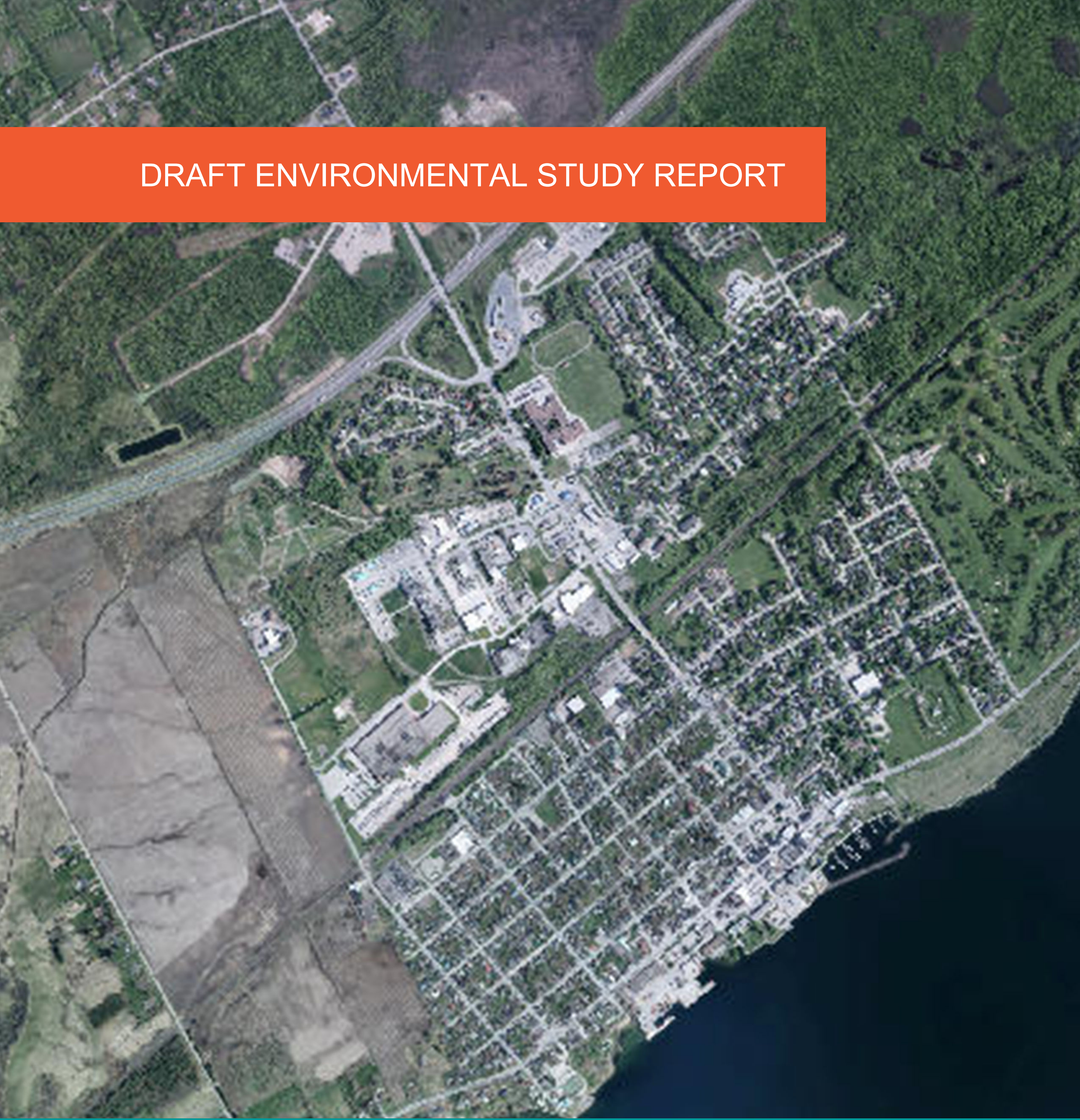
DRAFT ENVIRONMENTAL STUDY REPORT



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PROJECT# 24079 | DECEMBER 15, 2025
Prepared for The Town of Prescott / Township of Augusta
Revision #0 – Issued as Draft

This report is respectfully submitted to the Town of Prescott and the Township of Augusta in response to the request for engineering services scope of work for the completion of a Schedule "C" Environmental Assessment for the Prescott Water Pollution Control Plant (WWTP).

Prepared By:

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List of Revisions

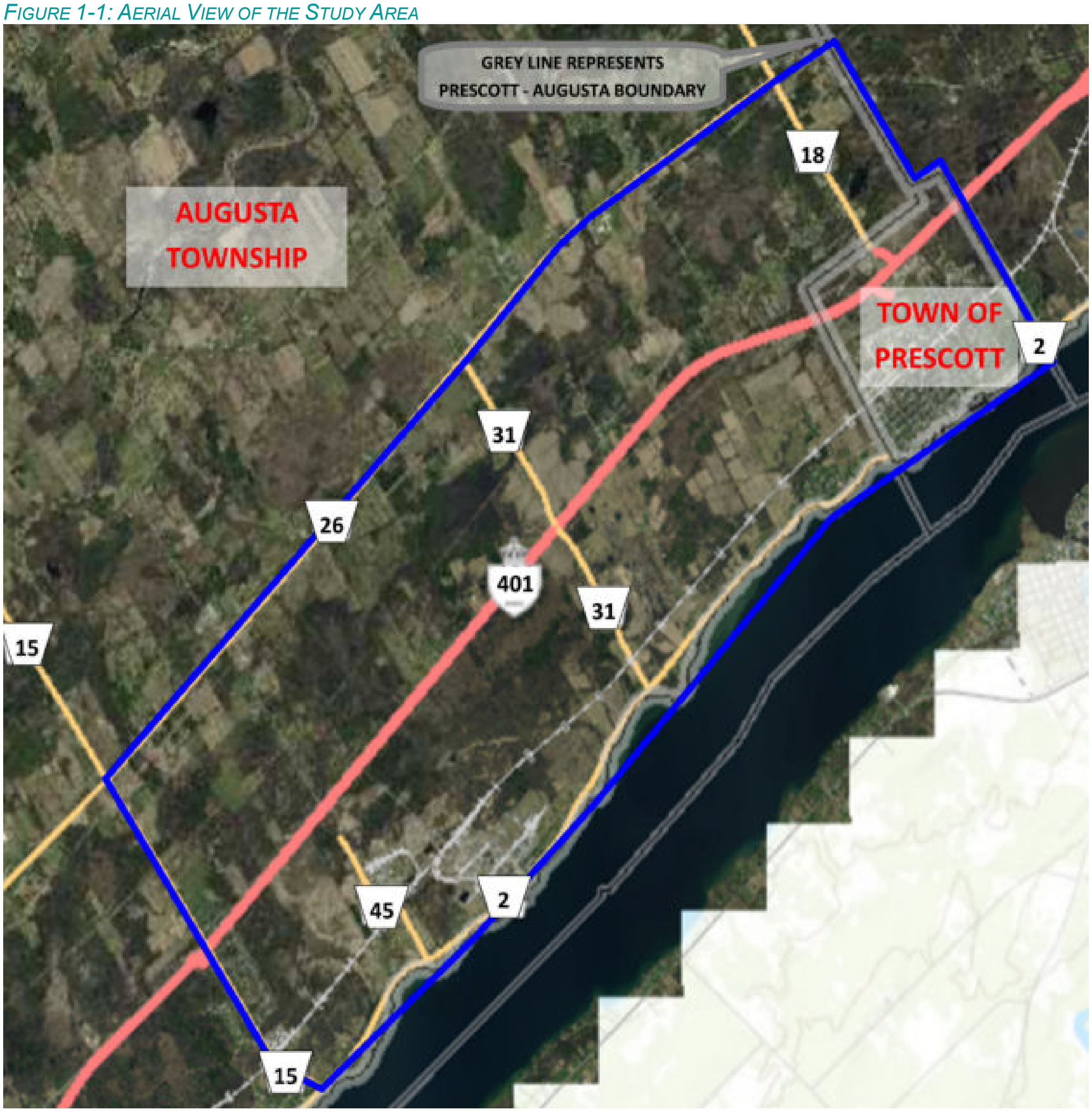
Date	Revision #	Issued For	Revision Details
2025-12-15	0	Draft	

1 INTRODUCTION

1.1 BACKGROUND

In 2021, the Town of Prescott (Town) and the Township of Augusta (Township) completed a join Land Development Needs Analysis. The goal of this study was to support their economic development strategy with a document that identifies the infrastructure needed to support potential growth within the study area. The outer boundaries being County Road 15 to the west; the St. Lawrence River to the south; County Road 26 to the north; and the municipal boundaries of Augusta and Prescott to the east, as depicted in the Study Area Map (Figure 1).

