent Criteria (ADF of 1,050 $m^3$/d)**

| PARAMETER | EFFLUENT OBJECTIVE | EFFLUENT LIMIT | |
|---|---|---|---|
| | | CONCENTRATION | WASTE LOADING |
| $cBOD_5$ | 15 mg/L | 25 mg/L | 26.3 kg/d |
| TSS | 15 mg/L | 25 mg/L | 26.3 kg/d |
| TP | 0.25 mg/L | 0.5 mg/L | 0.50 kg/d |
| TAN (as N)<br>Summer (14°C)<br>Winter (4°C) | <br>0.1 mg/L<br>0.1 mg/L | <br>0.25 mg/L<br>1.1 mg/L | <br>0.26 kg/d<br>1.2 kg/d |
| *E. coli* | 100 organisms/100mL | 200 organisms/100mL | - |

These effluent requirements were recently referenced to the MECP in the 2015 re-rating of the WPCP to a rated ADF capacity of 787 $m^3$/d and the MECP did not request any changes to these approved limits. However, since an ADF of 1,050 $m^3$/d far exceeds the ADF required for the Existing + Area D growth scenario, it is anticipated that the current effluent loadings for TP and TAN would be maintained which would result in more stringent effluent concentration limits to accommodate the increase in rated ADF capacity. The current WPCP effluent requirements are provided in Table 4.8. It is assumed however, that the current effluent objectives and limits for $cBOD_5$ and TSS of 15 mg/L and 25 mg/L will remain unchanged as this is consistent with the effluent requirements in Table 5.16 and in the Cornwall WWTP ECA.

**PRIVATE SEPTIC SYSTEMS**

According to the findings of the door-to-door survey as described in Section 4.4, municipal servicing of lots currently not connected to the Township's wastewater system is not urgently required as the existing condition of the private systems appears to be satisfactory. Through the septic system field investigation program, it has been determined that servicing of existing and proposed/approved subdivisions with current private septic systems would not need to be considered further for municipal servicing in this Master Plan Study. This is largely due to preference expressed by residents in these areas to maintain their current private systems, as well as the financial implications of providing municipal wastewater servicing to these areas. Further, new developments in the growth areas are being designed for private septic systems on each lot. It is understood that studies completed in the planning of these developments have indicated favourable geotechnical and hydrogeological conditions in these areas for septic systems.

## 5.5 FUTURE WATER SYSTEM REQUIREMENTS

### *5.5.1 WATER DEMANDS AND SUPPLY CAPACITY REQUIREMENTS*

The unit flow criteria indicated in Section 5.2.1 were used to estimate the future water demands in the Township. Table 5.17 presents the projected water demand for each growth scenario as well as the WTP rated capacity, for reference. The highlighted values indicate design values that exceed the existing WTP rated capacity.

**Table 5.17 Water Demand Projections**

| GROWTH SCENARIO | PROJECTED AVERAGE DAY WATER DEMAND | PROJECTED MAXIMUM DAY WATER DEMAND | PROJECTED PEAK HOUR WATER DEMAND |
|---|---|---|---|
| Existing | 263 $m^3/d$ | 580 $m^3/d$ (1) | 750 $m^3/d$ |
| Existing + Area D | 288 $m^3/d$ | 634 $m^3/d$ | 821 $m^3/d$ |
| Near-Term (0 – 5 years) | 529 $m^3/d$ | 1,163 $m^3/d$ | 1,508 $m^3/d$ |
| Mid-Term (5 – 10 years) | 603 $m^3/d$ | 1,328 $m^3/d$ | 1,719 $m^3/d$ |
| Long-Term (10 – 20 years) | 727 $m^3/d$ | 1,599 $m^3/d$ | 2,072 $m^3/d$ |
| WTP Rated Capacity | - | 995 $m^3/d$ | - |

1 Based on 2016 water production data from the Glen Walter WTP.

2 Highlighted design values exceed the existing WTP rated capacity.

The existing Glen Walter WTP has capacity to produce water up to the Existing + Area D growth scenario. Additional servicing could be provided to select “areas” included in the Near-Term growth scenario.

### 5.5.2 WATER DISTRIBUTION SYSTEM ANALYSIS

An “all-pipe” hydraulic network water model was built 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. Unlike simplified models that could have been created, the detailed “all-pipe” model will support this Master Plan as well as future updates and “what-if” investigations beyond the Master Plan. In this respect, the model is an information asset that can be maintained and reused. **Appendix A** presents a technical memorandum that outlines the process undertaken to build, calibrate, and validate the hydraulic water model.

The growth scenarios were developed in the WaterGEMS model to allow for various extended period simulations (EPSs) to be run which represent different demand loading conditions including peak conditions over a period of 24 hours. The simulation settings ensure that a conservative model representation of the Glen Walter system is used for the purposes of infrastructure service gap analysis and review of suitable alternatives.

Extended period simulations were run for each growth scenario under the following water demand conditions:

- Average Day Demand (ADD)
- Maximum Day Demand (MDD)
- Peak Hour Demand (PHD)
- Maximum Day Demand Plus Fire Flow (MDD+FF)

The results of the fire flow analysis indicate that there is no fire fighting capacity in the Glen Walter water system, regardless of fire location. In other words, the simulated available fire flow is significantly less than the FUS recommended fire flow or “required fire flow” throughout the water distribution system.

### 5.5.3 PUMPING AND WATER STORAGE

Given the projected demands and fire flow requirements an assessment was carried out of the available pumping capacity and storage available within the water system. A combination of pumping and storage is necessary to adequately supply the system during maximum day demand and fire flow conditions.

To assess the suitability of the existing distribution system, a two-step approach was taken:

- **Step 1:** Compare the firm capacity of the WTP pumping to the estimated peak flows (i.e. maximum day demand plus fire flow) during the planning horizon.
- **Step 2:** Determine the storage requirements for the pressure zone.

A system is considered to be adequate if the firm capacity of a pumping station is greater than the maximum day demand and the available storage is greater than or equal to the required storage (calculated per MOE Design Guidelines and FUS design criteria). Using the MOE Design Guidelines (MOE, 2008) formula, the total water storage volume required for the Existing + Area D growth scenario is 1,165 $m^3$. Detailed calculations are provided in **Appendix C**. The current WTP reservoir storage capacity is 623 $m^3$, therefore additional storage volume of 542 $m^3$ is required to provide fire flow for the Existing + Area D growth scenario.

The results of the first step indicate that the Glen Walter WTP high lift pumps have sufficient firm capacity to meet maximum day demands for Existing + Area D, however would need to be upgraded to meet maximum day demands for all other scenarios. The maximum day plus fire flow demands exceed the firm pumping capacity of the high lift pumps under all scenarios.

The results of the storage assessment indicate that Glen Walter does not have sufficient floating storage to provide equalization, fire and emergency storage. The combination of existing floating storage and pumping capacity are not sufficient to meet demand requirements for all scenarios. A water storage facility will need to be designed such that it will provide sufficient pressure to the water distribution system when in use.

# 5.6 FUTURE WASTEWATER SYSTEM REQUIREMENTS

## 5.6.1 WASTEWATER FLOWS AND TREATMENT CAPACITY REQUIREMENTS

The design influent wastewater flows were estimated using historical operating data and the design criteria identified in Table 5.6. The historical wastewater flows for the currently serviced population was assumed to be unchanged, while estimates were made for the new service population. The average day flow (ADF) for the new service population was calculated assuming a flow rate of 450 L/cap/d and an inflow and infiltration (I/I) flow rate of 90 L/cap/d. The maximum day flow (MDF) for the Existing + Area D growth scenario was calculated by applying the historical MDF factor to the design ADF. Table 5.18 presents a summary of the design flows.

