Class Environmental Assessment - Environmental Study Report

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City of Clarence-Rockland
2024-045

Expansion of the Rockland Water Treatment Plant and Upgrade of the Caron Booster Pumping Station
June 4, 2026

Class Environmental Assessment - Environmental Study Report

Client Name:	City of Clarence-Rockland		
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Executive Summary

The following subsections outline the executive summary for this ESR.

Introduction

The City of Clarence-Rockland (City) has undertaken a Schedule C Class Environmental Assessment (EA) to evaluate and identify alternative solutions for the Rockland Water Treatment Plant (WTP) and Caron Booster Station (BPS). The following section introduces the project background and the EA process.

Background

The Rockland WTP is a conventional filtration treatment plant in Rockland, Ontario, and services the City including five hamlets (Clarence Creek, St. Pascal, Hammond, Bourget, and Cheney). It treats water from the Ottawa River and is rated for a capacity of 13.5 ML/d.

The Caron Booster Pumping Station (BPS) has a design capacity of 4.0 ML/d. The Caron BPS in the distribution system provides pressure to a regional feeder main servicing the five hamlets.

The City and The Nation Municipality (Limoges) have a Joint Water Use Agreement to supply Limoges with water from the Clarence-Rockland Water System. The Joint Water Use Agreement includes the commitment to supply no less than 350 m^3 of water per day to Limoges through the Joint Water System. The water supplied to Limoges must also meet the minimum requirements for pressure and quality specified in the agreement. This includes minimum and maximum water pressures of 385 kPa and 620 kPa, respectively, maintaining a minimum of 1.0 mg/L of combined chlorine residual, and meet or exceed the Ontario Drinking Water Quality Standards at the Joint Metering Station at all times.

As the City and Limoges are rapidly growing, both the Rockland WTP and Caron BPS are required to meet the increase in water demand and conveyance associated with projected growth. In response, the City of Clarence-Rockland has undertaken this Schedule C EA to identify and re-evaluate alternatives for the Rockland WTP and Caron BPS. In accordance with the 2024 Municipal Engineers Association (MEA) Municipal Class Environmental Assessment (MCEA) Process, a Schedule C MCEA is required to identify and evaluate potential alternative solutions and design concepts to recommend the preferred long-term solutions to upgrade and expand the Clarence-Rockland Water Supply System to reliably meet current water quality regulations and system safeguards and projected future needs.

Environmental Assessment Process

The following two subsections describe the EA process at the provincial and municipal level.

Ontario's Environmental Assessment Process

The objective of the Ontario *Environmental Assessment Act* R.S.O. 1990, c. E 18 is to consider the possible effects of projects early in the planning process, when concerns may be most easily resolved and to select a preferred alternative with the fewest identified impacts as well as identify mitigation measures.

The *Environmental Assessment Act* requires the Study, documentation, and examination of the environmental effects that could result in projects or activities.

The *Environmental Assessment Act* defines "environment" very broadly as follows:

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

In applying the requirements of the Environmental Assessment Act to projects, two types of EA planning and approval processes are identified:

1. Individual EAs: Projects have terms of reference and individual EAs, which are carried out and submitted to the Ministry of Environment, Conservation and Parks (MECP) for review and approval.
2. Class EAs: Projects are approved subject to compliance with an approved Class EA process; provided that the appropriate Class EA approval process is followed, a proponent will comply with the requirements of the *Environmental Assessment Act*.

Municipal Class Environmental Assessment Process

The Municipal Class EA (MCEA) process is a decision-making framework that effectively meets the requirements of the Environmental Assessment Act and consists of the following five phases.

1. Identify the problem or opportunity.
2. Identify alternative solutions and establish a preferred solution.
3. Examine alternative methods of implementing the preferred solution that will minimize negative effects and maximize positive effects.
4. Prepare an Environmental Study Report (ESR).
5. Implement the preferred solution.

This Study was completed as a Schedule C Class EA, including Phase 1 through 4 of the Municipal Engineer Association Class EA process (MEA 2024) as follows:

- Phase 1
  - Identify the problem or opportunity, Notice of Commencement
- Phase 2
  - Identify and assess alternative solutions
  - Consult with public agencies, First Nations and other stakeholders
  - Select a preferred solution based on evaluation criteria and identify proposed timing for implementation

- Phase 3
  - Examine alternative methods of implementing the preferred solution
  - Identify impact of alternative design concepts and select a preferred design
  - Consult with public agencies, First Nations, and other stakeholders
- Phase 4
  - Prepare ESR documenting Phases 1 to 3 for public review
  - Notice of completion
- Phase 5
  - Implement the preferred solution

A Section 16 Order is the legal mechanism through which the status of an undertaking can be elevated (that is, elevated to be completed as an individual EA or have further conditions imposed) before the project can progress to Phase 5. The MECP has the authority and discretion to make an Order under the following two circumstances:

- There is outstanding concern that a project going through the Class EA process may have potential adverse effect on constitutionally protected Aboriginal treaty rights
- There is an assertion that an Order may prevent, mitigate, or remedy this impact

The MECP will not accept a Section 16 Order in an attempt to delay or stop the planning and implementation of a project proceeding through a Class EA process.

Existing Conditions

This section describes the existing conditions of the Rockland WTP and Caron BPS.

Rockland Water Treatment Plant

The Rockland WTP currently supplies water to two pressure zones (PZs). Pressure Zone 1 (PZ-1) services Rockland with the Rockland elevated tower (ET) for storage and the Caron BPS supplies water to Pressure Zone 2 (PZ-2) which services the surrounding Hamlets and Villages with the Bouvier and Cheney ET for storage. Limoges draws from PZ-2 but is considered its own PZ. Table ES-1 outlines the existing water demands at the Rockland WTP including the average daily demand (ADD), maximum daily demand (MDD) and peak hour demand (PHD) for PZ-1, PZ-2 and Limoges PZ.

Table ES-1. Rockland WTP Existing Water Demands (Jacobs 2023)

Pressure Zone	ADD	MDD	PHD
Clarence-Rockland PZ-1	4,544	5,555	8,382
Clarence-Rockland PZ-2	1,785	3,099	3,562
Limoges	346	346	346

The Rockland WTP has sufficient capacity to meet the current water demands. Capacity constraints to service existing demands are identified at the Caron BPS. These constraints are presented in greater detail in Section 5.2.1.2.

The total water demand at the WTP outlined in the Clarence-Rockland Water Master Plan (WMP) (Jacobs 2023) includes the following:

- ADD: 6,675 m^3/d
- MDD: 9,000 m^3/d
- PHD: 12,290 m^3/d

A number of condition-based needs are required at the WTP. Jacobs performed a state of assets on the existing Rockland WTP and low lift pumping station (LLPS) as part of the Clarence-Rockland WMP (Jacobs 2023). A site visit was also conducted in April 2025 to further determine the state of assets. These findings are in Section 5.1.1.4.

Caron Booster Pumping Station

The Caron BPS supplies water to PZ-2 which services the surrounding Hamlets and Villages with the Bouvier and Cheney ETs for storage. Limoges draws from PZ-2 but is considered its own PZ. Table ES-2 outlines the existing water demands serviced by the Caron BPS including the ADD, MDD and PHD for PZ-1, PZ-2 and Limoges PZ.

Table ES-2. Caron BPS Existing Water Demands (Jacobs 2023)

Pressure Zone	ADD	MDD	PHD
Clarence-Rockland PZ-2	1,785	3,099	3,562
Limoges	346	346	346

The pumping capacity of the Caron BPS has been determined to be sufficient to meet the current demands of the facility. Based on the current condition of the pumps at the BPS, the capacity is constrained under the existing conditions as it is unable to pump up to its rated capacity. Upgrades are currently underway to restore the facility to its rated capacity.

The total water demand at the BPS outlined in the Clarence-Rockland WMP (Jacobs 2023) includes the following:

- ADD: 2,131 m^3/d
- MDD: 3,445 m^3/d
- PHD: 3,908 m^3/d

A number of condition-based needs are required at the BPS. Jacobs performed a state of assets on the existing Rockland BPS as part of the Clarence-Rockland WMP (Jacobs 2023). A site visit was also conducted in April 2025 to further determine the state of assets. These findings are in Section 5.2.1.4.

Future Water Demands

The Clarence-Rockland WMP (Jacobs 2023) recommended phased infrastructure upgrades for the WTP expansion. When not considering other neighbouring communities, this includes meeting the 2046 maximum day demand with an additional 13.5 ML/d capacity expansion in Phase 1 and meeting the ultimate maximum day demand with an additional 20.0 ML/d capacity expansion in Phase 2. When considering neighbouring communities, this includes an additional 20.5 ML/d capacity expansion in Phase 1 and 20.0 ML/d capacity expansion in Phase 2. Infrastructure upgrades are likely required for the intake at the Rockland WTP for both WTP expansion alternatives as they will significantly increase the raw water flow through the intake.

The Caron BPS was also recommended to be expanded to achieve a capacity of 11.0 ML/d during Phase 1 and 18.0 ML/d during Phase 2 to meet the future demand for water conveyance when not considering neighbouring communities. When considering neighbouring communities, it was recommended to expand the BPS to achieve a capacity of 17.0 ML/d during Phase 1 and 25.0 ML/d during Phase 2.

The future water demands summarized in Table 6-1 define the additional treatment capacity required to meet the needs of the growing community. To meet future needs over the planning horizon to 2046 and beyond, the following process upgrades to the Rockland WTP are necessary:

- **Disinfection:** The UV disinfection system is used as a redundant disinfection system for when the chlorine contact tank (CCT) is offline for maintenance or repairs and the City is to evaluate the continuous use of UV for primary disinfection during low temperatures where there may not be adequate chlorine contact.
- **Filtration:** Perform a more detailed analysis of filter run times to fully characterize the filter performance and determine opportunities for process optimization such as backwash time, flowrate, and media depths.
- **ActiFlo and Media Filters:** Performance capacity during extended periods of high flows can be optimized through field testing.

Development and Evaluation of Water Supply Alternatives

A long list of alternative solutions was developed and screened as part of the 2021 WMP (Jacobs 2021). This eliminated alternatives that were not feasible for the Rockland WTP and Caron BPS from consideration.

To identify a comprehensive solution to address the project Problem and Opportunity Statement in Section 7 the alternatives will be identified for both the Rockland WTP and Caron BPS as follows:

- **Rockland WTP:** relating to the expansion of the treatment process as presented in the water demand projections in Section ES-3
- **Caron BPS:** relating to the expansion of the BPS water conveyance capacity presented in the water demand projections in Section ES-3

Three water treatment and conveyance alternatives were identified for the Rockland WTP and Caron BPS. Table ES-3 outlines the alternatives identified.

Table ES-3. List of Alternatives for the Rockland WTP and Caron BPS

Alternative	Rockland WTP	Caron BPS
Alternative 1	**Do Nothing:** Continue maintaining and rehabilitating the existing WTP using existing intake.	**Do Nothing:** Continue maintaining and rehabilitating the existing BPS.
Alternative 2	**High-Rate Conventional Filtration:** Expand the facility using the same process flow and trains of similar size.	**Single-Zone:** Expand the facility using one set of pumps and pressure reducing valves to supply Pressure Zone 2 and 3, respectively.
Alternative 3	**Membrane Filtration:** Expand the facility using coagulation, flocculation, and membrane filtration.	**Dual-Zone:** Expand the facility using two sets of pumps with one set supplying each pressure zone.

A multi-objective decision-making framework was developed to identify the preferred alternative for the Rockland WTP and Caron BPS. This methodology is consistent with Phase 2 of the MEA process for MCEAs (MEA 2024).

This methodology allows for a comparative assessment of each set of alternative solutions. A unique set of evaluation criteria reflecting four overarching categories of environment will be established for evaluating alternatives identified for the Rockland WTP and Caron BPS.

The following subsections summarize the preferred alternatives for the Rockland WTP and Caron BPS.

Rockland Water Treatment Plant Preferred Alternative

The preferred alternative for the Rockland WTP is Alternative 2: High-rate conventional filtration. It was the highest scoring alternative for the evaluation (including all four sensitivity analyses) and has a lower cost than Alternative 3. The advantages of the alternative include the following:

- The expanded Rockland WTP will serve the current servicing area of Clarence-Rockland and Limoges and provides the opportunity to service other neighbouring communities.
- The alternative involves expanding the facility using the same process flow and trains of similar size, therefore simplifying the integration into the existing treatment process (for example, same backwash pumps and blowers can be used).
- This alternative can be implemented in phases and includes provisions for future expansions.
- Operation and maintenance of the expanded facility will be relatively simple as the operations staff at the facility are familiar with the equipment.

Caron Booster Pumping Station Preferred Alternative

The preferred alternative for the Caron BPS is Alternative 3: Dual-Zone. It was the highest scoring alternative for the evaluation including all four sensitivity analyses. The advantages of the alternative include the following:

- This alternative increases the rated capacity of the Caron BPS to service the existing customers and provides additional capacity to service growth in Limoges
- Dual-zones will provide greater redundancy as there will be two transmission mains available for distribution
- Provides greater energy efficiency as there is less energy lost within the distribution system (as pressure reducing valves are not required)

Servicing Strategy

The preferred alternatives presented in Section ES-4 identify expanding the Rockland WTP and Caron BPS to provide capacity for growth as the preliminary preferred solution. This preferred alternative allows the City to consider the opportunity of servicing new neighbouring communities requiring water to meet future growth needs. This section identifies and evaluates servicing strategy alternatives to determine the City's preferred approach.

Servicing Strategy alternatives were developed considering the preferred solution for water treatment and conveyance system. Servicing Strategies include:

- **Servicing Strategy 1:** Continuing to service the existing committed service area, Clarence-Rockland and Limoges. This includes increasing the Rockland WTP capacity from 13.5 MLD to 27 MLD and the Caron BPS from 4 MLD to 11 MLD.
- **Servicing Strategy 2:** Expanding the service area to provide water to new customers of neighbouring communities. This includes increasing the Rockland WTP capacity from 13.5 MLD to 34 MLD and the Caron BPS from 4 MLD to 17 MLD.

Both Servicing Strategy 1 and 2 require upgrading the capacity and conveyance of the Rockland WTP and Caron BPS, respectively, using the preferred alternatives outlined in Section ES-4. Therefore, the primary difference between alternatives regarding design is the expanded capacity.

Economically, Servicing Strategy 2 is advantageous for Clarence-Rockland as there would be a lower cost per cubic metre of water demand associated with the expansion due to the contribution of the surrounding communities. Servicing Strategy 2 could potentially provide environmental benefits including a consolidated Permits to Take Water (PTTW) from Clarence-Rockland and the surrounding communities, potentially reduce the volume of water allocated to be taken from the Ottawa River and surrounding tributaries.

Neighbouring communities would also receive the opportunity to receive more water with Servicing Strategy 2. This would be a reliable source of high-quality raw water of sufficient quantity to meet their requirements. Additionally, the neighbouring communities no longer need to operate their own facility.

If neighbouring communities would like to purchase water from the Rockland WTP, Servicing Strategy 2 is the preferred Servicing Strategy for the City. It is recommended that the City consult with neighbouring communities to determine their level of interest in purchasing water from the City. It is expected that the City will need to provide information to neighbouring communities regarding the cost-sharing expected under Servicing Strategy 2. This effort is ongoing separately outside of this Schedule C Class EA. As neighbouring communities are not yet committed to purchasing water from the City, Phase 3 of the Class EA process (as detailed in Section ES-6) will outline the preferred alternatives for both Servicing Strategy 1 and 2.

Alternative Design Concept Development Methodology

Phase 3 of the Class EA process is to develop alternative design concepts for the preferred solutions identified in Phase 2 of this Class EA, as summarized in Section ES-4. As discussed in Section ES-5, as neighbouring communities are not yet committed to purchasing water from the City, Phase 3 of the Class EA process will develop alternative design concepts for the preferred solutions outlined in Section ES-4 for both Servicing Strategy 1 and 2.

Alternative design concepts were developed for the following categories:

- **Rockland WTP intake:** Development and technology review of alternative design concepts focusing on alternative raw water intake technologies that could be implemented.
- **Rockland WTP:** Development and evaluation of alternative design concepts focusing on alternative technologies that could be implemented in the Rockland WTP expansion.
- **Caron BPS:** Development and evaluation of alternative design concepts focusing on the configuration of the new BPS.

Three design alternatives were identified for the intake, Rockland WTP and Caron BPS. Table ES-4 outlines the alternatives identified.

Table ES-4. List of Alternatives for the Intake, Rockland WTP, and Caron BPS

Alternative	Intake	Rockland WTP	Caron BPS
Alternative 1	**Do Nothing:** Continue maintaining the existing intake with no modifications.	**Do Nothing:** Continue maintaining and rehabilitating the existing WTP.	**Do Nothing:** Continue maintaining and rehabilitating the existing BPS.
Alternative 2	**Bell Mouth:** Replace existing intake structure with a bell mouth structure.	**High-Rate Conventional Filtration:** Expand the facility using the same process flow and trains of similar size.	**Single-Zone:** Expand the facility using one set of pumps and pressure reducing valves to supply Pressure Zone 2 and 3, respectively.
Alternative 3	**Tee Screen:** Replace existing intake structure with a submerged tee screen.	**Membrane Filtration:** Expand the facility using coagulation, flocculation, and membrane filtration.	**Dual-Zone:** Expand the facility using two sets of pumps with one set supplying each pressure zone.

An evaluation methodology was developed to allow for a comparative assessment of each set of design concepts and identify the preferred design concepts, aligned with the Class EA evaluation framework. Whereas the Phase 2 alternative solution evaluation focused on natural, sociocultural, technical, and economic criteria, the alternative design concept evaluation methodology in Phase 3 focuses on the technical and economic criteria in light of the technology-driven nature of the design concepts.

The following subsections summarize the preferred solutions for the intake, Rockland WTP, and Caron BPS.

Intake

The preliminary preferred alternative for both Servicing Strategies for the intake design is Alternative 2: Bell Mouth Intake due to the ease of implementation and construction and lack of maintenance. The advantages of the alternative include the following:

- The intake will have the capability of servicing the current servicing area of Clarence-Rockland and Limoges.
- The bell mouth allows for the entrance velocity in the intake to be less than the lowest escape velocity outlined by the Natural Heritage Technical Memorandum (Jacobs 2025c).
- The alternative involves adding to the existing intake, therefore simplifying the construction and minimizing impacts to plant operations.
- Avoiding the use of a screen minimizes the risk of blockages due to debris or ice that would restrict the flow of water to the WTP as well as significantly reduces the operations and maintenance (O&M) requirements (for example, cleaning the screen and maintaining the air burst equipment).

Rockland Water Treatment Plant

The preliminary preferred alternative for the Rockland WTP is Alternative 2: Ballasted Flocculation and High-Rate Sedimentation. It is the highest scoring alternative for the evaluation (including three of four sensitivity analyses) and has a lower cost than Alternative 3.

The advantages of the alternative include the following:

- The expanded Rockland WTP will serve the current servicing area of Clarence-Rockland and Limoges and provides the opportunity to service other neighbouring communities.
- The alternative involves expanding the facility using the same process flow and trains of similar size, therefore simplifying the integration into the existing treatment process (for example, same backwash pumps and blowers can be used).
- This alternative can be implemented in phases and includes provisions for future expansions.
- Operation and maintenance of the expanded facility will be relatively simple as the operations staff at the facility are familiar with the equipment.

Caron Booster Pumping Station

The preliminary preferred alternative for the Caron BPS is Alternative Design Concept 2: Build New BPS. It was the highest scoring alternative for the evaluation (including all four sensitivity analyses) and has a similar cost to Alternative 3. This alternative is illustrated in Figure 16-2.

The advantages of the alternative include the following:

- Allows for the existing BPS to maintain operations while the new BPS is constructed.
- Increases the rated capacity of the Caron BPS to service the existing customers and provides additional capacity to service Limoges.

Summary of Preferred Solution and Design Concepts

The following outlines the summary of preferred solutions and design concepts for the intake, Rockland WTP, and Caron BPS.

Intake Design

If field investigations determine that the existing intake can provide 34 MLD while maintaining the required lowest escape velocity for the fish expected to be in the vicinity of the intake, then the recommended solution is to Do Nothing and proceed with expanding the Rockland WTP and Caron BPS with no changes to the intake structure. However, in the case that the existing intake is not able to meet this requirement, a new intake structure or upgrades to the existing structure will be required.

The preliminary preferred alternative is the same for both Servicing Strategy 1 and 2, with Alternative 2: Bell Mouth Intake as the preferred solution. Information on the existing intake is limited and investigations to confirm the existing intake condition, type, and dimensions are required to confirm future needs. At this time, it is assumed that a new intake structure will be required to expand the treatment capacity of the Rockland WTP.

It is expected that the City will need to expand to the ultimate treatment capacity of 54 ML/d to service future population within the typical useful life of the intake structure. Due to the anticipated useful life of

the intake structure, it is recommended that consideration be given to designing the new intake structure to achieve flows of 54 ML/d to service the projected ultimate future capacity needs identified in TM-2 Future Growth Assumptions and Water Use Estimates (Jacobs 2025b) as part of the WMP Update. This minimizes environmental impacts related to in-water work required to replace the intake in the future. As such, it is recommended that consideration be given in the design of the new structure to accommodate a second raw water pipe connection, as the existing raw water pipe to the LLPS is not sufficiently sized to accommodate flows of 54 ML/d. This will be further assessed once the findings from the studies on the existing intake are available and the upgrade requirements can be confirmed. If the entire intake needs to be replaced to accommodate the 27 ML/d capacity increase, it would likely be replaced with an intake with sufficient capacity for the ultimate water demands. At this stage, the EA is intended to cover the range of possible outcomes and upgrade requirements. The costs, impacts to the river, impacts to plant operations during construction, and impacts to fish are all similar between the various options.

Rockland Water Treatment Plant Design

The preliminary preferred alternative solution is Alternative 2: Ballasted Flocculation and High-Rate Sedimentation for both Servicing Strategy 1 (27 ML/d) and 2 (34 ML/d).

The need to expand to 34 ML/d is anticipated to service future population growth in the Clarence-Rockland WMP (Jacobs 2021). However, the timing of this expansion may change if neighbouring communities confirm interest in purchasing water from the City in the near-term. Therefore, it is recommended that the expansion to 27 ML/d account for this opportunity by designing and constructing the building and other structural elements with the flexibility to simplify future expansion to 34 ML/d (for example, build the tankage for the third train of ballasted flocculation/high-rate sedimentation/ filtration but initially leave them empty). This allows the City the flexibility to expand to 34 ML/d with less capital cost in the event that neighbouring communities decide to purchase water from the City in the near-term. If neighbouring communities do not purchase water from the City, this approach decreases future capital costs when the second phase of expansion is required.

Caron Booster Pumping Station Design

The preliminary preferred alternative solution is Alternative 2: Build New BPS under both Servicing Strategy 1 (11 ML/d) and 2 (17 ML/d). The need to expand to 17 ML/d is anticipated to service future population growth in the Clarence-Rockland WMP (Jacobs 2021). However, the timing of this expansion may change if neighbouring communities confirm interest in purchasing water from the City in the near-term. Therefore, it is recommended that the expansion of the Caron BPS account for this opportunity by designing and constructing the building and other structural elements with the flexibility to simplify future expansion. It is recommended to design and construct the pumping station building envelope and other structural assets with the flexibility to simplify future expansion. With this approach, the equipment required to produce the flows required for Servicing Strategy 1 would be installed, with the space and piping connections necessary for a future expansion. This allows the City the flexibility to easily expand to 17 ML/d without building modification if neighbouring communities decide to purchase water from the City in the near-term. If neighbouring communities do not purchase water from the City, this approach decreases future capital costs when the second phase of expansion is required.

Implementation Plan

The preferred solutions identified in this report will be implemented as the first of two phases of infrastructure upgrades and expansion required to meet the 2046 maximum day demand as identified in Section 6. The second phase of expansion will meet the ultimate maximum day demand and the timing

will be determined by future WMPs which may be triggered earlier should neighbouring communities decide to proceed with purchasing water from the City.

The recommended preferred solution for the expansion of the Rockland WTP and Caron BPS is to account for the anticipated future expansion to 34 ML/d in the design and construction of the first phase of expansion to 27 ML/d. It is important to incorporate the flexibility to expand in the future in this expansion to reduce future capital costs and allow the City the flexibility to adjust the timeline for the second phase expansion neighbouring communities commit to purchase water from the City trigger the need to expand earlier. It is recommended that the design of the first phase of expansion includes the following to provide the flexibility to expand to 34 ML/d when required:

- The Rockland WTP intake should be sized for future expansion to at least 34 ML/d (depending on the findings of the intake investigations and discussions with regulatory agencies)
- Designing the Rockland WTP for a capacity of 27 ML/d with provisions to expand to 34 ML/d in the future such that expanding the building footprint is not required

The timeline for implementing the Rockland WTP and Caron BPS includes the following assumptions:

- ESR completion in spring 2026
- 6 months for Design of the Caron BPS expansion and 12 months for the Design of the Rockland WTP expansion
- 3-month Tendering Period for each construction contract
- 18 months for Construction for the Caron BPS expansion and 24 months for Construction for the Rockland WTP expansion

The implementation timeline for the preferred solution is summarized in Table ES-5.

Table ES-5. Implementation Timeline

Capacity Required By	Identified Solution	Triggers
<5 years	Expansion of Caron BPS to 11 ML/d	Additional capacity is required to service the existing serviced area.
2032	Expansion of Rockland WTP to 27 ML/d	Additional capacity is required to service the existing serviced area.
2046	Expansion of Caron BPS to 21 ML/d	Growth is realized more quickly than anticipated. Neighbouring communities commit to purchasing water from the City.
2046	Expansion of Rockland WTP to 54 ML/d to meet Maximum Day Demand	Growth is realized more quickly than anticipated. Neighbouring communities commit to purchasing water from the City.

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Acronyms and Abbreviations

Acronym	Description
ADD	Average Day Demand
ANSI	Areas of Natural and Scientific Interest
BPS	Booster Pumping Station
CCT	Chlorine Contact Tank
CF	Community Facilities
CT	Contact Time
DAF	Dissolved Air Flotation
DFO	Department of Fisheries and Oceans
DWWP	Drinking Water Works Permit
EA	Environmental Assessment
ECA	Environmental Compliance Approval
EPA	Environmental Protection Act
ESA	Electrical Safety Authority
ESAs	Environmentally Significant Areas
EST	Elevated Storage Tank
Ha	Hectare
HIA	Heritage Impact Assessment
HVAC	Heating Ventilation and Air Conditioning
IPZ	Intake Protection Zone
kW	Kilowatt
LLPS	Low Lift Pumping Station
L	Litre

Acronym	Description
LIO	Land Information Ontario
L/s	Litres Per Second
M	Metre
m2	Metres Squared
MCC	Motor Control Centre
MCEA	Municipal Class Environmental Assessment
MDD	Maximum Day Demand
MEA	Municipal Engineers Association
MECP	Ministry of Environment, Conservation, and Parks
ML/d	Megaliters Per Day
Mm	Millimetre
MNR	Ontario Ministry of Natural Resources
m/s	Metres Per Second
NTU	Nephelometric Turbidity Unit
OCWA	Ontario Clean Water Agency
OWRA	Ontario Water Resources Act
O&M	Operation and Maintenance
PHD	Peak Hour Demand
PIF	Project Information File
PLC	Programmable Logic Controller
PSWs	Provincially Significant Wetlands
PTTW	Permit to Take Water
PWQO	Provincial Water Quality Objectives
PZ	Pressure Zone

Acronym	Description
RPD	Replica Parametric Design
SARA	Species at Risk Act
SCADA	Supervisory Control and Data Acquisition
SNC	South Nation Conservation
SNCA	South Nation Conservation Authority
SWH	Significant Wildlife Habitat
TM	Technical Memorandum
TSSA	Technical Standards and Safety Authority
UFRV	Unit Filter Run Volume
UV	Ultraviolet
WMP	Water Master Plan
WTP	Water Treatment Plant

1. Introduction

The City of Clarence-Rockland (City) has undertaken a Schedule C Environmental Assessment (EA) to evaluate and identify alternative solutions for the capacity expansion of the Rockland Water Treatment Plant (WTP) and Caron Booster Station (BPS). The following section introduces the project background, study purpose and approach, report structure, and project contacts.

1.1 Background

The Rockland WTP is a conventional filtration treatment plant in Rockland, Ontario, and services the City including five hamlets (Clarence Creek, St. Pascal, Hammond, Bourget, and Cheney). It treats water from the Ottawa River and is rated for a capacity of 13.5 ML/d.

The Caron Booster Pumping Station (BPS) has a design capacity of 4.0 ML/d. The Caron BPS in the distribution system provides pressure to a regional feeder main servicing the five hamlets.

The City and The Nation Municipality (Limoges) have a Joint Water Use Agreement to supply Limoges with water from the Clarence-Rockland Water System. The Joint Water Use Agreement includes the commitment to supply no less than 350 m^3 of water per day to Limoges through the Joint Water System. The water supplied to Limoges must also meet the minimum requirements for pressure and quality specified in the agreement. This includes minimum and maximum water pressures of 385 kPa and 620 kPa, respectively, maintaining a minimum of 1.0 mg/L of combined chlorine residual, and meet or exceed the Ontario Drinking Water Quality Standards at the Joint Metering Station at all times.

As the City and Limoges are rapidly growing, both the Rockland WTP and Caron BPS are required to meet the increase in water demand and conveyance associated with projected growth. In response, the City of Clarence-Rockland has undertaken this Schedule C EA to identify and re-evaluate alternatives for the Rockland WTP and Caron Booster Pumping Station. In accordance with the 2024 Municipal Engineers Association (MEA) Municipal Class Environmental Assessment (MCEA) Process, a Schedule C MCEA is required to identify and evaluate potential alternative solutions and design concepts to recommend the preferred long-term solutions to upgrade and expand the Clarence-Rockland Water Supply System to reliably meet current water quality regulations and system safeguards and projected future needs.

1.2 Study Purpose and Approach

This MCEA was initiated by the City to develop preferred alternatives to expand the Rockland WTP and Caron BPS to meet the 2046 maximum day demand based on the future water demand estimates (presented in Section 6). This Study is being conducted in accordance with the planning and design process for municipal projects outlined in the MEA's MCEA process for Schedule C municipal infrastructure projects (MEA 2024). The Study will complete Phases 1 through 4 of the MCEA process as outlined in Section 2.

1.3 Report Structure

This Environmental Study Report (ESR) is structured as follows:

- **Section 1: Introduction** provides an overview of the project background and approach.
- **Section 2: Ontario Environmental Assessment Process** describes how the EA process has informed the development of this MCEA Study.

- **Section 3: Project Context** reviews the Study Area and presents the regulations and policies that inform and shape this MCEA Study.
- **Section 4: Methods and Approach** presents the approach to public engagement and the decision-making process.
- **Section 5: Inventory of Existing Conditions** outlines the existing conditions in terms of Natural Heritage Features, Cultural Heritage Resources, and establishing a foundation for understanding the existing and future needs at the Rockland WTP and Caron BPS.
- **Section 6: Future Water Demands** presents the anticipated future requirements and capacity needs within the planning horizon, forming the basis for the Study Problem and Opportunity Statement.
- **Section 7: Problem and Opportunity Statement** defines the problems and opportunities identified through the documentation of the existing conditions and future needs in accordance with the MCEA process.
- **Section 8: Alternatives Development and Evaluation Methodology** outlines the methodology used for the alternatives identification and detailed evaluation of alternatives as part of Phase 2 of this Class EA.
- **Section 9: Development and Evaluation of Rockland Water Treatment Plant Alternatives** outlines the alternatives identified for the Rockland WTP as part of Phase 2 of this Class EA.
- **Section 10: Development and Evaluation of Caron Booster Pumping Station Alternatives** outlines the alternatives identified for the Caron BPS as part of Phase 2 of this Class EA.
- **Section 11: Servicing Strategy** identifies and evaluates servicing strategy alternatives to determine the City's preferred approach.
- **Section 12: Summary of Preferred Solutions** states the preliminary preferred solutions for the Rockland WTP and Caron BPS as part of Phase 2 of this Class EA.
- **Section 13: Alternative Design Concept Methodology** outlines the alternative design concepts that will be evaluated as part of Phase 3 of this Class EA and the rationale for the evaluation methodology.
- **Section 14: Intake Alternatives Identification and Evaluation** outlines and evaluates the alternative design concepts identified for the Rockland WTP intake as part of Phase 3 of this Class EA.
- **Section 15: Rockland Water Treatment Plant Alternatives Identification and Evaluation** outlines and evaluates the alternative design concepts identified for the Rockland WTP intake as part of Phase 3 of this Class EA.
- **Section 16: Caron Booster Pumping Station Alternatives Identification and Evaluation** outlines and evaluates the alternative design concepts identified for the Caron BPS intake as part of Phase 3 of this Class EA.
- **Section 17: Summary of Preferred Design Concepts and Solutions** states the preferred solutions for the intake, Rockland WTP, and Caron BPS as part of Phase 3 of this Class EA.
- **Section 18: Public, Agency, and Indigenous Communities Consultation and Engagement** details the engagement activities conducted throughout the Study and how the feedback received through engagement activities informed the MCEA.
- **Section 19: Implementation Plan and Mitigation Measures** propose the anticipated implementation timing and triggers that could result in changes in the implementation timeline, permits and approval requirements, and the potential impacts and mitigation measures for the preliminary preferred solution and design concepts identified in this Class EA.

1.4 Project Contact

Primary contacts for the project are as follows:

The City of Clarence-Rockland
Charles Bonneau
Project Coordinator
T: 613-446-6022 x2425
EEMPG_MCEA@clarence-rockland.com

Jacobs Engineering Group
André Bourque, P.Eng.
Project Manager
T: 613-762-9723
CR.WaterSupply@jacobs.com

You may provide written comments to our Project Team by July 13, 2026. All comments and concerns should be sent directly to Charles Bonneau at EEMPG_MCEA@clarence-rockland.com.