Figure 1-1: Aerial View of the Study Area



1.1.1 TOWN OF PRESCOTT

The Town of Prescott is situated on the banks of the St. Lawrence River flanked on its north, east and west sides by some of Canada's most diverse urban areas: Ottawa, Montreal, Kingston, and – at a greater distance – Toronto, and is located directly across from the United States to the south. Prescott exists in a strategic location that boasts central and accessible transportation routes by land, sea, and air. It was this strategic location, and the accessibility that it offered, that lead to the development of the Town in history as an important forwarding station for goods and people along the rapids that used to course down the St. Lawrence River at Prescott's doorstep.

Long known as the Fort Town, the community offers a balance of the past and present through the historical time travel experience of Fort Wellington National Historic Site and its costumed interpretive guides, and its contemporary incarnation as a relaxed waterfront town featuring heritage architecture, an eclectic mix of retail shops and services, and an active and accessible waterfront park and marina.

1.1.2 TOWNSHIP OF AUGUSTA

The Township of Augusta is situated immediately to the west/north of the Town of Prescott. The Township shares their eastern boundary with the Town of Prescott and the Township of Cardinal/Edwardsburg. The Township of Elizabeth-Kitley resides on the western boundary.

The Township is one of the oldest townships in Ontario with roots dating back to the 1700's. Here you will find historic houses and ultra-modern estates. The Township is home to many attractions including the Homewood Museum, the Blue Church, Point au Baril, a burgeoning garden trail featuring the Garden of Hope and Van Berlo Gardens, the Rothesay dive site and events and festivals such as Antique Wheels in Motion and the North Augusta Labour Day Festival.

The Township is the home of large industries including Valero, Dyno Nobel, Airgas, Invista (Canada), Evonik Canada Inc. Augusta is also home to many thriving small businesses and agricultural operations. Our Business Park is strategically located on County Road 2 near Highway 401 and an increasing number of small businesses are calling Augusta Township home.

1.2 HISTORICAL BACKGROUND FOR PRESCOTT

The study area was settled in the late 1700s, primarily by United Empire Loyalists. The Township is named after one of King George III's daughters. The Town was named after General Robert Prescott, governor of Canada from 1796 to 1799. This area was a strategic site on the St. Lawrence River as it stood at the head of a series of rapids (Gallop Rapids) in the St. Lawrence River.

Fort Wellington, in Prescott, was used by the British and Canadian military during the 19th and 20th centuries, as it was built midst the War of 1812. The Fort still stands and is a National Historic Site, operated by Parks Canada, and is a draw for tourism into the area.

1.3 POPULATION

According to the 2021 Census Profile, the population of the Town of Prescott and the Township of Augusta are shown in Table 1.3.

TABLE 1.3 – POPULATION DATA FOR MUNICIPALITIES

Community	Population	Households
Prescott	4,078	1,993
Township of Augusta	7386	3046

2 ENVIRONMENTAL ASSESSMENT PROCESS

2.1 THE PROCESS

In Ontario, municipal roads, water, wastewater and master planning projects are subject to the provisions of the Municipal Class Environmental Assessment (2000, amended in 2007, 2011, 2015 and 2023). The Class Environmental Assessment (Class EA) is an approved planning document which describes the process which municipalities must follow to meet the requirements of the Environmental Assessment Act (EAA) of Ontario. By following the Class EA process, the municipality does not have to apply for an individual environmental assessment under the Act. The Class EA approach allows for the evaluation of the environmental effects of carrying out a project and alternative methods of carrying out a project, includes mandatory requirements for public input, and expedites the environmental assessment of smaller recurring projects.

The Class EA planning process was developed to ensure that the potential social, economic and natural environmental effects are considered in planning roads, water, stormwater and sewage projects. Since roads, sewage, stormwater management and water projects undertaken by municipalities under the Class EA planning process vary in their environmental impact, such projects are classified in terms of schedules.

Schedule A projects are limited in scale, have minimal adverse effects and include most municipal operations and maintenance activities. These projects are approved and may proceed to implementation without any further requirements under the provisions of the Class EA planning process.

Schedule A+ projects are similar in size and scope to Schedule A activities. Schedule A+ activities require municipalities to advise the public of the project implementation and provide them with an opportunity to comment to municipal council.

Schedule B projects have the potential for some adverse environmental effects. The proponent is required to undertake a screening process involving mandatory contact with directly affected public and with relevant government agencies to ensure that they are aware of the project and that their concerns are addressed. If there are no outstanding concerns, then the proponent may proceed to implementation. If, however, the screening process raises a concern which cannot be resolved, then the Part II Order ("bump-up") procedure may be invoked; alternatively, the proponent may elect voluntarily to plan the project as a Schedule C undertaking. Typically, Schedule B projects involve extensions to existing municipal infrastructure such as sewage collection systems and water distribution systems.

Schedule C projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA process. Schedule C projects require that an Environmental Study Report be prepared and submitted for review by the public. If concerns are raised that cannot be resolved, the "bump-up" procedure may be invoked, which may result in the requirement to complete a full environmental assessment. Refer to Section 2.3 for further discussion of the Part II Order ("bump-up") procedure. Typically, these projects involve the construction of municipal infrastructure such as wastewater treatment facilities, new sewage collection and water distribution systems, and water treatment facilities.

Figure 2-1 (Exhibit A.2, from the Class Environmental Assessment publication, refer to page 5) presents a flow chart which illustrates the Planning and Design Process for Municipal Roads, Water and Wastewater Projects. The precise path to be followed in the process is dependent on the nature of the project and more particularly the schedule in which the project falls.

Phase 1 defines the nature and extent of the problem and the project opportunity. Often a discretionary public meeting is held to inform interested parties of the EA planning process and to discuss the problem.

Phase 2 involves the identification of the alternative solutions. Also included are an inventory of the natural, social, and economic environment; the identification of the impacts of alternative solutions on the environment; the identification of mitigative measures; an evaluation of alternative solutions; consultation with review agencies and the public regarding the identified problem and alternative solutions; the identification of the preferred alternative solution; and confirmation of the path or schedule to follow for the balance of the Class EA process. Public consultation is mandatory at this phase and includes review agencies and the affected public. The appropriate EA schedule for the project is also identified.

Phase 3 involves the identification of alternative designs for the selected alternative solution. Also included are a detailed inventory of the natural, social, and economic environment relating to the selected alternative solution; the identification of the impacts of alternative designs on the environment; the identification of mitigative measures; consultation with review agencies and the public regarding the alternative designs; and the identification of the recommended alternative design. Public consultation is mandatory at this phase and includes review agencies and the affected public.

Phase 4 represents the culmination of the planning and design process as set out in the Class EA. Phase 4 involves the completion of the documentation including the Environmental Study Report (ESR), if required, and the Notice of Completion. The ESR documents all the activities undertaken through Phases 1, 2 and 3 including the Consultation. The ESR is filed with the Clerk of the municipality and placed on the public record for at least 30 days to allow for public review. The public and mandatory agencies are notified through the Notice of Completion, which also discloses the Part II Order (“bump-up”) provisions.