**Table 5.18 Design Wastewater Flows**

| GROWTH SCENARIO | DESIGN AVERAGE DAY FLOW | DESIGN MAXIMUM DAY FLOW | DESIGN MDF PEAKING FACTOR | DESIGN PEAK FLOW | DESIGN PEAK FLOW PEAKING FACTOR |
|---|---|---|---|---|---|
| Existing | 665 $m^3$/d (1) | 1,851 $m^3$/d (1) | 2.78 | 2,665 $m^3$/d | 4.00 |
| Existing + Area D | 713 $m^3$/d | 1,982 $m^3$/d | 2.78 | 2,852 $m^3$/d | 4.00 |
| Near-Term | 1,042 $m^3$/d | 2,897$m^3$/d | 2.78 | 4168 $m^3$/d | 4.00 |
| Mid-Term | 1,138$m^3$/d | 3,164 $m^3$/d | 2.78 | 4,552 $m^3$/d | 4.00 |
| Long-Term | 1,297 $m^3$/d | 3,605 $m^3$/d | 2.78 | 5,188 $m^3$/d | 4.00 |
| WPCP Rated Capacity | 787 $m^3$/d | - | - | - | - |

1 Based on 2015-2017 daily influent wastewater flow data from the Glen Walter WPCP.

2 Highlighted design values exceed the existing WTP rated capacity.

It should be noted that although the design ADF for the Existing + Area D growth scenario is less than the current rated capacity of the Glen Walter WPCP, it accounts for 91% of the rated capacity. Generally, it is recommended that solutions to reliably provide wastewater treatment servicing are identified prior to a facility reaching 80% of its rated capacity.

Although the Glen Walter WPCP ECA does not identify a rated influent peak flow capacity, according to the original ECA (1988), the grit tank is designed for a peak flow of 26.6 L/s (2,298 $m^3$/d) and the clarifier is designed for a peak flow of 2,296 $m^3$/d. The projected future peak flow value of 2,840 $m^3$/d exceeds the process design values and should be considered when designing upgrades.

### 5.6.2 SEWER MODELLING FINDINGS

An “all-pipe” hydraulic network wastewater model was built using the program SewerGEMS by Bentley™, an industry standard software modelling program, to represent the existing Glen Walter wastewater system and wastewater flows. Available data was compiled and audited to construction the wastewater model. This data included flow data collected following a comprehensive flow monitoring program that was developed for recording real-time in-line flow in the wastewater collection system.

The model was built using GIS data and other wastewater servicing infrastructure information provided by the Township. GIS information was entered into ArcMAP©, which was selected as the data compiling and auditing platform. This information was then compared with As-Built drawings to verify critical infrastructure features such as pipe inverts and slopes. Information collected and checked was then imported into SewerGems© using the ModelBuilder tools. **Appendix A** presents a technical memorandum that outlines the process undertaken to build, calibrate, and validate the hydraulic water model, as well as information regarding the flow monitoring program.

The growth scenarios were developed in the SewerGEMS model to allow for various dry-weather loading and wet-weather loading simulations to be run to simulate average and peak flow conditions in the collection system. A summary of simulation results is as follows:

- Under dry-weather conditions, all pipes were found to provide sufficient servicing.
- Under wet-weather conditions (100yr storm), there is approximately 2,800 m of surcharging sewer pipes (full pipes) observed under existing conditions. Refer to **Appendix D** for details.

Figure 5.2 illustrates areas of sewer surcharging under Existing + Area D growth scenario conditions.

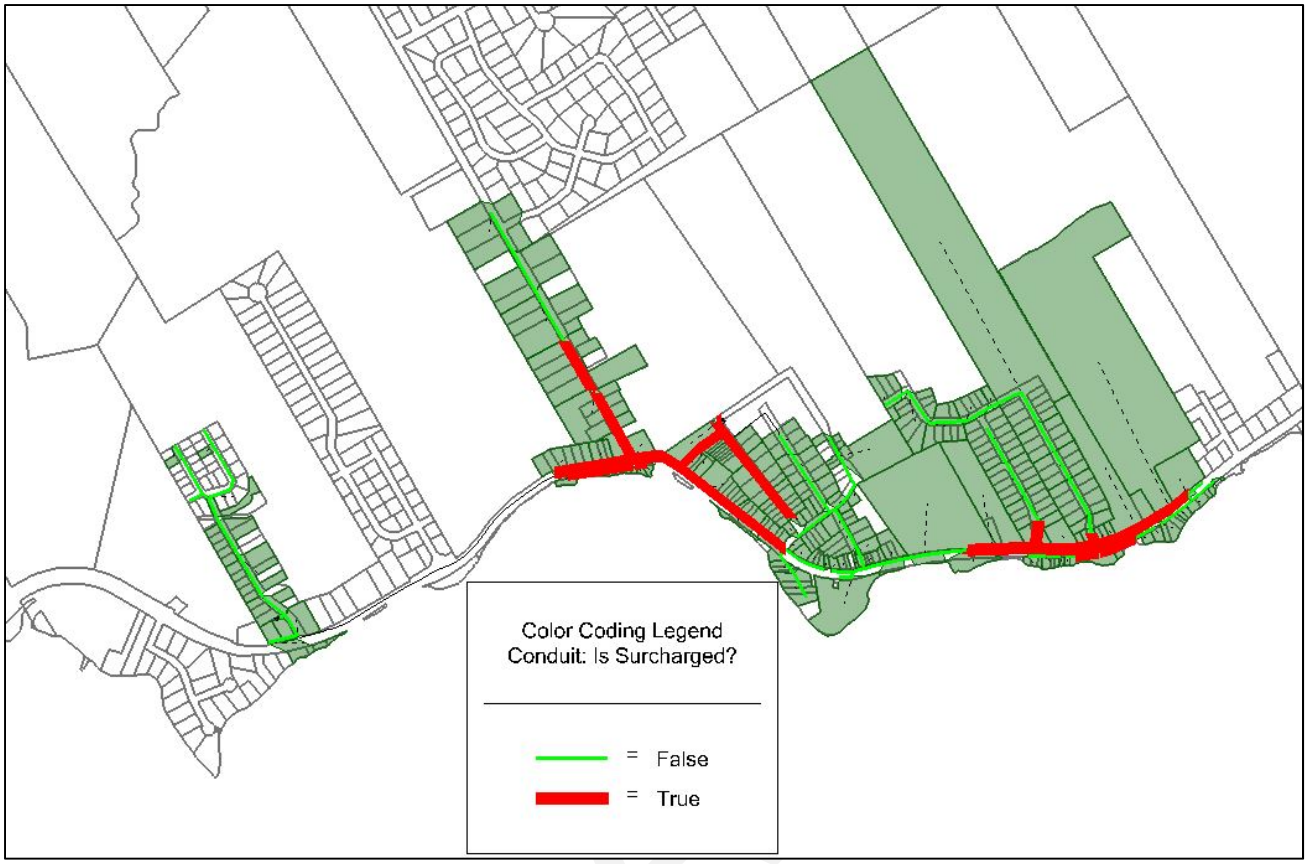


**Figure 5.2 Sewers Approaching Capacity (100yr Storm Model Results for Existing Conditions + Area D)**

# 6 GAP ANALYSIS

This section compares the technical design criteria that will be used for this study as described in Section 5.2 and the Level of Service (LOS) that will be applied during the analysis and planning of infrastructure in the Glen Walter area for this Master Plan Study for the water and wastewater systems as described in Section 5.3 and Section 5.4, respectively, to identify servicing gaps.

Table 6.1 provides information on the various water and wastewater infrastructure components in Glen Walter and discuss the LOS or design criteria (primarily recommendations from the MOE Design Guidelines) required for consideration for each component as part of this Master Plan Study. Included in this assessment are the water distribution and wastewater collection systems as well as the water and wastewater treatment systems.

Table 6.1 presents the critical gaps in LOS to provide servicing up to the Existing + Area D growth scenario based on the identified water and wastewater system design criteria and hydraulic model simulation results. The identified gaps will need to be addressed in the review of alternative solutions. LOS classifications correspond to those described in Sections 5.3 and 5.4.