The City will work with the public, Indigenous communities and government agencies to determine the preferred means of addressing a problem or opportunity. Project consultation is intended to address all comments received during the consultation period and resolve any outstanding concerns with the Project Team. In the event there are outstanding concerns that relate to the potential adverse impacts to constitutionally protected Indigenous and treaty rights, a Section 16 request on those matters (only), should be addressed in writing to:

Ministry of Environment, Conservation and Parks
777 Bay Street, Fifth Floor
Toronto, ON M7A 2J3
minister.mecp@ontario.ca

Director, Environmental Assessment Branch
Ministry of Environment, Conservation and Parks
135 St. Clair Avenue, First Floor
Toronto, ON M4V 1P5
EABDirector@ontario.ca

Requests should specify what conditions, if any, the requestor is seeking or that a comprehensive EA is being sought, how the requested Order may prevent, mitigate or remedy potential adverse impacts on Aboriginal and treaty rights, and any other information in support of the request.

All personal information included in your request – such as name, address, telephone number and property location – is collected, under the authority of section 30 of the Environmental Assessment Act and maintained for the purpose of creating a record that is available to the general public. As this information is collected for the purpose of a public record, the protection of personal information provided in the Freedom of Information and Protection of Privacy Act does not apply (s.37). Personal information you submit will become part of a public record that is available to the general public unless you request that your personal information remain confidential.

2. Environmental Assessment Process

The following two subsections describe the EA process at the provincial and municipal level.

2.1 Ontario's Environmental Assessment Process

The objective of the Ontario *Environmental Assessment Act* R.S.O. 1990, c. E 18 is to consider the possible effects of projects early in the planning process, when concerns may be most easily resolved and to select a preferred alternative with the fewest identified impacts.

The *Environmental Assessment Act* requires the Study, documentation, and examination of the environmental effects that could result in projects or activities.

The *Environmental Assessment Act* defines "environment" very broadly as follows:

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

In applying the requirements of the Environmental Assessment Act to projects, two types of EA planning and approval processes are identified:

1. Individual EAs: Projects have terms of reference and individual EAs, which are carried out and submitted to the Ministry of Environment, Conservation and Parks (MECP) for review and approval.
2. Class EAs: Projects are approved subject to compliance with an approved Class EA process; provided that the appropriate Class EA approval process is followed, a proponent will comply with the requirements of the *Environmental Assessment Act*.

2.2 Municipal Class Environmental Assessment

The Municipal Class EA (MCEA) process is a decision-making framework that effectively meets the requirements of the Environmental Assessment Act and consists of the following five phases.

1. Identify the problem or opportunity.
2. Identify alternative solutions and establish a preferred solution.
3. Examine alternative methods of implementing the preferred solution that will minimize negative effects and maximize positive effects.
4. Prepare an ESR.
5. Implement the preferred solution.

This Study was completed as a Schedule C Class EA, including Phase 1 through 4 of the Municipal Engineer Association Class EA process (MEA 2024) as follows:

- Phase 1
  - Identify the problem or opportunity, Notice of Commencement
- Phase 2
  - Identify and assess alternative solutions
  - Consult with public agencies, First Nations and other stakeholders
  - Select a preferred solution based on evaluation criteria and identify proposed timing for implementation
- Phase 3
  - Examine alternative methods of implementing the preferred solution
  - Identify impact of alternative design concepts and select a preferred design
  - Consult with public agencies, First Nations, and other stakeholders
- Phase 4
  - Prepare ESR documenting Phases 1 to 3 for public review
  - Notice of completion
- Phase 5
  - Implement the preferred solution

A Section 16 Order is the legal mechanism through which the status of an undertaking can be elevated (that is, elevated to be completed as an individual EA or have further conditions imposed) before the project can progress to Phase 5. The MECP has the authority and discretion to make an Order under the following two circumstances:

- There is outstanding concern that a project going through the Class EA process may have potential adverse effect on constitutionally protected Aboriginal treaty rights
- There is an assertion that an Order may prevent, mitigate, or remedy this impact

The MECP will not accept a Section 16 Order in an attempt to delay or stop the planning and implementation of a project proceeding through a Class EA process.

3. Project Context

This section presents an overview of the Study Area for the Rockland WTP and Caron BPS, the relevant legislative framework, and related documents that informed the Study.

3.1 Study Area

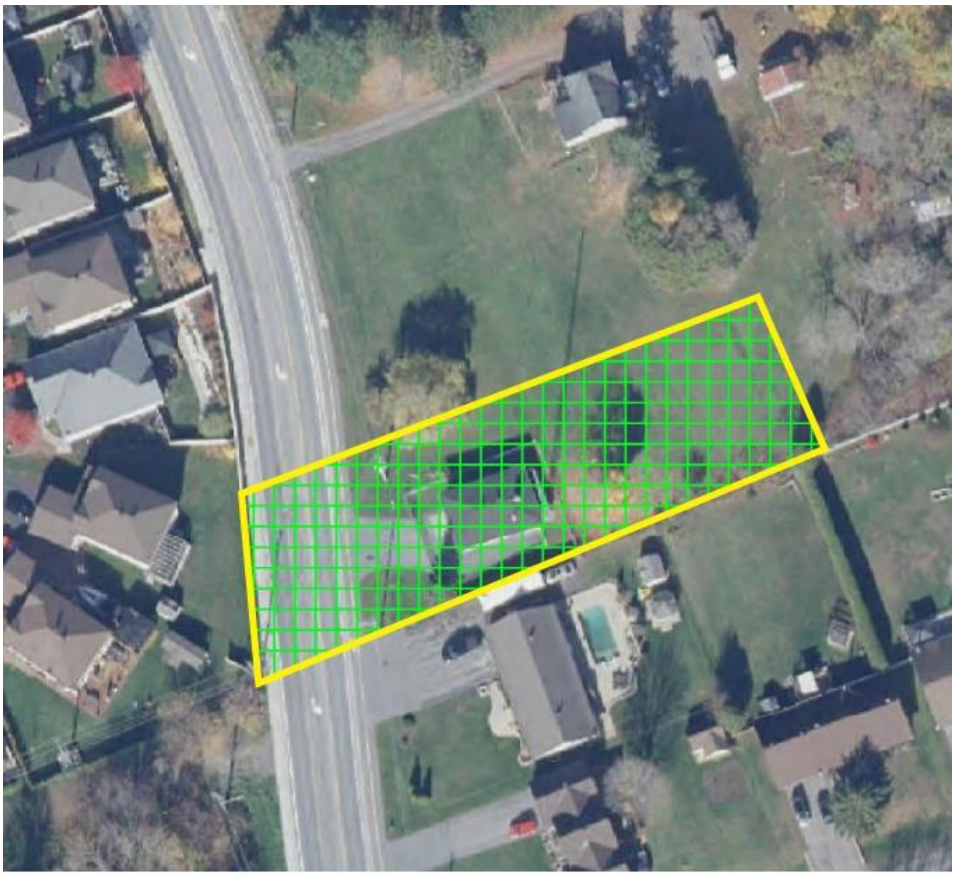
The Study Area is the area within the spatial boundaries defined for the Class EA. These boundaries vary based on the distribution, movement patterns, or potential zones of interaction between the proposed activities and the natural or social environment. The Study Area for the Rockland WTP and Caron BPS upgrades are in Figure 3-1 and Figure 3-2, respectively.

Figure 3-1 and Figure 3-2 illustrate the area that may be directly disturbed by implementing the project recommendations. Section 5 of this report describes existing conditions within the Study Areas.

Figure 3-1. Rockland WTP Study Area

Map generated by UCPR A la Carte web mapping application. The United Counties of Prescott and Russell disclaims all responsibility for errors, omissions or inaccuracies in this publication. Do not rely on it as being a precise indicator of routes or location of features.Produced by UCPR under Licence with the OMNRF. © King's Printer for Ontario, 2024. © 2024 United Counties of Prescott and Russell, All rights reserved.

Figure 3-2. Caron BPS Study Area



Map generated by UCPR A la Carte web mapping application. The United Counties of Prescott and Russell disclaims all responsibility for errors, omissions or inaccuracies in this publication. Do not rely on it as being a precise indicator of routes or location of features.Produced by UCPR under Licence with the OMNRF. © King's Printer for Ontario, 2024. © 2024 United Counties of Prescott and Russell, All rights reserved.

3.2 Legislative Framework

This section provides an overview of the relevant federal, provincial, and local legislation that were considered for this Study.

3.2.1 Planning Act

The Planning Act, 1990, (Ontario, Planning Act, 1990) is a provincial law that regulates how land is used and developed in Ontario. It sets out the framework, principles, policies and procedures for planning decisions and appeals. The Act aims to integrate community input, environmental health, and economic growth in the planning process, and describes how land uses may be controlled, and who may control them. The purpose of the Act is to:

- Provide for planning processes that are fair by making them open, accessible, timely and efficient
- Promote sustainable economic development in a healthy natural environment within a provincial policy framework
- Provide for a land use planning system led by provincial policy

- Integrate matters of provincial interest into provincial and municipal planning decisions by requiring that all decisions be consistent with the Provincial Policy Statement and conform/not conflict with provincial plans
- Encourage co-operation and coordination among various interests
- Recognize the decision-making authority and accountability of municipal councils in planning
- The roles and responsibilities of the Province include:
- Issuing provincial policy statements under the Planning Act
- Promoting provincial interests, such as: protecting farmland, natural resources and the environment; and, promoting development that is designed to be sustainable, supportive of public transit and designed for the needs of pedestrians
- Preparing provincial plans (for example, A Place to Grow: Growth Plan for the Greater Golden Horseshoe)
- Providing advice to municipalities and the public on land use planning issues
- Administering local planning controls and giving approval where required
- The roles and responsibilities of municipalities include:
- Making local planning decisions that will determine the future of communities
- Preparing planning documents, such as official plans, which set out the municipality's general planning goals and policies that will guide future land use, and zoning bylaws, which set the rules and regulations that control development as it occurs
- Ensuring planning decisions and planning documents are consistent with the Provincial Policy Statement and conform or do not conflict with provincial plans

3.2.1.1 Bill 23 – More Homes Built Faster Act (2022)

On November 28, 2022, the Government of Ontario passed the More Homes Built Faster Act, 2022 (Bill 23) (Ontario, Bill 23, More Homes Built Faster Act, 2022), a bill that significantly amends and creates new legislation affecting planning and land development across the province of Ontario. Bill 23 supports long-term strategies to increase housing supply, with a goal of building 1.5 million homes in 10 years.

Bill 23 introduced changes to the *Planning Act* and *Development Charges Act* to create expanded "as of right" development rights for small scale residential development, regulate the use of inclusionary zoning, require municipalities to be more flexible with parkland dedications, limit the application of site plan control, and change how planning authority is exercised in upper-tier and lower-tier municipalities, giving communities more influence over decisions that impact them directly. Changes to the Planning Act also require municipalities to adopt zoning by-law amendments that ensure that development meets minimum density targets near major transit station areas within one year of identifying such major transit station areas in an Official Plan (OP). Amendments to the Development Charges Act include several new discounts and exemptions to the rates that municipalities can charge for new development, including affordable and inclusionary zoning units, select attainable housing units, non-profit housing developments, as well as rental construction and development.

Schedule 9 of the Act makes various amendments to the *Planning Act, 1990*, including changes to the third-party appeal process of OPs and amendments, zoning bylaws and amendments, consents, and minor variances. *The Act* now requires that only persons from a specified person list be allowed to appeal a

decision. Appeal rights are maintained for key participants, except where appeals have been restricted elsewhere (such as a minister's decision on a new OP).

Amendments to the *Conservation Authorities Act* have the potential to permit development in areas that were previously prohibited through regulation, freeze certain fees payable to the conservation authority and impose new limits on a conservation authority's programs or services, if related to reviewing development applications. Further, conservation authority appeals under the *Planning Act* will be limited to matters that affect land owned by them, or where the conservation authority is the applicant. In the future, a conservation authority may only act as a public body in specific appeals, to be listed in the revised statute, where the appeal is made under a provision relating to natural hazard policies in the Provincial Planning Statement (2024).

3.2.1.2 Bill 185 – Cutting Red Tape to Build More Homes Act (2024)

The Cutting Red Tape to Build More Homes Act, 2024 (Bill 185), (Ontario, Bill 185, Cutting Red Tape to Build More Homes Act, 2024) received royal assent from the Government of Ontario on June 6, 2024, and aims to accelerate the development of new housing by removing perceived barriers.

3.2.2 Provincial Planning Statement, 2024

The Provincial Planning Statement, 2024 (PPS) (Ontario 2024) is a key document that provides direction on matters of provincial interest related to land use planning and development and sets the foundation for policies regarding the regulation of development and use of land. The PPS came into effect in October 2024 and replaces both the Provincial Policy Statement 2020 and a Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019, while building upon housing-supportive policies from both documents.

The PPS 2024 provides municipalities with the tools and flexibility they need to build more homes. It enables municipalities to:

- Plan for and support development and increase the housing supply across the province.
- Align development with infrastructure to build a strong and competitive economy that is investment-ready.
- Foster the long-term viability of rural areas.
- Protect agricultural lands, the environment, public health and safety.

Municipal OPs, such as the Official Plan of the Urban Area of the City of Clarence-Rockland (2021) are considered the most important "vehicle" for implementation of the PPS.

Policies that may be applicable to the Study are listed as follows:

- **Policy 2.9.1:** Planning authorities shall plan to reduce greenhouse gas emissions and prepare for the impacts of a changing climate through approaches that incorporate climate change considerations in planning for the development of infrastructure, including stormwater management systems, and public service facilities; support energy conservation and efficiency; and take into consideration any additional approaches that help reduce greenhouse gas emissions and build community resilience to the impacts of a changing climate
- **Policy 3.6.1:** Planning for sewage and water services shall: accommodate forecasted growth in a manner that promotes the efficient use and optimization of existing municipal sewage services; ensure that these systems can be sustained by water resources, is feasible and financially viable over their life

cycle, protects human health and safety, and the natural environment, including the quality and quantity of water, promote water conservation and water use efficiency and considers opportunities to allocate, and re-allocate if necessary, the unused system capacity of municipal water services and municipal sewage services to support efficient use of these services to meet current and projected needs for increased housing supply.

- **Policy 3.6.8:** Planning for stormwater management shall: be integrated with planning for sewage and water services and ensure that systems are optimized, retrofitted as appropriate, feasible and financially viable over their full life cycle; minimize or prevent or reduce increases in stormwater volumes and contaminant loads; minimize erosion or changes in water balance including through the use of green infrastructure; mitigate risks to human health, safety, property and the environment; maximize the extent and function of vegetative and pervious surfaces; and promote best practices, including stormwater attenuation and reuse, water conservation and efficiency, and low impact development.
- **Policy 4.1.1:** Natural features and areas shall be protected for the long term.
- **Policy 4.1.2:** The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.
- **Policy 4.1.3:** Natural heritage systems shall be identified in Ecoregions 6E and 7E, recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas, and prime agricultural areas.
- **Policy 4.1.5:** Development and site alteration shall not be permitted in significant woodlands in Ecoregions 6E and 7E, significant wildlife habitat, and significant areas of natural and scientific interest (ANSI) unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.
- **Policy 4.1.7:** Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.
- **Policy 4.6.2:** Planning authorities shall not permit development and site alteration on lands containing archaeological resources or areas of archaeological potential unless the significant archaeological resources have been conserved.
- **Policy 4.6.3:** Planning authorities shall not permit development and site alteration on adjacent lands to protected heritage property unless the heritage attributes of the protected heritage property will be conserved.
- **Policy 4.6.5:** Planning authorities shall engage early with Indigenous communities and ensure their interests are considered when identifying, protecting and managing archaeological resources, built heritage resources and cultural heritage landscapes.
- **Policy 5.2.4:** Planning authorities shall prepare for the impacts of a changing climate that may increase the risk associated with natural hazards.
- **Policy 6.2.1:** A coordinated, integrated, and comprehensive approach should be used when dealing with planning matters within municipalities, including managing natural heritage, water, agricultural, mineral, cultural heritage, and archaeological resources.
- **Policy 6.2.2:** Planning authorities shall undertake early engagement with Indigenous communities and coordinate on land use planning matters to facilitate knowledge-sharing, support consideration of Indigenous interests in land use decision-making and support the identification of potential impacts of decisions on the exercise of Aboriginal or treaty rights.

3.2.3 Clarence-Rockland Official Plan

The OP of the Urban Area of the City of Clarence-Rockland (2021) outlines the objectives and policies to guide the short- and long-term physical development within the limits of the Urban Area of Clarence-Rockland. The OP (2021) guides municipal land use within the framework of the PPS. Policies and objectives applicable to the Project or Study Area are provided as follows.

3.2.4 Clarence-Rockland Community Improvement Plan

The Clarence-Rockland Community Improvement Plan (CIP) encompasses all communities of Clarence-Rockland and is one of the key economic development tools used to support local businesses and encourages revitalization and private sector improvements (Clarence-Rockland 2024). The CIP outlines and identifies the full scope of financial incentive programs provided by the City to support local businesses and encourage private sector investments and the geographic regions in which they operate. Additionally, it identifies a range of resource requirements for successful implementation, including marketing, administration, monitoring and evaluation.

3.3 Legislative Approvals

This section provides an overview of the federal, provincial, and local legislation and policies that are relevant for the Rockland WTP and Caron BPS expansions and provide guidance for protecting the natural heritage, cultural heritage, and archaeological features.

3.3.1 Federal Legislation and Policy

This section outlines the federal legislation and policies that are relevant for the Rockland WTP and Caron BPS expansions.

3.3.1.1 Fisheries and Oceans Canada – Fisheries Act

The Fisheries Act (1985) is a federal legislation mandated by Fisheries and Oceans Canada (DFO), in conjunction with various other agencies (Environment and Climate Change Canada (ECCC), Ontario Ministry of Natural Resources (MNR), MECP), that provides a framework for the proper management and control of fisheries, and the conservation and protection of fish and fish habitat, including by preventing pollution.

The following sections of the Act are relevant to this Class EA regarding fish and fish habitat protection and pollution prevention:

- **Section 34.4(1):** No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish
- **Section 35(1):** No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat
- **Section 36(3):** No person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water.

3.3.1.2 Environment and Climate Change Canada – Migratory Bird Convention Act

The Migratory Birds Convention Act (MBCA) (1917, amended 1944, 2005), is to protect migratory birds, their eggs, and their nests. The MBCA was created to implement the Migratory Birds Convention between Canada and the United States. The Act, administered by ECCC, lists protected families and subfamilies of migratory birds and lays out legislation surrounding activities that may impact migratory birds or nests, including when and where activities may occur.

3.3.1.3 Environment and Climate Change Canada – Species at Risk Act

The Species at Risk Act (SARA) focuses on preventing wildlife species in Canada from disappearing, providing for the recovery of wildlife species that are extirpated (no longer exist in the wild in Canada), endangered, or threatened as a result of human activity, and managing species of special concern to prevent them from becoming endangered or threatened.

Species are designated at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) by using biological information on a species deemed to be in danger. The COSEWIC reviews the best available scientific, community and Aboriginal knowledge and applies assessment criteria based on international standards to evaluate risk of extinction.

While SARA applies to species on federal land, it also applies to species at risk migratory birds under the MBCA and fish anywhere they occur. Therefore, SARA may apply to any fish species that are deemed a federal species at risk as a result of the project.

3.3.2 Provincial Legislation and Policy

This section outlines the provincial legislation and policies that are relevant for the Rockland WTP and Caron BPS expansions.

3.3.2.1 Ontario Ministry of Citizenship and Multiculturalism – Ontario Heritage Act

The Ontario Heritage Act, mandated by the Ministry of Citizenship and Multiculturalism (MCM), allows municipalities and the provincial government to designate individual properties and districts as being of cultural heritage value or interest. The Act requires that cultural heritage resources, including buildings, sites and archaeological (land and marine) resources be protected and that any potential impacts to these features must be avoided or mitigated.

As part of the Class EA, a Stage 1 Archaeological Assessment (AA) (Matrix Heritage 2025) was completed for the Rockland WTP and Caron BPS under Project Information Form (PIF) numbers P1032-0045-2025 and P1032-0046-2025, respectively. The full report is included in Appendix A. Where subsequent investigations are identified, those must be completed prior to construction, recommendations for the monitoring and mitigation of cultural heritage and archaeological resources are incorporated in this Schedule C EA. Should previously undocumented archaeological resources be discovered during construction, the City of Clarence-Rockland will cease construction until the MCM is contacted, and appropriate mitigation or resource recovery is implemented.

3.3.2.2 Ontario Ministry of Environment, Conservation and Parks– Endangered Species Act and Species Conservation Act

The Endangered Species Act (2007), similar to the SARA, aims to identify species at risk based on the best available scientific information, including information obtained from community knowledge and

Aboriginal traditional knowledge, to protect species that are at risk and their habitats, and to promote the recovery of species that are at risk, as well as stewardship activities to assist in the protection and recovery of species that are at risk.

The Endangered Species Act provides guidance on determining whether anthropogenic activities, such as construction, could impact regulated species and considers biology and behaviour of the species, details of the activity, and how the activity may affect the species' ability to carry out its life processes.

On March 30, 2026, Schedule 10 of Bill 5 came into force, repealing the ESA and enacting new legislation called the Species Conservation Act (SCA). Technical work related to this assignment was completed prior to this change coming into force. The SCA will apply to measures identified in the implementation of the project.

3.3.2.3 Ontario Ministry of Environment, Conservations and Parks– Environmental Protection Act and Ontario Water Resources Act

The Environmental Protection Act (EPA) is the primary pollution control legislation in Ontario and is used with the Ontario Water Resources Act (OWRA) to protect air and water quality in Ontario. The EPA prohibits the discharge of contaminants into the environment that are likely to cause adverse effects, by establishing limits for air emissions and wastewater effluent that must not be exceeded. Environmental Compliance Approvals (ECAs) are issued under the Act. In addition, the Act controls the removal, transport, and disposal of excess soils; if they are deemed to be contaminated. Management of excavated soils must be in accordance with Ontario Regulation (O. Reg.) 406/19 (amended October 2025): On-site and Excess Soil Management.

The OWRA focuses on the protection of groundwater and surface water in Ontario. The Act regulates the approval, construction, and operation of wastewater treatment facilities, including ensuring that effluent discharges to receiving waters meet Provincial Water Quality Objectives (PWQOs). Permits to Take Water (PTTW) from the ground or surface water sources are also regulated under the Water Resources Act.

The EPA and OWRA are key legislation applicable to this project. The recommended design concept identified through the Class EA process must incorporate mitigation measures to reduce risks to the community and the environment to receive subsequent approvals under these Acts.

3.3.2.4 Water Management – Policies, Guidelines, Provincial Water Quality Objectives

To support municipalities in meeting the EPA and OWRA, the MECP has developed water management guidelines. The two most relevant guidelines to this Class EA are described here:

1. MECP Procedure D-5-1

   Procedure D-5-1 provides a standardized method for calculating and reporting uncommitted reserve capacity at sewage and WTPs. The procedure's aim is to ensure new developments in approved plans of subdivisions do not result in the exceedance of environmental limits at the sewage or WTP. Alternative approaches to calculating and reporting uncommitted reserve capacity may be proposed to and considered by the MECP Regional Office from a municipality.

   Section 2.0 of the procedure specifies the role of the MECP is to facilitate and promote compliance with the EPA, OWRA, and regulations enacted under those statutes. This is fulfilled through the issuance of Certificates of Approval and based on Ministry policies and guidelines. Sufficient

uncommitted hydraulic capacity and plant performance that is environmentally acceptable is essential to receive favourable comments from the MECP on development proposals. However, Section 3.3 specifies that municipalities are responsible for ensuring they are in compliance with the Certificate of Approval issued for their facilities and Environmental Laws.

Section 4.0 of the report specifies municipalities should produce an annual report based on the calculation methods in Procedure D-5-1 within 90 days of the end of each year that addresses both hydraulic capacity and performance factors. The reports must be retained by the municipality for a period of three years and made available to Ministry personnel upon request, as required under environmental legislation.

2. Ontario Drinking Water Objectives (Province of Ontario 1994)

   The Ontario Drinking Water Objectives are unique provincial guidelines designed to protect public health, ensure drinking water is safe, palatable, and aesthetically pleasing. The objectives are categorized in three main categories: microbiological (for example, E. coli, total coliforms), chemical and physical (for example, lead, arsenic), and aesthetic (for example, colour, methane). While the critical objectives focus on health-related parameters, aesthetic and operational guidelines ensure the water is acceptable to consumers and does not damage infrastructure through corrosion.

The objectives function as the minimum target level for water quality in Ontario and are used by the MECP to evaluate the design and performance of WTPs. Many health-based objectives have been superseded by O. Reg. 169/03, however, the Ontario Drinking Water Objectives remains an essential management tool for parameters that affect treatment efficiency and consumer satisfaction.

3.3.2.4.1 Permits to Take Water

The updated Environmental Activity and Sector Registry (EASR) regulations for temporary dewatering allow proponents to self-register instead of obtaining a PTTW for the removal of up to 400,000 L/day of construction dewatering. For temporary dewatering on land, the volume of water entering the excavation will be based on both groundwater infiltration and precipitation events. Based on Ontario Regulation 63/16 reflecting amendments that came into force in July 2025, the following dewatering limits and requirements are as follows:

- Construction Dewatering less than 50,000 litres per day (L/day): The takings of both groundwater and stormwater does not require a PTTW from the MECP or registration in the EASR.
- Construction Dewatering greater than 50,000 L/day and less than 400,000 L/day: The taking of groundwater and/or stormwater requires the preparation of a water-taking report, registration in the EASR.
- Construction Dewatering greater than 400,000 L/day: The taking of groundwater and/or stormwater requires a PTTW from the MECP rather than an EASR registration.

For permanent dewatering, based on Section 34 of Ontario Regulation 387/04 reflecting amendments that came into force in July 2025, the dewatering limits and requirements are as follows:

- Water-Taking less than 50,000 L/day: A PTTW is not required from the MECP.
- Water-Taking greater than 50,000 L/day: A PTTW is required from the MECP (likely Category 3).

An amendment to the PTTW will be required to allow the City to pump more than the currently approved volumes from the Ottawa River for the increase in water production.

3.3.2.4.2 Drinking Water Works Permit

Drinking Water Works Permits (DWWP) are regulated under the Safe Drinking Water Act, 2002, Ontario Regulation 170/03 (Drinking Water Systems), and Ontario Regulation 205/18 (Municipal Residential Drinking Water Systems in Source Protection Areas). A DWWP is required prior to the establishment or alternation of a municipal residential drinking water system, therefore, both the Rockland WTP and Caron BPS will require DWWP amendments.

3.3.2.5 Ontario Regulation 406/19: On-Site and Excess Soil Management

The management and reuse of excess soil generated from construction at the Rockland WTP and Caron BPS are governed by Ontario Regulation 406/19 (as amended October 2025). The goal of the regulation is to beneficially reuse excess soil for purposes such as backfilling and landscaping, provided it meets provincial environmental quality standards. This soil must be tested by a qualified professional and must be tracked and documented from its source to its new location. Landfills will no longer accept reusable soil starting as of January 2025, and restrictions are in place to prevent inappropriate dumping.

3.3.2.6 Ontario Ministry of Public and Business Service Delivery and Procurement - Electrical Safety Code (Ontario Regulation 164/99)

Electrical power system upgrades are required as part of the upgrade and expansion work at the Rockland WTP and Caron BPS and will require a notification of work (also known as a permit) from the Electrical Safety Authority This notification creates a permanent record of the work and triggers an inspection by the Electrical Safety Authority to ensure compliance with the Ontario Electrical Safety Code.

3.3.2.7 Ontario Ministry of Public and Business Service and Delivery Procurement – Technical Standards and Safety Authority

The Technical Standards and Safety Authority (TSSA) is Ontario’s public safety regulator for devices and equipment such as boilers, pressure vessels, and fuels across Ontario. TSSA's work includes design reviews, inspections, investigations, and public education to enhance safety. Any new biosolids treatment facilities (for example, digesters) must meet all standards for use of biogas and solids operation.

3.3.2.8 Ontario Ministry of Natural Resources - Fish and Wildlife Conservation Act

The MNR issues permits under the Fish and Wildlife Conservation Act for activities such as collecting, transporting, or releasing scheduled wildlife or fish species. If sensitive natural habitats are impacted by construction, then the species within the habitats may have to be relocated. If so, a Scientific Collecting Permit (or Wildlife Scientific Collector's Authorization) from MNR may be necessary. The intake to the Rockland WTP is in the Ottawa River. Should an expansion of the intake be required to meet future needs, the escape velocity of the fish species within the Ottawa River will dictate the intake design basis, potentially requiring engagement with the MNR.

3.3.2.9 Conservation Authority Regulation and Policy

The Conservation Authorities Act (1990) provides for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario. On March 10, 2026 the Ontario Provincial Government announced that conservation authorities will be consolidated from 36 to 9 over 2026 with transition completed in early 2027 (Ontario 2026a). The Ontario Provincial Conservation Agency (OPCA) will oversee the transition and

was created in fall 2025 as a newly established, provincial board-governed agency (Ontario 2026b). The OPCA is overseen by the MECP and was established to lead improvements to the province's conservation authority system (Ontario 2026b). The newly created St. Lawrence River Regional Conservation Authority consolidates the Mississippi Valley, Raisin Region, Rideau Valley, and South Nation River CA's and will have authority over the Study Area (Ontario 2026a).

The legislative mandate of a conservation authority, as set out in Section 21 of the Conservation Authorities Act, is to establish and undertake programs designed to further the conservation, restoration, development, and management of natural resources. Conservation Authorities are local agencies that protect and manage water and other natural resources at the watershed level.

3.4 Clarence-Rockland Water Master Plan

The Clarence-Rockland Water Master Plan (WMP) recommends a strategy for continued capital improvements of the existing water supply and distribution system to improve reliability and address current and future regulatory requirements (Jacobs 2023).

Infrastructure improvements and capital costs associated with water servicing to meet current and future regulatory requirements outlined in the Clarence-Rockland WMP were reviewed and updated in 2023 (Jacobs 2023). It addresses the City's water servicing and distribution requirements for the 20-year planning period through considering the City's long-term planning objectives. As outlined in the MCEA guidance, a Master Plan is to be reviewed every 5 years to assess recommended strategies and consider the timing and need for capital improvements. The 2023 Clarence-Rockland WMP is currently being revised under an addendum which includes re-evaluating the future growth assumptions and water use estimates and revising the recommended infrastructure upgrades over the planning horizon.

4. Methods and Approach

The following section outlines the methods and approach used for this Class EA.

4.1 Study Approach Overview

This Study was completed as a Schedule C MCEA, following Phases 1 through 4 of the Class EA process.

The activities completed in Phases 1 through 4 are as follows:

- **Phase 1 – Existing Conditions and Future Needs:** This phase included documenting existing conditions at the Rockland WTP and Caron BPS identifying future needs for each facility; identifying gaps in meeting future needs; and developing a Problem and Opportunity Statement.
- **Phase 2 – Identification and Evaluation of Alternative Solutions:** This phase included identifying alternative solutions to meet the future needs identified in Phase 1. Alternative solutions were subject to comparative evaluation to identify preferred solutions.
- **Phase 3 – Development of Design Concepts and Implementation Plan:** This phase included developing and evaluating a design concept for the preferred solutions identified in Phase 2; identifying implementation triggers; and developing an overall schedule for the recommended solutions. Potential impacts and mitigation measures were also identified.
- **Phase 4 – Environmental Study Report (ESR):** The methodology and project recommendations are documented in this ESR.

Community engagement is an important component of the Class EA process that is carried out throughout each Phase of the EA process. The approach to community engagement is presented in Section 18.

4.2 Decision-Making Process

A multi-objective decision-making framework was developed to identify the preferred alternative for the Rockland WTP and Caron BPS. This methodology is consistent with phase 2 of the MEA process for MCEAs (MEA 2024).

This methodology allows for a comparative assessment of each set of alternative solutions. A unique set of evaluation criteria reflecting four overarching categories of environment will be established for evaluating alternatives identified for the Rockland WTP and Caron BPS.

Criteria are identified in the following four broad categories:

- Natural Environment
- Sociocultural Environment
- Technical Environment
- Economic Environment

A performance scale is defined for each criterion including a criterion definition and a performance scale defining how the score for each criterion will be applied to each identified alternative. A rationale is provided to explain the assigned score for each criterion by alternative. The performance scale used for this evaluation is generally defined as follows:

- 0 represents the lowest score
- 5 represents the moderate score
- 10 represents the highest score

Each category was given an equal weighting of 25 percent so that the number of criteria within the category does not bias the overall scores for the alternatives. After scoring the alternatives, sensitivity analyses were completed by giving each category a higher weighting to determine the impact of certain categories on the selection of the preferred solutions. If the sensitivity analysis does not change the ranking of the alternatives the scoring exercise is considered well balanced and unlikely to be influenced by a single factor.

4.3 Cost Estimate Basis

Cost estimates were developed for the alternative solutions and design concepts presented in Section 9, Section 10, Section 15, and Section 16 to support the detailed evaluation process. This section presents the approach and basis used to develop the cost estimates to support the alternatives evaluation.