Phase 5 is the implementation phase of the Class EA process, and includes final design, construction plans and specifications, tender documents, and construction and operation. It also includes monitoring for environmental provisions and commitments (e.g. mitigative measures) as defined in the ESR.

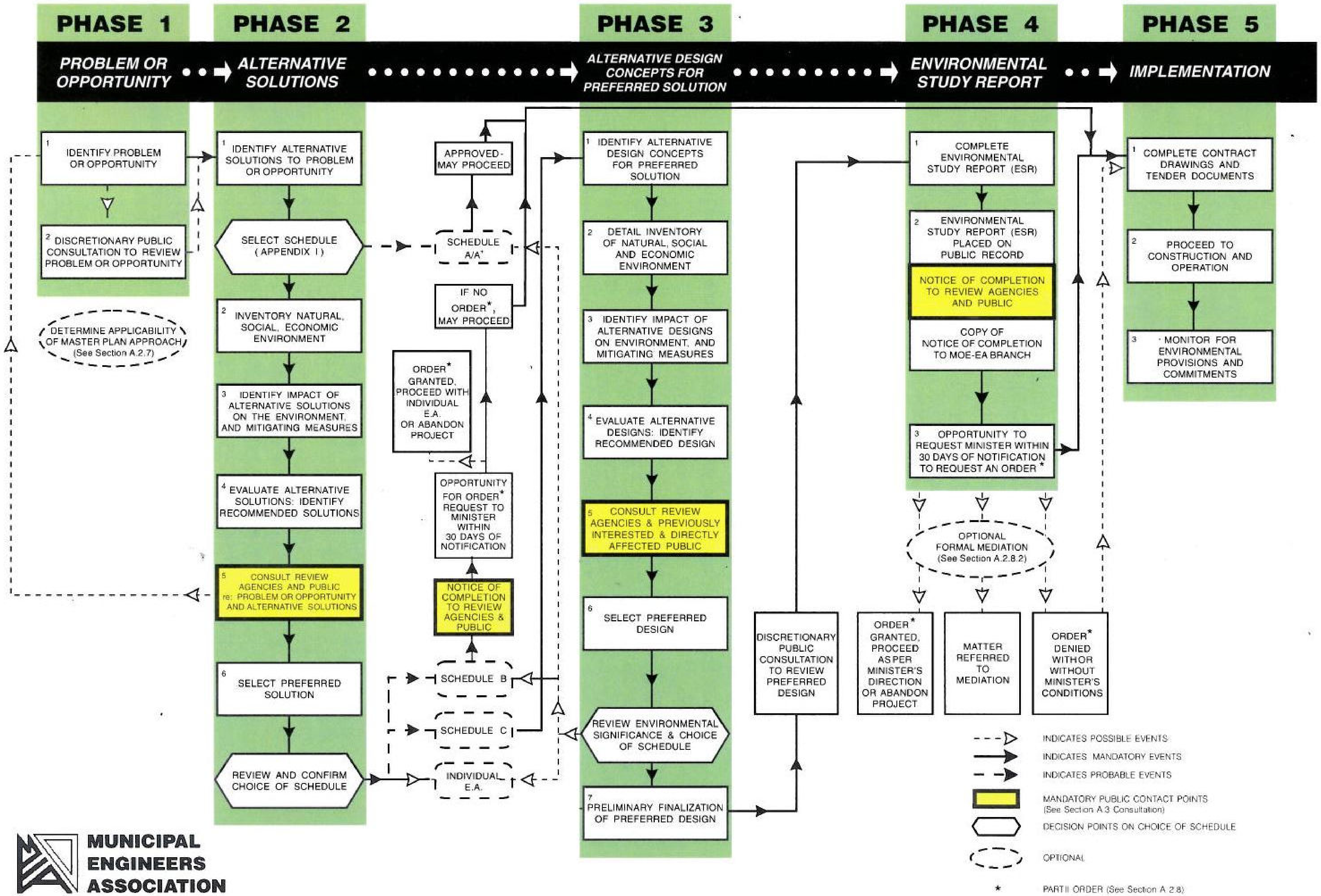


Figure 2-1 - Exhibit A.2 - Municipal Class EA Planning Process

2.2 PROJECT SCHEDULE

Based on a review of the Municipal Class Environmental Assessment manual, the required increase in the rated capacity of the Prescott WWTP Expansion has been designated as a Schedule "C" Class EA.

2.3 THE APPEAL PROCESS (PART II ORDER REQUEST)

The environmental assessment process allows for the public, indigenous communities, and review agencies to identify concerns with the information provided during public consultation centre or during the mandatory public circulation periods. Should a member of the public, indigenous communities or a review agency feel that the proposed undertaking needs to be made subject to a more comprehensive review, they can request a Part II Order.

The Part II Order is a legal mechanism which requires a review of the project file by the Minister, or delegate, to determine if the process that was followed meet all of the requirements of the Environmental Assessment Act. Should the Minister determine that the proper process was not followed, they can order the proponent to undertake a different Schedule of EA or an individual EA before proceeding with the project. Or the Minister may determine that the proper process was followed and allow the project to proceed as planned.

2.4 PUBLIC AND AGENCY CONSULTATION

Public consultation is an integral component of the environmental assessment process, allowing the public, indigenous communities and various governmental agencies an opportunity to provide input into the selection of a preferred solution for the provision of sewage services to the Town of Prescott.

Upon the onset of the project a list of entities (property owners, indigenous communities and agencies) was developed and is provided in Appendix B.

On April 17, 2024, a Notice of Study Commencement was issued to the contacts on the list provided in Appendix B and advertised on the Town's and the Township's website and social media.

The Town hosted a public information centre on March 26, 2025 to present preliminary information. Feedback from the issuance of the Notice of Study Commencement and Public Information Centre #1 will be collected and amended to this report.

A second public information centre is schedule for November 26, 2025 to present the recommendations from the environmental assessment process.

If no significant concerns are received, the Town intends to proceed with Phase 5 of the Environmental Assessment process which involves the implementation of the preferred solution.

3 PHASE 1: PROBLEM STATEMENT

3.1 EXISTING INFRASTRUCTURE

The Town of Prescott's sanitary sewage system includes over 30 km of sewer ranging in diameter from 150 to 750 mm; four sewage pumping stations with capacities ranging from 70 L/s to 160 L/s; and a WWTP with a rated capacity of 4,728 m^3/d.

3.1.1 SEWAGE COLLECTION SYSTEM

The sanitary sewer network is divided into three drainage areas each culminating at a sewage pumping station. The existing network contains over 30 km of sewer of varying diameter, material, and age. The sewer system consists of clay, asbestos cement, concrete and PVC pipe with the oldest sewers having been installed as early as 1890, and the newest pipes being installed in 2006. There are five sanitary sewer overflow chambers located at the bottom of Sophia St., West St., Edward St., Boundary St. and between George St. and West St.

Included in Appendix A is a report documenting the development of the sewer infrastructure in the Town. The Town was originally serviced by a combined sanitary/stormwater collection system. Some of the system's components date back to the late 1800's and early 1900's.

There is a history of surcharging in the collection system which has resulted in basement flooding, combined sewer overflows, and pumping station bypasses during significant rainfall/snowmelt events. The wastewater system also has high levels of infiltration and inflow (I&I), which limit the Town's ability to service future growth in the community.

To address these issues, a sewer replacement program was initiated in 1972 and continuing in various phases until 1995. The program included the replacement of older sections of pipe along King, Centre, Henry, Ann, West, Boundary, James, Wood, Victoria, Edward, Russell, Irvine, Florence, Jessup, Dibble and Park Streets, Roberta Cresc, Massie Dr., Victor and Irvine Rd. and Railway Ave.