**Table 6.1 Level of Service Classification for Servicing of the Existing + Area D Growth Scenario**

| PARAMETER | OBSERVATIONS | LOS CLASSIFICATION |
|---|---|---|
| **Water System** | | |
| WTP | The existing WTP capacity is sufficient for the Existing and Existing + Area D growth scenario water demands. A portion of the near-term growth scenario may also be serviced within the existing WTP capacity. | GOOD |
| Watermains | Existing watermains are sized for ADD, MDD and PHD servicing for Existing and Existing + Area D growth scenario water demands, however watermains are not sized for maximum day demand plus fire flow conditions. | GAP |
| Water Storage | According to the water model fire flow simulation results, the existing system does not have sufficient fire flow capacity and consequently will not have sufficient capacity to provide servicing for any of the growth scenarios under fire flow conditions. | GAP |
| **Wastewater System** | | |
| Gravity Sewers | Under dry-weather conditions, all pipes were found to meet the LOS criteria.<br>Under wet-weather conditions (100yr storm), there is approximately 2,800 m of sewer which does not satisfy the LOS criteria. Refer to **Appendix D** for additional details and locations of surcharging pipes observed under existing conditions. | GAP |
| Pumping Stations and Forcemains | *Bray St. PS* - This PS has a documented history of sewer back-up and flow capacity exceedance in 2017. The minor design storm model simulations showed that the pumping station only has a 2yr design storm LOS under existing conditions while the forcemain can convey flows above the 10yr design storm. | GAP |
| | *Yacht St. PS* – While a large influence of wet-weather is observed during design storm events in the catchment area upstream of the PS, the analysis shows that the PS and forcemain were able convey the dry-weather and minor design storm flow during model simulations and met the LOS for Existing and Existing + Area D however would be operating near capacity. | REVIEW |
| WPCP | Based on the flows included in the annual report and model simulation flows, the WPCP currently does not meet the LOS criteria. In the 10yr storm analysis scenario, the WPCP experiences peak wet weather flow exceedances causing overflows. Given the capacity exceedances observed and reported a capacity assessment and/or expansion is warranted.<br>According to operations staff, peak flows were difficult to manage due to extreme wet weather conditions experienced in 2017 and early 2018. | GAP |

# 7 PROBLEM STATEMENT

The purpose of the Problem Statement is to define the starting point of the Master Plan Study and assist in defining the scope of the project. It reflects the review of existing conditions, assessment of growth scenarios, and strives to address the identified servicing gaps. Accordingly, the Problem Statement is as follows:

> *The Glen Walter Area Water and Wastewater Servicing Master Plan seeks to identify a cost-effective, environmentally sound, and socially acceptable solution to provide safe municipal drinking water and wastewater servicing to the current municipal water and wastewater serviced population of Glen Walter.*

To address the Problem/Opportunity Statement, the Township has initiated a Master Plan Study which evaluates alternative solutions to solve the problem identified above for the Existing + Area D growth scenario only.

# 8 LONG-LIST OF ALTERNATIVE SOLUTIONS

Various high-level alternative solutions to address the problem statement for this Master Plan Study were identified. This section identifies and describes the long-list of water and wastewater servicing options considered for the Glen Walter area. The long-list consists of the following alternative solutions:

1. Do Nothing
2. Limit Municipal Servicing and Optimize Existing Processes
3. Water Efficiency and Wastewater Reduction
4. Expand / Upgrade Servicing Infrastructure
5. Construct New Storage Facilities
6. Construct New Treatment Facilities
7. Connect to Servicing Infrastructure in Cornwall

## 8.1 DO NOTHING

This alternative would allow the existing combined private and municipal servicing to continue as is. No infrastructure upgrades would be carried out to either the water or wastewater treatment or distribution / collection systems.

This alternative does not provide a reliable solution municipal wastewater servicing issues such as pumping station overflows and improvements to existing wastewater treatment plant (WPCP) capacity limitations as experienced in recent years. Further, this alternative does not provide a solution to the Township's goal of providing fire-fighting capacity within the areas receiving municipal water servicing. Lastly, this alternative does not allow the Township to provide servicing to support the committed service area. By definition, this alternative does not satisfy the requirements of the Problem Statement and will not be carried forward for evaluation.

## 8.2 OPTIMIZE EXISTING PROCESSES

The existing water treatment and distribution systems appear to have sufficient capacity to continue providing water to the existing service area as well as some of the planned future growth areas. However, in 2017, the annual average day flow (ADF) experienced at the Glen Walter WPCP was almost 100% of the rated capacity and these trends appeared to be consistent with flows to the facility in early 2018. The WPCP is approaching its ADF rated capacity and does not provide enough flexibility to accommodate the new trend in extreme precipitation events being experienced more frequently and continue to service the existing population. This alternative involves some operational adjustments to the wastewater conveyance system such as pump setting adjustment. Accordingly, the ability to service the committed service population would be limited by the capacity of the wastewater system.

The hydraulic capacity of existing infrastructure, particularly wastewater collection system facilities such as pumping stations, would need to be improved through optimization and potentially in combination with other solutions. This alternative would also include modifying and optimizing operational practices at the existing WPCP to relieve current capacity restraints.

## 8.3 WATER EFFICIENCY AND WASTEWATER REDUCTION

This alternative would include the implementation of programs to reduce water demand and wastewater flows through water efficiency measures and sewer rehabilitation to reduce infiltration and inflow.

Expanded water conservation programs, including improvements to water metering practices (e.g. investigating zero meters) and public education, would be used to maintain and possibly reduce future water consumption. A reduction in sewage flow could be accomplished by water conservation measures such as the installation of plumbing fixture retrofit kits, and the replacement of high-water use fixtures. An added benefit of these programs would be reduced water demand resulting in additional available capacity at the Glen Walter WTP.

An important component of this solution is sewer rehabilitation to reduce extraneous flows, including wet-weather inflow and infiltration, into the wastewater collection system. Reducing wet-weather inflow would reduce the total flow to be conveyed to and treated at the WPCP. Wet-weather inflow reductions are difficult to quantify, and results are typically not guaranteed. It is understood that the Township recently conducted a CCTV investigation of the entire Glen Walter wastewater collection system and that the results identified specific locations within the collection network that are particularly susceptible to significant volumes of inflow and infiltration. Recently, Township Council have approved sewer rehabilitation capital works projects.

Although the reduction to wastewater flows resulting from an I/I reduction program cannot be estimated at this time, this alternative would include flow monitoring of the wastewater collection system once sewer rehabilitation efforts are complete, to better quantify the reduction in wastewater flows to the pumping stations and WPCP. Accordingly, this alternative may be considered in conjunction with another solution, recognizing limitations in information at this time.

## 8.4 EXPAND / UPGRADE SERVICING INFRASTRUCTURE

This alternative involves the expansion of the existing Glen Walter WPCP and conveyance infrastructure to address Existing + Area D service population needs. This alternative will require expansion of the Bray Street PS and the Glen Walter WPCP to service the existing and committed service population.

Expansion of a new WPCP may result in new effluent limits and the capacity of the expanded WPCP would depend on the treatment requirements (i.e. effluent quality) in addition to the new flows and loadings that would require treatment. It is possible that the governing agency may impose more stringent effluent limits to the new WPCP which would result in a new treatment process.

Although there are constraints on the existing site footprint, Township staff have indicated that if additional area is required for an expansion, the existing administration building on the site can be demolished and the footprint used for expansion of the facilities. It is understood that office space for operations staff would then be moved off-site to a known available space owned by the Township (identifying alternate locations for the administration space is outside the scope of this assignment).

## 8.5 CONSTRUCT NEW STORAGE FACILITIES

This alternative involves the construction of a new water storage tank and a new wastewater equalization tank. The existing treatment facilities would remain unchanged. This option would mitigate hydraulic concerns at the Bray Street PS and the Glen Walter WPCP. The equalization tank would be located upstream of the WPCP to mitigate peak flows to the treatment process.

A location for the new storage facilities would need to be confirmed as part of the subsequent Class EA process.

The water storage tank will need to be sized and placed such that it will provide sufficient pressure to the water distribution system when in use. The construction of a new water storage facility would also improve the

distribution networks functional storage which would increase redundancy and stability of pressure distributions throughout. Storage systems with elevated tanks and reservoirs are generally more sustainable and require less mechanical and operational requirements for boosting which may reduce energy consumption and maintenance.