4.3.1 Capital Cost Estimation Basis

Capital costs for the alternative expansions are developed using Jacobs' Replica Parametric Design (RPD) tool. The RPD tool uses a database of actual project data, typical design values, and quantity take-offs to develop relative conceptual cost estimates. Unit process modules within RPD are based on actual equipment and installation costs from Jacobs' projects supplemented by Means and Richardson's cost data for comparison purposes. The construction capital costs developed using RPD are accurate to approximately +50 percent/-30 percent. Cost estimates include the following mark-ups and adjustment factors:

- 15% contractor overhead, profit, mobilization, demobilization, insurance and bonding
- 30% contingency
- 15% design and engineering fees
- 10% design pricing contingency and location/market adjustment factor

4.3.2 Operations and Maintenance Cost Estimation Basis

The yearly operations and maintenance (O&M) requirements and associated costs for the alternative expansions are based on the operational and maintenance unit costs currently employed at the Rockland WTP and Caron BPS (where applicable). It considers the yearly cost of chemical consumption, electricity consumption, labour, and annual equipment maintenance. Unit chemical costs are based on bulk costs provided by the Ontario Clean Water Agency (OCWA) and current consumption for the unit processes from Jacobs' RPD tool.

5. Inventory of Existing Conditions

The purpose of this section is to describe the natural and social environment within the spatial boundaries defined for the Study Areas illustrated in Figure 3-1 and Figure 3-2 (Section 3.1) through information available from existing literature, government databases and online resources, and feedback collected during community engagement. The level of detail provided in this section corresponds to the nature and scale of the predicted effects and public feedback related to the Study. This information supports the identification of the detailed evaluation framework and the selection of alternatives.

5.1 Technical Environment

This section describes the existing conditions of the Rockland WTP and Caron BPS.

5.1.1 Rockland WTP

The technical environment for the Rockland WTP includes the intake, treatment processes, and description of current treated flows.

5.1.1.1 Existing Process

The existing process at the Rockland WTP is a 13.5 ML/d rated conventional treatment plant with raw water pumping, coagulation, ActiFlo® ballasted flocculation and sedimentation processes, dual-media filtration, primary disinfection with free chlorine and ultraviolet (UV), and secondary disinfection with chloramines.

Raw water is obtained from the Ottawa River through a 630 mm diameter intake pipe. The screened water is pumped through a low lift pumping station (LLPS) to the WTP. The LLPS includes three vertical turbine pumps. Two pretreatment ActiFlo® units provide coagulation, ballasted flocculation, and sedimentation processes. Settled water from each of the ActiFlo® units passes through two individual dual-media gravity filters operating in parallel consisting of sand and anthracite. Filtered water passes through UV disinfection reactor units used in primary disinfection for pathogen reduction. Post-filter chlorination is also used for primary disinfection purposes, which is achieved through a baffled chlorine contact tank (CCT). The treated water from the CCT flows to the primary and secondary reservoirs. Ammonium sulphate was introduced in 2010 on the outlet of the secondary reservoir, to achieve chloramination for secondary disinfection purposes. Sodium hydroxide addition also occurs to raise the pH for distribution system corrosion control purposes. Filter backwash water is supplied by two backwash supply tanks each with a backwash supply pump. Backwash wastewater generated from the filter backwash operation is discharged into the two backwash wastewater holding tanks, which is then pumped into a clarifier. The clarifier was originally used in the pretreatment process but was repurposed in 2002. The clarifier also accepts waste sludge from the ActiFlo® units. The supernatant from the clarifier is returned to the storm water network while the settled sludge is discharged to the sanitary sewer. Treated water is pumped from the secondary and/or primary reservoirs by the high-lift pumps into the City's water distribution system. The rate of water supply is based on the water level in the elevated storage tanks (EST) and demand from the City and the Hamlets serviced by the WTP. There are four centrifugal high-lift pumps, three duty and one standby.

These pumps include:

- Pump 1 and 4: 55 L/s each
- Pump 2: 45 L/s
- Pump 5: 76 L/s

Regulatory approvals relevant to the Rockland WTP and water supply system include:

- PTTW (3168-B2JK5N)
- Municipal Drinking Water Licence (175-101 issue 5)
- DWWP (175-201 issue 4)

5.1.1.2 Water Supply System

The Rockland WTP currently supplies water to two pressure zones (PZs). Pressure Zone 1 (PZ-1) services Rockland with the Rockland elevated tower (ET) for storage and the Caron BPS supplies water to Pressure Zone 2 (PZ-2) which services the surrounding Hamlets and Villages with the Bouvier and Cheney ET for storage. Limoges draws from PZ-2 but is considered its own PZ. Table 5-1 outlines the existing water demands at the Rockland WTP including the average daily demand (ADD), maximum daily demand (MDD) and peak hour demand (PHD) for PZ-1, PZ-2 and Limoges PZ.

Table 5-1. Rockland WTP Existing Water Demands (Jacobs 2023)

Pressure Zone	ADD	MDD	PHD
Clarence-Rockland PZ-1	4,544	5,555	8,382
Clarence-Rockland PZ-2	1,785	3,099	3,562
Limoges	346	346	346

5.1.1.3 Flow Analysis

The Rockland WTP has sufficient capacity to meet the current water demands. Capacity constraints to service existing demands are identified at the Caron BPS. These constraints are presented in greater detail in Section 5.1.2.2.

The total water demand at the WTP outlined in the Clarence-Rockland WMP (Jacobs 2023) includes the following:

- ADD: 6,675 m^3/d
- MDD: 9,000 m^3/d
- PHD: 12,290 m^3/d

5.1.1.4 Condition of Assets

Jacobs performed a state of assets on the existing Rockland WTP and LLPS as part of the Clarence-Rockland WMP (Jacobs 2023). The findings of the WMP are summarized in this section.

Overall, based on the 43-year age of the LLPS, it would be characterized as being in a fair condition. According to the operations staff, the wet well chamber of the LLPS is emptied every year for annual inspection and checked for any structural damage. There were no cracks, spalls, or visible leaks reported. Although comments from the operations staff suggest that the building is in relatively good condition, the WMP capital investment in structural and architectural refurbishment should be accounted for in the Capital Investment Budget based on the age-based remaining life calculation (Jacobs 2023).

The intake structure was built in 1970 but has been modified over the years. The intake structure has an estimated remaining useful lifetime of 48 years based on the age-based remaining life calculation. The intake structure is inspected every 5 years. The latest inspection did not note condition related issues. Based on this information, the intake structure is in good condition.

The original portion of the main WTP building is 52-years old. Like the LLPS, the architectural components of the main WTP building, such as building exterior and interior, roofing, ceiling, flooring, are part of the original installation. Based on their age they have passed their typical expected end-of-life. However, it was noted that the WTP architectural components had few replacements and upgrades in the last 15 to 20 years. For instance, the interior of the WTP building was painted in 2010, and the windows were replaced in 2021. The WMP identified that major architectural refurbishment is required.

The newer section of the WTP building, which was part of the WTP expansion in 2002, is characterized as fair to good condition in the WMP. The building mechanical and architectural assets for the newer part of the WTP building were finished during the 2002 expansion project. This work included ducting, roofing, ceiling, interior and exterior walls and finishes, and doors and windows. Upgrade of WTP civil site works (paved areas, parking, etc.) at was also completed during the 2002 expansion project. The WMP identified that these components are not expected to require significant capital expenditure within the next 20 years.

Many of the asset types in the chemical storage area are 20 years old and can be characterized as being in fair condition. The Silicon Controlled Rectifier for the chemical dosing systems is antiquated technology and are recommended to be replaced and budgeted for a modernized, self-contained variable speed dosing pumping system in the WMP. Many of the process mechanical assets at the WTP were installed in 2002 and are 20 years old. The OCWA maintenance report indicates overall minor repairs, replacement or refurbishment of asset sub-types. No major process mechanical asset upgrades were identified in the WMP.

Major electrical infrastructure and primary distribution systems at the original WTP, predominantly from the original installation, were upgraded in 2010. This includes the transformers and switchgear, emergency power, and motor control centre (MCC, no. 1). The newer section of the WTP building has had no significant capital investment since its installation in 2002. The MCC (no. 2) at the new WTP has at least 10 years of expected lifetime. Based on this, there are no major electrical asset replacements expected to be required within the next 10 years.

The existing WTP has a combination of obsolete and/or antiquated programmable logic controller (PLC), local control panels and communications technology. The OCWA maintenance report indicates numerous repairs, modifications, and upgrades to the PLC and SCADA system throughout 2019 – 2020. Operations staff noted that it is difficult to procure replacement parts for components for the exiting PLCs to complete. Therefore, the WMP identified that these systems have reached the end of their service life, requiring major upgrades and replacement to modern technology. The WMP recommended that PLC (and panel), local control panels and communications equipment replacement and upgrades must be accounted for in the Capital Investment Budget for the planning period. The SCADA software and hardware upgrades were done in 2015. Although the upgrades are not required until 2025 or more, it is recommended to include the SCADA software and hardware upgrades simultaneously during the upgrade of PLC panels.

The high-lift pumps are expected to be in good condition, as they are well within their expected operable lifetime. The electric motors for the pumps were in good condition, particularly for Pumps 1 and 4 installed in 2010. The electric motors for Pumps 2 and 5 were installed in 2002 and have an estimated remaining life of 5 years and are considered to be in fair condition; replacements is required within 5-10 years. The CCT (or clearwell) was installed in 2002 and has a remaining life of 60 years. According to operations staff, the CCT and baffle curtains are inspected annually, and no outstanding issues were reported to date. The primary reservoir is part of the original WTP construction and has an estimated remaining life of 28 years. The secondary reservoir structure was built in 2002 and has 60 years of service. No structural issues have been reported during inspections.

A site visit was conducted in April 2025 to further determine the state of assets. The findings of the WMP and recent site visit identified opportunities to replace existing assets based on age and condition. Condition of existing assets and opportunities for asset replacement are documented in TM1 - Existing WTP Scoping Study which is in progress as part of this project (Jacobs 2025a).

5.1.2 Caron BPS

The technical environment for the Caron BPS includes the existing process and description of current flows.

5.1.2.1 Existing Process

The Caron BPS is located at 1441 Caron St., Rockland, ON, and has a design capacity of 4.0 ML/d. It has three horizontal centrifugal pumps (two duty, one standby). The station has a chemical feed system for chloramination dosing purposes, though it is no longer in operation (since the treated water is now chloraminated at the WTP). The Caron BPS in the distribution system provides pressure to a regional feeder main servicing five hamlets: Clarence Creek, St. Pascal Baylon, Hammond, Bourget, and Cheney.

5.1.2.2 Water Supply System

The Caron BPS supplies water to PZ-2 which services the surrounding Hamlets and Villages with the Bouvier and Cheney ETs for storage. Limoges draws from PZ-2 but is considered its own PZ. Table 5-2 outlines the existing water demands serviced by the Caron BPS including the ADD, MDD and PHD for PZ-1, PZ-2 and Limoges PZ.

Table 5-2. Caron BPS Existing Water Demands (Jacobs 2023)

Pressure Zone	ADD	MDD	PHD
Clarence-Rockland PZ-2	1,785	3,099	3,562
Limoges	346	346	346

5.1.2.3 Flow Analysis

The pumping capacity of the Caron BPS has been determined to be sufficient to meet the current demands of the facility. Based on the current condition of the pumps at the BPS, the capacity is constrained under the existing conditions as it is unable to pump up to its rated capacity. Upgrades are currently underway to restore the facility to its rated capacity.

The total water demand at the BPS outlined in the Clarence-Rockland WMP (Jacobs 2023) includes the following:

- ADD: 2,131 m^3/d
- MDD: 3,445 m^3/d
- PHD: 3,908 m^3/d

5.1.2.4 Condition of Assets

Jacobs performed a state of assets on the existing Caron BPS as part of the Clarence-Rockland WMP (Jacobs 2023). The record of installation of the BPS or as-built drawing details were not available at the time of the Report. The Caron BPS was constructed in 2002.

Overall, based on the 20-year age of the Caron BPS, the WMP characterized it as being in good condition. The three pumps at the Caron BPS would be expected to have more than 50 years of remaining life (after the ongoing upgrades are complete). Due to the capacity upgrade required as part of the expansion project, the pumps will be upgraded to a higher capacity and/or supplemented with additional pumps.

The WMP identified that the pumps for the chloramination dosing system have less than 5 years of expected service life and the chemical storage tanks would be expected to remain in good condition for the next 68 years. The WMP identified that the dosing system and related appurtenances are not currently being used at the Caron BPS.

The WMP identified that the building exterior, interior and major building mechanical assets, such as ducting, HVAC systems and lightning, are part of the original installation. Therefore, they would not be expected to require upgrades or replacements for another 20 – 30 years. Similar assessments are made for the structural components.

The WMP identified that the fence for the Caron BPS is in need for replacement, but the remaining site civil items are in good condition and do not require any significant capital investment.

The 60 kW generator with a fuel storage tank has at least 20 years of remaining useful life. The existing main electrical infrastructure and distribution system are 20 years old and would not be expected to require upgrades or replacements for approximately 10 years. The OCWA maintenance record indicates minor repairs and refurbishment of booster motor pumps, including the replacement of the soft start on the pump and rebuild of the booster pump motor were completed in 2018.

Similar to the Rockland WTP, the WMP recommended that upgrades to the PLC and communication networks installed in 2002 at the Caron BPS are accounted for in the Capital Investment Budget over the 2021 to 2041 planning period.

A site visit was conducted in April 2025 to further determine the state of assets. The findings of the WMP and recent site visit identified that there are opportunities to replace existing assets based on age and condition. Condition of existing assets and opportunities for asset replacement are being documented in TM2 - Existing BPS Scoping Study which is in progress as part of this assignment.

5.2 Social Cultural Environment

Within the MEA process for MCEAs the social cultural environment includes considerations for nearby land uses, cultural heritage resources (including built and natural heritage landscapes), and archaeological resources.

5.2.1 Rockland WTP

This section outlines the social cultural environment as it relates to the Study Area for the Rockland WTP.

5.2.1.1 Clarence-Rockland

The Study Area consists of the urban areas of Clarence-Rockland. The City is a two-tiered municipality with the United Counties of Prescott and Russell being the upper-tier municipality. The Rockland WTP intake is owned by the City and is run by the OCWA.

The Rockland WTP services the City of Clarence-Rockland and five hamlets. The five hamlets include Clarence Creek, St. Pascal, Hammond, Bourget, and Cheney. The Caron BPS conveys water from the WTP to the five hamlets. The City also supplies water to The Nation Municipality of Limoges (Limoges) and has

been approached by neighbouring communities to connect to the City's water system due to degradation in their water supply. Development is currently restricted in the neighbouring municipalities due to the limited availability of water services.

The economy is largely based on industrial, commercial, residential and rural agriculture sectors (Clarence-Rockland 2025). The WTP and BPS supply approximately 10,000 residents and businesses within the municipality. Clarence-Rockland encourages the development of commercial services, light industrial and business park uses as well as existing businesses to expand (Clarence-Rockland 2013).

5.2.1.2 Land Use

Nearby land use considerations are important to understand the potential impact of the project on the community. Considerations include impacts on local residents, schools, daycares, places of worship, and recreational uses of public and private lands.

The Study Area is mostly surrounded by low and medium density residential development. A large tourist recreation area to the North-West of the Rockland WTP called Du Moulin Park and a business park to the southeast. Two ANSI are also present around the Study Area. Land use of the surrounding area of the Rockland WTP is illustrated in Figure 5-1.

Figure 5-1. Nearby Land Use of the Rockland WTP

Map generated by UCPR A la Carte web mapping application. The United Counties of Prescott and Russell disclaims all responsibility for errors, omissions or inaccuracies in this publication. Do not rely on it as being a precise indicator of routes or location of features.Produced by UCPR under Licence with the OMNRF. © King's Printer for Ontario, 2024. © 2024 United Counties of Prescott and Russell, All rights reserved.

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Legend

Roads
- Provincial
- Comté / County
- Rural
- Urbain / Urban
- Rampe / Ramp
- Saisonier / Seasonal
- Privé / Private

Parcels

Areas of Natural and Scientific Interest

Pumping Station

Floodplain

Land Use
- SECTEUR COMMERCIAL CENTRE-VILLE / COMMERCIAL CORE
- COMMERCE DE SERVICES / SERVICE COMMERCIAL
- PARC D'AFFAIRES / BUSINESS PARK
- INSTALLATIONS COMMUNAUTAIRES / COMMUNITY FACILITIES
- COMMERCE RÉCRÉOTOURISTIQUE / TOURIST RECREATION
- COMMERCIAL
- RÉSIDENTIELLE À FAIBLE DENSITÉ / LOW DENSITY RESIDENTIAL
- RÉSIDENTIELLE À MOYENNE DENSITÉ / MEDIUM DENSITY RESIDENTIAL
- RÉSIDENTIELLE À MOYENNE DENSITÉ EXCEPTION 3 / MEDIUM DENSITY RESIDENTIAL EXCEPTION 3
- RÉSIDENTIELLE À MOYENNE DENSITÉ EXCEPTION 4 / MEDIUM DENSITY RESIDENTIAL EXCEPTION 4
- RÉSIDENTIELLE À HAUTE DENSITÉ /HIGH DENSITY RESIDENTIAL
- TERRE HUMIDE / WETLAND
- ESPACE OUVERT DE GRANDE ÉTENDUE / MAJOR OPEN SPACE
- SECTEUR D'ETUDE SPÉCIAL / SPECIAL STUDY AREA
- TERRAINS AJOUTÉS À L'AIRE URBAINE / LANDS ADDED IN THE URBAN AREA

- River or Lake
- River or Stream
- Lot and Concession Fabric
- Settlement Area (< 20k scale)
- Municipal Boundary (< 150k scale)

5.2.1.3 Anticipated Growth

Clarence-Rockland is anticipated to add approximately 11,800 people and 1,750 new jobs by 2046, based on the future growth projections outlined in TM-2 Future Growth Assumptions and Water Use Estimates (Jacobs 2025b) as part of the City of Clarence-Rockland WMP Update (Jacobs 2023). This equates to an approximate maximum additional water use per day of 75 L/s.

5.2.1.4 Archaeological Resources

A Stage 1 AA was completed within the Study Area to support this Class EA (PIF #P1032-0045-2025). The objective of a Stage 1 AA is to complete a background study to determine areas of archaeological potential within the Study Area. If archaeological potential or resources are present, the Stage 1 assessment would recommend further, more detailed AA to be undertaken (up to a Stage 4). The Stage 1 AA included a review of the MCM's archaeological site database, a review of relevant environmental, historical, and archaeological literature, and primary historical research. The report is presented in Appendix A. Recommendations are summarized as follows (Matrix Heritage 2025a):

1. A Stage 2 AA be conducted by a licensed consultant archaeologist using the test pit survey method at 5 m intervals in areas with archaeological potential as shown in Appendix A in dark blue.
2. No further archaeological study is required for the areas with low to no archaeological potential as shown in Appendix A delineated in orange.
3. The Stage 2 AA follow the requirements set out in the 2011 Standards and Guidelines for Consultant Archaeologists.

5.2.1.5 Built Heritage

The Cultural Heritage Screening Report was completed within the Study Area, as well as the properties immediately adjacent to the proposed work within 250 m, to support this Class EA (Matrix Heritage 2025b). The report identified any known or potential cultural heritage resources in the category of built heritage resources within the Study Area. The report is presented in Appendix A.

The report concluded that none of the non-designated properties that appear to be more than 40 years old should be reviewed further due to limited or no heritage value (Matrix Heritage 2025b).

5.2.2 Caron BPS

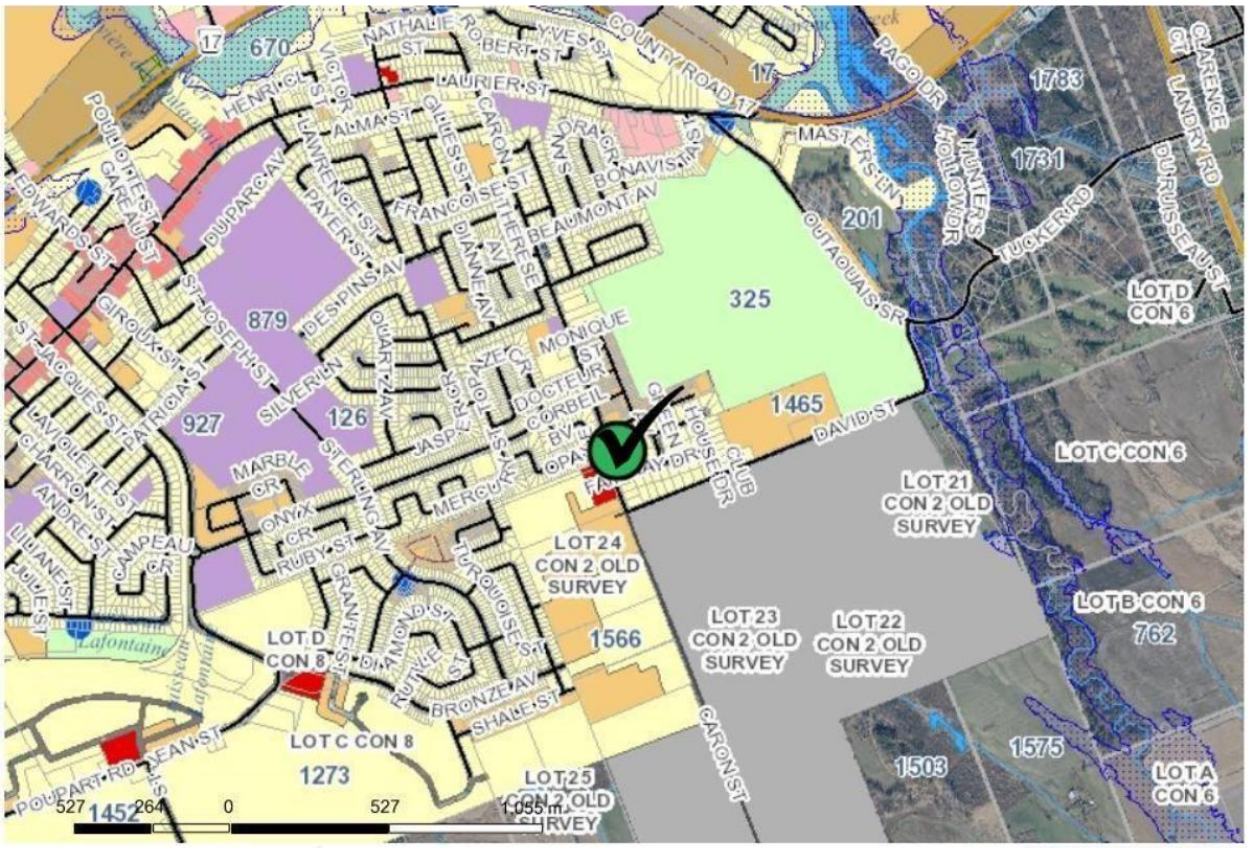
This section outlines the social cultural environment as it relates to the Study Area for the Caron BPS.

5.2.2.1 Land Uses

Nearby land use considerations are important to understand the potential impacts of the project on the community. Considerations include impacts on local residents, schools, daycares, places of worship, and recreational uses of public and private lands.

The Study Area is mostly surrounded by low and medium density residential developments, a few high-density residential developments and has a major open space to the North-East of the building. There is also a large area identified as lands added in the urban area south of the BPS. Land use of the surrounding area of the Caron BPS are in Figure 5-2.

Figure 5-2. Nearby Land Use of the Caron BPS



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Legend

Roads
- Provincial
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- Rural
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- Saisonier / Seasonal
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Parcels

Areas of Natural and Scientific Interest

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Floodplain

Land Use
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- TERRAINS AJOUTÉS À L'AIRE URBAINE / LANDS ADDED IN THE URBAN AREA

- River or Lake
- River or Stream
- Lot and Concession Fabric
- Settlement Area (< 20k scale)
- Municipal Boundary (< 150k scale)

5.2.2.2 Archaeological Resources

A Stage 1 AA was completed within the Study Area to support this Class EA (PIF #P1032-0046-2025). The objective of a Stage 1 AA is to complete a background study to determine areas of archaeological potential within the Study Area. If archaeological potential or resources are present, the Stage 1 assessment would recommend further, more detailed AA to be undertaken (up to a Stage 4). The Stage 1 AA included a review of the MCM's archaeological site database, a review of relevant environmental, historical, and archaeological literature, and primary historical research. The report is presented in Appendix A. Recommendations are summarized as follows (Matrix Heritage 2025a):

1. A Stage 2 AA be conducted by a licensed consultant archaeologist using the test pit survey method at 5 m intervals in areas with archaeological potential as shown in Appendix A in dark blue.
2. No further archaeological study is required for the areas with low to no archaeological potential as shown in Appendix A delineated in orange.
3. The Stage 2 AA follow the requirements set out in the 2011 Standards and Guidelines for Consultant Archaeologists.

5.2.2.3 Built Heritage

The Cultural Heritage Screening Report was completed within the Study Area, as well as the properties immediately adjacent to the proposed work within 250 m, to support this Class EA (Matrix Heritage 2025b). The report identified any known or potential cultural heritage resources in the category of built heritage resources within the Study Area. The report is presented in Appendix A.

The report concluded that none of the non-designated properties that appear to be more than 40 years old should be reviewed further due to limited or no heritage value (Matrix Heritage 2025b).

5.2.2.4 Heritage Landscapes

The Cultural Heritage Screening Report was completed within the Study Area, as well as the properties immediately adjacent to the proposed work within 250 m, to support this Class EA (Matrix Heritage 2025b). The report identified any known or potential cultural heritage resources in the category of cultural heritage landscapes within the Study Area. The report is presented in Appendix A.

The report concluded that no Heritage Impact Assessments will be required within the Study Area or properties immediately adjacent to the proposed work (Matrix Heritage 2025b).

5.2.2.5 Heritage Landscapes

The Cultural Heritage Screening Report was completed within the Study Area, as well as the properties immediately adjacent to the proposed work within 250 m, to support this Class EA (Matrix Heritage 2025b). The report identified any known or potential cultural heritage resources in the category of cultural heritage landscapes within the Study Area. The report is presented in Appendix A.

The report concluded that a Heritage Impact Assessment will be required to evaluate potential impacts of the proposed work on Du Moulin Park/former Edwards Sawmill and address any potential impacts on the cultural heritage value of the Ottawa River as a Canadian Heritage River (Matrix Heritage 2025b).

5.3 Natural Environment

The natural environment incorporates considerations for the physical environment, water quality and quantity, floodplains, source water protection, natural features study, and atmospheric environment.

5.3.1 Rockland WTP

This section outlines the natural environment as it relates to the Study Area for the Rockland WTP.

5.3.1.1 Physical Environment

The Rockland WTP Study Area is located in the Canadian Shield physiographic region, consisting of crystalline Precambrian rock (The Canadian Encyclopedia 2022). The Rockland WTP is underlain by limestone, dolostone, shale, arkose, and sandstone (Geology Ontario 2025).

5.3.1.2 Water Quality and Quantity

The Rockland WTP is located in the Ottawa River watershed and Grande Presqui'Ile subwatershed. The Grande Presqui'Ile subwatershed is downstream of the Chaudière Falls subwatershed which discharges to the Ottawa River where the WTP intake is located. Therefore, the Chaudière Falls subwatershed water quality characteristics are important to determine downstream impacts from the WTP taking more water from the Grande Presqui'Ile subwatershed (Government of Ontario 2025). The land use within the subwatershed includes a mix of urban settlements, forested area, and agricultural land uses.

The nearest active provincial stream water quality monitoring station is located upstream from the WTP on St. Patrick Street in Ottawa, Ontario, for the Rideau River (Government of Ontario 2024). There are several inactive monitoring stations near the Study Area. Although the Rockland WTP does not regularly monitor raw water quality, the typical water quality from the Ottawa River at the WTP is provided in Table 5-3.

Table 5-3. Ottawa River Raw Water Quality

Title	Parameters	Typical Value or Range
Physical	True Colour (TCU)	40 – 85
	Turbidity	1.3 – 5.2
Inorganics	Alkalinity (as $CaCO_3$)	15 – 25 mg/L
	Arsenic	0.005
	Aluminum	0.0956
	Manganese	0.0089
	Sulphate	8.5
	Iron	0.163
	pH (dimensionless)	6.5 – 7.5
	Total Dissolved Solids	92
Organics	Organic Nitrogen	0.44
	Total Organic Carbon	6.5

Water in the Ottawa River is regulated by the Ottawa River Regulation Planning Board. The planning board is responsible for reducing flood impacts, drought impacts, and maintaining beneficial water uses along

the Ottawa River and its tributaries. The planning board consists of seven members representing the governments of Ontario, Quebec, and Canada (ORPB 2025). It implements integrated water management policies for over 50 major dams and 13 principal reservoirs within the Ottawa River basin (Ottawa River Keeper 2025). Approximately 60 percent of the watershed is regulated through dams and reservoirs. As a partially regulated watershed flows are influenced by runoff from rainfall events and from natural snowmelt (ORPB 2025). There are two dams located upstream of the WTP. The closest dam is the Ottawa River at Cumberland followed by the Rideau River Dam Complex. These dams are used to regulate the water levels flowing into the Ottawa River (ORPB 2025).

Beneficial uses within the Ottawa River watershed include:

- Municipal water supply
- Hydroelectric power generation
- Ecological function of the watershed
- Recreational and commercial activities

The planning board provides current river conditions including water levels and flows relative to typical values, information on water stored in reservoirs, and flood forecasting to the public. The nearest downstream hydrometric station is located at Thurso (ORPB 2025). The nearest upstream hydrometric station is located at Gatineau (Hull) (ORPB 2025). These stations report observed water levels and flow rates relative to the high, median, and minimum historical data record.

5.3.1.3 Floodplain

According to the South Nation Conservation Authority (SNCA) (2020), floodplains are low lying areas near watercourses that are naturally subject to flooding. As outlined in the Public Geoportal (SNCA n.d), the WTP Study Area does partly occur within the SNCA Regulated Area and Floodline Boundary, specifically the LLPS. As such, any development will be regulated under Bill 23. The regulatory floodline boundary relative to the Rockland WTP Study Area is illustrated in Figure 5-3.

Figure 5-3. Regulatory Floodline Boundary Relative to the Rockland WTP

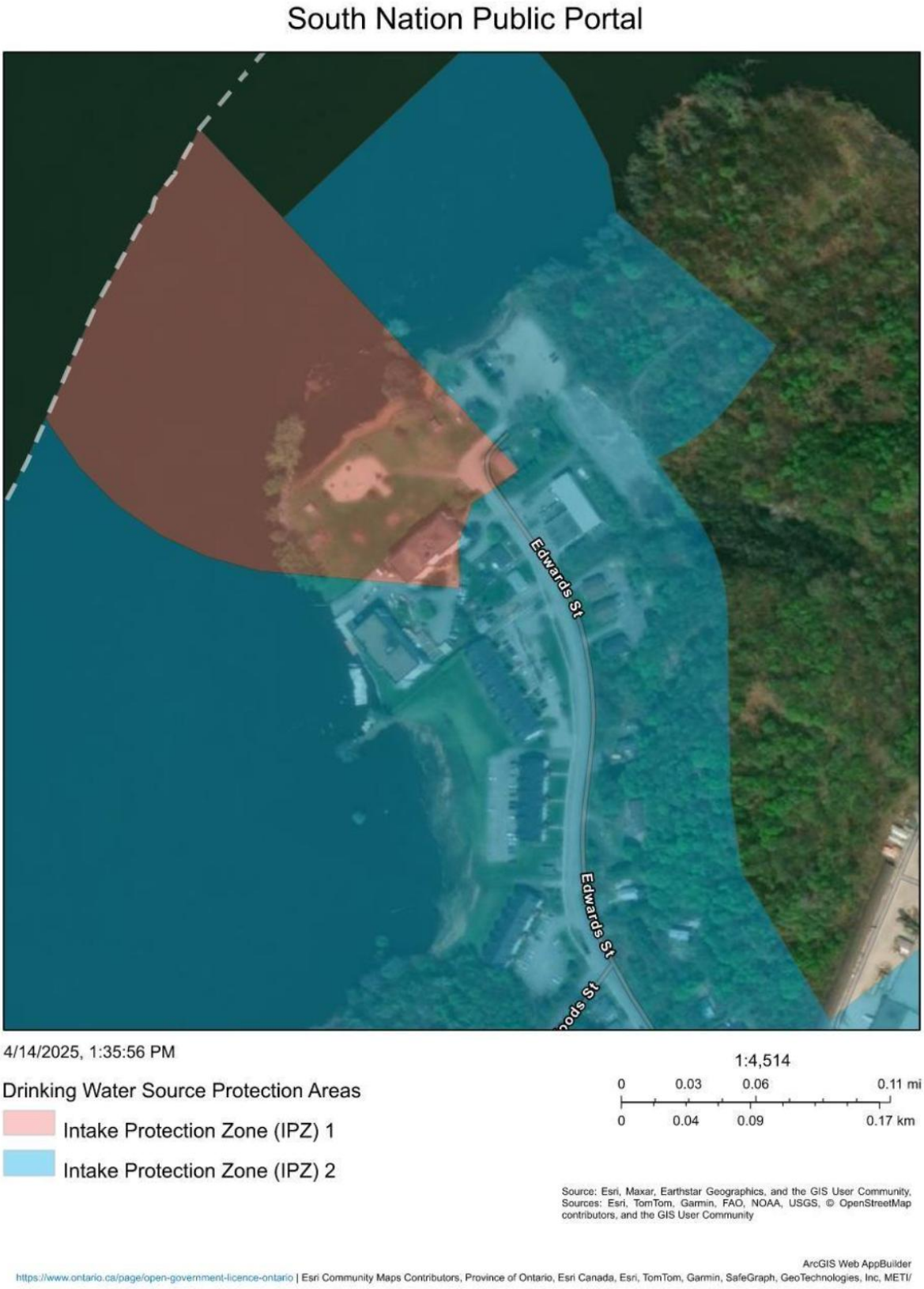
5.3.1.4 Source Water Protection

The Study Area for the Rockland WTP expansion is located within the Raisin-South Nation Source Protection Region. According to MECP Source Protection Information Atlas (MECP 2021), the Study Area is not located within a Wellhead Protection Area or Groundwater Recharge Area but does encounter the following:

- Highly vulnerable aquifer (score of 6)
- Intake Protection Zones (IPZs) for the Rockland WTP, including IPZ-1 (score of 9) and IPZ-2 (score of 7.2)

The Study Area does not include a defined significant threat policies described in Appendix E of the Raisin-South Nation Source Protection Plan (Raisin-South Nation Source Protection Region 2016). The IPZs for the Rockland WTP are illustrated in Figure 5-4.