Ainley Associates prepared a *Sewage System Optimization Study* in 1996. The objectives of the study were to identify areas of significant infiltration and inflow and to develop recommendations on the necessary upgrades to eliminate basement flooding, reduce sanitary sewage overflows and optimize the wastewater treatment plant. Ainley's study indicated that the sanitary sewer system south of the CN rail line is in poor structural condition. Based on CCTV inspection pipes were found to be collapsing, with heavy roots and misaligned joints. The sewer infrastructure in the drainage area north of the CN line was found to have misaligned pipes and poor grading, which combined with the high-water table in this area contribute to high infiltration. Furthermore, Ainley indicated that service connections, maintenance holes and roof leaders, sump pumps and foundation drains in private properties were also suspected to cause significant infiltration and inflow into the system. The sewer collection system was found to have inadequate capacity to convey a storm with recurrence of 1:5 years. The *Sewage System Optimization Study* recommended a storm/sanitary sewer separation program, a rooftop disconnection program, and the implementation of stormwater management controls.

Based on the recommendations of Ainley's study, a separation program was initiated in 1999 to address the most critical areas of the system. The program was completed as part of five different contracts (99-100 to 99-500). Additional details are included in Appendix B.

Of the sewers identified in Ainley's study as top priority, the following were not completed as part of the separation program:

- Duke Street between Dibble and Wood Street – Section between Park and Wood not completed
- East Street between Dibble and Wood Street – Section between Dibble and James not completed
- Wood Street between Walker and Victoria
- Florence Street
- Walker Street
- Dibble Street between Duke and Russell

The Florence Street section was addressed in a project to decommission the Florence Street pumping station and to install a new gravity sewer.

3.1.2 SEWAGE PUMPING STATIONS

As noted above, the sanitary sewage system is divided into four separate sewage collection basins, namely West, Central North, and Fort Town each discharging to Pump Stations No. 3, 4, 5, and Fort Town respectively.

- SPS No. 3 services the western portion of the Town south of the CN Rail and conveys flows to the SPS No. 4 drainage area.
- SPS No. 4 services the central portion of the Town south of the CN Rail and conveys flows to the SPS No. 5 drainage area.
- SPS No. 5 services the eastern portion of the Town south of the CN Rail as well as the all areas north of the CN Rail and conveys flows to SPS No. 6 located at the WWTP.
- Fort Town Pumping Station services a small development on the north east end of Town.

Table 3-1 below provides a summary of the main features of Sewage Pump Stations 3 to 5. All four Sewage Pumping Stations are described in the Town's Consolidated Linear Infrastructure (CLI) Environmental Compliance Approval (ECA) for the Prescott Sewage Collection System.

TABLE 3-1: SEWAGE PUMPING STATIONS

Sewage Pumping Station	Last Upgraded	Wet Well Volume	Pump Capacity
SPS#3	2006	11 m^3	2 submersible pumps each rated at 87.7 L/s (1 Standby) for a total rated capacity of 87.7 L/s at 13m TDH.
SPS#4	2006	20 m^3	2 submersible pumps each rated at 109.8 L/s (1 Standby) for a total rated capacity of 109.8 L/s at 13.3m TDH
SPS#5	2006	31.6 m^3	3 dry well/ wet well submersible pumps each rated at 80.5 L/s (1 Standby) for a total rated capacity of 161 L/s at 22.5m TDH.
Fort Town SPS	2007	2 m^3	2 submersible pumps each rated at 9.3 L/s (1 Standby) for a total rated capacity of 9.3 L/s at 8.2m TDH.

3.1.3 PRESCOTT WASTEWATER TREATMENT PLANT

The Prescott Wastewater Treatment Plant (WWTP) is located on the north side of Highway 2 in the Township of Edwardsburg/Cardinal, east of the Town of Prescott. The plant, constructed in the 1970s, was upgraded in 2007 to a rated capacity of 4,728 m^3/d. The main process components of the facility are as follows:

- Raw Sewage Pumping Station, referred to as Sewage Pumping Station #6, consists of 3 dry well/wet well submersible pumps each rated at 100.3 L/s (1 Standby) at 19.6m TDH.
- Preliminary Treatment consisting of a mechanical grinder/screen (PFR of 16,000 m^3/d), with a secondary inlet channel equipped with one (1) 12mm manual bar screen) and two vortex grit separators (each with a PFR of 8,000 m^3/d), along with a screening conveyor, grit classifier and dewatering unit.
- Secondary Treatment is provided in three (3) 2306 m^3 sequencing batch reactors, which discharge into a 1059 m^3 effluent equalization tank, prior to disinfection.
- Effluent disinfection is provided by a UV disinfectant system.
- Final effluent is discharged to the St. Lawrence River via a 1,050 mm diameter gravity outfall sewer.
- Waste Activated Sludge is transferred to a two-stage aerobic digestion system.
- Digested Biosolids are stored within a 2,090 m^3 on-site storage tank. Should the storage tank fill prior to being able to spread the biosolids, liquid biosolids can be transferred to one of two biosolids drying beds (325 m^2), which provide additional storage.
- A 550 kW standby diesel generator set provides emergency backup power to the facility.

The Prescott WWTP has a rated capacity of 4,728 m^3/d and effluent criteria as follows:

TABLE 3-2: CURRENT PRESCOTT WWTP EFFLUENT OBJECTIVES AND LIMITS

Effluent Parameter	Effluent Objective	Effluent Limit
$cBOD_5$	15 mg/L	25
Total Suspended Solids	15 mg/L	25
Total Phosphorus	0.5 mg/L	1
Total Ammonia Nitrogen	2 mg/L (May 1 to Nov 30) 4 mg/L (Dec 1 to Apr 30)	4 mg/L (May 1 to Nov 30) 8 mg/L (Dec 1 to Apr 30)
E. coli	150 organisms/100 mL	200 organisms/100 mL
pH	maintained within the range of 6.0 - 9.5	

3.1.4 PRESCOTT WWTP – HISTORIC FLOW

The past five years of flow data is provided in the following table.

TABLE 3-3: HISTORIC PRESCOTT WWTP INFLUENT FLOWS

Year	Flows	
	ADF	MDF
	m^3/d	
2019	3,641	13,936
2020	3,049	12,220
2021	2,683	7,829
2022	3,579	13,045
2023	3542	13401
Criteria	4,728	16,000

3.1.5 PRESCOTT WWTP – RAW WATER QUALITY

The past five years of influent quality data is provided in the following table.

TABLE 3-4: HISTORIC INFLUENT QUALITY INFORMATION

Year	BOD	TSS	TP	TKN
	mg/L	mg/L	mg/L	mg/L
2019	105	317	3.91	27
2020	127	200	3.86	27
2021	161	376	4.97	31
2022	85	158	1.91	19
2023	78	114	2.34	21

3.1.6 PRESCOTT WWTP – TREATED WATER QUALITY

The past five years of effluent quality data is provided in the following table.

TABLE 3-5: HISTORIC EFFLUENT QUALITY INFORMATION

Year	cBOD	TSS	TP
	mg/L	mg/L	mg/L
2019	3.2	4.3	0.14
2020	3.6	3.8	0.16
2021	3	3.4	0.11
2022	3	5.2	0.1
2023	3.05	4.27	0.15
Criteria	30	30	1
WESR	25	25	NA

Text in RED represents exceedances of the rated capacity of the facility.

3.1.7 BIOSOLIDS HAULED

The following is a summary of the amount of biosolids removed from the Prescott WWTP on an annual basis.

TABLE 3-6: BIOSOLIDS REMOVED FROM PRESCOTT WWTP [M^3]

Year	Spring	Fall	Total
2019	1,194	1,840	3,034
2020	1,883	1,318	3,201
2021	2,440	2,280	4,720
2022	3,160	0	3,160
2023	2200	1080	3,280

3.2 REVIEW OF THE PROJECT'S ENVIRONMENTAL SETTING

Supplemental studies will be undertaken to help define the potential impacts on the natural and social environment including mitigation strategies to minimize impacts on the resources identified.