Depending on the required wastewater storage volume, the equalization tank could be located on the existing WPCP site. Although there are constraints on the existing site footprint, Township staff have indicated that if additional area is required for an expansion, the administration building on the site can be demolished and the footprint used for expansion of the facilities. It is understood that office space for operations staff would then be moved off-site to a known available space owned by the Township (alternate locations for the administration space is outside the scope of this assignment).

## 8.6 CONSTRUCT NEW TREATMENT FACILITIES

This alternative involves the construction of a new WTP and/or WPCP on the existing and/or new site. New treatment facilities would be sized to accommodate the increased water demand and wastewater flows associated with growth within the community. This alternative would only be required if municipal water servicing is extended to the new growth areas and if municipal wastewater servicing is provided to developments beyond that of the existing service population and committed service population. The existing WTP and/or WPCP would be decommissioned.

The new WPCP may be subject to new, more stringent effluent limits and the capacity of the new WPCP would depend on the treatment requirements (i.e. effluent quality) in addition to the new influent flows and loadings that would require treatment. It possible that the governing agency may impose more stringent effluent limits to the new WPCP which would result in a new treatment process.

This alternative would be one of the most expensive solutions, even if the existing site and existing infrastructure / equipment was re-used to the extent possible.

## 8.7 CONNECT TO SERVICING INFRASTRUCTURE IN CORNWALL

This alternative involves decommissioning of the Glen Walter WTP and WPCP and connection of water and wastewater servicing to the City of Cornwall. For this scenario, the City of Cornwall would supply drinking water and wastewater servicing to the Glen Walter Area, as required. This alternative would require construction/upgrade of pumping stations and underground linear infrastructure from the Cornwall WPP and WWTP facilities to Glen Walter.

In the most recent Cornwall WWTP Class EA Addendum (2010), it was noted that the Cornwall WWTP may be able to accommodate 525 $m^3$/d to 1,050 $m^3$/d of wastewater from the Township of South Glengarry. The Township is currently pursuing wastewater servicing for the industrial area located just east of the City of Cornwall city limit along Tyotown Road. It is not known at this time how much capacity will be required to service the industrial area, however this may reduce the amount of water and wastewater servicing capacity available for the remaining Glen Walter area. It should also be noted that this alternative would require that the Township enter into a servicing agreement with the City of Cornwall.

## 8.8 SHORT-LIST OF ALTERNATIVE SOLUTIONS

A preliminary evaluation was conducted to determine if the alternative solutions developed are capable of satisfying the Problem Statement. Only those alternatives that satisfy the project objectives were considered for a detailed evaluation.

Alternative 1 (Do Nothing) would not provide sufficient wastewater treatment capacity for the Existing + Area D growth scenario and would not provide sufficient fire flow capacity to the Glen Walter area. As a result, Alternative 1 does not satisfy the study objectives and will not be considered further.

Alternative 2 (Optimize Existing Processes) and Alternative 3 (Water Efficiency and Wastewater Reduction) may free up servicing capacity for the Existing + Area D service areas and potentially other growth areas; however, the increase in peak wastewater flows would exceed the hydraulic capacity of components of the existing wastewater infrastructure if Alternative 2 is implemented exclusively. Neither of these alternatives provide fire flow capacity to the Glen Walter area. Both Alternative 2 and Alternative 3 are low-cost solutions that could result in regaining capacity within the existing servicing infrastructure. Accordingly, both Alternative 2 and Alternative 3 will be carried forward for further evaluation as a partial solution that will be combined with other solutions.

Alternative 4 (Expand / Upgrade Servicing Infrastructure), Alternative 5 (Build New Storage Facilities), Alternative 6 (Build New Treatment Facilities), and Alternative 7 (Connect to Existing Infrastructure in Cornwall) would all satisfy the study objectives; however, Alternative 4 and Alternative 6 are very expensive and do not provide any benefit over Alternative 5 or Alternative 7. Therefore, Alternative 5 and Alternative 7, only, will be carried forward for further evaluation. A summary of the ability of each alternative to satisfy the study objectives is provided in Table 8.1.

**Table 8.1 Evaluation of Long-Listed Alternative Solutions**

| NO. | ALTERNATIVE SOLUTION | SHORT-LIST | RATIONALE |
|---|---|---|---|
| 1. | Do Nothing | No | Does not satisfy any of the study objectives. |
| 2. | Optimize Existing Processes | Yes (Partially) | Has potential to satisfy all of the study objectives. May be considered as part of the overall solution. |
| 3. | Water Efficiency and Wastewater Reduction | Yes (Partially) | Has potential to satisfy all of the study objectives. May be considered as part of the overall solution. |
| 4. | Expand / Upgrade Servicing Infrastructure | No | Satisfies study objectives. However, requires significant expense to the Township and does not provide any added benefit over Alternative 5. Further this alternative exposes the ECA to more stringent effluent criteria that could expose the facility to tertiary treatment requirements. |
| 5. | Build New Storage Facilities | Yes | Satisfies all of the study objectives. |
| 6. | Build New Treatment Facilities | No | Satisfies study objectives. However, requires significant expense to the Township and does not provide any added benefit over Alternative 5. |
| 7. | Connect to Existing Infrastructure in Cornwall | Yes | Satisfies study objectives. However, may require significant capital expense compared to other alternatives. |

Alternative 2 and Alternative 3 are low-cost solutions that may assist in freeing up additional capacity in both the water and wastewater systems. Accordingly, they will be carried forward to the detailed evaluation in combination with Alternative 5 and Alternative 7. The solutions that will be further developed and evaluated are:

- Alternative 5a: Build New Water Storage Facility
- Alternative 7a: Connect to Existing Water Infrastructure in Cornwall
- Alternative 5b: Build New Wastewater Storage Facility
- Alternative 7b: Connect to Existing Wastewater Infrastructure in Cornwall

# 9 SHORT-LISTED ALTERNATIVE SOLUTIONS

## 9.1 WATER SYSTEM

### 9.1.1 ALTERNATIVE 5A: CONSTRUCT A WATER STORAGE FACILITY

This alternative involves the construction of a new water storage facility to provide fire storage in Glen Walter. The existing water treatment and distribution infrastructure would remain unchanged with the exception of connection to the storage tank and feed pump upgrades. Storage may be provided in the form of an elevated tank or an in-ground reservoir with a booster pumping station.

The construction of a water storage tank to supplement available onsite storage was simulated in the hydraulic water model to confirm the feasibility of providing fire flow to the service area. The water storage tank was simulated as an elevated storage tank in the hydraulic water model. The model simulation results indicated that sufficient fire flow and pressure could be provided, however upgrades to the pump would be required as well as significant upgrades to the water distribution piping. The water model results are provided in **Appendix E**.

### 9.1.2 ALTERNATIVE 7A: CONNECT TO EXISTING WATER INFRASTRUCTURE IN CORNWALL

This alternative would require decommissioning of the Glen Walter WTP and construction of a new watermain(s) from the City of Cornwall (the City) water distribution network directly to the Glen Walter water distribution network. The City was consulted during the study and has expressed interest in pursuing an agreement with the Township for the purchase of City water servicing. Although the City is not aware of any operational issues / limitations / constraints under current operating conditions that would impact the ability of the water treatment and distribution infrastructure to provide servicing to Glen Walter, it was noted that the City would need to do an extensive review of its own infrastructure and Township servicing needs to determine if water servicing could be provided. The following is a list of potential tasks that the City would need to undertake:

- Identification of projected service population growth within the City of Cornwall;
- Definition of the actual capacity of the City's water system (likely through water system stress testing, however this is not currently planned);
- Confirmation of uncommitted reserve capacity with consideration to other water servicing agreements / commitments that are either in-progress or in-place; and
- Approval from City Council to proceed with service agreement preparation and negotiations.