Figure 5-4. Rockland WTP IPZs



5.3.1.5 Natural Heritage

A natural features desktop study was completed in May 2025 as part of this Class EA and identified features in the aquatic habitat, nearby wetlands, vegetation and vegetative communities, wildlife and wildlife habitat, species at risk, and ANSI. This report available in Appendix A.

The study recommended field surveys to be carried out during the growing season, beginning with breeding bird surveys after May 24, 2025. These additional surveys have been completed. The desktop study information was be used in the evaluation of alternatives in phases 2 and 3 of the Class EA process. A Natural Features and Impact Assessment (NFIA) report was prepared as a conclusion to Phase 3 to provide an evaluation of direct and indirect impacts the project may have on natural features. The NFIA report can be found in Appendix A.

Natural heritage features within the natural heritage boundaries were investigated by referencing available mapping from South Nation Conservation (SNC), Natural Heritage Information Centre (NHIC), and DFO. Spatial datasets were also downloaded from Land Information Ontario (LIO) (MNR 2025a). According to online Make a Natural Heritage Map (MNR 2025b), ANSIs and ESAs do not occur within the Study Areas or the 120 m adjacent lands.

According to MNR mapping (MNR 2024a and 2024b), woodland areas occur throughout both the City of Clarence-Rockland WTP and Caron Booster Station and 120m adjacent lands, but no valleylands were present.

5.3.1.6 Atmospheric Environment

The atmospheric environment of the Rockland WTP can be characterized using the Ottawa, ON, weather station data. The Canadian climate normals outlined on the Environment of Canada website from 1991 to 2020 for the region was used for analysis (Government of Canada 2025). This includes average seasonal temperatures for spring, summer, fall and winter of 5.9, 20.1, 8.8 and -7.6 °C, respectively. The average annual precipitation in the region is 938.1 mm.

5.3.1.7 Wetlands

A review of MNR LIO datasets (MNR 2025a), SNC Mapping (SNC 2020) and online Make a Natural Heritage Map (MNR 2025b) indicated that one non-evaluated wetland occurs within the Rockland WTP and the 120 m adjacent lands. No other wetlands are present in the Study Area or 120 m adjacent lands.

Additionally, no Provincially significant wetlands (PSWs) were identified within the Study Areas based on MNR's LIO datasets (MNR, 2025a), SNC Mapping (SNC, 2020), and online Make a Natural Heritage Map (MNR 2025b).

5.3.1.8 Species at Risk

According to information from the Natural Heritage Information Centre, Ontario Breeding Bird Atlas (OBBA), DFO Species at Risk (SAR) Aquatic Mapping, and iNaturalist, the Study Area may provide suitable habitat for the following species at risk and rare and sensitive species:

- Bank Swallow (*Riparia riparia*)
- Barn Swallow (*Hirundo rustica*)
- Black Tern (*Chlidonias niger*)
- Bobolink (*Dolichonyx oryzivorus*)
- Canadian Warbler (*Cardellina canadensis*)

- Chimney Swift (*Chaetura pelagica*)
- Common Nighthawk (*Chordeiles minor*)
- Eastern Meadowlark (*Sturnella magna*)
- Eastern Wood-Pewee (*Contopus virens*)
- Golden-Winged Warbler (*Vermivora chrysoptera*)
- Grasshopper Sparrow (*Ammodramus savannarum*)
- Least Bittern (*Botaurus exilis*)
- Loggerhead Shrike (*Lanius ludovicianus*)
- Peregrine Falcon (*Falco peregrinus*)
- Red-Headed Woodpecker (*Melanerpes erythrocephal*us)
- Short-Eared Owl (*Asio flammeus*)
- Midland Painted Turtle (*Chrysemys picta marginata*)
- Snapping Turtle (*Chelydra serpentina*)
- American Eel (*Anguilla rostrata*)
- Channel Darter (*Percina copelandi*)
- Cutlip Minow (*Exoglossum maxillingua*)
- Hickorynut (*Obovaria olivaria*)
- Lake Sturgeon (Great Lakes – Upper St. Lawrence River population) (*Acipenser fulvescens pop. 3*)
- North Brook Lamprey (*Ichthyomyzon fossor*)
- River Redhorse (*Moxostoma carinatum*)
- Silver Lamprey (Great Lakes – Upper St. Lawrence populations) (*Ichthyomyzon unicuspis pop. 1*)

More information on SAR can be found in Appendix A.

5.3.1.9 Wildlife and Significant Wildlife Habitats

Background data obtained for wildlife included an OBBA review, which provided information on avifauna occurrences within an area of 10 square kilometres. The 2nd atlas of the OBBA, which includes data collected from 2001 to 2005, was accessed on May 9, 2025. The Study Areas and 120 m adjacent lands occur within OBBA Square Summary 18VR74. iNaturalist online was also accessed.

The Significant Wildlife Habitat (SWH) Technical Guide (MNR 2000) was reviewed to determine whether SWH is present within the City of Clarence-Rockland WTP and 120m adjacent lands. No SWH were identified using NHIC data (MNR 2025b).

5.3.2 Caron BPS

This section outlines the natural environment as it relates to the Study Area for the Caron WTP.

5.3.2.1 Physical Environment

The Study Area for the Caron BPS is located in the Canadian Shield physiographic region, consisting of crystalline Precambrian rock (The Canadian Encyclopedia 2022). The Caron BPS is underlain by limestone, dolostone, shale, arkose, and sandstone (Geology Ontario 2025).

5.3.2.2 Water Quality and Quantity

The Caron BPS is located in the Ottawa River watershed and Grande Presqu'Ile subwatershed. The Grande Presqu'Ile subwatershed is downstream of the Chaudière Falls subwatershed which discharges to the Ottawa River where the WTP intake is located. Therefore, the Chaudière Falls subwatershed water quality

characteristics are important to determine downstream impacts from the WTP taking more water from the Grande Presqu'Ile subwatershed.

There are two dams located upstream of the WTP. The closest dam is the Ottawa River at Cumberland followed by the Rideau River Dam Complex. These dams are used to regulate the water levels flowing into the Ottawa River.

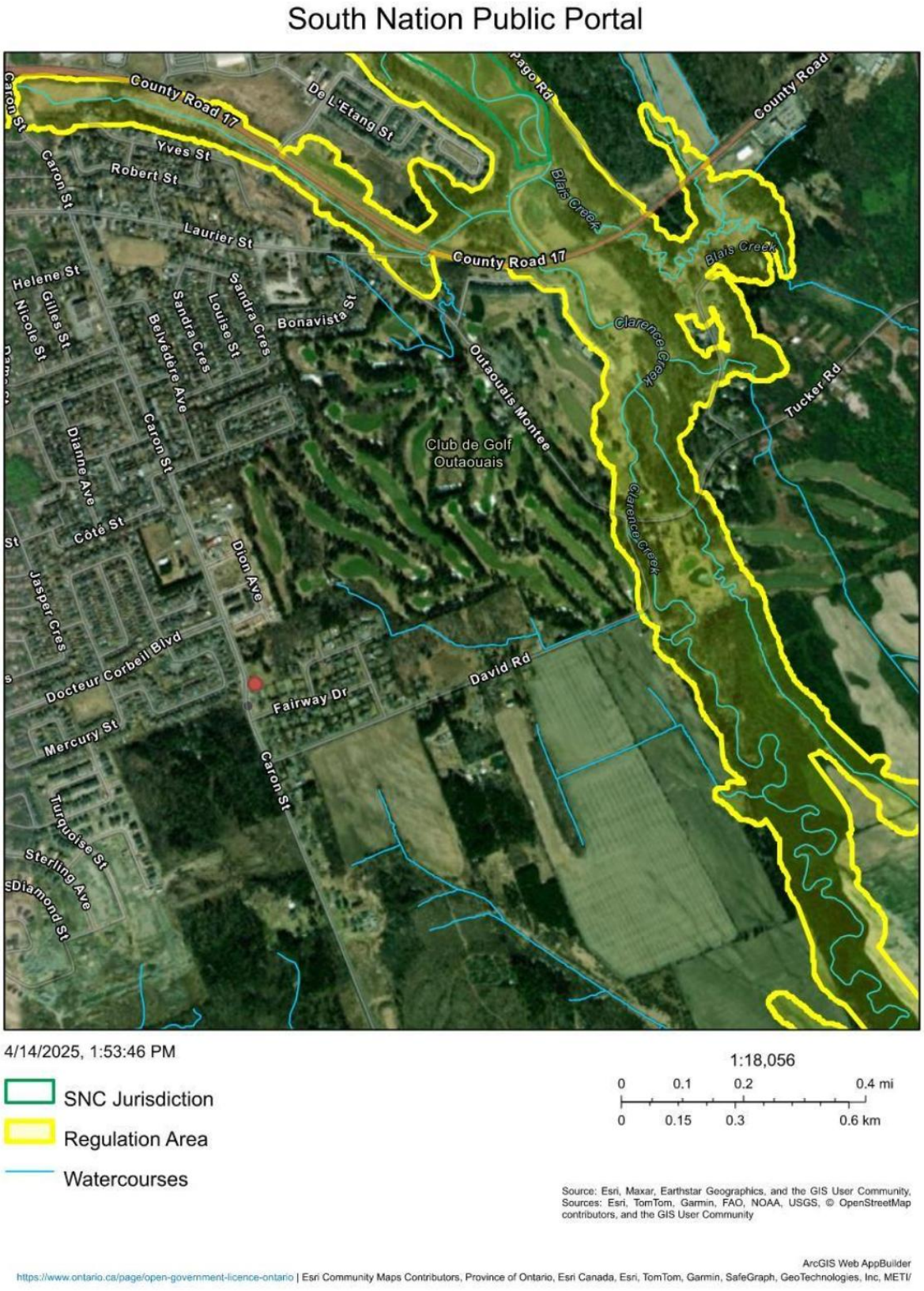
The Study Area is mostly surrounded by low and medium density residentials, a few high-density residentials and has a major open space to the North-East of the building.

Refer to Section 5.3.1.2 for more information on water quality and quantity related to the Clarence-Rockland Water Supply System.

5.3.2.3 Floodplain

According to the SNCA (2020), floodplains are low lying areas near watercourses that are naturally subject to flooding. As outlined in Geology Ontario Spatial Search (Geology Ontario n.d), the Caron BPS Study Area does not occur within the SNCA Regulated Area and Floodline Boundary. The regulatory floodline boundary relative to the Caron BPS Study Area is illustrated in Figure 5-5.

Figure 5-5. Regulatory Floodline Boundary Relative to the Caron BPS



5.3.2.4 Source Water Protection

The Study Area for the Caron BPS expansion is located within the Raisin-South Nation Source Protection Region. According to MECP Source Protection Information Atlas (MECP 2021), the Study Area is not located within a Wellhead Protection Area, Groundwater Recharge Area or IPZ but does encounter a highly vulnerable aquifer (score of 6).

The Study Area does not involve any of the defined significant threat policies described in the Raisin-South Nation Source Protection Plan (Raisin-South Nation Source Protection Region 2016).

5.3.2.5 Natural Heritage

A natural features desktop study was completed in May 2025 as part of this Class EA and identified features in the aquatic habitat, nearby wetlands, vegetation and vegetative communities, wildlife and wildlife habitat, SAR, and ANSI. This report available in Appendix A.

The study recommended field surveys commence during the growing season, beginning with breeding bird surveys after May 24, 2025. These additional surveys have been completed. The desktop study information was used in the evaluation of alternatives in phases 2 and 3 of the Class EA process. A NFIA report will be prepared as a conclusion to Phase 3 to provide an evaluation of direct and indirect impacts the project may have on natural features. The recommended surveys are required to identify impacts and mitigation measures in Technical Memorandum 3 and the ESR.

Natural heritage features within the natural heritage boundaries were investigated by referencing available mapping from SNC, NHIC, and DFO. Spatial datasets were also downloaded from LIO (MNR 2025a). According to online Make a Natural Heritage Map (MNRF 2025b), ANSIs and ESAs do not occur within the Study Areas or 120 m adjacent lands.

5.3.2.6 Atmospheric Environment

The atmospheric environment of the Caron BPS can be characterized using the Ottawa, ON, weather station data. The Canadian climate normals outlined on the Environment of Canada website from 1991 to 2020 for the region was used for analysis (Government of Canada 2025). This includes average seasonal temperatures for spring, summer, fall and winter of 5.9, 20.1, 8.8 and -7.6°C, respectively. Additionally, the average annual precipitation in the region is 938.1 mm.

5.3.2.7 Wetlands

A review of MNR's LIO datasets (MNR 2025a), SNC Mapping (SNC 2020) and online Make a Natural Heritage Map (MNR 2025b) indicated that one non-evaluated wetland occurs in the120 m adjacent lands of the Caron Booster Station. No other wetlands are present in the Study Area or 120 m adjacent lands.

Additionally, no PSWs were identified within the Study Areas based on MNR's LIO datasets (MNR 2025a), SNC Mapping (SNC 2020), and online Make a Natural Heritage Map (MNR 2025b).

5.3.2.8 Species at Risk

According to information from the Natural Heritage Information Centre, OBBA, DFO SAR Aquatic Mapping, and iNaturalist, the Study Area may provide suitable habitat for the following species at risk and rare and sensitive species:

- Bank Swallow (*Riparia riparia*)
- Barn Swallow (*Hirundo rustica*)
- Black Tern (*Chlidonias niger*)
- Bobolink (*Dolichonyx oryzivorus*)
- Canadian Warbler (*Cardellina canadensis*)
- Chimney Swift (*Chaetura pelagica*)
- Common Nighthawk (*Chordeiles minor*)
- Eastern Meadowlark (*Sturnella magna*)
- Eastern Wood-Pewee (*Contopus virens*)
- Golden-Winged Warbler (*Vermivora chrysoptera*)
- Grasshopper Sparrow (*Ammodramus savannarum*)
- Least Bittern (*Botaurus exilis*)
- Loggerhead Shrike (*Lanius ludovicianus*)
- Peregrine Falcon (*Falco peregrinus*)
- Red-Headed Woodpecker (*Melanerpes erythrocephal*us)
- Short-Eared Owl (*Asio flammeus*)
- Midland Painted Turtle (*Chrysemys picta marginata*)
- Snapping Turtle (*Chelydra serpentina*)
- American Eel (*Anguilla rostrata*)

More information on SAR can be found in Appendix A.

5.3.2.9 Wildlife and Significant Wildlife Habitats

Background data obtained for wildlife included an OBBA review, which provided information on avifauna occurrences within an area of 10 square kilometres. The 2nd atlas of the OBBA, which includes data collected from 2001 to 2005, was accessed on May 9, 2025. The Study Areas and 120 m adjacent lands occur within OBBA Square Summary 18VR74. iNaturalist online was also accessed.

The SWH Technical Guide (MNR 2000) was reviewed to determine whether SWH is present within the Caron Booster Station Study Area and 120m adjacent lands. No SWH were identified using NHIC data (MNR 2025b).

According to MNR mapping (MNR 2025a and 2025b), woodland areas occur throughout both the City of Clarence-Rockland WTP and Caron Booster Station and 120m adjacent lands, but no valleylands were present.

6. Future Water Demands

This section outlines the future water needs for the areas serviced by the Rockland WTP and Caron BPS to the planning horizon of 2046 and beyond.

6.1 Growth Projections

Population growth forecasting for the area serviced by the Rockland WTP and Caron BPS was initially completed in 2021 as part of the Clarence-Rockland WMP (Jacobs 2023) and updated in April 2025 (Jacobs 2025b) for the planning period of 2026 to 2046. This section defines the current understanding of the most recent serviced residential and commercial population projections and the resulting future water demand. The future water demand for the Rockland WTP and Caron BPS will be used as the basis for alternatives identification in Phase 2 of the Class EA Process, and ultimately the facility design basis.

6.1.1 Growth Assumptions

This section details assumptions used to develop the residential and employment growth scenario for the purposes of understanding future water demands from residents and businesses.

6.1.1.1 Residential

Residential growth over the planning horizon to 2046 will be used to understand the future water treatment and pumping capacity at the Rockland WTP and Caron BPS. The growth projections updated in April 2025 (Jacobs 2025b) used the following assumptions to project future water demand residential growth:

- An average of 154 residential units per year will be built within the urban area of Clarence-Rockland and 24 residential units per year will be built in the Villages between 2025 and 2031
- An average of 175 residential units per year will be built within the urban area of Clarence-Rockland and 27 residential units in Villages between 2032 and 2046
- An average of 2.59 people will reside in each unit, unless developer projections state otherwise,
- The residential per capita water demand is 0.28 m^3 per capita per day
- A maximum day residential peak factor of 1.5 times the average day demand

The Village of Limoges future employment growth projections were also refined in April 2025 (Jacobs 2025b). The following assumptions were used to project future water demand and employment growth for the Village of Limoges:

- A residential growth target of 150 units per year
- An average residential of 2.59 people per unit
- A residential per capita average day demand of 0.28 m^3 per person per day
- A maximum day residential peak factor of 1.8 times the average day demand

6.1.1.2 Employment

Economic and employment growth over the planning horizon to 2046 will be used, in combination with the projected residential growth, to understand the future water treatment and pumping capacity at the Rockland WTP and Caron BPS. The following assumptions to project future water demand employment growth for Rockland and the Villages in the April 2025 refinements (Jacobs 2025b):

- An average of 3,366 m^2 of employment growth floor space per year will be built within Clarence-Rockland between 2025 and 2046
- An average of 213 m^2 of employment growth floor space per year will be built within the Villages between 2025 and 2046
- An average employment floor area per worker of 50 m^2
- An average employment growth of:
  - 67 employees per year for Clarence-Rockland urban area
  - 4 employees per year for the Villages
- A per capita average day water demand of 0.18 m^3 per person per day
- A maximum day employment peak factor of 1.8 times the average day demand
- A school water demand of 0.09 m^3 per student per day
- A floor to gross area employment ratio of 30.8 percent floor area (ha) per gross area (ha)

The Village of Limoges future employment growth projections were refined in April 2025 (Jacobs 2025b). The following assumptions were used to project future water demand and employment growth for the Village of Limoges:

- An average employment growth target of 2 hectares per year
- An average day employment demand parameter of 10 m^3 per hectare per day
- A maximum day employment peak factor of 1.5 times the average day demand
- An average day employment demand parameter of 10 m^3 per hectare per day
- A maximum day employment peak factor of 1.5 times the average day demand

6.1.2 Future Population and Water Use

The projections provided in Table 6-1 are used in the April 2026 growth refinements (Jacobs 2025b) for water use projections for Clarence-Rockland and added to the existing water demands. The water use projections for each scenario were calculated by considering the residential and employment population for each individual development area and multiplying the sum of that population by the assumed per capita water use outlined in Section 6.1.1.1 and 6.1.1.2. As shown in Table 6-1, there is a significant increase in residential and employment population throughout the Study period resulting in the increased average day water use.

Table 6-1. Future Population and Water Use Projections

Location	Total Future Population		Total Future Employees		Total Future Maximum Day Water Use (m^3/d)	
	2046	Ultimate	2046	Ultimate	2046	Ultimate
CR-Rockland	9,976	37,076	1,495	4,902	5,512	20,275
CR-Villages	1,799	2,325	254	318	989	1,274
CR-Subtotal	11,775	39,401	1,749	5,220	6,501	21,549
Limoges	12,240	21,698	2,715	3,085	5,116	10,364
Neighbouring Communities	8,798	8,902	1,235	1,397	4,784	4,984
Total Without Neighbouring Communities	24,015	61,099	4,464	8,305	11,617	31,913
Total With Neighbouring Communities	32,813	70,001	5,699	9,702	16,401	36,897

Note:

Values are based on those available in neighbouring municipality master plans (Jacobs 2025b).

The Rockland WTP does not currently supply water to neighbouring communities (other than Limoges). The population and water use projections for neighbouring communities are presented with the purpose of defining the opportunity to supply water to additional neighbouring communities. If the municipality continues to service only the current areas and not expand their agreements to include neighbouring communities, the total future maximum day water use would be 11,617 m^3/d in 2026 and 34,678 m^3/d for ultimate. If the municipality expands their agreement to include neighbouring communities, the total future maximum day water use would be 18,418 m^3/d for 2046 and 41,763 m^3/d for ultimate.

6.2 WTP Capacity Needs

This section describes the future capacity needs at the Rockland WTP and the Caron BPS in 2032 and 2046 based on the condition of the assets and future water demands defined in Section 6.

6.2.1 Condition-Based

The Rockland WTP has a rated capacity of 13.5 ML/d. The Clarence-Rockland WMP (Jacobs 2023) included a desktop-based capacity assessment of the main treatment process to characterize the current treatment capacity. The capacity assessment reviewed and extracted information from existing documentation such as DWWPs, engineer reports, previous design reports, treated water quality data, logged SCADA operational data, operations manuals, process control narratives, and discussions with Operation staff. The review of capacity information from existing documents was supplemented with engineering calculations to determine process capacities where published process capacities were not available. The assessment confirmed that the individual treatment processes can achieve the stated rated capacity and identified bottlenecks within the processes.

The key findings from the desktop capacity assessment at the Rockland WTP include:

- **Treatment**: The ActiFlo® units and media filtration processes have sufficient capacity to meet the rated capacity of 13.5 ML/d. There is an opportunity for process optimization to improve the settled water turbidity and filter effluent performance.
- **Primary Disinfection and Secondary Reservoir:** The primary disinfection is currently able to meet the requirements at the full plant rated capacity of 13.5 ML/d due to the UV system achieving a minimum of 2.0 log reduction of Giardia and Cryptosporidium. Based on the CCT, the primary disinfection and Secondary reservoir do not have adequate capacity to achieve 0.5-log reduction of Giardia at the rated 13.5 ML/d capacity alone. This was determined using the U.S. EPA contact time calculation method under the worst-case conditions at the lowest temperature (0.5°C). Therefore, there is opportunity to improve disinfection.
- **Chemical Metering and Storage:** The chemical metering pump and storage systems have sufficient capacity to meet the rated 13.5 ML/d capacity, both the bulk liquid and dry (prepared in batch) treatment chemicals.

The following provides the recommendations based on the results of the capacity assessment as outlined in the Clarence-Rockland WMP (Jacobs 2023):

- **UV Disinfection:** The UV disinfection system is currently used as a redundant disinfection system when the chlorination system is offline. It is recommended that the City evaluate the continuous use of UV for primary disinfection during the lowest temperature scenario where there may not be adequate chlorine contact time.
- **Filtration Operation:** There is an opportunity to optimize filter operation based on the estimated unit filter run volume information. A more detailed analysis of filter run times is recommended to fully characterize the filter performance, which requires the actual filtration time, and the amount of water filtered per backwash cycle.
- **ActiFlo and Filtration Optimization:** Intermittent high turbidity spikes were observed in the ActiFlo and filtration process data when the maximum daily turbidity was much higher than the regulated turbidity limit of 0.3 NTU. It is recommended that actual turbidity is recorded every 15 minutes to determine the validity of this data. This will help to determine if it is linked to a specific event or related to a process upset.
- **Performance Capacity of ActiFlo and Media Filters:** Field testing is recommended to better characterize performance capacity of the ActiFlo and media filter during extended periods of high flows.
- **Raw Water Characterization:** It is recommended that the City sample the raw water on a minimum of a monthly basis to assess future treatment efficacy.

6.2.2 Capacity Based

As part of the WMP Update, TM-2 Future Growth Assumptions and Water Use Estimates (Jacobs 2025b) identified infrastructure upgrades to meet the projected future demands for the Rockland WTP. Based on the current servicing area, the following phased infrastructure upgrades are recommended:

- **Rockland WTP Phase 1 expansion without Neighbouring Communities:** meets the 2046 maximum day demand (20.6 ML/d) with a capacity expansion of 13.5 ML/d, bringing the total capacity to 27.0 ML/d.
- **Rockland WTP Phase 2 expansion without Neighbouring Communities:** meets the ultimate maximum day demand (43.6 ML/d) with a capacity expansion of 20.0 ML/d beyond Phase 1, bringing the total capacity to 47.0 ML/d.

If Clarence-Rockland expands their agreement to include other neighbouring communities, the following phased infrastructure upgrades are recommended for the WTP:

- **Rockland WTP Phase 1 expansion with Neighbouring Communities:** meets the 2046 maximum day demand (27.4 ML/d) with a capacity expansion of 20.5 ML/d, bringing the total capacity to 34.0 ML/d.
- **Rockland WTP Phase 2 expansion with Neighbouring Communities:** meets the ultimate maximum day demand (50.7 ML/d) with a capacity expansion of 20.0 ML/d beyond Phase 1, bringing the total capacity to 54.0 ML/d.

Infrastructure upgrades are likely required for the intake at the Rockland WTP for both WTP expansion alternatives as both alternatives will significantly increase the raw water flow through the intake. The upgrades are recommended to supply sufficient raw water the WTP while meeting current regulatory requirements.

6.3 Caron BPS Capacity Needs

As part of the WMP Update, TM-2 Future Growth Assumptions and Water Use Estimates (Jacobs 2025b) identified future demands for the Caron BPS. Based on the current servicing area, the following phased infrastructure upgrades are recommended:

- **Caron BPS Phase 1 expansion without Neighbouring Communities:** meets the 2046 maximum day demand (9.6 ML/d) with a capacity expansion of 7.0 ML/d, bringing the total capacity to 11.0 ML/d.
- **Caron BPS Phase 2 expansion without Neighbouring Communities:** meets the ultimate maximum day demand (17.8 ML/d) with a capacity expansion of 7 ML/d beyond Phase 1, bringing the total capacity to 18.0 ML/d.

If Clarence-Rockland expands their agreement to include other neighbouring communities, the following phased infrastructure upgrades are recommended for the Caron BPS:

- **Caron BPS Phase 1 expansion with Neighbouring Communities:** meets the 2046 maximum day demand (16.4 ML/d) with a capacity expansion of 13.0 ML/d, bringing the total capacity to 17.0 ML/d.
- **Caron BPS Phase 2 expansion with Neighbouring Communities:** meets the ultimate maximum day demand (25.0 ML/d) with a capacity expansion of 8.0 ML/d beyond Phase 1, bringing the total capacity to 25.0 ML/d.

These phased expansions include adding a new transmission main from the Caron BPS to the Bouvier ET. The installation of that transmission main is currently under construction.

6.4 Summary of Future Needs

The Clarence-Rockland WMP (Jacobs 2023) recommended phased infrastructure upgrades for the WTP expansion. When not considering other neighbouring communities, this includes meeting the 2046 maximum day demand with an additional 13.5 ML/d capacity expansion in Phase 1 and meeting the ultimate maximum day demand with an additional 20.0 ML/d capacity expansion in Phase 2. When considering neighbouring communities, this includes an additional 20.5 ML/d capacity expansion in Phase 1 and 20.0 ML/d capacity expansion in Phase 2. Infrastructure upgrades are likely required for the intake at the Rockland WTP for both WTP expansion alternatives as they will significantly increase the raw water flow through the intake.

The Caron BPS was also recommended to be expanded to achieve a capacity of 11.0 ML/d during Phase 1 and 18.0 ML/d during Phase 2 to meet the future demand for water conveyance when not considering

neighbouring communities. When considering neighbouring communities, it was recommended to expand the BPS to achieve a capacity of 17.0 ML/d during Phase 1 and 25.0 ML/d during Phase 2.

The future water demands summarized in Table 6-1 define the additional treatment capacity required to meet the needs of the growing community. To meet future needs over the planning horizon to 2046 and beyond, the following process upgrades to the Rockland WTP are necessary:

- **Disinfection:** The UV disinfection system is used as a redundant disinfection system for when the CCT is offline for maintenance or repairs and the City is to evaluate the continuous use of UV for primary disinfection during low temperatures where there may not be adequate chlorine contact.
- **Filtration:** Perform a more detailed analysis of filter run times to fully characterize the filter performance and determine opportunities for process optimization such as backwash time, flowrate, and media depths.
- **ActiFlo and Media Filters:** Performance capacity during extended periods of high flows can be optimized through field testing.

7. Problem and Opportunity Statement

The City of Clarence-Rockland is rapidly growing, resulting in a significant increase in water demand and the requirement for additional water supply and capacity. The current Rockland WTP and Caron BPS do not have the capacity to meet these needs.

The Schedule C EA Study represents an opportunity to evaluate alternatives for the Rockland WTP and Caron BPS that will provide for current and future water demand of the Clarence-Rockland Water Supply System. There are opportunities to evaluate alternatives capable of supplying more water to the Nation (Limoges) and expanding the service area to include other neighbouring communities. This additional water provides an opportunity for the municipalities to expand development within their communities, enabling them to build housing and businesses. During the expansion of the facilities, there is also the opportunity to address condition-based needs through asset renewal. There is also the opportunity to implement the expansion of the Rockland WTP in phases.

8. Alternatives Development and Evaluation Methodology

This section outlines the alternatives identified to develop a comprehensive preferred solution to address the Problem and Opportunity Statement identified for this Schedule C EA. This section includes alternatives identification and the detailed evaluation of alternatives completed in accordance with the Municipal Engineers Association Phase 2 decision-making process for Municipal Class EAs (MEA 2024). This section presents the methodology for alternatives identification and detailed evaluation of alternatives for this Class EA.

8.1 Alternatives Identification

A long list of alternative solutions was developed and screened as part of the 2021 WMP (Jacobs 2021). This eliminated alternatives that were not feasible for the Rockland WTP and Caron BPS from consideration. The shortlisted alternatives are evaluated in detail in the following sections.

To identify a comprehensive solution to address the project Problem and Opportunity Statement in Section 7 the alternatives will be identified for both the Rockland WTP and Caron BPS as follows:

- **Rockland WTP –** relating to the expansion of the treatment process as presented in the water demand projections in Section 6
- **Caron BPS –** relating to the expansion of the BPS water conveyance capacity presented in the water demand projections in Section 6

Three water treatment and conveyance alternatives were identified for the Rockland WTP and Caron BPS. Table 8-1 outlines the alternatives identified.

Table 8-1. List of Alternatives for the Rockland WTP and Caron BPS

Alternative	Rockland WTP	Caron BPS
Alternative 1	**Do Nothing:** Continue maintaining and rehabilitating the existing WTP using existing intake.	**Do Nothing:** Continue maintaining and rehabilitating the existing BPS.
Alternative 2	**High-Rate Conventional Filtration:** Expand the facility using the same process flow and trains of similar size.	**Single-Zone:** Expand the facility using one set of pumps and pressure reducing valves to supply Pressure Zone 2 and 3, respectively.
Alternative 3	**Membrane Filtration:** Expand the facility using coagulation, flocculation, and membrane filtration.	**Dual-Zone:** Expand the facility using two sets of pumps with one set supplying each pressure zone.

8.2 Evaluation Methodology

A multi-objective decision-making framework was developed to identify the preferred alternative for the Rockland WTP and Caron BPS. This methodology is consistent with Phase 2 of the MEA process for MCEAs (MEA 2024).

This methodology allows for a comparative assessment of each set of alternative solutions. A unique set of evaluation criteria reflecting four overarching categories of environment will be established for evaluating alternatives identified for the Rockland WTP and Caron BPS.

Criteria are identified in the following four broad categories:

- Natural Environment
- Sociocultural Environment
- Technical Environment
- Economic Environment

A performance scale is defined for each criterion including a criterion definition and a performance scale defining how the score for each criterion will be applied to each identified alternative. A rationale is provided to explain the assigned score for each criterion by alternative. The performance scale used for this evaluation is generally defined as follows:

- 0 represents the lowest score
- 5 represents the moderate score
- 10 represents the highest score

Each category was given an equal weighting of 25 percent so that the number of criteria within the category does not bias the overall scores for the alternatives. After scoring the alternatives, sensitivity analyses were completed by giving each category a higher weighting to determine the impact of certain categories on the selection of the preferred solutions. If the sensitivity analysis does not change the ranking of the alternatives the scoring exercise is considered well balanced and unlikely to be influenced by a single factor. The category weightings for the alternatives evaluation and the sensitivity analyses are presented in Table 8-2.

Table 8-2. Category Weighting for Alternatives Evaluation and Sensitivity Analyses

Category	Evaluation (%)	Sensitivity Analysis 1 (for Natural Environment) (%)	Sensitivity Analysis 2 (for Social/Cultural Environment) (%)	Sensitivity Analysis 3 (for Technical Environment) (%)	Sensitivity Analysis 4 (for Economic Environment) (%)
Natural Environment	25	40	20	20	20
Social/Cultural Environment	25	20	40	20	20
Technical Environment	25	20	20	40	20
Economic Environment	25	20	20	20	40

8.3 Cost Estimation Methodology

This section presents the cost estimating methodology that was used to develop capital costs and O&M costs for each alternative. The capital and O&M costs were used to compare and evaluate the relative costs of the alternatives.

8.3.1 Capital Cost Estimation Basis

Capital costs for the alternative expansions are developed using Jacobs' RPD, which uses a database of actual project data, typical design values, and quantity take-offs to develop relative conceptual cost estimates. For comparison purposes, unit process modules within RPD are based on actual equipment and installation costs from Jacobs' projects supplemented by Means and Richardson's cost data. The construction capital costs developed using RPD are approximately +50%/-30%. Further to this, we have included typical construction costs which include the following mark-ups and adjustment factors:

- 15% contractor overhead, profit, mobilization, demobilization, insurance and bonding
- 30% contingency
- 15% design and engineering fees
- 10% design pricing contingency and location/market adjustment factor

8.3.2 Operations and Maintenance Cost Basis

The yearly O&M requirements and associated costs for the alternative expansions are based on the operational and maintenance unit costs currently employed at the Rockland WTP and Caron BPS (where applicable). It considers the yearly cost of chemical consumption, electricity consumption, labour, and annual equipment maintenance. Unit chemical costs are based on bulk costs provided by the OCWA and current consumption for the unit processes from Jacobs' RPD tool.