3.2.1 NATURAL/BUILT ENVIRONMENT

The Prescott WWTP is situated in the Johnston Industrial Park within the Township of Edwardsburg/Cardinal. The area is developed and consists of the Port of Johnston (along the water front to the south east), vacant forested lot to the east, Prysmian Group facility (to the north), and a mix of industrial and commercial buildings to the west.

The area is all zoned "Industrial Park Policy Area" within the Official Plan.

3.2.2 ECONOMIC ENVIRONMENT

The Town, working with the Township of Augusta, completed a Land Needs Assessment in 2022. The report identified areas within the Town of Prescott, and immediately to the west in the Township of Augusta that would become more attractive for growth with the provision of water and wastewater services. The Prescott Water Treatment Plant has sufficient capacity to support the additional growth area, however, the Prescott WWTP does not, hence the municipalities are moving forward with the preparation of an environmental assessment to identify the preferred solution to the expansion of the Prescott WWTP.

Refer to Section 3.3 for the results of the Land Needs Study.

3.2.3 CULTURAL ENVIRONMENT

The completion of the Checklist of Criteria for Evaluating Archaeological Potential has demonstrated that no further evaluation is required for heritage resources and cultural landscapes. A copy can be found in Appendix C.

The completion of the Checklist of Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes has demonstrated that no further evaluation is required for heritage resources and cultural landscapes. A copy can be found in Appendix C.

3.3 GROWTH POTENTIAL

During the preparation of the Land Needs Assessment, the following work was undertaken by the municipalities:

- The Town of Prescott reviewed the vacant lands within its borders and determined the number of residential lots that can be developed in areas zoned for residential development and determine the amount of vacant land required for industrial, commercial and institutional development.
- The Township of Augusta reviewed the vacant lands within its borders, south of Highway 401 to determine the possibility of encouraging both residential and ICI growth through the provision of municipal water and wastewater services from the Town of Prescott.

The results of the above exercise are summarized in the Table 3-7.

TABLE 3-7: WATER AND WASTEWATER DEMAND FOR EXPANDED SERVICE AREA

Development Area	Residential Lots	ICI Area	MDF Water Needs (m^3/d)	ADF Wastewater Needs (m^3/d)
Prescott Infill	300	30	1,221	1,067
Augusta Expansion	500	34	1,715	1,459
Total Growth Demand			2,936	2,526

This potential growth has the following impact on the Prescott WWTP.

TABLE 3-8: FUTURE WASTEWATER NEEDS

Demand Requirement	ADF (m^3/d)
5-Year Annual Daily Flow	3,238
Growth Demand for Sewage Treatment	2,526
Total Demand for Sewage Treatment	5,864
Rated Capacity of Prescott WWTP	4,728
Over Capacity	1,036

Therefore, the Prescott WWTP would be over capacity if the growth were to move ahead.

3.4 PROBLEM STATEMENT

The Town of Prescott and Township of Augusta have identified mutual benefit for the extension of services to a larger area to the west of Prescott. The Prescott Drinking Water System Plant has sufficient capacity to supply water to the expanded service area, however, the Prescott Wastewater Treatment Plant requires expansion. The municipalities are pursuing the identification of the preferred solution to meet the projected wastewater treatment needs.

3.4.1 DESIGN BASIS

The expansion of the Prescott WWTP will be designed for the following hydraulic loadings:

TABLE 3-9: DESIGN HYDRAULIC LOADINGS

Hydraulic Loadings	ADF (m^3/d)	MDF (m^3/d)	PIF
Design	6,304	21,333	24,000

The expansion of the Prescott WWTP will be designed for the following organic loadings:

TABLE 3-10: DESIGN ORGANIC LOADINGS

Parameter	Concentration (mg/L)	Loadings (kg/d)
Biological Oxygen Demand	15	94.6
Total Suspended Solids	15	94.6
Total Phosphorus	0.5	3.15
Total Ammonia Nitrogen	2 (May 1 – Nov 30) 4 (Dec 1 to Apr 30)	(May 1 – Nov 30) (Dec 1 – Apr 30)

The expansion of the Prescott WWTP will be designed to achieve the design objectives and effluent limits summarized in Table 3-11.

TABLE 3-11: DESIGN OBJECTIVES AND EFFLUENT LIMITS

Parameter	Design Objective (mg/L)	Effluent Limit (mg/L)
Biological Oxygen Demand	15	25
Total Suspended Solids	15	25
Total Phosphorus	0.5	1
Total Ammonia Nitrogen	2 (May 1 to Nov 30) 4 (Dec 1 to Apr 30)	4 (May 1 to Nov 30) 8 (Dec 1 to Apr 30)

In addition to the effluent objectives, there will be requirements for quarterly toxicity sampling to demonstrate compliance with ammonia concentrations.

4 PHASE 2: WASTEWATER CONVEYANCE SOLUTIONS

During the preparation of the 2021 Land Needs Study, a SWOT Analysis was completed and identified the need for municipal servicing of parts of the Township of Augusta to the west of the Town of Prescott to encourage development.

The analysis concluded:

– Lands to the west of Prescott are designated Settlement Area, whereas Focus Area is located within Rural Policy Area.

– Westward extension of services is likely to be a more cost-efficient option, with potential future developments being more affordable.

– Extension of several existing streets in Prescott would provide better, safer pedestrian and vehicle connectivity to existing services and amenities located within Prescott.

– It is recommended that lands in Augusta to the west of Prescott be considered the "preferred focus area" for the purposes of consideration of extending municipal services.

FIGURE 3 – TARGET PROPERTIES IN AUGUSTA

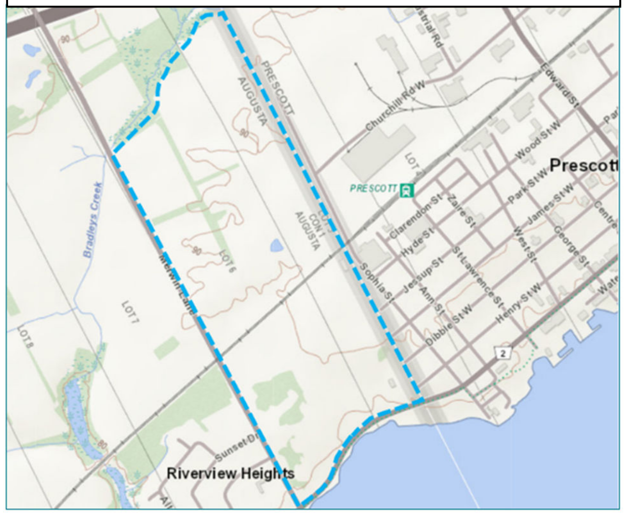


FIGURE 4 – INFRASTRUCTURE REQUIRED IN AUGUSTA

To help accelerate the housing growth in this area, the installation of trunk watermains and sewage pumping stations will make municipal services available to these properties.

A cursory review of the properties contained within the dashed blue line in the illustration (Figure 3), reveals that there is a natural break in topography that divides the area in half along the train tracks that cross the property from east to west. As illustrated in Figure 4.

To service this area, the following is required:

- Trunk watermain extensions from Churchill Road West (shown as blue lines on Figure 4)
- Trunk watermain extension from King Street West (shown as blue lines on Figure 4)
- Construction of two new sewage pumping stations (shown as red squats on Figure 4)
- Construction of two new forcemains:

- One forcemain will run from the northern of the two new sewage pumping stations to the sanitary sewer extension on Churchill Road West.
- The second forcemain can be run for discharge in one of two locations depending on the outcome of the sanitary model for the Prescott Wastewater Collection System:
  - The forcemain will run from the new southern sewage pumping station to the north and the discharge into the collection system for the new northern sewage pumping station. This is the preferred option as it avoids the requirement to upgrade SPS#3 and SPS#4.
  - The forcemain will run from the southern sewage pumping station to King Street West trunk sewer near Sophia. This will add the flows from the area to the hydraulic loading to both SPS#3 and SPS#4 which should be avoided if the sewers in the northern section of Prescott can handle all the flow for the proposed development in August.