To provide a basis for understanding the feasibility of this alternative for the purposes of this Master Plan Update Study, the above listed information gaps were addressed as follows:

- Historical population data was gathered from Census Canada for the City of Cornwall and reviewed alongside the City of Cornwall's 2018 Official Plan population projections to estimate the reserve capacity that would be allotted to growth within the City;
- Review of the Cornwall Water Purification Plant (WPP) Annual Reports to identify its existing used capacity;

- Estimation of Township needs and other water purchase agreements to determine the remaining capacity after consideration to City growth; and
- Review of the City's 2015 Hydraulic Water Model to provide a high-level assessment of the ability of the City's water system to provide servicing to Glen Walter.

## ESTIMATE OF CORNWALL WATER SYSTEM UNCOMMITTED RESERVE CAPACITY

### HISTORICAL WATER USAGE

The City noted that uncommitted reserve capacity of the Cornwall WPP is unknown at this time and a more extensive review would be required to provide this information. However, the City agreed that a cursory review of recent census data to estimate future growth in Cornwall with consideration to historical water demand would provide a reasonable estimate of WPP reserve capacity. Following a review of the City's Annual Drinking Water Quality Reports from 2014 to 2017, it was found that under MDD conditions, the City has historically used approximately 59% of the Cornwall WPP's approved maximum day water-taking capacity of 100,000 $m^3$/d.

### GROWTH PROJECTIONS

An analysis of historical Census Canada data for the City of Cornwall from 1996 to 2016 found that the City has historically experienced growth at a rate of less than 0.2% per annum. The 2018 City of Cornwall Official Plan document references an estimated 2016 population of 47,848 and projects a population of 50,900 in 2036. This is equivalent to a growth rate of 0.31% per annum. Applying this growth rate to the 2017 Cornwall WPP MDD of 59,522 $m^3$/d, provides an estimated MDD of 63,323 $m^3$/d in 2037 which accounts for less than 65% of the WPP capacity.

### CORNWALL WATER PURCHASE CONSIDERATIONS

The Township's projected MDD for the Existing + Area D scenario is 635 $m^3$/d, which represents only 0.635% of the Cornwall WPP's capacity. Other potential uses of the Cornwall WPP reserve capacity include the Tyotown industrial area (Township of South Glengarry) and servicing of a portion of the Township of North Glengarry. It is assumed based on discussions with the City that the capacity allotment to these sources does not reflect significant reserve water capacity. It is understood that the Township of North Glengarry may require approximately 3,300 $m^3$/d (or 3.3% of the City's water servicing capacity) to the year 2035, however there is potential that this agreement will not proceed. Based on this assessment, it is estimated that approximately 30% of the WPP capacity is uncommitted and is therefore available to provide the required water servicing to the Township. In addition, the Township would have further flexibility to consider municipal servicing of the Glen Walter area Long-Term growth scenario areas. Accordingly, the Township may wish to pursue a phased approach to the agreement that would allow for servicing capacity to be provided and charged in sequence with Glen Walter population growth. This would be negotiated between the City and Township if this alternative is recommended. It should be noted that typically it is recommended that treatment facilities consider options for increasing capacity once a capacity of 80% is reached.

## REVIEW OF THE 2015 CITY OF CORNWALL HYDRAULIC WATER MODEL

A preliminary assessment of the City's 2015 hydraulic water model was conducted as part of the review of this alternative. Although the 2015 system model was confirmed by the City to be the most current system information available, verification of model accuracy was not conducted as it is out of the scope of this assignment. For the purposes of this study, it is assumed that the City's 2015 hydraulic water model provides a reasonable indication of the ability of the City's water network to supply and convey drinking water to Glen Walter. Preliminary results of the model simulations suggest that sufficient capacity exists to provide maximum day demand flows to the Glen Walter Existing + Area D service area, however upgrades to Township infrastructure would be required to provide fire flow capabilities within Glen Walter. These upgrades could be watermain looping along Tyotown Road or water storage within the Township. The City commented that any City design needs / expectations (e.g. watermain looping) would be identified by the City following a hydraulic analysis of the preferred design concept.

**FUTURE CONSIDERATIONS**

SERVICING AGREEMENT NEGOTIATIONS

This alternative would require that the Township enter into a servicing agreement with the City of Cornwall, similar to the in-progress Boundary Road industrial area agreement or added onto the Boundary Road agreement. The City and the Township are actively working on a purchase agreement for servicing of the Boundary Road Industrial Area however the details are still being finalized. The fulfillment of this alternative will be dependant on a full review of the City's uncommitted reserve capacity in relation to the projected growth and preferred servicing of Glen Walter, as described in this section.

WATER METERING

It should be noted that the City does not have water meters. Should a water purchase agreement be pursued with the Township, the City would charge the Township based on a net production-use and the Township would then be responsible for the collection of water use charges from users within the Township. The Township will need to consider how to address the cost of the significant water leakage in the system.

# 9.2 WASTEWATER SYSTEM

## *9.2.1 ALTERNATIVE 5B: CONSTRUCT A WASTEWATER EQUALIZATION TANK*

This alternative will take place in the following two (2) phases:

1. Phase 1 – Upgrades to the sewage collection system to reduce I/I followed by an optimization study and potential re-rating of the WPCP.
2. Phase 2 – Construction of a wastewater equalization tank.

**PHASE 1**

Phase 1 of this alternative includes completion of the sewer rehabilitation program approved by Township Council. The sewer rehabilitation program is an excellent first step in addressing the core issue of extreme peak flows experienced in the wastewater system during wet weather events. A recently completed CCTV investigation of the entire Glen Walter wastewater collection system identified areas of significant inflow in addition to minor leaks found throughout the system. Although the improvement to peak wastewater flows cannot be estimated at this time, it is anticipated that upon completion of the sewer rehabilitation program, a meaningful decrease in peak flows to the WPCP will be observed.

Once the sewer rehabilitation program is complete, flow monitoring should be completed, including monitoring of flows to and from the Bray Street PS and the Glen Walter WPCP. The intention is to assess the impact of the sewer repairs and understand the impact on the wastewater infrastructure available capacity. Based on the findings of the flow monitoring program it can be determined whether or not additional capacity has been achieved.

The last step in Phase 1 is to conduct a unit process capacity assessment and optimization study of the Bray Street PS and the Glen Walter WPCP to determine if through operational changes and minor capital improvements, additional hydraulic and/or treatment capacity can be realized. The WPCP consistently achieves excellent effluent quality, therefore there is likely opportunity to re-rate the secondary treatment processes based on treatment capacity, if not limited by hydraulic capacity. If the findings of the flow monitoring program and the optimization study indicate that additional capacity exists, the Township should pursue a re-rating of its facilities.

**PHASE 2**

In the case that Phase 1 does not achieve the wastewater servicing capacity required to provide municipal wastewater servicing to the existing and committed population, construction of a new equalization facility will be pursued for this alternative, with no change to the Glen Walter WPCP treatment unit processes. For the purposes of this assessment, it is assumed that following completion of Phase 1, equalization of peak flows will still be required. In addition, Bray St. PS upgrades and gravity sewer sections experiencing LOS gaps will need to be upgraded based on the hydraulic requirements. It is estimated that the Bray St. PS will require a capacity increase upgrade of approximately 1,000 $m^3$/d and approximately 2.8 km of sewer mains will require upsizing. Details on the scale of upgrades and locations of gravity sewers impacted are provided in **Appendix D.**

**DESIGN REQUIREMENTS**

Should the construction of an equalization tank be necessary to accommodate the design flows, the MECP will need to approve the proposed system upgrade.

The new equalization tank will need to have sufficient capacity to retain peak flows sufficiently to mitigate hydraulic overloading or upset of the Glen Walter WPCP. The wastewater equalization tank could be located downstream of the Bray Street PS, allowing for the PS to operate at a high pumping speed to improve the conveyance of wastewater through this section of the wastewater collection system. The equalization tank would be located upstream of the WPCP to mitigate peak flows to the treatment process.