9. Development and Evaluation of Rockland Water Treatment Alternatives

This section outlines the development and evaluation of alternatives for the Rockland WTP.

9.1 Rockland WTP Water Supply Alternatives

Water treatment alternatives were developed to address the overall water treatment strategy as reflected in the Problem and Opportunity Statement in Section 7, and to meet the future water demand projections related to the service areas presented in Section 6. The alternative solutions were compared against the "Do Nothing" baseline alternative (continue maintaining and rehabilitating the existing Rockland WTP).

9.1.1 Rockland WTP Alternative 1: Do Nothing

The evaluation of a "Do Nothing" alternative is required under the MEA MCEA process. The purpose of this alternative is to define a baseline alternative where the Problem and Opportunity Statement is not addressed.

For the purposes of this Schedule C Class EA, the "Do Nothing" alternative is defined as maintaining the existing facility without expanding the treatment processes. Under this alternative, the existing Rockland WTP will continue to be maintained and rehabilitated based on the state of assets in the Clarence-Rockland WMP (Jacobs 2021) and TM1 – Existing WTP Scoping Study (Jacobs 2025a). This would include undergoing process optimization and state of good repair maintenance. High priority items include process mechanical and instrumentation and controls upgrades. The key components of this alternative are summarized as follows:

- Upgrade and modernize the chemical dosing system to a self-contained variable speed dosing pump
- Replace and upgrade the PLC systems with modern technology
- Major architectural refurbishment of the "original" portion of the main Rockland WTP building

This alternative results in limited development opportunities in Clarence-Rockland and no development in Limoges. This alternative also does not provide the opportunity to service other neighbouring communities.

9.1.2 Rockland WTP Alternative 2: High-Rate Conventional Filtration

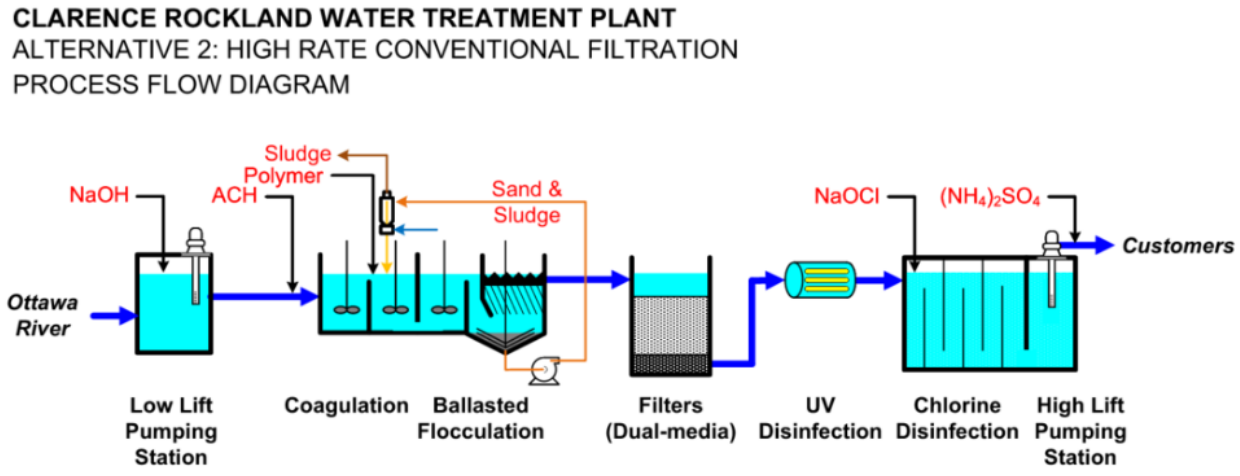
Rockland WTP Alternative 2 expands the treatment capacity using high-rate conventional filtration. High-rate conventional filtration is used to remove particulate matter and coagulated organics from raw water at higher flow rates than traditional rapid sand filters. A multi-media filter bed would be comprised of sand and anthracite coal. This alternative includes a range of pretreatment process technologies including dissolved air flotation (DAF), plate settlers, and ActiFlo ballasted flocculation. These technologies are suitable for the raw water present at the Rockland WTP which is characterized as having moderate organics and low turbidity.

For the purposes of this evaluation, this alternative is defined as using ActiFlo ballasted flocculation and filtration. ActiFlo ballasted flocculation is the pretreatment process currently used at the Rockland WTP for coagulation, flocculation and sedimentation followed by dual-media conventional filters. Managing multiple treatment trains using the same technology would be the simplest from an operation and

maintenance perspective as operations staff are familiar with the technology. While the sand recycle system may be complex, it is relatively straight forward in comparison to other proposed technologies.

The process flow block diagram for this alternative is illustrated in Figure 9-1. This alternative includes expanding the facility using the same process flow and trains of similar size, which has the advantage of reusing existing equipment, similar chemical usage, and waste characteristics.

Figure 9-1. High-rate Conventional Filtration Process Block Flow Diagram



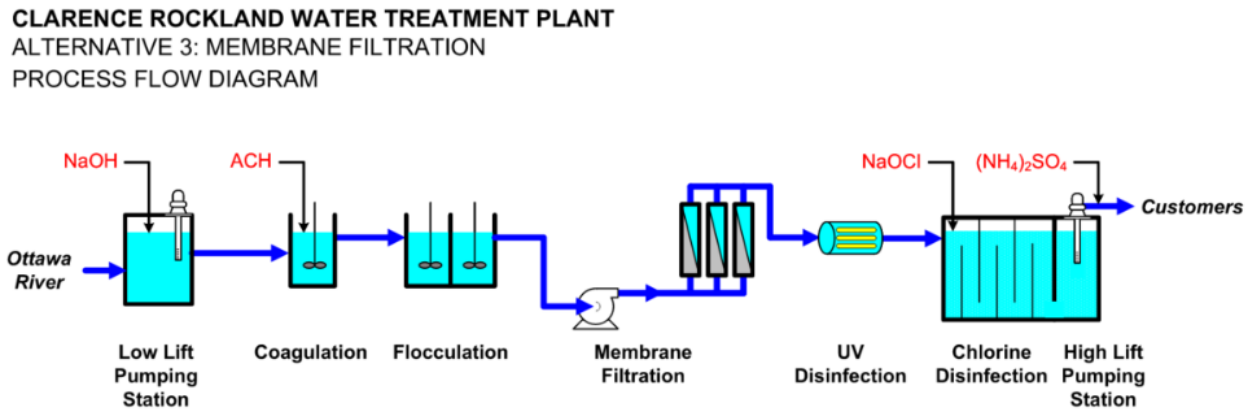
9.1.3 Rockland WTP Alternative 3: Membrane Filtration

Rockland WTP Alternative 3 expands the treatment capacity using membrane filtration. Membrane filtration is used to physically remove particulate matter and coagulated organics from raw water. Unlike gravity filters, the membrane filtration process operates under pressure (or vacuum) and is based on a size exclusion theory as opposed to depth filtration. This technology has been demonstrated at other full-scale installations for similar raw water characteristics and is considered a proven technology for this application. The technology is not cost prohibitive and provides water quality objectives that would exceed the Ontario Drinking Water Standards (O. Reg. 169/03) (Government of Canada 2020) and facilitate particle and microbial removal, regardless of feedwater quality.

While this process simplifies the overall treatment train through eliminating the settling process, the membrane filtration process is significantly more complex than the technologies proposed in Rockland WTP Alternative 2. There is a significant increase in the required mechanical components, chemical systems associated with chemical cleaning, and other ancillary equipment. Membrane filters are prone to membrane fouling and have increased contaminants which results in the production of high sludge volumes, requiring more complex residual management strategies. This technology requires additional skillsets to operate and maintain compared to the existing processes at the facility.

The process flow block diagram for this alternative is illustrated in Figure 9-2. This alternative would include a mix of process technologies including coagulation and flocculation processes upstream of membrane filtration.

Figure 9-2. Membrane Filtration Process Block Flow Diagram



9.2 Evaluation of Rockland WTP Alternatives

The following section outlines the evaluation of the Rockland WTP alternatives. This includes the evaluation criteria, evaluation of alternatives, and the preliminary preferred alternative.

9.2.1 Evaluation Criteria

Each alternative identified for the Rockland WTP was evaluated using the methodology presented in Section 8. The evaluation criteria for the alternatives and their scoring measures are presented in Table 9-1.

Table 9-1. Rockland WTP Alternatives Evaluation Criteria and Scoring Measures

Category	Criterion	Description	High	Medium	Low
Natural Environment	Impacts to surface water quality	The potential for the alternative to have a negative impact on surface water quality (focus is WTP residuals discharge), that would result in harm to the aquatic environment.	The alternative will have no substantial impact on surface water quality that may impact aquatic environments.	The alternative has some potential to change surface water quality that may negatively impact aquatic habitats.	The alternative has a high potential to change surface water quality that may negatively impact aquatic habitats.
	Impacts to surface water quantity	The potential for the alternative to have an impact on surface water quantity that would result in negative impacts to other users and/or the aquatic environment.	The alternative will have no substantial impact on surface water quantity that would result in negative impacts to other users and/or the aquatic environment.	The alternative will have some potential impact on surface water quantity that would result in negative impacts to other users and/or the aquatic environment.	The alternative will have a high potential impact on surface water quantity that would result in negative impacts to other users and/or the aquatic environment.
	Impacts on terrestrial environment	The potential for the alternative to have a long-term negative impact on the viability of terrestrial habitats in terms of density and diversity of species.	This alternative avoids terrestrial habitat.	This alternative requires special measures to protect terrestrial habitat.	This alternative results in an unacceptable loss of habitat.
	Impacts on aquatic environment	The potential for the alternative to have a long-term negative impact on the viability of aquatic habitats in terms of density and diversity of species.	The alternative will protect aquatic habitats and fisheries and has the potential to provide enhancements.	The alternative may require special measures to protect aquatic habitats and fisheries.	The alternative will result in an unacceptable loss of aquatic habitat and fisheries.
	Impacts on Climate Change	The potential for the alternative to mitigate climate change.	The alternative has the potential to significantly mitigate climate change.	The alternative has the potential to moderately mitigate climate change.	The alternative has minimal potential to mitigate climate change.
	Maximize Climate Change Adaptation	The potential to provide climate adaptation and resiliency benefits.	The alternative has significant adaptation and resiliency benefits.	The alternative has moderate adaptation and resiliency benefits.	The alternative has minimal adaptation and resiliency benefits.
	Impacts to fluvial geomorphic stability	The potential of the alternative to impact the geomorphic stability of the watercourse (based on stream crossings).	The alternative will have no substantial impact on the fluvial geomorphic stability of the watercourse.	The alternative will somewhat reduce the fluvial geomorphic stability of the watercourse.	The alternative will substantially reduce the fluvial geomorphic stability of the watercourse.
	Minimize the Impact to the Local Hydrogeology and Groundwater System	The alternative's potential to induce water table impacts, hydrogeological settling, and surface and groundwater quality degradation.	The alternative will result in minimal impacts to the hydrogeology environment and groundwater system.	The alternative will result in moderate impacts to the hydrogeology environment and groundwater system.	The alternative will result in significant impacts to the hydrogeology environment and groundwater system.
	Minimize Impacts to Air Quality	The alternative's potential to negatively impact air quality.	The alternative will result in minimal impacts to air quality.	The alternative will result in moderate impacts to air quality.	The alternative will result in significant impacts to air quality.
	Minimize Impacts to Wetlands	The alternative's potential to negatively impact wetland environments.	This alternative will avoid wetlands.	The alternative may require special measures to maintain wetland protection.	The alternative will result in an unacceptable threat to wetlands.

Category	Criterion	Description	High	Medium	Low
Social/Cultural	Occupational Health and Safety	The potential of the alternative to minimize risk or liability regarding occupational health and safety for construction period and ongoing operation and maintenance.	The alternative poses very little risk to occupational health and safety.	The alternative poses moderate risk to occupational health and safety; construction and O&M safety measures may be required to address specific health and safety concerns.	The alternative poses high risk to occupational health and safety; personal injury may be expected; construction and O&M safety measures will be required to address a number of health and safety concerns.
	Minimize Community Health and Safety Risks	The alternative's potential to induce negative effects on the existing community's health and safety.	The alternative will not present any health and safety risks to the community.	The alternative will present some health and safety risks to the community.	The alternative will present significant health and safety risks to the community.
	Minimize Noise	The alternative's potential to generate noise and its' proximity to sensitive receptors.	The alternative is unlikely to generate noise.	The alternative generates some level of noise that can be mitigated.	The alternative generates a high level of noise that requires a high level of mitigation and is close to sensitive receptors.
	Archaeological Impacts	Minimize impact of archaeological resources or areas of archaeological potential.	This alternative protects features of archaeological potential.	This alternative results in no change to archaeological resources.	This alternative has the potential to disturb archaeological resources.
	Built Heritage Resources and Cultural Heritage Landscapes	The degree of impact that the alternative has on areas with documented built heritage resources and cultural heritage landscapes.	This alternative protects features of built heritage resources and cultural heritage landscapes.	This alternative results in no change to built heritage resources and cultural heritage landscapes.	This alternative has the potential to disturb built heritage resources and cultural heritage landscapes.
	Maximize the Opportunity for Economic Development	Alternatives potential to provide the necessary infrastructure to enable housing development.	The alternative allows for planned housing development and can accommodate future housing or service area expansion.	The alternative allows for planned housing development.	The alternative allows no further opportunity for housing development.
	First Nations and Indigenous Community Cultural Heritage Impacts	The degree of impact that the alternative has on cultural heritage resources recognized by First Nations.	This alternative protects features of cultural heritage resources recognized by First Nations and Indigenous communities.	This alternative results in no change to cultural heritage resources recognized by First Nations and Indigenous communities.	This alternative has the potential to disturb cultural heritage resources recognized by First Nations and Indigenous communities.
	Public land Use Impacts (parks, open spaces)	The ability of the alternative to maintain or enhance character of the public lands in the community.	The Alternative will enhance the character of the public lands in the area.	The Alternative will maintain the character of the public lands in the area.	The Alternative will decrease the character of the public lands in the area.
	Private Lands Impacts	Impact of the alternative on private lands (Industrial, Commercial, Institutional, including farm operations) in regard to short-term disturbance or long-term use including easements.	The Alternative will have no impact on private lands in regard to short-term disturbance or long-term use.	The Alternative will have a moderate impact on private lands in regard to short-term disturbance or long-term use. Impacts can be mitigated.	The Alternative will have a significant impact on private lands in regard to short-term disturbance or long-term use. Impacts cannot be mitigated.
	Public Acceptability	The level of public acceptability for the alternative based on public consultation results.	The alternative may exceed the public's expectation technically and be accepted by the public.	The alternative may be acceptable to the public as it continues to provide treated water in compliance.	The alternative may not be accepted by the public.
	Disruption during Construction	The potential for the alternative to temporarily disrupt local traffic and or use of the area by the public during construction including noise and traffic.	The alternative will not result in disruption to traffic during construction.	The alternative will result in some disruption to traffic and use of the area by the public during construction.	The alternative will result in significant disruption to traffic and use of the area by the public construction.

Category	Criterion	Description	High	Medium	Low
Technical	Adaptability	The ability of the alternative to adapt to increasing water demands beyond the planning horizon.	The alternative is able to adapt to significant increases in water demands beyond the planning horizon.	The alternative is able to adapt to moderate increases in water demands beyond the planning horizon.	The alternative is not able to adapt to increases in water demands beyond the planning horizon.
	Ease of Approvals and Permitting	The relative difficulty in acquiring the necessary approvals/permits for the alternative from regulatory agencies and other jurisdictions.	Acquiring the permits for this alternative is relatively simple.	Acquiring the permits for this alternative is moderately difficult.	Acquiring the permits for this alternative is difficult.
	Ability for Phased Implementation	The ability of the alternative to increase treatment capacity in phases.	Increased capacity can be implemented in phases with limited new infrastructure/equipment and minimal interruption to water production.	Increased capacity can be implemented in phases with moderate addition of new infrastructure/equipment and some interruption to water production.	Increased capacity cannot be implemented in phases or require significant addition of new infrastructure/equipment and/or substantial interruption to water production.
	Improvement to Water Conveyance	The ability of the alternative to convey demand flows and improves the capacity of the conveyance system.	The alternative substantially improves water demand transmission and capacity.	The alternative achieves some improvement in water demand transmission and capacity.	The alternative provides limited, if any, improvement in water demand transmission and capacity.
	Constructability	The ability of the alternative to be implemented without significant complications, including disruptions to existing service.	The alternative can be implemented with no disruption to existing service.	The implementation of the alternative may result in minor disruptions to existing service.	The implementation of the alternative may require significant or periodic disruptions to the existing service.
	Ease of Implementation	The ability of the alternative to be constructed and implemented on a technical and practical basis; within a reasonable scope of work.	The alternative is easy to implement with limited constructability issues, reasonable construction work scope.	The alternative can be implemented with some difficult constructability issue or some constraints, or moderate scope of construction work.	The alternative has many challenges with respect to implementation and construction, or complex and large work scope.
	Energy Requirements	The resources and fuel the alternative requires in order to function, including electrical, gas, oil, water, etc.	This alternative has lower energy requirements.	This alternative maintains existing energy requirements.	This alternative has higher energy requirements.
	Chemical Requirements	The chemical requirements the alternative requires for adequate treatment performance.	This alternative has lower chemical requirements.	This alternative maintains existing chemical requirements.	This alternative has higher chemical requirements.
	Operational and Maintenance Complexity	The degree of complexity associated with operating and maintaining the alternative.	The alternative is simple to operate and easy to maintain.	The alternative is moderately difficult to operate, requires extensive and continuous operator training, the maintenance is somewhat difficult and requires higher skills.	The alternative is complex to operate and requires frequent/complex maintenance.
	Risk/Reliability	The level of risk associated with the alternative relating to probability of failure, water supply and regulatory compliance.	There are limited to no risks associated with the alternative.	There is a moderate level of risk associated with the alternative.	There is a high level of risk associated with the alternative.
	Impacts on Treated Water Quality	Capability of an alternative to meet more stringent water quality regulatory requirements in the future.	The alternative produces treated water superior in water quality to the existing WTP.	The alternative produces treated water superior in water quality to the existing WTP.	The alternative produces treated water with a similar water quality to the existing WTP.
Economic	Capital Cost	The capital cost of the alternative.	The alternative's capital costs are low relative to other alternatives.	The alternative's capital costs are moderate relative to other alternatives.	The capital costs are high relative to other alternatives.

9.2.2 Evaluation of Rockland WTP Alternatives

The evaluation results for the Rockland WTP alternatives are presented in Table 9-2. Detailed scoring and rationales of the evaluation for each category are presented in Appendix A.

Table 9-2. Evaluation Results for Rockland WTP Alternatives

Category	Rockland WTP Alternative 1: Do Nothing	Rockland WTP Alternative 2: High-Rate Conventional Filtration	Rockland WTP Alternative 3: Membrane Filtration
Natural Environment	20.0	15.0	15.0
Social/Cultural Environment	15.9	20.5	19.3
Technical Environment	8.8	21.3	11.3
Economic Environment	Lowest Capital and O&M Cost	Medium Capital and O&M Cost	Highest Capital and O&M Cost
Total	**44.7**	**56.7**	**45.6**
Sensitivity Analysis - 1	**51.7**	**57.4**	**48.5**
Sensitivity Analysis - 2	**48.5**	**61.7**	**51.9**
Sensitivity Analysis - 3	**42.7**	**62.4**	**45.5**
Sensitivity Analysis - 4	**35.7**	**45.4**	**36.5**

Although Alternative 1 provides the lowest cost, the alternative did not pass the technical evaluation as it does not address the problem identified in Phase 1 of the MCEA process. Therefore, Alternative 1 was not considered for the preferred alternative.

9.2.3 Preferred Rockland WTP Alternative

The preferred alternative for the Rockland WTP is Alternative 2: High-rate conventional filtration. It was the highest scoring alternative for the evaluation (including all four sensitivity analyses) and has a lower cost than Alternative 3. The advantages of the alternative include the following:

- The expanded Rockland WTP will serve the current servicing area of Clarence-Rockland and Limoges and provides the opportunity to service other neighbouring communities.
- The alternative involves expanding the facility using the same process flow and trains of similar size, therefore simplifying the integration into the existing treatment process (for example, same backwash pumps and blowers can be used).
- This alternative can be implemented in phases and includes provisions for future expansions.
- Operation and maintenance of the expanded facility will be relatively simple as the operations staff at the facility are familiar with the equipment.

10. Development and Evaluation of Caron BPS Alternatives

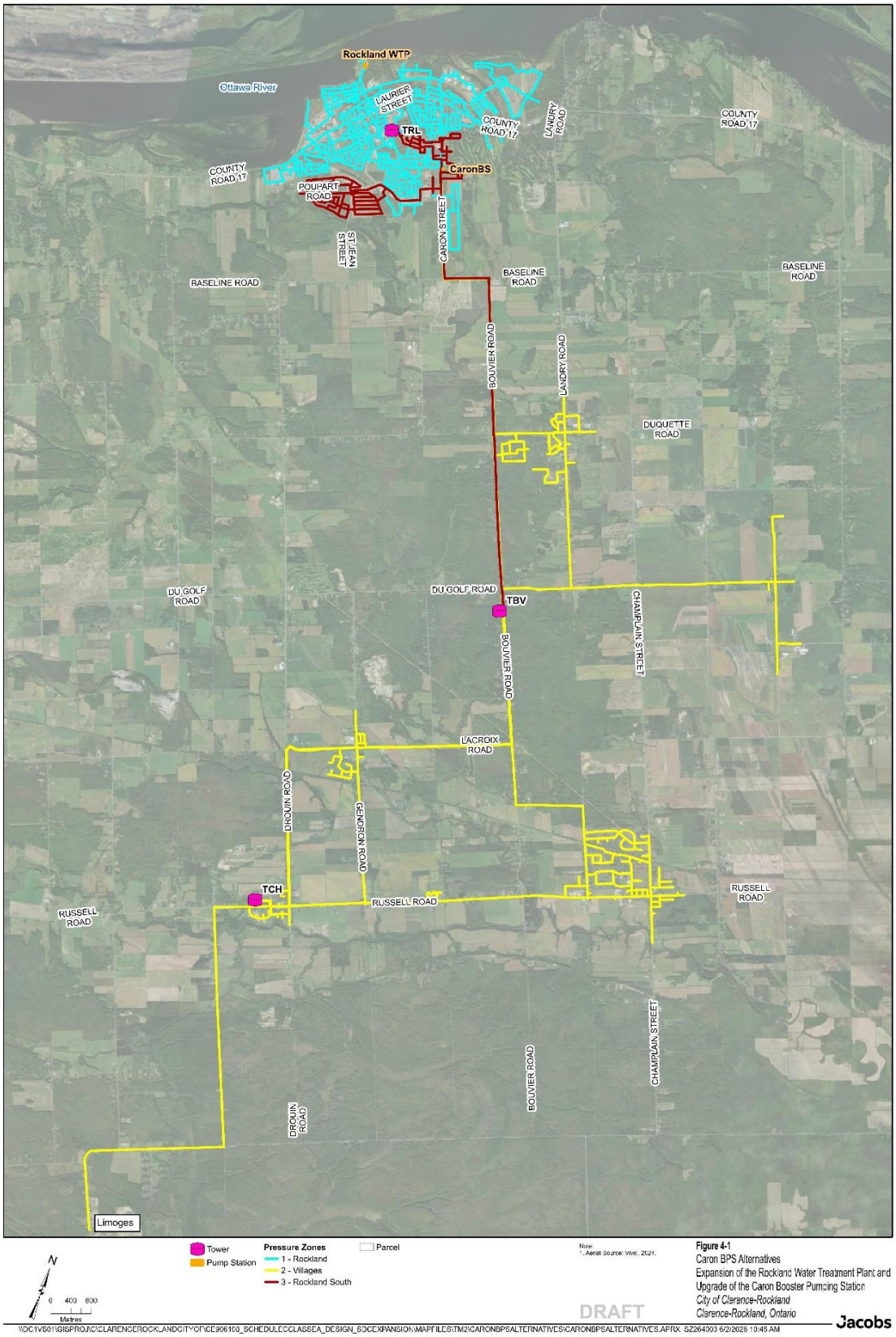
This section outlines the development and evaluation of alternatives for the Caron BPS.

10.1 Caron BPS Water Conveyance Alternatives

Water conveyance alternatives were developed to address the overall water conveyance strategy as reflected in the Problem and Opportunity Statement in Section 7, and to meet the future water demand projections related to the service areas presented in Section 6. The alternative solutions were compared against the "Do Nothing" baseline alternative (continue maintaining and rehabilitating the existing Caron BPS).

Figure 10-1 illustrates the three PZs supplied by the Rockland WTP. PZ 1 (red) supplies Rockland, PZ 2 (pink) supplies the Villages, and PZ 3 (blue) will supply Rockland South. The Caron BPS conveys water to PZ 2 and PZ 3.

Figure 10-1. Caron BPS Pressure Zones



10.1.1 Caron BPS Alternative 1: Do Nothing

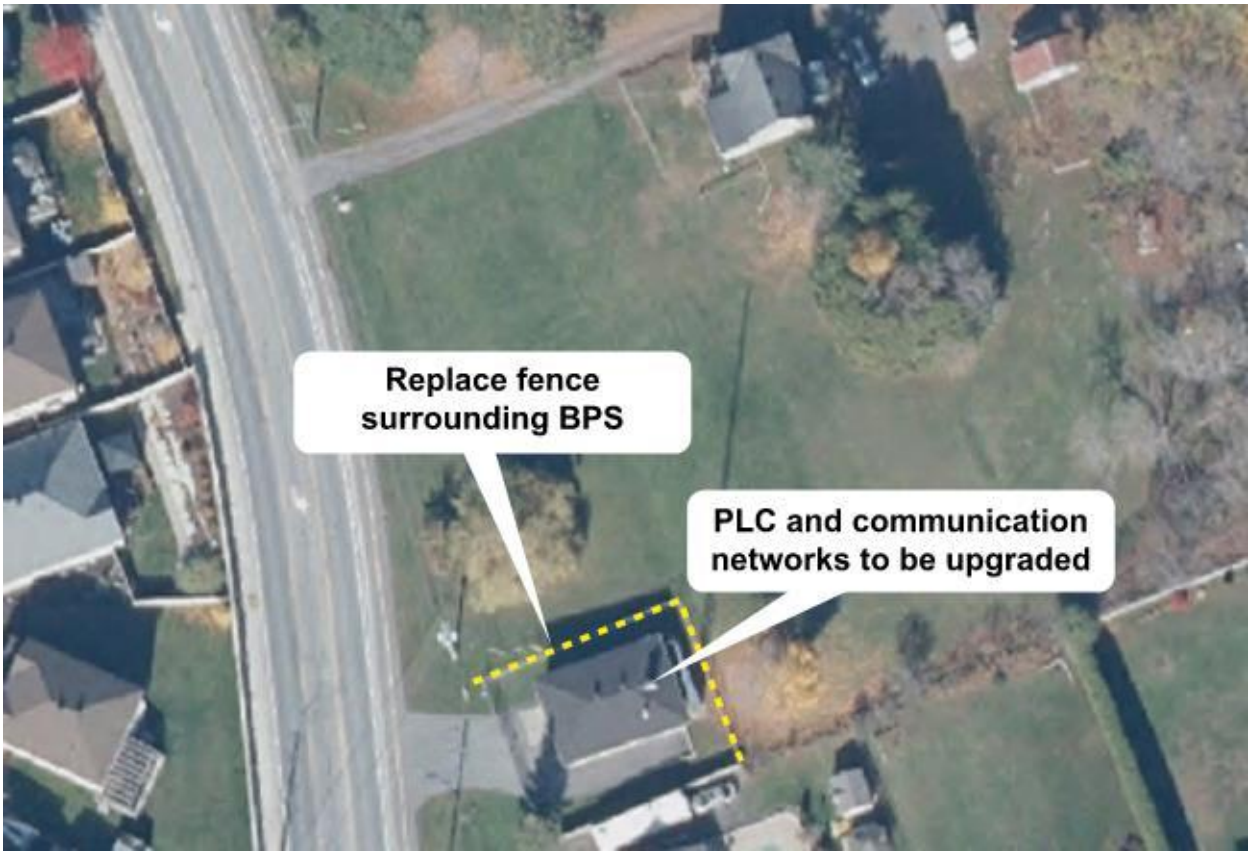
The evaluation of a "Do Nothing" alternative is required under the MEA MCEA process. The purpose of this alternative is to define a baseline alternative where the Problem and Opportunity Statement is not addressed. For the purposes of this Schedule C Class EA the "Do Nothing" alternative is defined as rehabilitating the Caron BPS to its approved rated capacity but will not provide additional capacity. The Caron BPS is not currently able to perform to the approved rated capacity; therefore, rehabilitation is required under the Do Nothing alternative.

The existing Caron BPS will continue to be maintained and rehabilitated based on the state of assets in the Clarence-Rockland WMP (Jacobs 2021) and TM1 – Existing WTP scoping Study (Jacobs 2025a). High priority items include civil and instrumentation and control upgrades. The key components of this alternative are summarized as follows:

- The fence surrounding the BPS needs replacement
- PLC and communication networks are recommended to be upgraded

This alternative results in limited growth within Clarence-Rockland as the existing demand is already close to the rated capacity of the Caron BPS. It would also not allow for additional water conveyance to the surrounding hamlets, Limoges, or other neighbouring communities, thereby also limiting growth within those areas. Figure 10-2 illustrates the upgrades required for Alternative 1 at the Caron BPS.

Figure 10-2. Caron BPS Alternative 1



10.1.2 Caron BPS Alternative 2: Single-Zone

Caron BPS Alternative 2 increases the rated capacity of the Caron BPS to service the existing customers and provides additional capacity to service growth in Limoges. It includes expansion of the pump station footprint to include one set of larger pumps supplying a single pressure zone (Figure 10-3). The second pressure zone would be supplied through a pressure reducing valve (PRV) in the transmission main located approximately 400 m south of the BPS. This alternative requires one transmission main for conveyance to the two PZs. The two PZs include PZ 2, supplying the surrounding Villages, and PZ 3, supplying the south end of Rockland where the elevation is higher. There is a new transmission main being built that would replace the current transmission main that covers PZ 2. This would be the sole transmission main required for this alternative. Figure 10-4 illustrates the process flow diagram for this alternative outlining the water conveyance from PZ 1 to PZ 3. Figure 10-5 illustrates the two pressure zones supplied by the Caron BPS and approximate location of the PRV for Alternative 2.