An opinion of the value of construction to service this area is provided in the following table.

TABLE 4-1: ESTIMATED CONSTRUCTION COST FOR INFRASTRUCTURE IN AUGUSTA

ITEM #	DESCRIPTION	TOTAL AMOUNT
1	Sanitary Forcemain	$1,480,000
2	Sanitary Air Release Valves	$80,000
3	Gravity Sanitary Sewer c/w MHs at 120m spacing	$1,482,000
4	Sanitary Pumping Station and By-Pass Metering Chamber	$2,600,000
5	Watermain 300 mm diameter (including trenching and restoration)	$2,475,000
6	Water Valves (300mm)	$75,000
7	Fire Hydrants	$180,000
8	Water Metering Chamber	$150,000
9	Rock Excavation Allowance	$200,000
	SUBTOTAL OF CONSTRUCTION COSTS	**$8,722,000**
10	Contingency (25%)	$2,180,500
	TOTAL CONSTRUCTION COST	**$10,902,500**

5 PHASE 2: WASTEWATER TREATMENT ALTERNATIVE SOLUTIONS

The MEA 2023 EA document defines "alternative solutions" as:

> *"Means feasible alternative ways of solving an identified problem (deficiency…"*

A long list of alternative solutions which are to be screened for further evaluation as part of this EA are listed below and described in the following sections:

Alternative A	Do Nothing
Alternative B	Optimization of the Existing WWTP
Alternative C	Expansion of the Existing WWTP
Alternative D	Construction of a new WWTP

5.1 ALTERNATIVE A: DO NOTHING

The "Do Nothing" scenario means that the Prescott WWTP will be unable to service the full extent of the projected growth area. This solution does not provide a comprehensive solution to the problem identified and it is not recommended as a long-term solution.

However, should it be determined by the municipalities that they do not have the financial ability to implement a comprehensive solution to the problem identified, this alternative may become an interim solution until the financial position presents itself for implementation.

5.2 ALTERANTIVE B: OPTIMIZATION OF THE EXISTING WWTP

The following table presents a comparison of the existing components to the hydraulic design basis for various plant components from the Ministry of the Environment, Conservation, and Parks' (MECP's) Design Guidelines for Sewage Works.

TABLE 5-1: COMPARISON OF HYDRAULIC DESIGN BASIS

Component	Comment
Screens	Design Peak Instantaneous Flow
	Current PIF (16,000 m^3/d) is less than Design PIF (23,465 m^3/d) expansion of screening system will be required.
Grit Removal	Design Peak Instantaneous Flow
	Current PIF (16,000 m^3/d) is less than Design PIF (23,465 m^3/d) expansion of grit system will be required.
Disinfection	Design Peak Hourly Flow
	Current PIF (16,000 m^3/d) is less than Design PIF (23,465 m^3/d) expansion of UV disinfection system will be required.
Outfall Sewer	Design Peak Instantaneous Flow
	New PIF results in velocity of 0.3 m/s in outfall. Hydraulic Gradeline will require confirmation that the flow can occur by gravity.
Sludge Treatment	Maximum Monthly Mass Loadings and Flow Rates
	Will be assessed as part of the secondary treatment evaluation

The following table presents a comparison of the existing operation to the MECP's Design Guidelines for Sewage Works.

Table 5-2: Comparison of Current Operation to Design Guidelines

Component	Existing Infrastructure	MECP Design Guidelines
Sequencing Batch Reactors	• Three tank design • 600 mm freeboard • HRT of 15 hours • Maximum water level 5m • TSS limit of 25 mg/L, scum is removed in SBR	• Three tank design • Freeboard >= 600 mm • HRT of 4 hours with one reactor off-line at design peak flow • Minimum water level 3.7m • Maximum OLR 0.24 kg BOD/(m^3d) • F/M 0.05 to 0.1 d^{-1} • Treated effluent has no scum and a TSS of < 30 mg/L • Maximum water level provides 2.0 mg/L DO during aeration
Disinfection	• Equalization of SBR decant flow • One Channel • Two Banks	• Redundancy Requirements • Dosage: > 30 mW·s/cm^2
Aerobic Digesters	• Two stage digesters • 4.5 m depth	• Two stage digestion • Loading 1.6 kg/(m^3d) • Depth 3.6-4.6 m • SRT of 45 days • DO between 1-2 mg/L • Air supply of 1.5 L/(m^3s) • Min bottom velocity of 0.25 m/s while aerating
Biosolids Storage	• 2,090 m^3 on-site storage tank • Two biosolids drying beds	• 240 days of storage when biosolids are field applied.

Based on the inability of many of the unit processes to handle higher flows, the opportunity to gain 1/3 capacity through the optimization process is very limited. We do not recommend exploring this option further.

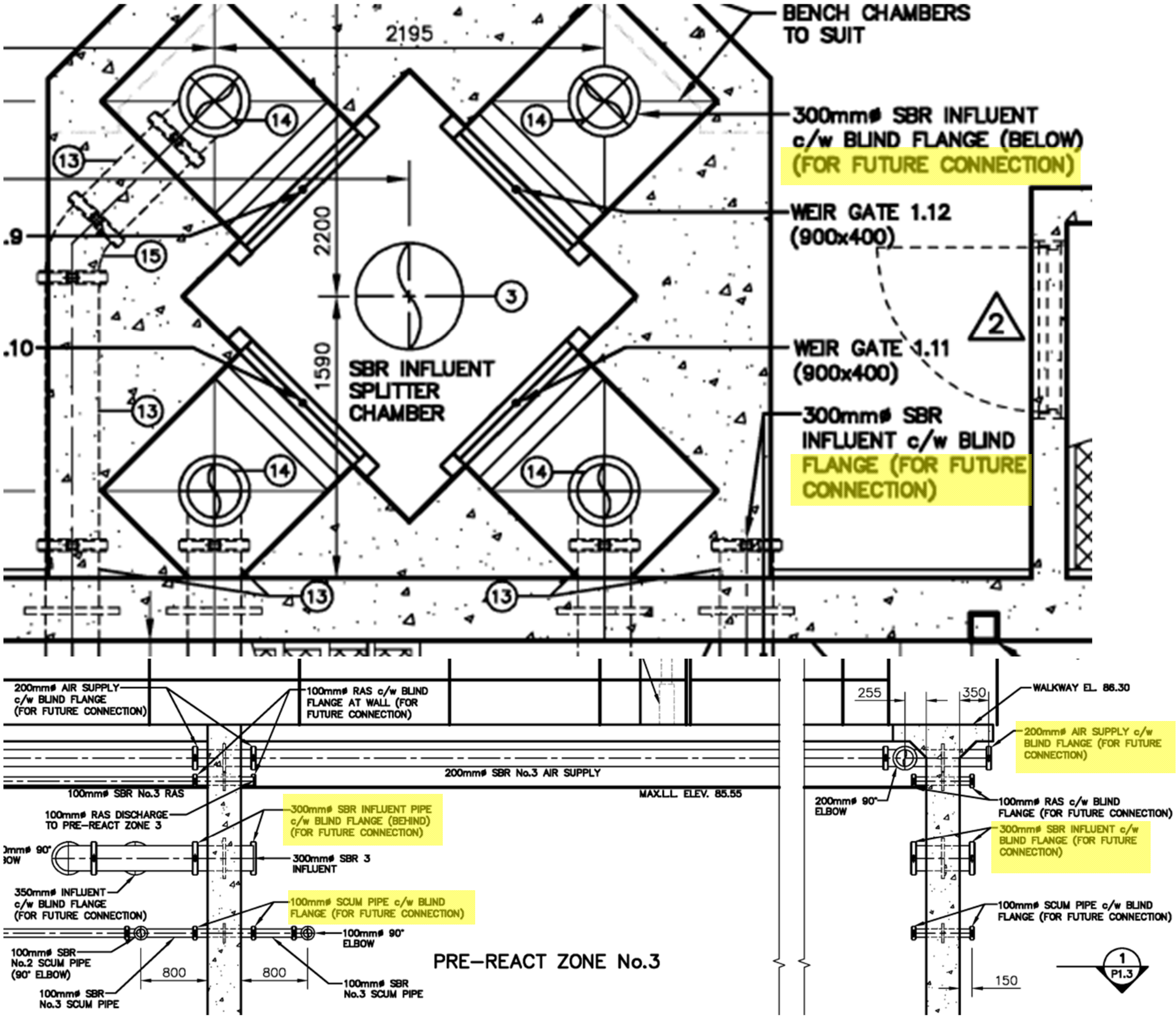
5.3 ALTERNATIVE C: EXPANSION OF THE EXISTING WWTP

A review of the as-built drawings for the Prescott WWTP provides the measures incorporated into the existing plant for the addition of a fourth sequencing batch reactor (refer to Figure 4-1, following page), which can accommodate the projected increase of wastewater.