A location for the new equalization tank would need to be confirmed at a location owned by the Township. Although there are constraints on the existing site footprint, Township staff have indicated that if additional area is required for an expansion, the administration building on the site can be demolished and the footprint used for expansion of the facilities. This would allow for the new equalization tank to be located on the existing WPCP site.

The estimated equalization tank volume required is approximately 145 $m^3$. This influent wastewater storage volume would allow for the mitigation of peak flows in exceedance of the design MDF of 1,982 $m^3$/d over a duration of 4 hours; however, it should be confirmed during the Class EA stage.

The construction of a wastewater equalization tank with the calculated volume was simulated in the hydraulic wastewater model to confirm the feasibility of mitigating hydraulic surcharging and back-ups within the wastewater system through construction of a wastewater equalization tank. The model simulation results indicated that the equalization tank provided sufficient attenuation of WPCP influent flows under peak flow conditions. The wastewater model results are provided in **Appendix D**.

### 9.2.2 ALTERNATIVE 7B: CONNECT TO EXISTING WASTEWATER INFRASTRUCTURE IN CORNWALL

This alternative would require decommissioning of the Glen Walter WPCP and construction / upgrades of pumping stations and underground linear infrastructure from the Township's wastewater collection network directly to the City's Wastewater Treatment Plant (WWTP). To achieve wastewater servicing from the City, the Township would likely need to increase pumping capacity at the Glen Walter WPCP site where some of the wastewater generated in the Glen Walter area will collected and then need to be pumped towards the Cornwall WWTP. The Bray Street PS will also require an expansion/upgrade to increase capacity. Finally, a new forcemain will need to be constructed that carries wastewater from the Glen Walter wastewater collection system directly to the City's WWTP (i.e. rather than connecting to the Cornwall wastewater collection system, which would require upsizing of gravity sewers along Highway 2) and is estimated to be 4 km in length. The City was consulted during the study and has expressed interest in pursuing an agreement with the Township for the purchase of City wastewater servicing / treatment.

Although the City is not aware of any operational issues / limitations/ constraints under current operating conditions that would impact the wastewater treatment infrastructure's ability to provide servicing to Glen Walter, it was noted that the City would need to do an extensive review of its own infrastructure and Township servicing

needs to determine if wastewater servicing could be provided. The following is a list of potential tasks that the City would need to undertake:

- Identification of projected service population growth within the City of Cornwall;
- Definition of the actual capacity of the City's WWTP (the City is actively initiating a WWTP re-rating study which will begin in the near future);
- Confirmation of uncommitted reserve capacity with consideration to other wastewater servicing agreements / commitments that are either in-progress or in-place; and
- Approval from City Council to proceed with service agreement preparation and negotiations.

To provide a basis for understanding the feasibility of this alternative for the purposes of this Master Plan Update Study, the above listed information gaps were addressed as follows:

- Review of the 2010 Cornwall WWTP Class EA Addendum to understand potential available capacity for servicing of Glen Walter.
- Estimation of Township needs and other wastewater servicing agreements to determine the remaining capacity after consideration to City growth.

## REVIEW OF THE 2010 CORNWALL WWTP CLASS EA ADDENDUM

In the most recent Cornwall WWTP Class EA Addendum (2010), it was noted that the Cornwall WWTP may be able to accommodate 525 $m^3$/d to 1,050 $m^3$/d of wastewater from the Township of South Glengarry. The Township is currently pursuing wastewater servicing for the Boundary Road industrial area, located just east of the City of Cornwall city limit along Tyotown Road, which will utilize some or potentially all of this considered WWTP capacity. Therefore, the amount of wastewater servicing capacity available for the remaining Glen Walter area would consequently be reduced, however The City noted that the Cornwall WWTP has recently been upgraded with an enhanced secondary wastewater treatment system (employing BAF technology). Hydraulic conveyance and treatment performance to date suggest that additional capacity may exist beyond that identified as rated capacity in the facility's Environmental Compliance Approval. Accordingly, the City will be embarking on a re-rating and optimization study in the near future to confirm the actual capacity of the system and for use in pursuit of WWTP re-rating.

## FUTURE CONSIDERATIONS

### SERVICING AGREEMENT NEGOTIATIONS

This alternative would require that the Township enter into a servicing agreement with the City of Cornwall, similar to the in-progress Boundary Road industrial area agreement or added onto the Boundary Road agreement. The City and the Township are actively working on a purchase agreement for servicing of the Boundary Road Industrial Area however the details are still being finalized. The fulfillment of this alternative will be dependant on a full review of the City's WWTP uncommitted reserve capacity in relation to the projected growth, findings of the WWTP re-rating study, and preferred servicing of Glen Walter, as described in this section.

# 10 EVALUATION APPROACH AND CRITERIA

## 10.1 EVALUATION APPROACH

The approach used to determine the preferred alternatives for water and wastewater servicing in the Glen Walter area is explained in this section. A matrix was created to document the advantages and disadvantages of each alternative, and to ultimately identify a single preferred solution.

- **Define Evaluation Criteria** – Criteria were defined for the evaluation of the alternatives. The evaluation criteria for this project included (1) impact on the natural environment, (2) impact on the social and cultural heritage, (3) economic viability, and (4) technical and operational merit. The four (4) evaluation criteria were considered to have equal importance in this evaluation.
- **Document Advantages, Disadvantages and Potential Impacts** – The impacts associated with each alternative were determined and documented. These impacts were categorized under one (1) of the four (4) evaluation criteria.
- **Compare Alternatives** – Each alternative's performance with respect to the evaluation criteria was compared to that of the other alternatives. Two (2) ratings were used to describe an alternative's relative performance on a specific criterion: "most preferred" and "least preferred." This was represented visually by assigning colors; grey for "most preferred" and red for "least preferred."
- **Determine the Preferred Alternative** – The servicing alternative with the least overall impact is preferred and recommended for implementation.

The evaluation assessed the relative advantages and disadvantages of the alternative solutions in consideration of their net environmental effects. These are the residual effects to the environment once reasonable mitigation measures have been implemented. Net effects include the impacts associated with construction, operation, maintenance and decommissioning activities for each of the options as well as the social aspects of the environment (i.e. debt, changes in operation).

## 10.2 EVALUATION CRITERIA

The evaluation methodology involves the assessment of the impacts associated with the water and wastewater servicing alternatives on four (4) main evaluation criteria categories. Evaluation criteria for this project included impacts on the natural environment, the impacts on the social and cultural environments, economic impact, and technical and operational merit. A more detailed breakdown of the impacts within the respective criterion category is provided in Table 10.1.

**Table 10.1 Evaluation Criteria**

| CATEGORY | CRITERIA | DESCRIPTION |
|---|---|---|
| Natural Environment | Surface water and groundwater impacts | Impacts on water quantity and water quality of receiving waters including the St. Lawrence River and area municipal drains as well as groundwater quality and quantity |
| | Impact on natural heritage features/vegetation | Impacts on terrestrial resources such as trees and other vegetation. |
| Social and Cultural Heritage | Impact to developed areas and private properties | Noise, traffic, odour and visual distraction impacts on residents resulting from construction and/or the long-term operation of a facility. |
| | Compatibility with proposed land uses | Compatibility of official plan land use with proposed land use. |
| Technical Suitability | Ease of construction and site access | Ability to maintain the performance of the treatment process during construction. |
| | Impact on operations during construction | Change to operational requirements and impact on operations staff. |
| | Ease of integration with existing infrastructure and ability to expand the system | Compatibility with existing infrastructure in terms of the application / use of existing equipment and ability for retrofit. |
| | Ease of operation | Change to operational requirements and impact of complexity on operations staff. |
| | Impact on vulnerability to future climate changes | Ability to address potential issues arising from common climate change issues such as peak wet weather flows. |
| Economic Viability | Capital costs (a breakdown of Opinion of Probable Costs is provided in **Appendix F**) | Estimated capital costs. |
| | Operation and maintenance costs | Estimated operation and maintenance costs. |

# 11 EVALUATION OF ALTERNATIVE SOLUTIONS

## 11.1 WATER ALTERNATIVE SOLUTIONS

Table 11.1 presents a comparison of the two (2) short-listed alternatives. Two (2) ratings were used to describe an alternative's relative performance on a specific criterion: "most preferred" and "least preferred." This was represented visually by assigning colors; grey for "most preferred" and red for "least preferred."