Figure 10-3. Caron BPS Alternative 2 Site Plan

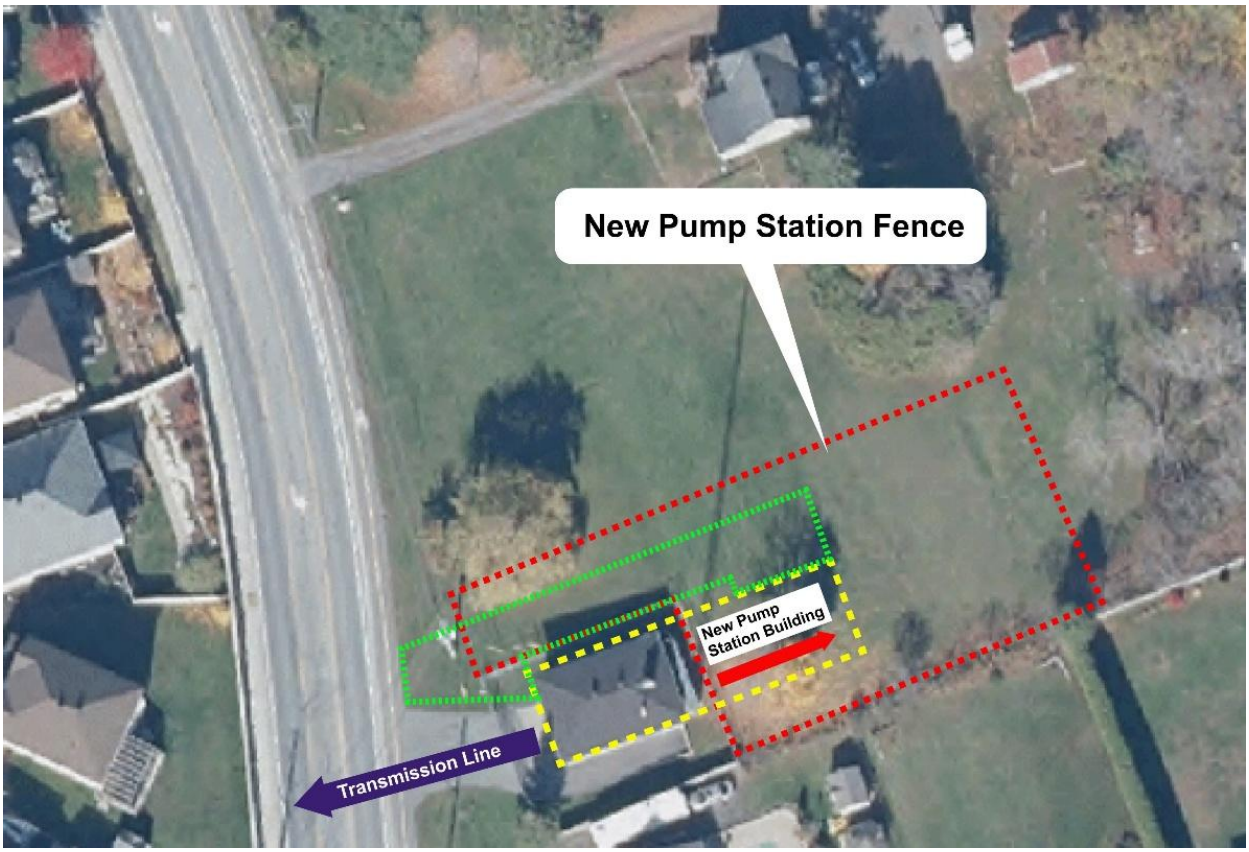


Figure 10-4. Caron BPS Alternative 2 Process Flow Diagram

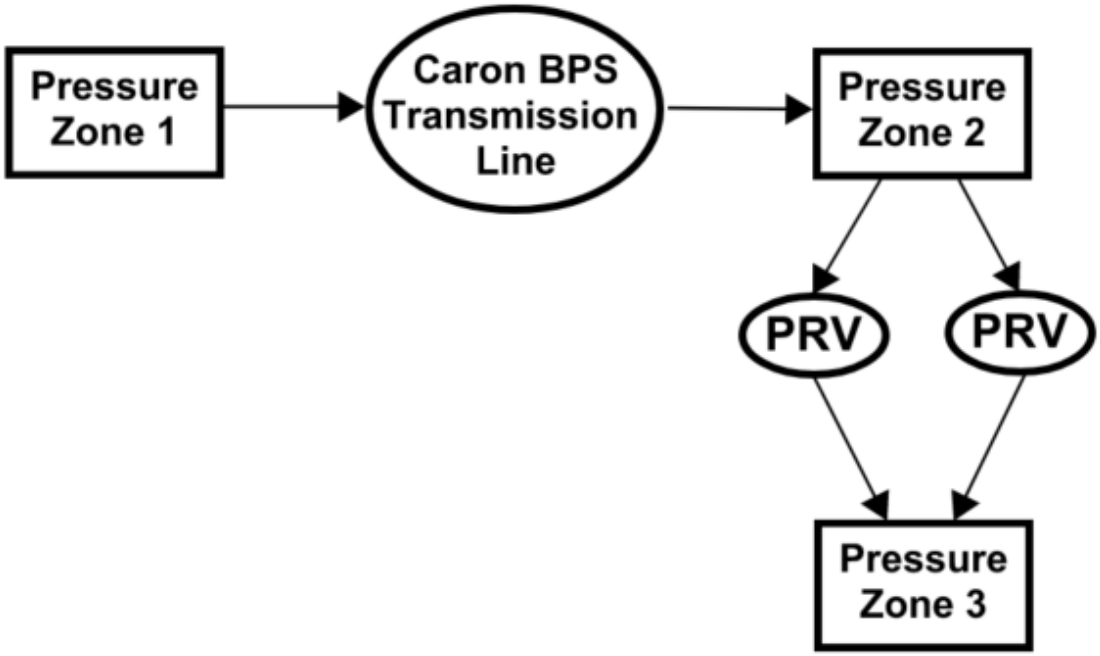
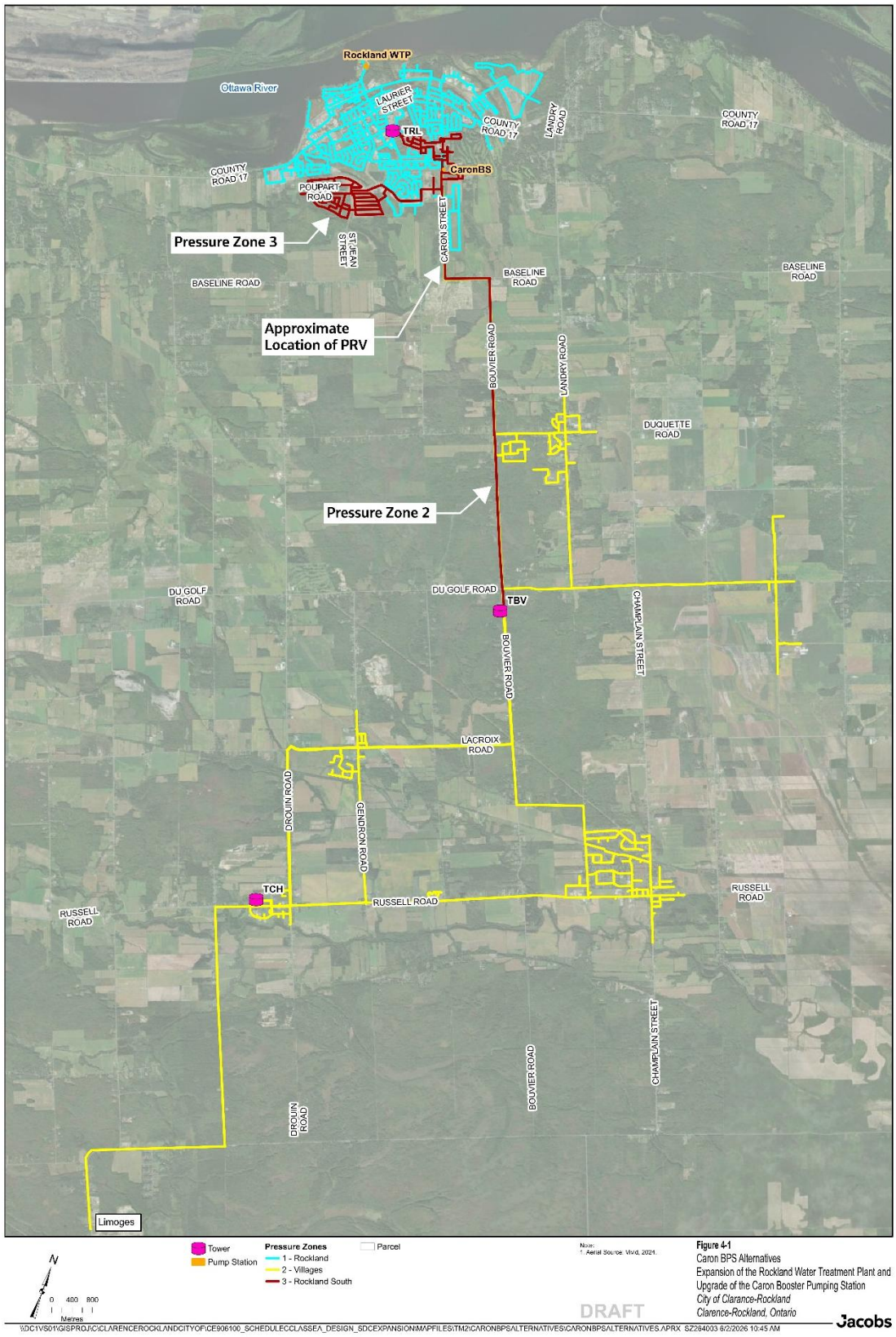


Figure 10-5. Caron BPS Alternative 2 Pressure Zones and Approximate Location of the PRV



This alternative includes the condition-based needs included in the Caron BPS Do Nothing alternative (Caron BPS Alternative 1). These include:

- The fence surrounding the BPS needs replacement
- PLC and communication networks are recommended to be upgraded

In addition, this alternative is expected to require a new backup power generator to provide sufficient power for the larger pumps. As identified in the WMP (Jacobs 2021), this alternative would require a land acquisition for the expanded booster pump station equipment.

10.1.3 Caron BPS Alternative 3: Dual-Zone

Caron BPS Alternative 3 increases the rated capacity of the Caron BPS to service the existing customers and provides additional capacity to service growth in Limoges using a dual-zone pumping regime. It includes expansion of the pump station footprint to include two sets of new pumps and two transmission mains, new (Transmission Line PZ 2) and existing (Transmission Line PZ 1), with one set of pumps and transmission main supplying PZ 2 and PZ 3 separately (Figure 10-6). Dual-zones would provide greater redundancy and energy efficiency as there is less energy lost within the distribution system as pressure reducing valves are not required. The increased energy efficiency reduces cost and allows the system to provide consistent and reliable water conveyance. Figure 10-7 illustrates the process flow diagram for this alternative outlining the water conveyance from PZ 1 to PZ 3. Figure 10-8 highlights the two pressure zones and their respective transmission lines.

Figure 10-6. Caron BPS Alternative 3 Site Plan

Figure 10-7. Caron BPS Alternative 3 Process Flow Diagram

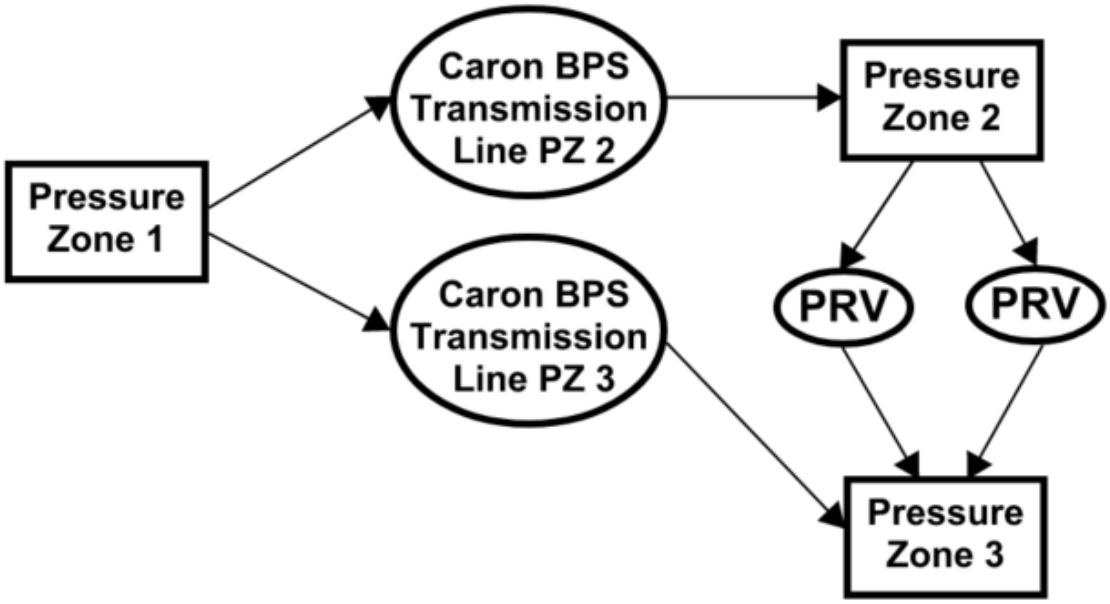
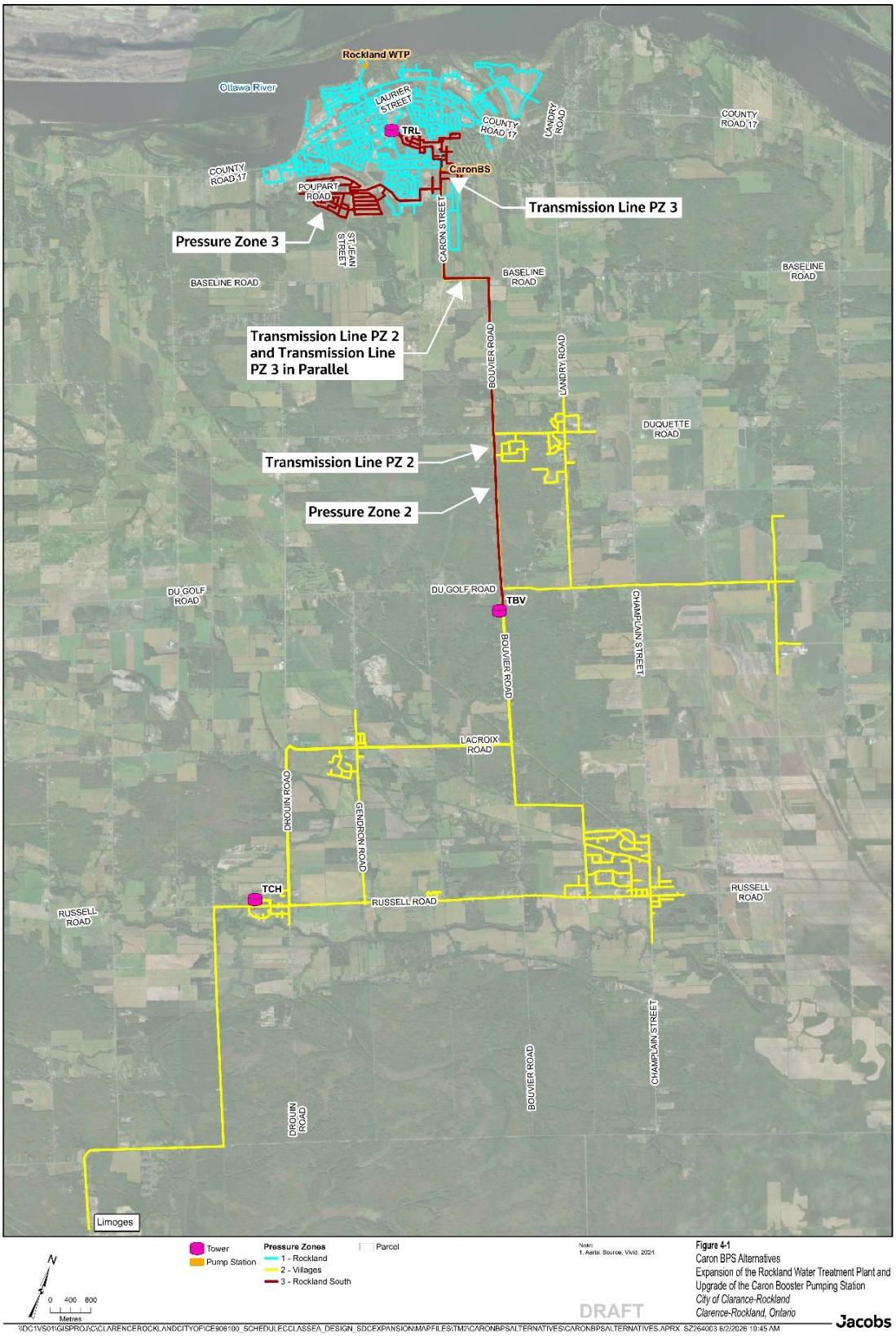


Figure 10-8. Caron BPS Alternative 3 Location of Pressure Zones and Respective Transmission Lines



This alternative includes the condition-based needs included in the Caron BPS Do Nothing alternative (Caron BPS Alternative 1). These include:

- The fence surrounding the BPS needs replacement
- PLC and communication networks are recommended to be upgraded

In addition, this alternative is expected to require a new backup power generator to provide sufficient power for the four pumps. As identified in the WMP (Jacobs 2021) this alternative would require land acquisition for the expanded booster pump station equipment.

10.2 Evaluation of Caron BPS Alternatives

The following section outlines the evaluation of the Caron BPS alternatives. This includes the evaluation criteria, evaluation of alternatives, and the preferred alternative.

10.2.1 Evaluation Criteria

Each alternative for the Caron BPS was evaluated using the methodology presented in Section 4. The evaluation criteria for the alternatives and their scoring measures are presented in Table 10-1.

Many of these criteria are non-differentiating for the proposed alternatives. However, these are important considerations identified through the Municipal Class EA process, and it is important to document where the alternatives are similar to one another rather than only highlighting differences.

Table 10-1. Caron BPS Alternatives Evaluation Criteria and Scoring Measures

Category	Criterion	Description	High	Medium	Low
Natural Environment	Impacts to surface water quality	The potential for the alternative to have a negative impact on surface water quality (focus is WTP residuals discharge), that would result in harm to the aquatic environment.	The alternative will have no substantial impact on surface water quality that may impact aquatic environments.	The alternative has some potential to change surface water quality that may negatively impact aquatic habitats.	The alternative has a high potential to change surface water quality that may negatively impact aquatic habitats.
	Impacts to surface water quantity	The potential for the alternative to have an impact on surface water quantity that would result in negative impacts to other users and/or the aquatic environment.	The alternative will have no substantial impact on surface water quantity that would result in negative impacts to other users and/or the aquatic environment.	The alternative will have some potential impact on surface water quantity that would result in negative impacts to other users and/or the aquatic environment.	The alternative will have a high potential impact on surface water quantity that would result in negative impacts to other users and/or the aquatic environment.
	Impacts on terrestrial environment	The potential for the alternative to have a long-term negative impact on the viability of terrestrial habitats in terms of density and diversity of species.	This alternative avoids terrestrial habitat.	This alternative requires special measures to protect terrestrial habitat.	This alternative results in an unacceptable loss of habitat.
	Impacts on aquatic environment	The potential for the alternative to have a long-term negative impact on the viability of aquatic habitats in terms of density and diversity of species.	The alternative will protect aquatic habitats and fisheries and has the potential to provide enhancements.	The alternative may require special measures to protect aquatic habitats and fisheries.	The alternative will result in an unacceptable loss of aquatic habitat and fisheries.
	Impacts on Climate Change	The potential for the alternative to mitigate climate change.	The alternative has the potential to significantly mitigate climate change.	The alternative has the potential to moderately mitigate climate change.	The alternative has minimal potential to mitigate climate change.
	Maximize Climate Change Adaptation	The potential to provide climate adaptation and resiliency benefits.	The alternative has significant adaptation and resiliency benefits.	The alternative has moderate adaptation and resiliency benefits.	The alternative has minimal adaptation and resiliency benefits.
	Minimize the impact to the Local Hydrogeology and Groundwater System	The alternative's potential to induce water table impacts, hydrogeological settling, and surface and groundwater quality degradation.	The alternative will result in minimal impacts to the hydrogeology environment and groundwater system.	The alternative will result in moderate impacts to the hydrogeology environment and groundwater system.	The alternative will result in significant impacts to the hydrogeology environment and groundwater system.
	Minimize Impacts to Air Quality	The alternative's potential to negatively impact air quality.	The alternative will result in minimal impacts to air quality.	The alternative will result in moderate impacts to air quality.	The alternative will result in significant impacts to air quality.
	Minimize Impacts to Wetlands	The alternative's potential to negatively impact wetland environments.	This alternative will avoid wetlands.	The alternative may require special measures to maintain wetland protection.	The alternative will result in an unacceptable threat to wetlands.

Category	Criterion	Description	High	Medium	Low
Social/Cultural	Occupational Health and Safety	The potential of the alternative to minimize risk or liability regarding occupational health and safety for construction period and ongoing operation and maintenance.	The alternative poses very little risk to occupational health and safety.	The alternative poses moderate risk to occupational health and safety; construction and O&M safety measures may be required to address specific health and safety concerns.	The alternative poses high risk to occupational health and safety; personal injury may be expected; construction and O&M safety measures will be required to address a number of health and safety concerns.
	Minimize Community Health and Safety Risks	The alternative's potential to induce negative effects on the existing community's health and safety.	The alternative will not present any health and safety risks to the community.	The alternative will present some health and safety risks to the community.	The alternative will present significant health and safety risks to the community.
	Minimize Noise	The alternative's potential to generate noise and its' proximity to sensitive receptors.	The alternative is unlikely to generate noise.	The alternative generates some level of noise that can be mitigated.	The alternative generates a high level of noise that requires a high level of mitigation and is close to sensitive receptors.
	Autonomy of Water Supply	The level to which the PUC relies on other governing bodies for water supply.	The alternative allows the PUC to not rely on any other governing bodies for their water supply.	The alternative requires the PUC to rely on other governing bodies for a small percentage of their water supply.	The alternative requires the PUC to rely on other governing bodies for a large percentage of their water supply.
	Archaeological Impacts	Minimize impact on archaeological resources or areas of archaeological potential.	This alternative protects features of archaeological potential.	This alternative results in no change to archaeological resources.	This alternative has the potential to disturb archaeological resources.
	Built Heritage Resources and Cultural Heritage Landscapes	The degree of impact that the alternative has on areas with documented built heritage resources and cultural heritage landscapes.	This alternative protects features of built heritage resources and cultural heritage landscapes.	This alternative results in no change to built heritage resources and cultural heritage landscapes.	This alternative has the potential to disturb built heritage resources and cultural heritage landscapes.
	Maximize the Opportunity for Economic Development	Alternatives potential to provide the necessary infrastructure to enable housing development.	The alternative allows for planned housing development and can accommodate future housing or service area expansion.	The alternative allows for planned housing development.	The alternative allows no further opportunity for housing development.
	First Nations and Indigenous Community Cultural Heritage Impacts	The degree of impact that the alternative has on cultural heritage resources recognized by First Nations.	This alternative protects features of cultural heritage resources recognized by First Nations and Indigenous communities.	This alternative results in no change to cultural heritage resources recognized by First Nations and Indigenous communities.	This alternative has the potential to disturb cultural heritage resources recognized by First Nations and Indigenous communities.
	Public land Use Impacts (parks, open spaces)	The ability of the alternative to maintain or enhance character of the public lands in the community.	The Alternative will enhance the character of the public lands in the area.	The Alternative will maintain the character of the public lands in the area.	The Alternative will decrease the character of the public lands in the area.
	Private Lands Impacts	Impact of the alternative on private lands (Industrial, Commercial, Institutional, including farm operations) in regard to short-term disturbance or long-term use including easements.	The Alternative will have no impact on private lands in regard to short-term disturbance or long-term use.	The Alternative will have a moderate impact on private lands in regard to short-term disturbance or long-term use. Impacts can be mitigated.	The Alternative will have a significant impact on private lands in regard to short-term disturbance or long-term use. Impacts cannot be mitigated.
	Public Acceptability	The level of public acceptability for the alternative based on public consultation results.	The alternative may exceed the public's expectation technically and be accepted by the public.	The alternative may be acceptable to the public as it continues to provide treated water in compliance.	The alternative may not be accepted by the public.
	Disruption during Construction	The potential for the alternative to temporarily disrupt local traffic and or use of the area by the public during construction including noise and traffic.	The alternative will not result in disruption to traffic during construction.	The alternative will result in some disruption to traffic and use of the area by the public during construction.	The alternative will result in significant disruption to traffic and use of the area by the public construction.

Category	Criterion	Description	High	Medium	Low
Technical	Adaptability	The ability of the alternative to adapt to increasing water demands beyond the planning horizon.	The alternative is able to adapt to significant increases in water demands beyond the planning horizon.	The alternative is able to adapt to moderate increases in water demands beyond the planning horizon.	The alternative is not able to adapt to increases in water demands beyond the planning horizon.
	Ease of Approvals and Permitting	The relative difficulty in acquiring the necessary approvals/permits for the alternative from regulatory agencies and other jurisdictions.	Acquiring the permits for this alternative is relatively simple.	Acquiring the permits for this alternative is moderately difficult.	Acquiring the permits for this alternative is difficult.
	Ability for Phased Implementation	The ability of the alternative to increase treatment capacity in phases.	Increased capacity can be implemented in phases with limited new infrastructure/equipment and minimal interruption to water production.	Increased capacity can be implemented in phases with moderate addition of new infrastructure/equipment and some interruption to water production.	Increased capacity cannot be implemented in phases or require significant addition of new infrastructure/equipment and/or substantial interruption to water production.
	Improvement to Water Conveyance	The ability of the alternative to convey demand flows and improve the capacity of the conveyance system.	The alternative substantially improves water demand transmission and capacity.	The alternative achieves some improvement in water demand transmission and capacity.	The alternative provides limited, if any, improvement in water demand transmission and capacity.
	Constructability	The ability of the alternative to be implemented without significant complications, including disruptions to existing service.	The alternative can be implemented with no disruption to existing service.	The implementation of the alternative may result in minor disruptions to existing service.	The implementation of the alternative may require significant or periodic disruptions to the existing service.
	Ease of Implementation	The ability of the alternative to be constructed and implemented on a technical and practical basis; within a reasonable scope of work.	The alternative is easy to implement with limited constructability issues, reasonable construction work scope.	The alternative can be implemented with some difficult constructability issue or some constraints, or moderate scope of construction work.	The alternative has many challenges with respect to implementation and construction, or complex and large work scope.
	Energy Requirements	The resources and fuel the alternative requires in order to function, including electrical, gas, oil, water, etc.	This alternative has lower energy requirements.	This alternative maintains existing energy requirements.	This alternative has higher energy requirements.
	Chemical Requirements	The chemical requirements the alternative requires for adequate treatment performance.	This alternative has lower chemical requirements.	This alternative maintains existing chemical requirements.	This alternative has higher chemical requirements.
	Operational and Maintenance Complexity	The degree of complexity associated with operating and maintaining the alternative.	The alternative is simple to operate and easy to maintain.	The alternative is moderately difficult to operate, requires extensive and continuous operator training, the maintenance is somewhat difficult and requires higher skills.	The alternative is complex to operate and requires frequent/complex maintenance.
	Risk/Reliability	The level of risk associated with the alternative relating to probability of failure, water supply and regulatory compliance.	There are limited to no risks associated with the alternative.	There is a moderate level of risk associated with the alternative.	There is a high level of risk associated with the alternative.
	Impacts on Treated Water Quality	Capability of an alternative to meet more stringent water quality regulatory requirements in the future.	The alternative produces treated water superior in water quality to the existing WTP and provides high degree of protection from certain emerging contaminants.	The alternative produces treated water superior in water quality to the existing WTP and provides a moderate degree of protection from certain emerging contaminants.	The alternative produces treated water with a similar water quality to the existing WTP and provides a moderate degree of protection from certain emerging contaminants.
	Infrastructure Sustainability	The degree of sustainability associated with the alternative in terms of appropriate technology and O&M.	The alternative has a high degree of sustainability.	The alternative has a moderate degree of sustainability.	The alternative has a low degree of sustainability.
Economic	Capital Cost	The capital cost of the alternative.	The alternative's capital costs are low relative to other alternatives.	The alternative's capital costs are moderate relative to other alternatives.	The capital costs are high relative to other alternatives.

10.2.2 Evaluation of Caron BPS Alternatives

The evaluation results for the Rockland WTP alternatives are presented in Table 10-2. Detailed scoring and rationales of the evaluation for each category are presented in Appendix B.

Table 10-2. Evaluation Results for the Caron BPS Alternatives

Category	Alternative 1: Do Nothing	Alternative 2: Single-Zone	Alternative 3: Dual-Zone
Natural Environment	20.8	19.4	22.2
Social/Cultural Environment	18.2	20.5	20.5
Technical Environment	11.3	20.0	23.8
Economic Environment	Lowest Capital and O&M Cost	Highest Capital and O&M Cost	Medium Capital and O&M Cost
Total	**50.3**	**59.9**	**66.4**
Sensitivity Analysis -1	**57.9**	**64.1**	**70.8**
Sensitivity Analysis -2	**55.8**	**64.9**	**69.4**
Sensitivity Analysis -3	**51.2**	**65.3**	**71.9**
Sensitivity Analysis -4	**41.2**	**48.6**	**53.0**

10.2.3 Preferred Caron BPS Alternative

The preferred alternative for the Caron BPS is Alternative 3: Dual-Zone. It was the highest scoring alternative for the evaluation including all four sensitivity analyses. The advantages of the alternative include the following:

- This alternative increases the rated capacity of the Caron BPS to service the existing customers and provides additional capacity to service growth in Limoges
- Dual-zones will provide greater redundancy as there will be two transmission mains available for distribution
- Provides greater energy efficiency as there is less energy lost within the distribution system (as pressure reducing valves are not required)

11. Servicing Strategy

The detailed evaluations of alternatives presented in Sections 9 and 10 identify expanding the Rockland WTP and Caron BPS to provide capacity for growth as the preliminary preferred solution. This preferred alternative allows the City to consider the opportunity of servicing new neighbouring communities requiring water to meet future growth needs. This section identifies and evaluates servicing strategy alternatives to determine the City's preferred approach.

Servicing strategy alternatives were developed considering the preferred solution for water treatment and conveyance system. Servicing Strategies include:

- Servicing Strategy 1: continuing to service the existing committed service area, Clarence-Rockland and Limoges
- Servicing Strategy 2: expanding the service area to provide water to new customers of neighbouring communities

Estimated water demands for neighbouring communities potentially interested in purchasing water from the City were developed in TM2 Future Growth Projections and Water Use Estimates completed as part of the Update to the WMP (Jacobs 2025b). The TM used planning documents, forecasts, development charge studies and other relevant documentation for Clarence-Rockland and neighbouring communities to identify forecasts for the years 2026, 2031, 2036, 2041, and Ultimate. Residential and employment growth assumptions were also developed. This information, along with the future population growth projections and water use estimates, were used to develop the water use estimates for each community and development area for each year.

11.1 Servicing Strategy 1: Clarence-Rockland and Limoges (27 MLD)

Servicing Strategy 1 includes continuing to service the existing committed service areas, including Clarence-Rockland and Limoges. The Rockland WTP would need to increase capacity from 13.5 MLD to 27 MLD to meet the 2046 maximum day demand based on the future water demand estimates in Section 6. The Caron BPS will need to be expanded from 4 MLD to 11 MLD to meet the 2046 maximum day demand for the surrounding Hamlets and Limoges.

11.2 Servicing Strategy 2: Expanded Service Area (34 MLD)

Servicing Strategy 2 includes expanding the current service area to provide water to new purchasers in neighbouring communities. Based on the future water demand estimates in Section 6, the Rockland WTP will increase capacity from 13.5 MLD to 34 MLD to meet the 2046 maximum day demand. The Caron BPS will also need to be expanded from 4 MLD to 17 MLD. In addition, the upgrades identified in the Clarence-Rockland WMP (Jacobs 2021) will be required sooner as the existing infrastructure will reach capacity due to the larger flow requirements.

11.3 Preferred Servicing Strategy

Both Servicing Strategy 1 and 2 require upgrading the capacity and conveyance of the Rockland WTP and Caron BPS, respectively, using the preferred alternatives outlined in Sections 9 and 10. Therefore, the primary difference between alternatives regarding design is the expanded capacity.

Economically, Servicing Strategy 2 is advantageous for Clarence-Rockland as there would be a lower cost per cubic metre of water demand associated with the expansion due to the contribution of the surrounding communities. Servicing Strategy 2 could potentially provide environmental benefits including a consolidated PTTW from Clarence-Rockland and the surrounding communities, potentially reduce the volume of water allocated to be taken from the Ottawa River and surrounding tributaries.

Neighbouring communities would also receive the opportunity to receive more water with Servicing Strategy 2. This would be a reliable source of high-quality raw water of sufficient quantity to meet their requirements. Additionally, the neighbouring communities no longer need to operate their own facility.

If neighbouring communities would like to purchase water from the Rockland WTP, Servicing Strategy 2 is the preferred servicing strategy for the City. It is recommended that the City consult with neighbouring communities to determine their level of interest in purchasing water from the City. It is expected that the City will need to provide information to neighbouring communities regarding the cost-sharing expected under Servicing Strategy 2. This effort is ongoing separately outside of this Schedule C Class EA. As neighbouring communities are not yet committed to purchasing water from the City, Phase 3 of the Class EA process (as detailed in Sections 13 through 17) will outline the preferred alternatives from Sections 9 and 10 for both Servicing Strategy 1 and 2.

12. Summary of Preferred Solutions

This section outlines the preliminary preferred solutions for the Rockland WTP and Caron BPS as part of Phase 2 of this Class EA.

12.1 Preferred Rockland WTP Alternative

The preferred alternative for the Rockland WTP is Alternative 2: High-rate conventional filtration. It was the highest scoring alternative for the evaluation (including all four sensitivity analyses) and has a lower cost than Alternative 3. The advantages of the alternative include the following:

- The expanded Rockland WTP will serve the current servicing area of Clarence-Rockland and Limoges and provides the opportunity to service neighbouring communities.
- The alternative involves expanding the facility using the same process flow and trains of similar size, therefore simplifying the integration to the existing treatment process (for example, same backwash pumps and blowers can be used).
- This alternative can be implemented in phases and includes provisions for future expansions.

Operation and maintenance of the expanded facility will be relatively simple as the operations staff at the facility are familiar with the equipment.

12.2 Preferred Caron BPS Alternative

The preferred alternative for the Caron BPS is Alternative 3: Dual-Zone. It was the highest scoring alternative for the evaluation including all four sensitivity analyses. The advantages of the alternative include the following:

- This alternative increases the rated capacity of the Caron BPS to service the existing customers and provides additional capacity to service growth in Limoges
- Dual-zones will provide greater redundancy as there will be two transmission mains available for distribution
- Provides greater energy efficiency as there is less energy lost within the distribution system (as pressure reducing valves are not required)

12.3 Preferred Servicing Strategy

If neighbouring communities would like to purchase water from the Rockland WTP, Servicing Strategy 2 is the preferred servicing strategy for the City. It is recommended that the City continue to consult with neighbouring communities to determine their level of interest in purchasing water from the City. It is expected that the City will need to provide information to neighbouring communities regarding the cost-sharing expected under Servicing Strategy 2. This effort is ongoing separately outside of this Schedule C Class EA. As neighbouring communities are not yet committed to purchasing water from the City, Phase 3 of the Class EA process will develop alternative design concepts for the preferred solutions outlined in Section 9 and 10 for both Servicing Strategy 1 and 2.

13. Alternative Design Concept Development Methodology

Phase 3 of the Class EA process is to develop alternative design concepts for the preferred solutions identified in Phase 2 of this Class EA, as summarized in Section 12. As discussed in Section 12.3, as neighbouring communities are not yet committed to purchasing water from the City, Phase 3 of the Class EA process will develop alternative design concepts for the preferred solutions outlined in Section 12 for both Servicing Strategy 1 and 2.

Alternative design concepts were developed for the following categories:

- Rockland WTP intake: Development and technology review of alternative design concepts focusing on alternative raw water intake technologies that could be implemented.
- Rockland WTP: Development and evaluation of alternative design concepts focusing on alternative technologies that could be implemented in the Rockland WTP expansion.
- Caron BPS: Development and evaluation of alternative design concepts focusing on the configuration of the new BPS.

An evaluation methodology was developed to allow for a comparative assessment of each set of design concepts and identify the preferred design concepts, aligned with the Class EA evaluation framework. Whereas the Phase 2 alternative solution evaluation focused on natural, sociocultural, technical, and economic criteria, the alternative design concept evaluation methodology in Phase 3 focuses on the technical and economic criteria in light of the technology-driven nature of the design concepts.