As the remainder of the plant is in relatively good condition, it is recommended to further explore this option.

A review of the hydraulic gradeline for the existing outfall demonstrates that there is sufficient capacity for the proposed upgrade.

FIGURE 5-1: MEASURES FOR FUTURE PLANT EXPANSION



Component	Existing Infrastructure	Proposed Infrastructure
Screens	• Current PIF (16,000 m³/d)	• Design PIF (21333 m³/d) expansion of screening system will be required. • 2 x Claro 1900-65-3 mm fine step screen
Grit Removal	• Current PIF (16,000 m³/d)	• Design PIF (21333 m³/d) expansion of grit system will be required. • 3"x3" or 4"x4" Gorman-Rupp grit pumps with CL-250 wide-body classifier units without hydrocyclone, control panel with VFDs for grit

		pumps • 270 deg or 360 deg Vortex
Disinfection	• Current PIF (16,000 m^3/d)	• Current PIF (16,000 m^3/d) is less than Design PIF (21333 m^3/d) expansion of UV disinfection system will be required.
Sequencing Batch Reactors	• Three tank design, each with a submersible mixer • 3 variable speed effluent decanters • 3 variable speed air blowers • 600 mm freeboard	• Four tank design (1 additional: tank with mixer and bubble aeration system, speed effluent decanter)
Biosolids Storage	• 2,090 m^3 on-site storage tank • Two biosolids drying beds	• Third drying bed
SBR Influent Pipe	• 3 pipes (one per reactor)	• Additional 300 mm pipe
Scum Pipe	• 3 pipes (one per reactor)	• Additional 100 mm pipe
Air supply c/w blind flange	• 3 air supplies (one per reactor)	• Additional 150 mm pipe
SBR Influent c/w blind flange	• 3 SBR influents (one per reactor)	• Additional 300 mm pipe
SBR Blowers	• 3 SBR blowers (one per reactor)	• Additional SBR blower

Given there is space in the WWTP for an additional batch reactor, this option is recommended to continue to Phase 3 of planning as it is believed to be the most time- and cost-effective solution. This is based on the judgement that the rest of the plant is in relatively good condition.

5.4 ALTERNATIVE D: CONSTRUCTION OF A NEW WWTP

The construction of a new WWTP would be considered if alternatives B and C were deemed unachievable given existing barriers, as this option is likely to be the costliest and would likely require the longest amount of time to implement.

However, should the municipalities decide they require a drastic change in the size of the WWTP, or wish to introduce a new treatment mechanism, this option is recommended to be explored further.

6 PREFERRED DESIGN

6.1 COMPONENTS OF PREFERRED DESIGN

It is recommended that the additional capacity requirements be achieved through the expansion of the existing plant on the existing site. The following sections review each component of the treatment train and make recommendations on how to accommodate the additional capacity.

6.1.1 SEWAGE PUMPING STATION NO. 5

Sewage Pumping Station #5 pumps all of the raw sewage from the Prescott Wastewater Collection System from the east boundary of the Town to Raw Sewage Pumping Station #6. SPS#5 contains three dry-pit pumps (2 duty, 1 standby), each with a rated capacity of 80 L/s. The sewage is currently conveyed through a 400mm forcemain to RSPS#6.

It is anticipated that all of the wastewater generated by the new growth will also flow through SPS#5. As such the pump capacity will need to be increased to approximately 126 L/s (ea), to be confirmed during detailed design. At this flow rate the velocity will be approximately 2.01 m/s in the 400 mm diameter forcemain. Evaluation of the need for a new forcemain or twinning of the forcemain should be undertaken in the detailed design phase

6.1.2 RAW SEWAGE PUMPING STATION NO. 6

Raw Sewage Pumping Station #6 (RSPS #6) transfers all wastewater from the collection system into the WWTP. There are currently three (2 duty and 1 standby) 100.3 L/s dry pit pumps that accomplish the station’s purpose. These pumps will need to be upgraded to 278 L/s pumps in order to achieve the new peak flow requirements.

The pumps convey the flow through a 350mm diameter forcemain to the inlet works. The new peak flow conditions will increase the velocity of the sewage in the forcemain to 2.89 m/s which is approaching the maximum velocity described in the MECP Design Guidelines for Sewage Works.

Additionally, the standby power system will need to take into consideration the additional load requirements for the upgraded pumps.

6.1.3 INLET WORKS

The existing inlet works consist of

- A primary inlet channel equipped with one (1) mechanical grinder/screen with a Peak Flow Rate of 16,000 m^3/d and a secondary inlet channel equipped with one (1) 12mm spacing manual bar screen.
- An emergency plant overflow weir, discharging to the plant outfall
- Two (2) vortex grit separators, each with a peak flow rate of 8,000 m^3/d.
- Screening conveyors, grit classifier and dewatering units.

The minimum requirements are to have one mechanical screen (Q = 24,000 m^3/d) and one manual screen plus two vortex grit removal systems, each sized for 12,000 m^3/d.

The existing screening channels have a cross-section of 0.8m wide and 1.4m deep. There are step screens available on the mark with a 3mm aperture that can be mounted into each of these channels providing a peak flow capacity of 24,000 m3/d in each channel and eliminating the maintenance related to a manual bar screen. An option for cost savings is to replace the existing 16,000 m^3/d mechanical screen with a 24,000 m^3/d and maintain the existing bar screen as backup.

The upgrades to the vortex grit units will be more challenging as they are installed on elevated legs and consideration for other structures need to be given to ensure the system will fit. We were not able to source full redundancy to fit the existing building, however, we were able to source two 12,000 m^3/d vortex grit units that would provide the same redundancy as the existing system.

The Sequencing Batch Reactor splitter box at the end of the screening channel was designed to accommodate flow to a fourth SBR reactor.

6.1.4 SEQUENCING BATCH REACTORS

Currently, there are three (3) 36.9m x 12.5m x 5.0m SWD sequencing batch reactors. The original design had taken into account the future addition of a fourth reactor and has incorporated tie-in points for scum, sludge, etc.

The manufacturer (Xylem Sanitaire) of the SBR system still produces the equipment for the ICEAS SBR system. The representative of the supplier provided a quotation for the necessary equipment including fine bubble aeration grids, decanter, and control package.

To minimize the size of the ultraviolet disinfection system, an equalization tank was constructed as part of the original construction. An evaluation of extending this equalization tank to minimize the UV disinfection system capacity compared to increasing the capacity to the peak decant rate should be undertaken to ensure that the most cost-effective solution is incorporated during detailed design.

In discussions with the operations group, algae formation in the equalization tank has been as issue. It is proposed to install a UV blanket cover on the equalization tank to minimize the formation of algae within this tank.

6.1.5 DISINFECTION

The existing UV channel is 300mm wide, 8900mm long and 1760mm deep. In order to accommodate 2 duty and 1 standby lamp system at a peak design of 24,000 m^3/d and a UVT of 55%, a channel measuring 600mm wide, 11,100mm long and 1570mm deep is required.