**Table 11.1 Detailed Comparative Evaluation of Short-Listed Water Servicing Alternatives**

| EVALUATION CRITERIA | ALTERNATIVE 5A: CONSTRUCT A NEW WATER STORAGE TANK | ALTERNATIVE 7A: CONNECT TO EXISTING WATER INFRASTRUCTURE IN CORNWALL |
|---|---|---|
| **Natural Environment** | | |
| • Surface water and groundwater impacts<br>• Impact on natural heritage features / vegetation | • No impacts to surface water anticipated.<br>• Groundwater dewatering, if necessary, may disturb the River. Less dewatering than Alternative 7A.<br>• Potential for tree-removal and ground disruption. | • New watermain will need to cross under a creek, therefore some surface water disruption anticipated. Additional creek crossings if looping is required.<br>• Groundwater dewatering, if necessary, may disturb the River. More dewatering than Alternative 5A.<br>• Potential for tree-removal and ground disruption. |
| **Social and Cultural Heritage** | | |
| • Impact to developed areas<br>• Impacts to private properties<br>• Compatibility with proposed land uses | • New storage tank may be located on a new site.<br>• Construction mitigation to adjacent built-up area includes air and noise control, traffic control.<br>• Less opportunity to achieve more servicing capacity.<br>• Elevated water storage tanks are perceived to be desirable landmarks. | • New watermain to be located through previously unimpacted lands.<br>• Construction mitigation to adjacent built-up area includes air and noise control, traffic control.<br>• Greater opportunity to achieve more servicing capacity.<br>• Dependent on Cornwall for drinking water access. |
| **Technical Suitability** | | |
| • Ease of construction and site access<br>• Impact on operations during construction<br>• Ease of integration with existing wastewater infrastructure<br>• Approvals<br>• Ease of operation<br>• Does not affect ability to expand facility<br>• Reduce vulnerabilities to future climate changes | • Existing site access. Potential for less construction if looping is required for Cornwall connection.<br>• Minor WTP shutdown during connection.<br>• Approvals required from MECP.<br>• Some change in operation from current – increase in operational complexity.<br>• Opportunity to retrofit equalization tank if needed, in the future.<br>• Improvement to the availability of stored water during power outages.<br>• Improved redundancy with functional storage provided to distribution network | • No existing site access. Potential for more construction if looping is required for Cornwall connection.<br>• Minor WTP shutdown during connection.<br>• Approvals required from MECP.<br>• Significant reduction in operation and maintenance efforts (limited to watermains and water storage, if any).<br>• Connects to Cornwall system in proximity to water reservoir.<br>• Many unknown factors at this time regarding availability of capacity.<br>• Improved redundancy with functional storage provided to distribution network |
| **Economic Viability** | | |
| • Capital costs<br>• Relative operation and maintenance costs (incl. energy) | • Lower opinion of probable capital cost ($8.6M to $10.2M)<br>• Lower operational and maintenance costs. | • Higher opinion of probable capital cost ($11.4M to $15.6M)<br>• Higher operational and maintenance costs (to be paid to the City). |
| Least Preferred | Most Preferred | |

Based on the results of Table 11.1, Alternative 5A - Construct a New Water Storage Tank is the preferred water system solution. This solution satisfies the Problem Statement and has the lowest capital and operation and maintenance costs.

# 11.2 WASTEWATER ALTERNATIVE SOLUTIONS

Table 11.2 presents a comparison of the two (2) short-listed alternatives. Two (2) ratings were used to describe an alternative's relative performance on a specific criterion: "most preferred" and "least preferred." This was represented visually by assigning colors; grey for "most preferred" and red for "least preferred."

**Table 11.2 Detailed Comparative Evaluation of Short-Listed Wastewater Servicing Alternatives**

| EVALUATION CRITERIA | ALTERNATIVE 5B: CONSTRUCT A NEW WASTEWATER EQUALIZATION TANK | ALTERNATIVE 7B: CONNECT TO EXISTING WASTEWATER INFRASTRUCTURE IN CORNWALL |
|---|---|---|
| **Natural Environment** | | |
| • Surface water and groundwater impacts<br>• Impact on natural heritage features / vegetation | • Negligible impacts as design effluent limits will be met.<br>• Groundwater dewatering, if necessary, may disturb the River. Less dewatering than Alternative 7B.<br>• Potential for tree-removal and ground disruption. | • Negligible impacts as design effluent limits will be met by Cornwall WWTP.<br>• Groundwater dewatering anticipated for new forcemain and PS upgrades, may disturb the River. More dewatering than Alternative 5B.<br>• New forcemain will need to cross under a creek, therefore some surface water disruption anticipated.<br>• Potential for tree-removal and ground disruption. |
| **Social and Cultural Heritage** | | |
| • Impact to developed areas<br>• Impacts to private properties<br>• Compatibility with proposed land uses | • New tank may be located on a new site (i.e. not on the existing WPCP site).<br>• Construction mitigation to adjacent built-up area includes air and noise control, traffic control.<br>• Greater opportunity for odours, however can be mitigated through odour control.<br>• Less opportunity to achieve more servicing capacity. | • Most infrastructure required on new lands and through Cornwall's right of way along Highway 2 (high disruption due to construction).<br>• Ownership and maintenance of forcemain is based on shared agreement.<br>• Construction mitigation to adjacent built-up area includes air and noise control, traffic control.<br>• Greater opportunity for odours, however can be mitigated through odour control.<br>• Greater opportunity to achieve more servicing capacity, allowing for flexibility in the future with respect to expansion of the municipally serviced area.<br>• City-dependent for wastewater treatment. |
| **Technical Suitability** | | |
| • Ease of construction and site access<br>• Impact on operations during construction<br>• Ease of integration with existing wastewater infrastructure<br>• Approvals<br>• Ease of operation<br>• Does not affect ability to expand facility<br>• Reduce vulnerabilities to future climate changes | • Existing site access.<br>• Minor WPCP shutdown/bypass during connection<br>• Approvals required from MECP.<br>• Change in operation from current – increase in operation complexity.<br>• Opportunity to retrofit equalization tank if needed, in the future.<br>• Improvement to the accommodation of high flows that may occur due to climate change. | • Existing site access except for forcemain through Cornwall.<br>• Minor WPCP shutdown/bypass during connection<br>• Approvals required from MECP.<br>• Reduction in operation and maintenance efforts (limited to PSs and sewers).<br>• Significant PS upgrades required.<br>• Less attenuation of high flows that may occur due to climate change.<br>• Many unknown factors at this time regarding availability of capacity. |

| EVALUATION CRITERIA | ALTERNATIVE 5B: CONSTRUCT A NEW WASTEWATER EQUALIZATION TANK | ALTERNATIVE 7B: CONNECT TO EXISTING WASTEWATER INFRASTRUCTURE IN CORNWALL |
|---|---|---|
| **Economic Viability** | | |
| • Capital costs<br>• Relative operation and maintenance costs (incl. energy) | • Lowest opinion of probable capital cost ($13.3M).<br>• Lower operational and maintenance costs. | • Highest opinion of probable capital cost ($27.6M).<br>• Higher operational and maintenance costs (to be paid to the City). BAF systems require more aeration (energy usage) than conventional treatment systems. |
| Least Preferred | Most Preferred | |

Based on the results of Table 11.2, Alternative 5B - Construct a New Wastewater Equalization Tank is the preferred wastewater system solution. This solution satisfies the Problem Statement and has the least impact to the natural, social/cultural, technical, and economic environments.

# 12 PUBLIC AND AGENCY CONSULTATION

Consultation with the public (which includes stakeholders and interested parties) and government review agencies is a necessary and important component of the Municipal Class EA process. To meet the Class EA consultation requirements for this Master Plan, the Township issued notices on the local newspaper and on the Township's website to advise the public of the Study and provide the opportunity to provide input on the assessment and evaluation process for the alternatives identified in the Master Plan. The following sub sections provide a summary of the key points of contact that were established throughout the course of the Study.