The design concept development and evaluations for the Rockland WTP intake, Rockland WTP, and Caron BPS are presented in Section 14, Section 15, and Section 16, respectively.

14. Intake Alternatives Identification and Evaluation

This section outlines the Rockland WTP intake alternatives for the two servicing strategies outlined in Section 11. Servicing Strategy 1 includes continuing service to the existing committed service areas (Clarence-Rockland and Limoges) and Servicing Strategy 2 includes expanding the current service area to provide water to new purchasers in neighbouring communities.

Both Servicing Strategy 1 and 2 will significantly increase the raw water flow through the intake. Alternatives for the Rockland WTP's intake that can provide sufficient water while meeting regulatory requirements will be identified in this section. As information on the existing intake crib and structure is not available at the time of this report, this section will assume that a new intake structure is required. At this time, analysis indicates that the intake pipe between the intake in the River and the LLPS has sufficient capacity for future needs and will not require replacement or twinning, therefore, the intake upgrades are limited to the actual raw water intake structure in the river

14.1 Intake Alternative Design Concepts

The following alternatives identification and evaluation will be considered for both Servicing Strategy 1 and 2. This includes continuing service to the existing committed service areas, including Clarence-Rockland and Limoges. The Rockland WTP will need to increase capacity from 13.5 ML/d to 27 ML/d (Servicing Strategy 1) or 34 ML/d (Servicing Strategy 2) to meet the future needs defined in Section 6.

Based on the expanded plant capacity of either servicing strategy and the diameter of the intake pipe (630 mm), the velocity through the intake would increase to 1.0 m/s, which still provides an acceptable headloss through the pipe. Unfortunately, information on the existing intake crib and structure was not available at the time of preparation of this report, therefore, the entry velocity for the existing intake cannot be determined for the expanded plant capacity. When examining the adequacy of the existing intake crib to accommodate the expansion, the design alternatives are primarily based on the intake velocity over the screen area. Based on the species identified in the area outlined in the Natural Heritage Technical Memorandum (Jacobs 2025c), the lowest escape velocity is for the American Eel, at 0.2 m/s. The appropriate species and lowest escape velocity to define the intake requirements under future conditions (27 or 34 ML/d) are to be confirmed through engagement with the MNR and MECP during detailed design. At this time the American Eel with an escape velocity of 0.2 m/s is the target entry velocity assumed for the intake structure. This escape velocity is considered conservative based on the known existing conditions.

14.1.1 Alternative 1: Do Nothing

The evaluation of a "do nothing" alternative is required under the MEA MCEA process. The purpose of this alternative is to define a baseline alternative where the Problem and Opportunity statement is not addressed. For the purposes of this Schedule C Class EA the "do nothing" alternative is defined as continuing to maintain the current intake with no modifications to reduce the velocity through the intake.

The existing 630 mm diameter intake pipe extends approximately 126 m into the Ottawa River and terminates at a wooden crib inlet equipped with three coarse intake screens. The coarse screens, facing upstream, downstream, and offshore, are to prevent any large debris, fish, algae or sediment entering the intake pipe and low lift station wet well. According to a dive investigation conducted by ODS Marine

Construction in 2022, the intake appears to be in good repair with only minor cleaning required at the time of inspection.

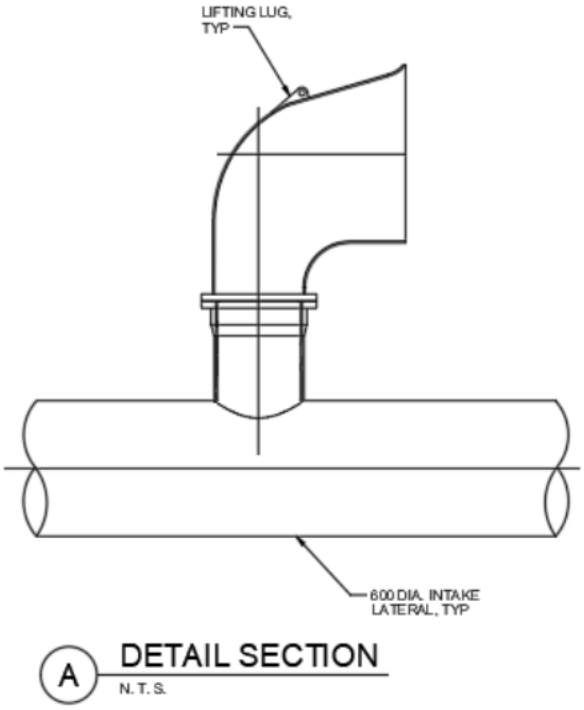
This alternative likely results in limited development opportunities in Clarence-Rockland and no development in Limoges as the existing demand flow already reaches the capacity of the intake.

14.1.2 Alternative 2: Bell Mouth

Alternative 2 replaces the existing intake structure with a bell mouth structure that would connect to the existing intake pipe with a rated capacity of 27 or 34 ML/d. Bellmouth intakes have inverted funnel-shaped inlets that reduce the inlet velocity by increasing the diameter at the inlet opening. This alternative would reduce the velocity of the water entering the intake without increasing the size of the actual intake pipe. A screen may be required to prevent debris and aquatic species from entering the intake. Alternatively, the inlet bell mouth may be designed and oriented in the river to avoid drawing fish and debris without the need for screens, which is preferred since screens are prone to blockages and require regular cleaning.

Figure 14-1 illustrates a typical bell mouth style intake. The Rockland WTP intake would require a row (or several rows) of these bell mouths.

Figure 14-1. Typical Schematic of a Bell Mouth Intake

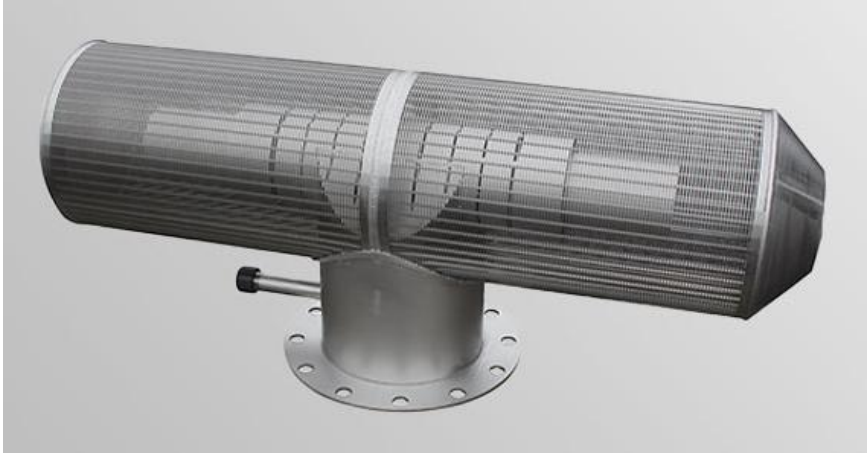


14.1.3 Alternative 3: Tee Screen

Alternative 3 replaces the existing intake structure with a submerged tee screen with a rated capacity of 27 or 34 ML/d. Tee screens allow raw water to passively flow through the intake pipe while debris and aquatic species are rejected at the point of entry. This alternative also typically requires an airburst cleaning system which requires additional space at the LLPS for the installation of an air compressor. The air compressor would deliver compressed air to the tee screens by the airlines in parallel to the intake pipe.

Figure 14-2 illustrates a typical submerged tee screen.

Figure 14-2. Typical Submerged Tee Screen Intake (Johnson Screens 2025)



14.2 Intake Cost Estimates

Capital cost estimates and O&M cost estimates were developed for each alternative and rounded to the nearest $100,000. These costs are not presented as they were used for relative comparison purposes for the economic score in the evaluation. Cost for the preferred solution is presented in Section 17.4.

14.3 Intake Technology Review

As little is known about the condition or the design details of the existing intake crib at the time of this report, a pass/fail technology screening evaluation for the intake design alternatives was conducted and is summarized in Table 14-1. The alternative must pass all screening criteria to be considered a feasible solution.

Table 14-1. Intake Technology Review

Consideration	Alternative 1: Do Nothing	Alternative 2: Bell Mouth	Alternative 3: T-Screen
Intake Velocity	Fail (likely)	Pass	Pass
Ease of Implementation	Pass	Pass	Pass
Improvement to Water Conveyance	Fail (likely)	Pass	Pass
Total	Fail (likely)	Pass	Pass

As little is currently known regarding Alternative 1, it is assumed, for the purpose of this evaluation, that it is not able to provide increased capacity while maintaining a velocity under 0.2 m/s, Alternatives 2 and 3 are acceptable for Servicing Strategy 1 and 2. Both alternatives would provide an acceptable intake and escape velocity for the American Eel of less than 0.2 m/s (Jacobs 2025c) and would have similar environmental impacts.

The main difference between Alternative 2 and 3 is the ease of implementation and construction and O&M requirements. Alternative 2 involves adding a bell mouth structure to replace the existing intake crib, whereas Alternative 3 involves replacing the existing crib with a tee screen. O&M requirements for the screen would include regular inspection and cleaning.

14.4 Intake Preferred Alternative

The preliminary preferred alternative for both Servicing Strategies for the intake design is Alternative 2: Bell Mouth Intake due to the ease of implementation and construction and lack of maintenance. The advantages of the alternative include the following:

- The intake will have the capability of servicing the current servicing area of Clarence-Rockland and Limoges.
- The bell mouth allows for the entrance velocity in the intake to be less than the lowest escape velocity outlined by the Natural Heritage Technical Memorandum (Jacobs 2025c).
- The alternative involves adding to the existing intake, therefore simplifying the construction and minimizing impacts to plant operations.
- Avoiding the use of a screen minimizes the risk of blockages due to debris or ice that would restrict the flow of water to the WTP as well as significantly reduces the O&M requirements (for example, cleaning the screen and maintaining the air burst equipment).

14.5 Intake Alternatives Evaluation Summary

If field investigations determine that the existing intake can provide 34 MLD while maintaining the required lowest escape velocity, then the recommended solution is to Do Nothing and proceed with expanding the Rockland WTP and Caron BPS with no changes to the intake. However, in the case that the existing intake cannot meet this requirement, a new intake will be required.

The preliminary preferred alternatives are the same for both Servicing Strategy 1 and 2. Alternative 2: Bell Mouth Intake is recommended as the preferred solution for both Servicing Strategy 1 and 2. Information on the existing intake is limited and investigations to confirm the existing intake condition, type, and dimensions are required to confirm future needs. At this time, it is assumed that a new intake will be required to expand the treatment capacity of the Rockland WTP.

It is expected that the City will need to expand to the ultimate treatment capacity of 54 ML/d to service future population. Due to the anticipated useful life of the intake structure, it is recommended that the intake is designed to achieve flows of 54 ML/d to service the projected ultimate future capacity needs identified in TM-2 Future Growth Assumptions and Water Use Estimates (Jacobs 2025b) as part of the WMP Update, or be designed to be easily upgraded in the future. This minimizes environmental impacts related to in-water work required to replace the intake in the future. As such, it is recommended that the new intake structure be designed to accommodate a second raw water pipe connection, as the existing raw water pipe to the LLPS is not sufficiently sized to accommodate flows of 54 ML/d. This will be further assessed once the findings from the studies on the existing intake are available and the upgrade requirements can be confirmed. If the entire intake needs to be replaced to accommodate the 27 ML/d capacity increase, it would likely be replaced with an intake with sufficient capacity for the ultimate water demands. At this stage, the EA is intended to cover the range of possible outcomes and upgrade requirements. The costs, impacts to the river, impacts to plant operations during construction, and impacts to fish are all similar between the various options. Any in-water work will comply with all applicable regulatory requirements and the necessary studies and subsequent permits and approvals will be sought prior to construction.

15. Rockland Water Treatment Plant Alternatives Identification and Evaluation

This section will identify the Rockland WTP pretreatment alternatives identification and evaluation for the two Servicing Strategies outlined in Section 11. In accordance with the recommendations identified in Section 14, alternatives identified for the Rockland WTP expansion for both Servicing Strategies include a bell mouth intake sized with a capacity of up to 54 ML/d. Servicing Strategy 1 includes continuing service to the existing committed service areas (Clarence-Rockland and Limoges) and Servicing Strategy 2 includes expanding the current service area to provide water to new purchasers in neighbouring communities.

Following pretreatment, dual-media filtration is the main source of turbidity and pathogen removal throughout the treatment process. The removal occurs by passing the pre-treated water through a layer of puracite (specialized anthracite), followed by silica sand. Following filtration, disinfection is achieved by UV lamps before entering the CCT. Currently, the Rockland WTP uses UV disinfection as a redundant system when the CCT is offline for maintenance or repairs. A minimum of 0.5-log reduction of *Giardia* and 2-log reduction of viruses is achieved through the disinfection process to meet provincial drinking water quality regulations and the plant's DWWP.

15.1 Rockland WTP Alternative Design Concepts

The following alternatives identification and evaluation will be considered for Servicing Strategy 1 and 2. The Rockland WTP would need to increase capacity from 13.5 ML/d to 27 ML/d (Servicing Strategy 1) or 34 ML/d (Servicing Strategy 2) to meet the future water needs defined in Section 6.

15.1.1 Alternative 1: Do Nothing

The evaluation of a "Do Nothing" alternative is required under the MEA MCEA process. The purpose of this alternative is to define a baseline alternative where the Problem and Opportunity Statement is not addressed.

For the purposes of this Schedule C Class EA, the "Do Nothing" alternative is defined as maintaining the existing facility without expanding the treatment processes. Under this alternative, the existing Rockland WTP would continue to be maintained and rehabilitated based on the state of assets in the Clarence-Rockland WMP (Jacobs 2021) and TM-1 Existing WTP Scoping Study (Jacobs 2025a). This includes undertaking process optimization and state of good repair maintenance. High priority items include process mechanical and instrumentation and controls upgrades. The key components of this alternative are summarized as follows:

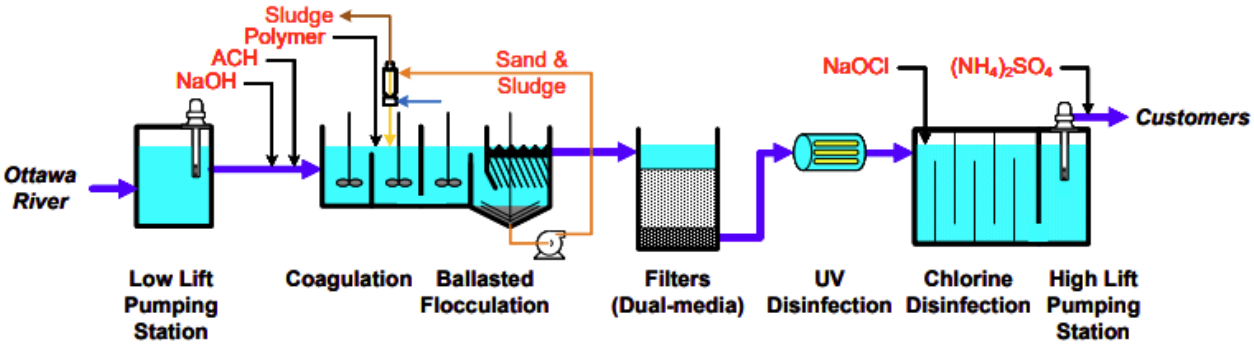
- Upgrade and modernize the chemical dosing systems to include self-contained variable speed dosing pumps
- Replace and upgrade the PLC systems with modern technology
- Major architectural refurbishment of the "original" portion of the main Rockland WTP building

This alternative results in limited development opportunities in Clarence-Rockland and no development in Limoges.

15.1.2 Alternative 2: Ballasted Flocculation and High-Rate Sedimentation

Alternative Design Concept 2 uses ballasted flocculation and high-rate sedimentation as the pretreatment process. ActiFlo® ballasted flocculation is the pretreatment process currently used at the Rockland WTP for coagulation, flocculation and high-rate sedimentation. The ActiFlo® system is a proprietary system provided by Veolia Water Technologies and consists of coagulation, polymer/sand injection, maturation, lamella clarifier which serves as the main chemical mixing, flocculation and high-rate tube settling process. Dual-media filters are used for filtration, and UV and chlorination are the primary disinfection systems that are currently used at the WTP. This alternative includes the addition of two or three new ActiFlo treatment units for Servicing Strategy 1 or 2, respectively, operating in parallel with design capacities of 6.75 ML/d each. Figure 15-1 presents a process flow diagram for Alternative 2.

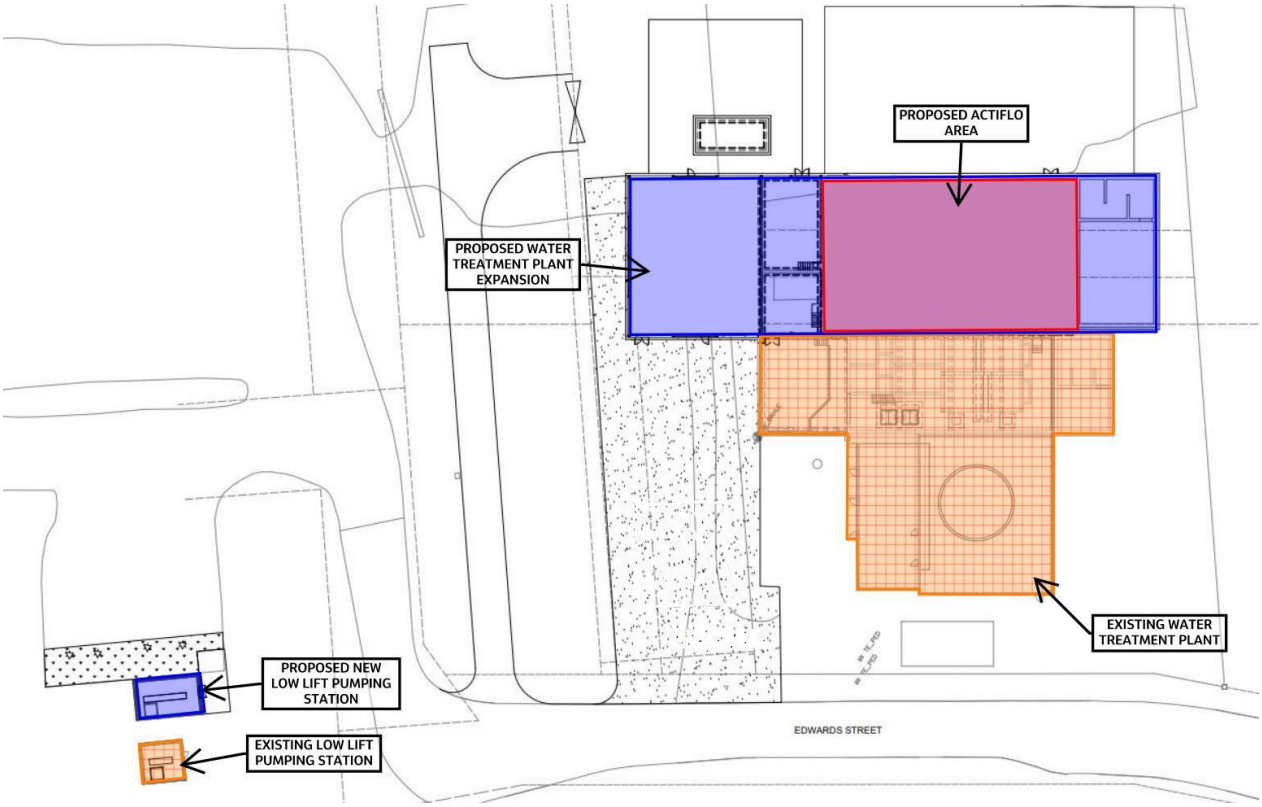
Figure 15-1. Rockland WTP Alternative 2 Process Flow Diagram



As there is insufficient space in the existing LLPS to accommodate new pumps for the capacity upgrade, this alternative requires a similar LLPS be constructed adjacent to the existing. The new LLPS includes three new low lift pumps with design capacities of 10.25 ML/d.

Figure 15-2 presents a preliminary site layout for Alternative Design Concept 2. The expanded portion of the WTP building will include the new pretreatment processes, filters, CCT, secondary reservoir, electrical room, mechanical room, and chemical room. The total footprint estimate for the new WTP building is approximately 1,050 and 1,100 square metres for Servicing Strategy 1 and Servicing Strategy 2, respectively, for this alternative. The footprint estimate for the new LLPS is approximately 50 square metres.

Figure 15-2. Rockland WTP Alternative 2 Site layout



The following bullets summarize the key design criteria for the ActiFlo system, which are unique to Alternative Design Concept 2:

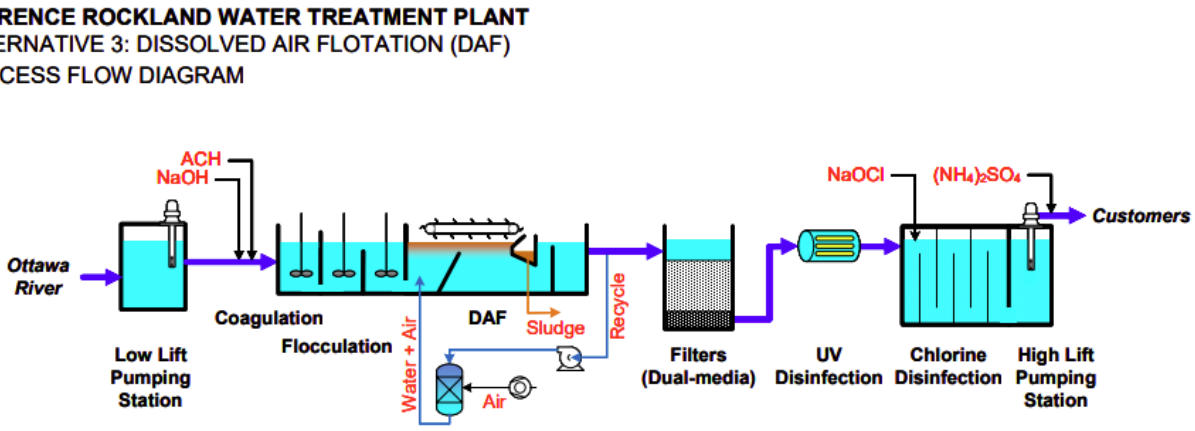
- Two (Servicing Strategy 1) or three (Servicing Strategy 2) new process trains, each consisting of a coagulation basin, injection basin, and maturation basin to provide pretreatment upstream of the filters.
- Two (Servicing Strategy 1) or three (Servicing Strategy 2) sand recirculation pumps to allow for reuse of microsand.
- Lamella tube settlers in the settling basin downstream of the maturation basin to provide high-rate sedimentation.

15.1.3 Alternative 3: Dissolved Air Flotation

Alternative Design Concept 3 uses High-rate DAF as the pretreatment process. DAF is a compact clarification process that utilizes dissolved air to remove suspended, coagulated and flocculated organic matter from the raw water. Rather than settling the coagulated particles, DAF causes sludge to float on top of the basin. The DAF unit typically consists of a coagulation or flash mix basin, flocculation basin, and DAF flotation and skimming cell, with associated dissolved air generating and recirculation systems. High-rate DAF systems include integrated platepacks and optimized baffle designs to improve separation efficiency and allow for higher hydraulic loads. Dual-media filters are used for filtration, and UV and chlorination are the primary disinfection systems that are currently used at the WTP. This alternative would include the addition of two or three new High-rate DAF units for Servicing Strategy 1 or 2, respectively, operating in parallel with design capacities of 6.75 ML/d each.

Figure 15-3 presents a process flow diagram for Alternative 3.

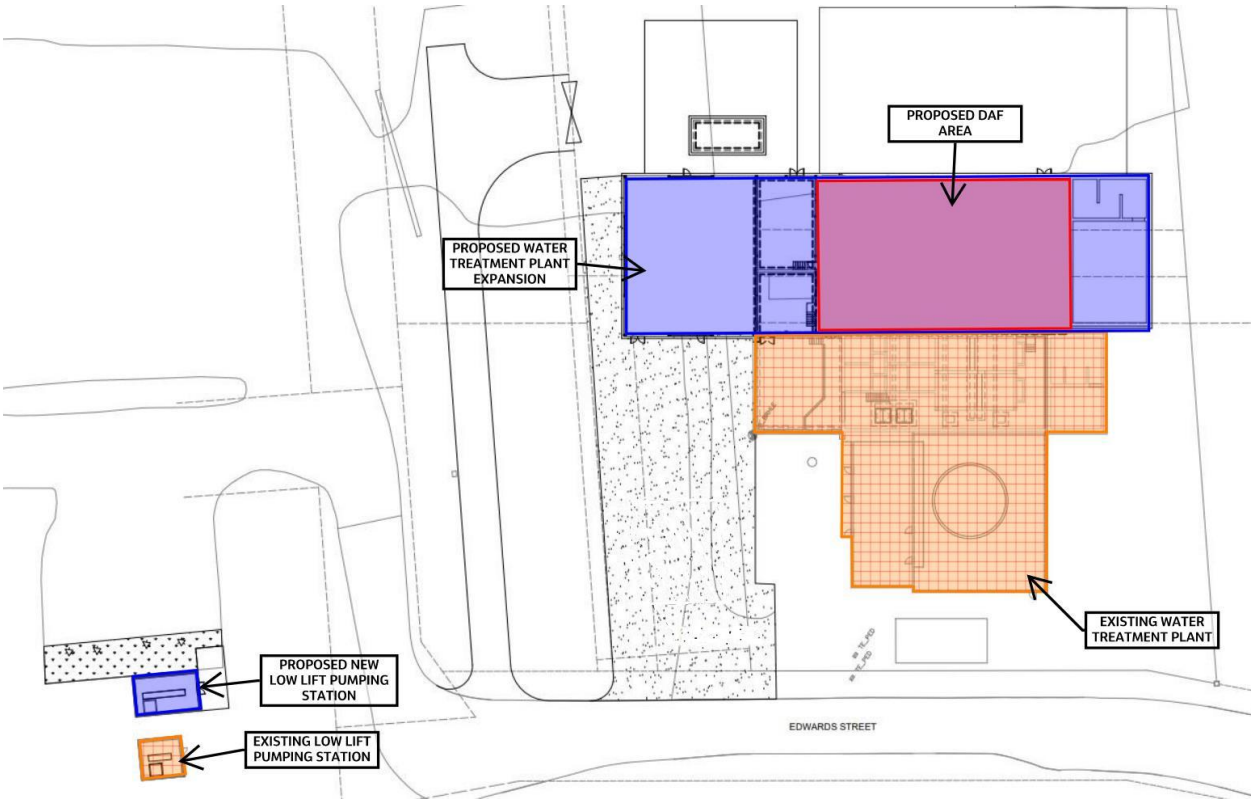
Figure 15-3. Rockland WTP Alternative 3 Process Flow Diagram



As there is insufficient space in the existing LLPS to accommodate new pumps for the capacity upgrade, this alternative also requires a similar LLPS to be constructed adjacent to the existing. The new LLPS would require three new low lift pumps with design capacities of 10.25 ML/d.

Figure 15-4 presents a preliminary site layout for Alternative Design Concept 3. The expanded portion of the building will include the new pretreatment processes, filters, CCT, secondary reservoir, electrical room, mechanical room, and chemical room. The total footprint estimate for the main WTP building is approximately 1,580 or 1,664 square metres for Servicing Strategy 1 and 2, respectively, this alternative. The footprint estimate for the new LLPS is approximately 50 square metres.

Figure 15-4. Rockland WTP Alternative 3 Site Layout



The following bullets summarize key design criteria for the pretreatment system, which are unique to Alternative Design Concept 3:

- Two (Servicing Strategy 1) or three (Servicing Strategy 2) new process trains consisting of a coagulation basin, flocculation basin, and DAF basin to provide pretreatment upstream of the filters.
- Two (Servicing Strategy 1) or three (Servicing Strategy 2) new air recirculation pumps.

15.2 Rockland WTP Cost Estimates

Capital cost estimates and O&M cost estimates were developed for each alternative and rounded to the nearest $100,000. These costs are not presented as they were used for relative comparison purposes for the economic score in the detailed evaluation. Costs for the preferred solutions are presented in Section 17.4.

15.3 Rockland WTP Detailed Evaluation

Each alternative was evaluated using the evaluation criteria presented in Table 15-1 for both Servicing Strategy 1 and 2.

Many of these criteria are non-differentiating for the proposed alternatives. However, these are important considerations identified through the Municipal Class EA process, and it is important to document where the alternatives are similar to one another rather than only highlighting differences.

Table 15-1. Rockland WTP Alternatives Evaluation Criteria

Category	Criterion	Description	High (10)	Medium (5)	Low (0)
Natural Environment	Impacts on surface water quality	The potential for the alternative to have a negative impact on surface water quality (focus is WTP residuals discharge), that would result in harm to the aquatic environment.	The alternative will have no substantial impact on surface water quality that may impact aquatic environments.	The alternative has some potential to change surface water quality that may negatively impact aquatic habitats.	The alternative has a high potential to change surface water quality that may negatively impact aquatic habitats.
	Impacts on surface water quantity	The potential for the alternative to have an impact on surface water quantity that would result in negative impacts on other users and/or the aquatic environment.	The alternative will have no substantial impact on surface water quantity that would result in negative impacts on other users and/or the aquatic environment.	The alternative will have some potential impact on surface water quantity that would result in negative impacts to other users and/or the aquatic environment.	The alternative will have a high potential impact on surface water quantity that would result in negative impacts on other users and/or the aquatic environment.
	Impacts on terrestrial environment	The potential for the alternative to have a long-term negative impact on the viability of terrestrial habitats in terms of density and diversity of species.	This alternative avoids terrestrial habitat.	This alternative requires special measures to protect terrestrial habitat.	This alternative results in an unacceptable loss of habitat.
	Impacts on aquatic environment	The potential for the alternative to have a long-term negative impact on the viability of aquatic habitats in terms of density and diversity of species.	The alternative will protect aquatic habitats and fisheries and has the potential to provide enhancements.	The alternative may require special measures to protect aquatic habitats and fisheries.	The alternative will result in an unacceptable loss of aquatic habitat and fisheries.
	Impacts on Climate Change per cubic metre of water produced	The potential for the alternative to mitigate climate change.	The alternative has the potential to significantly mitigate climate change.	The alternative has the potential to moderately mitigate climate change.	The alternative has minimal potential to mitigate climate change.
	Maximize Climate Change Adaptation	The potential to provide climate adaptation and resiliency benefits.	The alternative has significant adaptation and resiliency benefits.	The alternative has moderate adaptation and resiliency benefits.	The alternative has minimal adaptation and resiliency benefits.
	Impacts to fluvial geomorphic stability	The potential of the alternative to impact the geomorphic stability of the watercourse (based on stream crossings).	The alternative is expected to have no substantial impact on the fluvial geomorphic stability of the watercourse.	The alternative is expected to somewhat reduce the fluvial geomorphic stability of the watercourse.	The alternative is expected to substantially reduce the fluvial geomorphic stability of the watercourse.
	Minimize the Impact on the Local Hydrogeology and Groundwater System	The alternative's potential to induce water table impacts, hydrogeological settling, and surface and groundwater quality degradation.	The alternative is expected to have no substantial impact on the hydrogeology environment and groundwater system.	The alternative is expected to result in moderate impacts to the hydrogeology environment and groundwater system.	The alternative is expected to result in significant impacts to the hydrogeology environment and groundwater system.
	Minimize Impacts on Air Quality	The alternative's potential to negatively impact air quality.	The alternative is expected to result in minimal impacts on air quality.	The alternative is expected to result in moderate impacts on air quality.	The alternative is expected to result in significant impacts on air quality.
	Minimize Impacts to Wetlands	The alternative's potential to negatively impact wetland environments.	This alternative will avoid wetlands.	The alternative may require special measures to maintain wetland protection.	The alternative will result in an unacceptable threat to wetlands.

Category	Criterion	Description	High (10)	Medium (5)	Low (0)
Social/Cultural	Occupational Health and Safety	The potential of the alternative to minimize risk or liability regarding occupational health and safety for construction period and ongoing operation and maintenance.	The alternative poses very little risk to occupational health and safety.	The alternative poses moderate risk to occupational health and safety; construction and O&M safety measures may be required to address specific health and safety concerns.	The alternative poses high risk to occupational health and safety; personal injury may be expected; construction and O&M safety measures will be required to address a number of health and safety concerns.
	Minimize Community Health and Safety Risks	The alternative's potential to induce negative effects on the existing community's health and safety.	The alternative is not expected to present any health and safety risks to the community.	The alternative has the potential to present some health and safety risks to the community.	The alternative has the potential to present significant health and safety risks to the community.
	Minimize Noise	The alternative's potential to generate noise and its' proximity to sensitive receptors.	The alternative is unlikely to generate noise.	The alternative has the potential to generate some level of noise that can be mitigated.	The alternative has the potential to generate a high level of noise that requires a high level of mitigation and is close to sensitive receptors.
	Archaeological Impacts	Minimize impact on archaeological resources or areas of archaeological potential.	This alternative protects features of archaeological potential.	This alternative results in no change to archaeological resources.	This alternative has the potential to disturb archaeological resources.
	Built Heritage Resources and Cultural Heritage Landscapes	The degree of impact that the alternative has on areas with documented built heritage resources and cultural heritage landscapes.	This alternative protects features of built heritage resources and cultural heritage landscapes.	This alternative results in no change to built heritage resources and cultural heritage landscapes.	This alternative has the potential to disturb built heritage resources and cultural heritage landscapes.
	First Nations and Indigenous Community Cultural Heritage Impacts	The degree of impact that the alternative has on cultural heritage resources recognized by First Nations.	This alternative protects features of cultural heritage resources recognized by First Nations.	This alternative results in no change to cultural heritage resources recognized by First Nations.	This alternative has the potential to disturb cultural heritage resources recognized by First Nations.
	Public land Use Impacts (parks, open spaces)	The ability of the alternative to maintain or enhance character of the public lands in the community.	The Alternative has the potential to enhance the character of the public lands in the area.	The Alternative will maintain the character of the public lands in the area.	The Alternative has the potential to decrease the character of the public lands in the area.
	Private Lands Impacts	Impact of the alternative on private lands (Industrial, Commercial, Institutional, including farm operations) in regard to short-term disturbance or long-term use including easements.	The Alternative will have no impact on private lands in regard to short-term disturbance or long-term use.	The Alternative will have a moderate impact on private lands in regard to short-term disturbance or long-term use. Impacts can be mitigated.	The Alternative will have significant impact on private lands in regard to short-term disturbance or long-term use. Impacts cannot be mitigated.
	Public Acceptability	The level of public acceptability for the alternative based on public consultation results.	The alternative may exceed the public's expectation technically and be accepted by the public.	The alternative may be acceptable to the public as it continues to provide treated water in compliance.	The alternative may not be accepted by the public.
	Disruption during Construction	The potential for the alternative to temporarily disrupt local traffic and or use of the area by the public during construction including noise and traffic.	The alternative will not result in disruption to traffic during construction.	The alternative may result in some disruption to traffic and use of the area by the public during construction.	The alternative may result in significant disruption to traffic and use of the area by the public construction.