6.1.6 AEROBIC DIGESTERS

The existing facility utilizes aerobic digestion to process waste sludges. It is a two-stage process consisting of 1,404 m^3 of storage including 936 m^3 in stage 1 and 468 m^3 in stage 2.

Assuming a sludge production rate of 120 g/m^3 of wastewater treated and a solids retention time of 20 days in the sequencing batch reactor, the existing aerobic digesters will provide the following treatment

TABLE 6-1: SLUDGE STABILIZATION

Stage	Volume	TS% at end of Stage	SRT
1	936 m^3	1%[1]	12.7 days
2	468 m^3	2%[1]	12.7 days

1 Decanting of the liquid phase from the digesters during a settle stage allows for minor thickening of the sludge as it is digested.

A total of 45.4 to 54.3 days of solids retention time is provided between the SBRs (20 to 28.9 days, depending on the season) and the aerobic digesters (25.4 days).

6.1.7 BIOSOLIDS MANAGEMENT

Digested Biosolids are stored in the liquid phase at the existing facilitate. A biosolids storage tank providing 2,090 m^3 of storage is part of the sludge management complex. A biosolids drying bed has been constructed (2 beds x 32.5m x 10m) and are used when the biosolids storage tank is full.

To meet current standards for biosolids application on approved agricultural land, a total of 240 days of on-site storage is required. Therefore, approximately 8,850 m^3 of liquid storage would be required to meet the regulations.

It is proposed to construct a building on the sludge drying beds for the installation of a biosolids dewatering system with the storage of dewatered biosolids within a butler-like building. The dewatered biosolids facility will house approximately 600 m^3 of biosolids @ 24% dry weight.

6.1.8 OTHER SYSTEMS

The Town had acquired a dewatering bin to be used for discharges from vac trucks that were used to clean the scum and floatables out of the Town's sewage pumping stations. The intention is to construct an elevated drive that can discharge into the bin by gravity, with the liquid phase draining to the on-site gravity collection system that drains to SPS#6. The Town has completed a design for this installation and it should be amalgamated into the detailed design of the overall plant.

6.2 EVALUATION OF RECOMMENDED SOLUTION

6.2.1 NATURAL AND SOCIAL ENVIRONMENTS

Section 6 of the ESR reviewed the natural and social environmental impacts of the expansion of the Ingleside WWTP on the existing site. Table 6.2 provides mitigative measures to reduce or eliminate any potential impacts to the natural and social environments.

TABLE 6-2: SUMMARY OF ENVIRONMENTAL AND SOCIAL IMPACTS

ENVIRONMENTAL / SOCIAL CRITERIA	EXPANSION OF PLANT
Impact of Construction Through Environmentally Sensitive Areas	Not Applicable
Impact on Groundwater	No anticipated impact
Impact on Aquatic, Fish Habitat	No anticipated impact

ENVIRONMENTAL / SOCIAL CRITERIA	EXPANSION OF PLANT
Health	Potential for further improvement of effluent quality. Increased biosolids storage capacity
Cultural/Heritage Resources	Not Applicable
Aesthetics	The processes will not change much compared to the existing operation and noise levels should not increase. Plant is located in the middle of an industrial plant intended for this land use.
Land Uses	Land uses match the intended use.
Impact of Construction	Construction will be confined to the current site with minimal off-site impacts.
Growth and Development	Project will be able to support all infill with the Town of Prescott and the project area within the Township of Augusta

The following table lists environmental considerations and mitigative measures to be implemented during the following stage of the project.

TABLE 6-3: POTENTIAL EFFECTS CAUSED BY PROPOSED WORKS AND MITIGATIVE MEASURES

Potential Effect	Not Likely	Likely	Net Effect	Mitigative Measures	Net Effect
Impacts to Environment	X		+		Effluent quality will be equal or better. Entire facility will comply will MECP Design Guidelines
Effects of temporary disruption during construction (i.e. dust, noise, vibration)		X	-	Dust control measures to be implemented during construction project.	Minimized and mitigated to acceptable levels
Effects on Agricultural Properties	X				
Effects on terrestrial Vegetation and Wildlife	X				Land to be constructed upon has already been cleared for this intended use.
Possible effects on roadway and vegetation		X	-	Erosion and sediment control measures to be implemented	Minimized and mitigated to acceptable levels

				during construction stage	
Impacts on Aquatic Environment	X			No in-water work to be conducted	
Change in taxes and/or sewer rates		X	-	Sewer rate changes should be negligible. Capital cost recovery from new development will fund capital outlay. If growth does not happen, capital may need to be paid by existing users	Potential increased cost to users of the system
Effects of change in noise levels		X	-		All equipment to be enclosed within building limiting noise emissions from the site.

6.2.2 ECONOMIC ENVIRONMENT

The implementation of the preferred solution will have a large financial impact on the users of the system. The Town/Township will be seeking funding opportunities from higher levels of government to help minimize the economic impact on the users of the system.

The work at the Prescott WWTP is summarized in the following table.

TABLE 6-4: PRESCOTT WWTP EXPANSION COST (CONSTRUCTION)

ITEM #	DESCRIPTION	TOTAL AMOUNT
	PRESCOTT SPS UPGRADES	
1	SPS 3 Upgrades (Pumps, Generator, Controls)	$850,000
2	SPS 4 Upgrades (Pumps, Generator, Controls)	$850,000
3	SPS 5 Upgrades (Pumps, Generator, Controls)	$877,500
4	SPS 5 Forcemain (600mm Forcemain from SPS 5 to MH 51)	$1,680,000
5	SPS 6 Upgrades	$877,500
	WWTP UPGRADES	
6	Headworks Upgrades - Screens	$1,053,000
7	Headworks Upgrades - Grit Removal	$1,053,000
8	New Blower	$70,200
9	RAS/WAS Pumps Upgrades	$87,750
10	Fourth SBR Reactor	$2,340,000
11	Equalization Tank Upgrades	$409,500
12	UV Disinfection Systems Upgrades	$526,500
13	Centrifuge Dewatering System	$1,700,000
14	Misc. Concrete Repairs to Existing Infrastructure	$1,500,000
15	Coverall Building for Sludge Storage	$2,200,000
16	New Generator at WTP	$750,000
	CONSTRUCTION SUCTOTAL	**$16,074,950**
17	Contingency (25%)	$3,782,000
	TOTAL CONSTRUCTION COST	**$18,906,950**

7 TOTAL PROJECT DESCRIPTION

In order for the Town of Prescott to service the western portion of the Township of Augusta with wastewater treatment services, the following works are required:

- Extension of the Sanitary System into the areas identified in Augusta:
    - This will include the need for a minimum of two new sewage pumping stations, one located north of the rail tracks and one located south of the tracks and forcemains to transfer sewage from the pumping stations to the existing Prescott Wastewater Collection System;
    - Wastewater Collection Systems will be required in the development areas and can be approved through the Plan of Subdivision process.
    - Upgrades to the capacities of Sewage Pumping Station #3 and Sewage Pumping Station #4 may be required if all of the sewage from the development area cannot be addressed through a connection on Churchill Road West.
- Upgrades to Sewage Pumping Station No. 5 including the need to increase its capacity to match the new design capacity for the system as well as a new forcemain to covey sewage from SPS#5 to SPS#6.
- Upgrades to Sewage Pumping Station No. 6 to increase the capacity of the raw sewage pumping station.
- Upgrades to the Prescott Wastewater Treatment Plant:
    - Expanded headworks (screening and grit removal)
    - Fourth Sequencing Batch Reactor and an additional blower to support the aeration system
    - Extension of the post-SBR Equalization tank
    - Expansion of the UV disinfection system to match the new rated capacity.
    - Conversion of the sludge drying beds to a cover-all type building with dewatering equipment and dewatered biosolids storage.
    - Replacement of the standby generator if the new electrical loads exceed the capacity of the existing generator.

APPENDIX A

Public Notice Information