## 12.1 NOTICE OF STUDY COMMENCEMENT

The Notice of Study Commencement was developed to target the ministries, organizations, agencies and other stakeholders that may be affected and/or interested in the Master Plan. The Notice of Study Commencement was published on the Township's website on xxxx. The notice briefly outlined the purpose and justification for the Study and also indicated that a Public Information Centre would be held.

The Notice of Study Commencement can be found in **Appendix G**.

## 12.2 DOOR-TO-DOOR SURVEY

A door-to-door survey was conducted in areas where Glen Walter residents were on private water and/or wastewater systems. The survey provided residents with a questionnaire to fill out regarding the characteristics of their well and septic systems, however also provided spaces for comments.

## 12.3 NOTICE OF PUBLIC INFORMATION CENTRE

A Notice of Public Information Centre (PIC) was developed and published on the Township's website on xxxx with the objective of informing the public and other stakeholders of the Study. The notice briefly outlined the purpose and justification for the Study. It also indicated that a PIC would be held on xxxx to present the alternative water and wastewater servicing solutions, the evaluation of the alternatives and the preferred recommended solution.

## 12.4 PUBLIC INFORMATION CENTRE (PIC)

The Glen Walter Area Water and Wastewater Master Plan Update PIC was held on xxxx at the xxxx, to present an overview of the Study, the water and wastewater servicing alternatives considered, the evaluation criteria and methodology that were used, and the preferred alternatives. The purpose of this Public Information Centre was to communicate the process used to carry out the Study and provide an opportunity to receive comments on both the approach followed and on the preferred recommended solution. A copy of the material presented at the PIC is included in **Appendix G**.

## 12.5 NOTICE OF STUDY COMPLETION

A Notice of Study Completion will be published on the Township's website and sent to key stakeholders upon filing of this Master Plan Report. This Notice is relevant for two reasons: it provides the public and relevant agencies with a final 30-day period to review the final conclusions of the Study, and it informs the public of the outcome of the Study and the nature of the resulting projects.

The Notice was sent to the MECP Environmental Approvals Branch and to the local District office. The Notice was also forwarded to the City of Cornwall.

# 13 PREFERRED SOLUTION

## 13.1 WATER SYSTEM

The preferred water system alternative solution is the Construction of a Water Storage Tank. This alternative will provide the service area with fire flows and pressure as required in the Problem Statement. The water storage tank would need to be connected to the existing water system at a location that will provide the required fire flow and pressure to the community. The high lift pumps located at the Glen Walter WTP would need to be upgraded to increase pumping capacity. The Glen Walter WTP and water distribution system have sufficient capacity under current conditions to provide safe and reliable municipal drinking water to the service area. Upgrades to the distribution network including watermain upsizing and installation of new hydrants will be necessary to service maximum day demand plus fire flow conditions.

Table 13.1 includes a description of each project recommended as part of the preferred servicing strategy including the year when the project needs to be completed and whether a Municipal Class EA study (Schedule B or C) is required. This list can be used to develop a capital investment program for the Township's Water System. The project list includes major infrastructure projects required to address existing system deficiencies or which provide additional capacity to service the Existing + Area D growth scenario.

These projects are aimed to ensure adequate fire flows and system pressures and providing security of supply for the system overall.

**Table 13.1 Water System Projects**

| PROJECT | YEAR REQUIRED | OPINION OF PROBABLE COST (2017$) | CLASS EA SCHEDULE | TRIGGER |
|---|---|---|---|---|
| New Water Storage Tank and WTP High Lift Pump Upgrades | 2019-2021 | $3.3M to $4.3M | Schedule B | Water storage tank required to provide security of fire flow supply and redundancy in the distribution system |
| Upsizing of Existing Watermains and Addition of Hydrants | 2022-2025 | $2.3M | Schedule B | Prioritize by areas with known high leakage. |

## 13.2 WASTEWATER SYSTEM

The preferred wastewater system alternative solution is a phased approach to the Construction of a Wastewater Equalization Tank. This alternative will provide the service area with attenuation of peak flows, mitigating the need for a WPCP expansion. **Phase 1** of this alternative includes:

- Completion of the sewer rehabilitation program approved by Township Council;
- Flow monitoring to quantify the impact of the sewer rehabilitation program; and, if warranted based on the results of the flow monitoring program;
- Unit process capacity assessment and optimization study of the Glen Walter WPCP to support plant re-rating.

The sewer rehabilitation program is intended to address the core issue of extreme peak flows experienced in the wastewater system during wet weather events, particularly the known locations where significant inflow enters the collection system. Although the resulting reduction in peak wastewater flows cannot be estimated at this time, it is anticipated that upon completion of the sewer rehabilitation program a meaningful decrease in peak flows to the WPCP will be observed.

Once the sewer rehabilitation program is complete, flow monitoring should be conducted, including monitoring of flows to and from the Bray Street PS and the Glen Walter WPCP. The intention is to assess the flow reduction from the sewer repairs and to understand the impact on the wastewater infrastructure available capacity. Based on the findings of the flow monitoring program it can be determined whether or not additional capacity has been achieved.

The last step in Phase 1 is to conduct a unit process capacity assessment and optimization study of the Bray Street PS and the Glen Walter WPCP to determine if through operational changes and minor capital improvements, additional hydraulic and/or treatment capacity can be realized. The WPCP consistently achieves excellent effluent quality, therefore there is likely opportunity to re-rate the secondary treatment processes based on treatment capacity, if not limited by hydraulic capacity. If the findings of the flow monitoring program and the optimization study indicate that additional capacity may exist, the Township should pursue a re-rating of its facilities.

In the case that Phase 1 does not achieve the wastewater servicing capacity required to provide municipal wastewater servicing to the existing and committed population, **Phase 2** would be construction of a new equalization facility and capacity increase of the Bray Street PS with no change to the Glen Walter WPCP treatment unit processes. The wastewater equalization tank would need to be connected to the existing wastewater system at a location that will provide sufficient collection and attenuation of peak flows upstream of the WPCP. The Glen Walter WPCP would then have sufficient capacity under the reduced peak flow conditions to provide reliable municipal wastewater treatment to the service area.

Table 13.2 includes a description of each project recommended as part of the preferred wastewater servicing strategy including the year when the project needs to be completed and whether a Municipal Class EA is required. This list can be used to develop a capital investment program for the Township's Wastewater Systems.

These projects are aimed to ensure that there is adequate conveyance capacity at the sewage pumping stations and the sewer system, and adequate treatment capacity at the WPCP. Given that some of the upgrades required will involve additional investigation and the completion of a Municipal Class EA, capital cost estimates cannot be accurately determined as there are several alternative solutions to address the capacity deficit. The project list only includes major infrastructure projects required to address existing system deficiencies or which provide additional capacity to service the Existing + Area D growth scenario.

It is recommended that the Township develop a community growth strategy that targets priority areas to be developed. After this has been defined, the collection system upgrades can be implemented in a logical order.

**Table 13.2 Wastewater System Projects**

| PROJECT | YEAR REQUIRED | OPINION OF PROBABLE COST (2017$) | CLASS EA SCHEDULE | TRIGGER |
|---|---|---|---|---|
| Sewer Rehabilitation | 2018 | Already approved | n/a | Already triggered by significant I&I in the sewer system. |
| New Equalization Tank | 2019-2021 | $1.1M | Schedule B | Equalization storage tank required to provide attenuation of peak inflows into the WPCP and to reduce overflows. |
| Bray Street PS Upgrades | 2021-2025 | $2.9M | Schedule B | PS upgrades required immediately, however downstream capacity (i.e. equalization tank) is required prior to upgrades. Trigger upgrades following review of peak inflow following I/I reduction initiatives. |
| Upsizing of Sewer Network | 2019-2025 | - | Schedule A | Following I/I reduction initiatives and in conjunction with preferred alternative upgrades. |

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