Category	Criterion	Description	High (10)	Medium (5)	Low (0)
Technical	Ease of Approvals and Permitting	The relative difficulty in acquiring the necessary approvals/permits for the alternative from regulatory agencies and other jurisdictions.	Acquiring the permits for this alternative has the potential to be relatively simple.	Acquiring the permits for this alternative has the potential to be moderately difficult.	Acquiring the permits for this alternative has the potential to be difficult.
	Ability for Phased Implementation	The ability of the alternative to increase treatment capacity in phases.	Increased capacity may be implemented in phases with limited new infrastructure/equipment and minimal interruption to water production.	Increased capacity can be implemented in phases with moderate addition of new infrastructure/equipment and some interruption to water production.	There is no ability for phased implementation.
	Improvement to Water Conveyance	The ability of the alternative to convey demand flows and improve the capacity of the conveyance system.	The alternative has the potential to substantially improve water demand transmission and capacity.	The alternative has the potential to achieve some improvement in water demand transmission and capacity.	The alternative has the potential to provide limited, if any, improvement in water demand transmission and capacity.
	Constructability	The ability of the alternative to be implemented without significant complications, including disruptions to existing service.	The alternative has the potential to be implemented with no disruption to existing service.	The implementation of the alternative may result in minor disruptions to existing service.	The implementation of the alternative may require significant or periodic disruptions to the existing service.
	Ease of Implementation	The ability of the alternative to be constructed and implemented on a technical and practical basis; within a reasonable scope of work.	The alternative has the potential to be easy to implement with limited constructability issues; reasonable construction work scope.	The alternative has the potential to be implemented with some difficult constructability issue or some constraints; or moderate scope of construction work.	The alternative has the potential to have many challenges with respect to implementation and construction; or complex and large work scope.
	Energy Requirements	The resources and fuel the alternative requires in order to function, including electrical, gas, oil, water, etc.	This alternative has lower energy requirements.	This alternative maintains existing energy requirements.	This alternative has higher energy requirements.
	Chemical Requirements	The chemical requirements the alternative requires for adequate treatment performance.	This alternative has lower chemical requirements.	This alternative maintains existing chemical requirements.	This alternative has higher chemical requirements.
	Operational and Maintenance Complexity	The degree of complexity associated with operating and maintaining the alternative.	The alternative is simple to operate and easy to maintain.	The alternative is moderately difficult to operate, requires extensive and continuous operator trainings, the maintenance is somewhat difficult and requires higher skills.	The alternative is complex to operate and requires frequent/complex maintenance.
	Risk/Reliability	The level of risk associated with the alternative relating to probability of failure, water supply and regulatory compliance.	There are limited to no risks associated with the alternative.	There is a moderate level of risk associated with the alternative.	There is a high level of risk associated with the alternative.
	Impacts on Treated Water Quality	Capability of an alternative to meet more stringent water quality regulatory requirements in the future.	The alternative produces treated water superior in water quality to the existing WTP.	This alternative produces treated water with similar water quality to the existing WTP.	The alternative produces treated water with worse water quality than the existing WTP.
Economic	Capital Cost	The capital cost of the alternative.	The alternative's capital costs are low relative to other alternatives.	The alternative's capital costs are moderate relative to other alternatives.	The capital costs are high relative to other alternatives.

15.4 Rockland WTP Preferred Alternative

The preliminary preferred alternative for the Rockland WTP is Alternative 2: Ballasted Flocculation and High-Rate Sedimentation. It is the highest scoring alternative for the evaluation (including three of four sensitivity analyses) and has a lower cost than Alternative 3.

The advantages of the alternative include the following:

- The expanded Rockland WTP will serve the current servicing area of Clarence-Rockland and Limoges and provides the opportunity to service other neighbouring communities.
- The alternative involves expanding the facility using the same process flow and trains of similar size, therefore simplifying the integration into the existing treatment process (for example, same backwash pumps and blowers can be used).
- This alternative can be implemented in phases and includes provisions for future expansions.
- Operation and maintenance of the expanded facility will be relatively simple as the operations staff at the facility are familiar with the equipment.

16. Caron Booster Pumping Station Alternatives Identification and Evaluation

This section identifies the Caron BPS alternatives identification and evaluation for the two Servicing Strategies outlined in Section 11. Servicing Strategy 1 includes continuing service to the existing committed service areas (Clarence-Rockland and Limoges) and Servicing Strategy 2 includes expanding the current service area to provide water to new purchasers in neighbouring communities.

16.1 Caron BPS Alternative Design Concepts

The following alternatives identification and evaluation will be considered for Servicing Strategy 1 and 2 and incorporate the dual-zone approach as recommended in Section 10.2.3. The Caron BPS will need to be expanded from 4 ML/d to 11 ML/d (Servicing Strategy 1) or 17 ML/d (Servicing Strategy 2) to meet future needs for the surrounding Hamlets and Limoges.

16.1.1 Alternative 1: Do Nothing

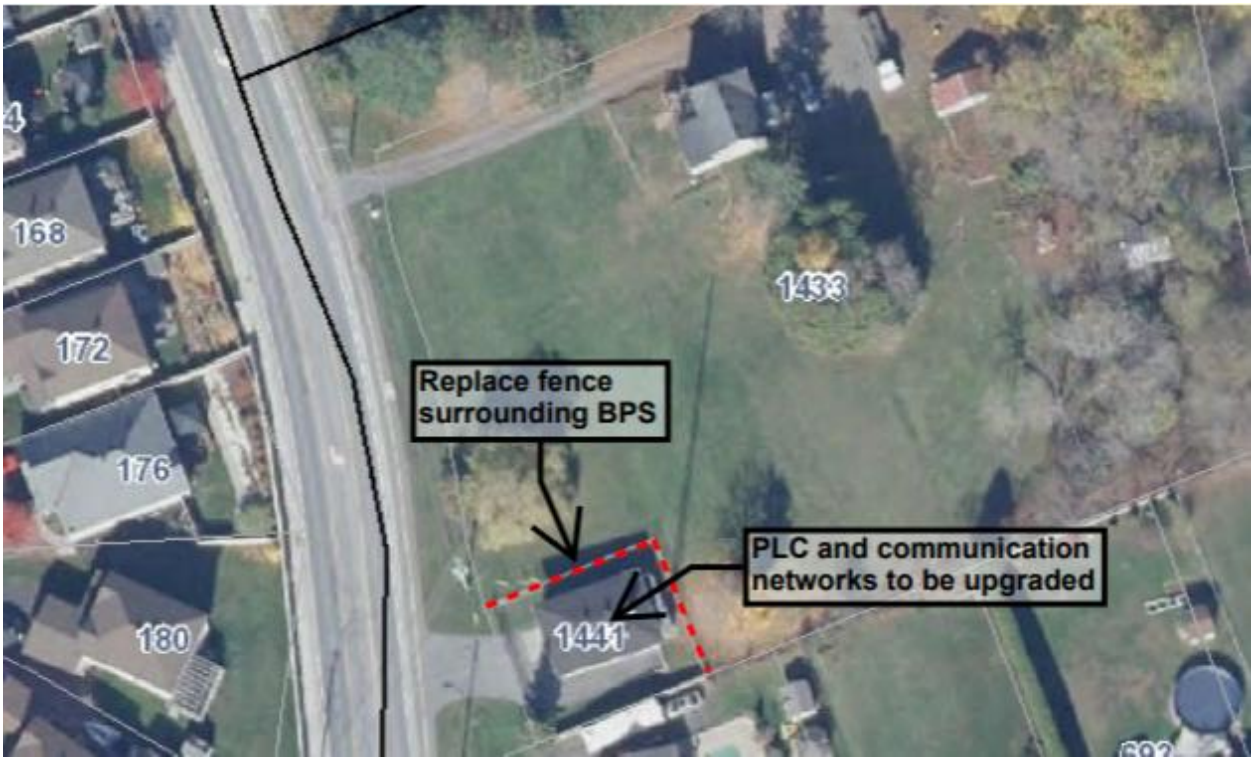
The evaluation of a "Do Nothing" alternative is required under the MEA MCEA process. The purpose of this alternative is to define a baseline alternative where the Problem and Opportunity Statement is not addressed. For the purposes of this Schedule C Class EA the "Do Nothing" alternatives are defined as rehabilitating the Caron BPS to its approved rated capacity but will not provide additional capacity. The Caron BPS is not currently able to perform to the approved rated capacity. Therefore, rehabilitation is required under the Do Nothing alternative.

The existing Caron BPS will continue to be maintained and rehabilitated based on the state of assets in the Clarence-Rockland WMP (Jacobs 2021) and TM1 – Existing WTP scoping Study (Jacobs 2025a). High priority items include civil and instrumentation and control upgrades. The key components of this alternative are summarized as follows:

- The fence surrounding the BPS needs replacement
- PLC and communication networks are recommended to be upgraded

This alternative is illustrated in Figure 16-1 and results in limited growth within Clarence-Rockland as the existing demand is already close to the rated capacity of the Caron BPS.

Figure 16-1. Caron BPS Alternative 1



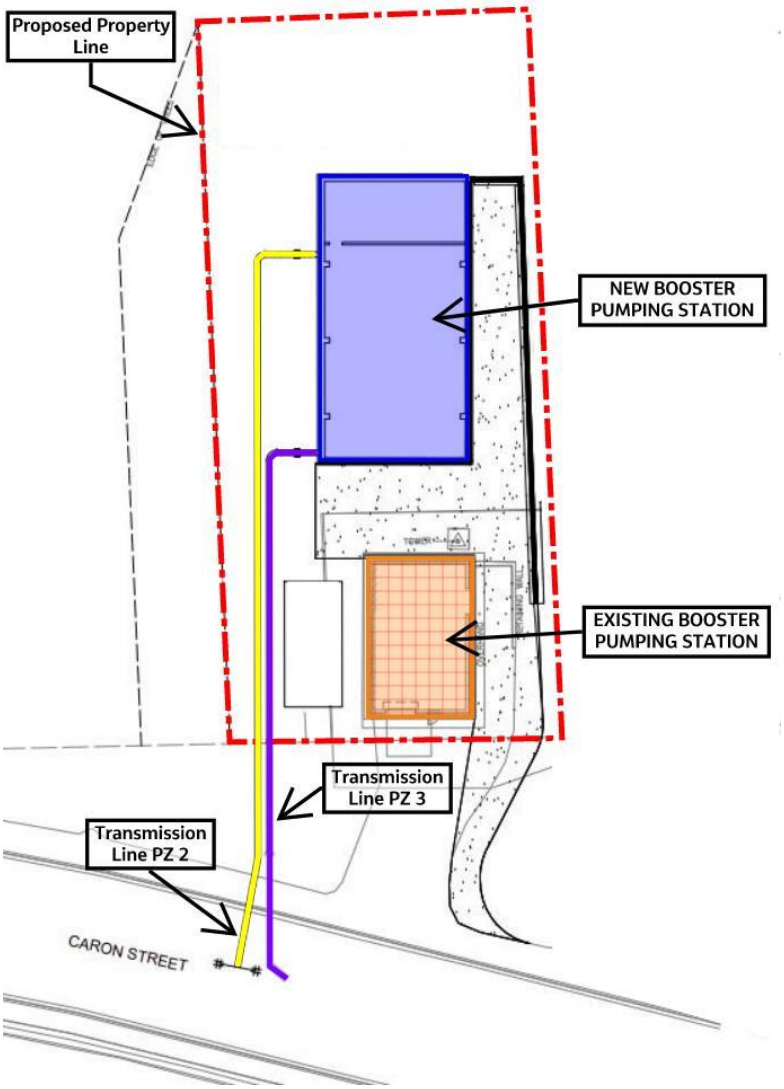
16.1.2 Alternative 2: Build New BPS

Alternative Design Concept 2 includes constructing a new BPS adjacent to the existing BPS with an additional capacity of 7 or 13 ML/d, increasing the total capacity to 11 or 17 ML/d for Servicing Strategy 1 and 2, respectively. This new BPS would contain three or four new booster pumps (2 or 3 duty, 1 standby) for Servicing Strategy 1 or 2, respectively, approximately three times the size of the existing, with rated capacities of 5.7 ML/d.

The alternative includes two new transmission lines leaving the new BPS that supply PZs 2 and 3 in addition to the existing transmission line leaving the existing BPS. Transmission Line PZ-3 would connect to the existing transmission main that supplies Rockland South along with the existing BPS. Transmission Line PZ-2 would connect to a new transmission main currently being built under a separate contract that will supply the Villages and end with a stub in front of the existing Caron BPS.

This alternative is illustrated in Figure 16-2 and allows for the existing BPS to maintain operations while the new BPS is constructed. The new BPS building would include the new booster pumps and electrical room. The total footprint estimate for the building is approximately 255 square metres for this alternative.

Figure 16-2. Caron BPS Alternative 2



16.1.3 Alternative 3: Expand Existing BPS

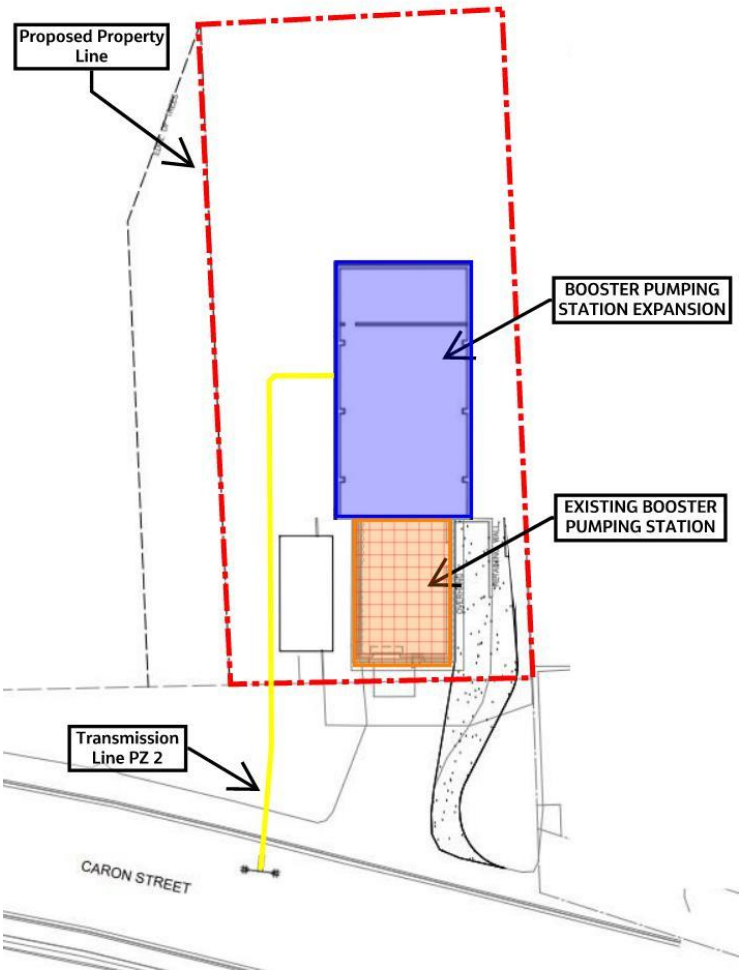
Alternative Design Concept 3 includes expanding the existing BPS to provide an additional capacity of 7 ML/d, increasing the total capacity to 11 ML/d. This alternative would include expanding the original building to house the addition of three or four new booster pumps (2 or 3 duty, 1 standby) for Servicing Strategy 1 or 2, respectively, approximately three times the size of the existing, with rated capacities of 5.7 ML/d.

This alternative would not allow the existing BPS to maintain operations for portions of the expansion works. Additionally, construction sequencing would be more difficult as the new BPS pumps are larger and require larger pipes.

The alternative includes one new transmission line leaving the expanded BPS that would supply PZ-2 in addition to the existing transmission line leaving the existing BPS that supplies PZ-3. Transmission Line PZ-2 would connect to the new transmission main currently being built under a separate contract that will supply the Villages and end with a stub in front of the existing Caron BPS.

Figure 16-3 presents the proposed site plan for Alternative 3. The BPS expansion would include the new booster pumps and electrical room. The total footprint estimate for the building is approximately 255 square metres for this alternative.

Figure 16-3. Caron BPS Alternative 3



16.2 Caron BPS Cost Estimates

Capital cost estimates and O&M cost estimates were developed for each alternative and rounded to the nearest $100,000. These costs are not presented as they were used for relative comparison purposes for the economic score in the detailed evaluation. Costs for the preferred solutions are presented in Section 17.4.

16.3 Caron BPS Detailed Evaluation

Each alternative was evaluated using the evaluation criteria presented in Table 16-1 for both Servicing Strategy 1 and 2.

Many of these criteria are non-differentiating for the proposed alternatives. However, these are important considerations identified through the Municipal Class EA process, and it is important to document where the alternatives are similar to one another rather than only highlighting differences.

Table 16-1. Caron BPS Alternatives Evaluation Criteria

Category	Criterion	Description	High (10)	Medium (5)	Low (0)
Natural Environment	Impacts on surface water quality	The potential for the alternative to have a negative impact on surface water quality (focus is WTP residuals discharge), that would result in harm to the aquatic environment.	The alternative will have no substantial impact on surface water quality that may impact aquatic environments.	The alternative has some potential to change surface water quality that may negatively impact aquatic habitats.	The alternative has a high potential to change surface water quality that may negatively impact aquatic habitats.
	Impacts on surface water quantity	The potential for the alternative to have an impact on surface water quantity that would result in negative impacts on other users and/or the aquatic environment.	The alternative will have no substantial impact on surface water quantity that would result in negative impacts to other users and/or the aquatic environment.	The alternative will have some potential impact on surface water quantity that would result in negative impacts to other users and/or the aquatic environment.	The alternative will have a high potential impact on surface water quantity that would result in negative impacts to other users and/or the aquatic environment.
	Impacts on terrestrial environment	The potential for the alternative to have a long-term negative impact on the viability of terrestrial habitats in terms of density and diversity of species.	This alternative avoids terrestrial habitat.	This alternative requires special measures to protect terrestrial habitat.	This alternative results in an unacceptable loss of habitat.
	Impacts on aquatic environment	The potential for the alternative to have a long-term negative impact on the viability of aquatic habitats in terms of density and diversity of species.	The alternative will protect aquatic habitats and fisheries and has the potential to provide enhancements.	The alternative may require special measures to protect aquatic habitats and fisheries.	The alternative will result in an unacceptable loss of aquatic habitat and fisheries.
	Impacts on Climate Change per cubic metre of water produced	The potential for the alternative to mitigate climate change.	The alternative has the potential to significantly mitigate climate change.	The alternative has the potential to moderately mitigate climate change.	The alternative has minimal potential to mitigate climate change.
	Maximize Climate Change Adaptation	The potential to provide climate adaptation and resiliency benefits.	The alternative has significant adaptation and resiliency benefits.	The alternative has moderate adaptation and resiliency benefits.	The alternative has minimal adaptation and resiliency benefits.
	Minimize the Impact on the Local Hydrogeology and Groundwater System	The alternative's potential to induce water table impacts, hydrogeological settling, and surface and groundwater quality degradation.	The alternative is expected to have no substantial impact on the hydrogeology environment and groundwater system.	The alternative is expected to result in moderate impacts to the hydrogeology environment and groundwater system.	The alternative is expected to result in significant impacts to the hydrogeology environment and groundwater system.
	Minimize Impacts on Air Quality	The alternative's potential to negatively impact air quality.	The alternative is expected to result in minimal impacts on air quality.	The alternative is expected to result in moderate impacts on air quality.	The alternative is expected to result in significant impacts on air quality.
	Minimize Impacts to Wetlands	The alternative's potential to negatively impact wetland environments.	This alternative will avoid wetlands.	The alternative may require special measures to maintain wetland protection.	The alternative will result in an unacceptable threat to wetlands.

Category	Criterion	Description	High (10)	Medium (5)	Low (0)
Social/Cultural	Occupational Health and Safety	The potential of the alternative to minimize risk or liability regarding occupational health and safety for construction period and ongoing operation and maintenance.	The alternative poses very little risk to occupational health and safety.	The alternative poses moderate risk to occupational health and safety; construction and O&M safety measures may be required to address specific health and safety concerns.	The alternative poses high risk to occupational health and safety; personal injury may be expected; construction and O&M safety measures will be required to address a number of health and safety concerns.
	Minimize Community Health and Safety Risks	The alternative's potential to induce negative effects on the existing community's health and safety.	The alternative is not expected to present any health and safety risks to the community.	The alternative has the potential to present some health and safety risks to the community.	The alternative has the potential to present significant health and safety risks to the community.
	Minimize Noise	The alternative's potential to generate noise and its' proximity to sensitive receptors.	The alternative is unlikely to generate noise.	The alternative has the potential to generate some level of noise that can be mitigated.	The alternative has the potential to generate a high level of noise that requires a high level of mitigation and is close to sensitive receptors.
	Archaeological Impacts	Minimize impact on archaeological resources or areas of archaeological potential.	This alternative protects features of archaeological potential.	This alternative results in no change to archaeological resources.	This alternative has the potential to disturb archaeological resources.
	Built Heritage Resources and Cultural Heritage Landscapes	The degree of impact that the alternative has on areas with documented built heritage resources and cultural heritage landscapes.	This alternative protects features of built heritage resources and cultural heritage landscapes.	This alternative results in no change to built heritage resources and cultural heritage landscapes.	This alternative has the potential to disturb built heritage resources and cultural heritage landscapes.
	Maximize the Opportunity for Economic Development	Alternatives potential to provide the necessary infrastructure to enable housing development.	The alternative allows for planned housing development and can accommodate future housing or service area expansion.	The alternative allows for planned housing development.	The alternative allows no further opportunity for housing development.
	First Nations and Indigenous Community Cultural Heritage Impacts	The degree of impact that the alternative has on cultural heritage resources recognized by First Nations.	This alternative protects features of cultural heritage resources recognized by First Nations.	This alternative results in no change to cultural heritage resources recognized by First Nations.	This alternative has the potential to disturb cultural heritage resources recognized by First Nations.
	Public land Use Impacts (parks, open spaces)	The ability of the alternative to maintain or enhance character of the public lands in the community.	The Alternative has the potential to enhance the character of the public lands in the area.	The Alternative will maintain the character of the public lands in the area.	The Alternative has the potential to decrease the character of the public lands in the area.
	Private Lands Impacts	Impact of the alternative on private lands (Industrial, Commercial, Institutional, including farm operations) in regard to short-term disturbance or long-term use including easements.	The Alternative will have no impact on private lands in regard to short-term disturbance or long-term use.	The Alternative will have a moderate impact on private lands in regard to short-term disturbance or long-term use. Impacts can be mitigated.	The Alternative will have significant impact on private lands in regard to short-term disturbance or long-term use. Impacts cannot be mitigated.
	Public Acceptability	The level of public acceptability for the alternative based on public consultation results.	The alternative may exceed the public's expectation technically and be accepted by the public.	The alternative may be acceptable to the public as it continues to provide treated water in compliance.	The alternative may not be accepted by the public.
	Disruption during Construction	The potential for the alternative to temporarily disrupt local traffic and or use of the area by the public during construction including noise and traffic.	The alternative will not result in disruption to traffic during construction.	The alternative may result in some disruption to traffic and use of the area by the public during construction.	The alternative may result in significant disruption to traffic and use of the area by the public construction.

Category	Criterion	Description	High (10)	Medium (5)	Low (0)
Technical	Ease of Approvals and Permitting	The relative difficulty in acquiring the necessary approvals/permits for the alternative from regulatory agencies and other jurisdictions.	Acquiring the permits for this alternative has the potential to be relatively simple.	Acquiring the permits for this alternative has the potential to be moderately difficult.	Acquiring the permits for this alternative has the potential to be difficult.
	Ability for Phased Implementation	The ability of the alternative to increase treatment capacity in phases.	Increased capacity may be implemented in phases with limited new infrastructure/equipment and minimal interruption to water production.	Increased capacity can be implemented in phases with moderate addition of new infrastructure/equipment and some interruption to water production.	There is no ability for phased implementation.
	Improvement to Water Conveyance	The ability of the alternative to convey demand flows and improve the capacity of the conveyance system.	The alternative has the potential to substantially improve water demand transmission and capacity.	The alternative has the potential to achieve some improvement in water demand transmission and capacity.	The alternative has the potential to provide limited, if any, improvement in water demand transmission and capacity.
	Constructability	The ability of the alternative to be implemented without significant complications, including disruptions to existing service.	The alternative has the potential to be implemented with no disruption to existing service.	The implementation of the alternative may result in minor disruptions to existing service.	The implementation of the alternative may require significant or periodic disruptions to the existing service.
	Energy Requirements	The resources and fuel the alternative requires in order to function, including electrical, gas, oil, water, etc.	This alternative has lower energy requirements.	This alternative maintains existing energy requirements.	This alternative has higher energy requirements.
	Operational and Maintenance Complexity	The degree of complexity associated with operating and maintaining the alternative.	The alternative is simple to operate and easy to maintain.	The alternative is moderately difficult to operate, requires extensive and continuous operator trainings, the maintenance is somewhat difficult and requires higher skills.	The alternative is complex to operate and requires frequent/complex maintenance.
Economic	Capital Cost	The capital cost of the alternative.	The alternative's capital costs are low relative to other alternatives.	The alternative's capital costs are moderate relative to other alternatives.	The capital costs are high relative to other alternatives.

16.4 Caron BPS Evaluation Results

The evaluation results for the Servicing Strategy 1 Caron BPS alternatives are presented in Table 16-2. Detailed scoring and rationales of the evaluation for each category are presented in Appendix B.

Table 16-2. Caron BPS Evaluation Results

Category	Alternative 1: Do Nothing	Alternative 2: Build New BPS	Alternative 3: Expand Existing BPS
Natural Environment	21.4	19.4	19.4
Social/Cultural Environment	18.2	20.5	20.5
Technical Environment	12.5	21.3	18.8
Economic Environment	Low	High	Medium
Total	**52.1**	**61.1**	**58.6**
Sensitivity Analysis -1	**55.4**	**58.8**	**57.5**
Sensitivity Analysis -2	**52.9**	**59.6**	**58.3**
Sensitivity Analysis -3	**45.0**	**54.6**	**51.9**
Sensitivity Analysis -4	**38.3**	**43.3**	**41.9**

16.5 Caron BPS Preferred Alternative

The preliminary preferred alternative for the Caron BPS is Alternative Design Concept 2: Build New BPS. It was the highest scoring alternative for the evaluation (including all four sensitivity analyses) and has a similar cost to Alternative 3. This alternative is illustrated in Figure 16-2.

The advantages of the alternative include the following:

- Allows for the existing BPS to maintain operations while the new BPS is constructed.
- Increases the rated capacity of the Caron BPS to service the existing customers and provides additional capacity to service Limoges.

17. Summary of Preferred Design Concepts and Solutions

This section summarizes the preferred design concepts and solutions identified in this report.

17.1 Intake Design

If field investigations determine that the existing intake can provide 34 MLD while maintaining the required lowest escape velocity for the fish expected to be in the vicinity of the intake, then the recommended solution is to Do Nothing and proceed with expanding the Rockland WTP and Caron BPS with no changes to the intake structure. However, in the case that the existing intake is not able to meet this requirement, a new intake structure or upgrades to the existing structure will be required.

The preliminary preferred alternative is the same for both Servicing Strategy 1 and 2, with Alternative 2: Bell Mouth Intake as the preferred solution. Information on the existing intake is limited and investigations to confirm the existing intake condition, type, and dimensions are required to confirm future needs. At this time, it is assumed that a new intake structure will be required to expand the treatment capacity of the Rockland WTP.

It is expected that the City will need to expand to the ultimate treatment capacity of 54 ML/d to service future population within the typical useful life of the intake structure. Due to the anticipated useful life of the intake structure, it is recommended that consideration be given to designing the new intake structure to achieve flows of 54 ML/d to service the projected ultimate future capacity needs identified in TM-2 Future Growth Assumptions and Water Use Estimates (Jacobs 2025b) as part of the WMP Update. This minimizes environmental impacts related to in-water work required to replace the intake in the future. As such, it is recommended that consideration be given in the design of the new structure to accommodate a second raw water pipe connection, as the existing raw water pipe to the LLPS is not sufficiently sized to accommodate flows of 54 ML/d. This will be further assessed once the findings from the studies on the existing intake are available and the upgrade requirements can be confirmed. If the entire intake needs to be replaced to accommodate the 27 ML/d capacity increase, it would likely be replaced with an intake with sufficient capacity for the ultimate water demands. At this stage, the EA is intended to cover the range of possible outcomes and upgrade requirements. The costs, impacts to the river, impacts to plant operations during construction, and impacts to fish are all similar between the various options.

17.2 Rockland WTP Design

The preliminary preferred alternative solution is Alternative 2: Ballasted Flocculation and High-Rate Sedimentation for both Servicing Strategy 1 (27 ML/d) and 2 (34 ML/d).

The need to expand to 34 ML/d is anticipated to service future population growth in the Clarence-Rockland WMP (Jacobs 2021). However, the timing of this expansion may change if neighbouring communities confirm interest in purchasing water from the City in the near-term. Therefore, it is recommended that the expansion to 27 ML/d account for this opportunity by designing and constructing the building and other structural elements with the flexibility to simplify future expansion to 34 ML/d (for example, build the tankage for the third train of ballasted flocculation/high-rate sedimentation/filtration but initially leave them empty). This allows the City the flexibility to expand to 34 ML/d with less capital cost in the event that neighbouring communities decide to purchase water from the City in the near-term. If neighbouring communities do not purchase water from the City, this approach decreases future capital costs when the second phase of expansion is required.

17.3 Caron BPS Design

The preliminary preferred alternative solution is Alternative 2: Build New BPS under both Servicing Strategy 1 (11 ML/d) and 2 (17 ML/d). The need to expand to 17 ML/d is anticipated to service future population growth in the Clarence-Rockland WMP (Jacobs 2021). However, the timing of this expansion may change if neighbouring communities confirm interest in purchasing water from the City in the near-term. Therefore, it is recommended that the expansion of the Caron BPS account for this opportunity by designing and constructing the building and other structural elements with the flexibility to simplify future expansion. It is recommended to design and construct the pumping station building envelope and other structural assets with the flexibility to simplify future expansion. With this approach, the equipment required to produce the flows required for Servicing Strategy 1 would be installed, with the space and piping connections necessary for a future expansion. This allows the City the flexibility to easily expand to 17 ML/d without building modification if neighbouring communities decide to purchase water from the City in the near-term. If neighbouring communities do not purchase water from the City, this approach decreases future capital costs when the second phase of expansion is required.

17.4 Preferred Design Concepts and Solutions

The preliminary preferred alternatives are the same for both Servicing Strategy 1 and 2 for the intake, Rockland WTP, and Caron BPS expansions. As neighbouring communities are not yet committed to purchasing water from the City, this report identifies the following preliminary preferred alternatives for both Servicing Strategies:

- The preliminary preferred alternative for the Intake is **Alternative 2: Bell Mouth Intake**
- The preliminary preferred alternative for the Rockland WTP is **Alternative 2: Ballasted Flocculation and High-Rate Sedimentation**
- The preliminary preferred alternative for the Caron BPS is **Alternative 2: Build New BPS**

As neighbouring communities have not confirmed their interest in purchasing water from the City, but the need to expand to 34 ML/d at the Rockland WTP and 17 MLD at the Caron BPS is anticipated to service future population growth, it is recommended that the preferred alternatives for the Rockland WTP and Caron BPS are designed with the flexibility to simplify future expansions. It is recommended that the design and construction of the Rockland WTP and Caron BPS building envelope and other structural assets be designed to account for Servicing Strategy 2, while the equipment to produce flows required for Servicing Strategy 1 is installed with the space and piping connections necessary for future expansion.

Table 17-1 summarizes the capital cost estimates associated with the preliminary preferred solution. These costs include:

- 10% for overhead and profit
- 7% for mobilization, bonding and insurance
- 25% project contingency
- 3.8% escalation to the estimated mid-point of construction (3% per year for 15 months)
- 5% market contingency
- 10% allocation for construction change orders
- Excludes engineering and HST

Table 17-1. Summary of Costs for the Preferred Solution

Location	Preferred Alternative	Capital Cost Estimate	O&M Cost Estimate
Rockland WTP	**Intake Alternative 2: Bell Mouth Intake**	$330,000	N/A
Rockland WTP	**Alternative 2: Ballasted Flocculation**	$63,555,810	$557,494
Caron BPS	**Alternative 2: Build New BPS**	$11,393,603	$37,497
Total		$75,279,413	$594,991

17.5 Long-Term Benefits

The preliminary preferred solutions and design concepts identified in this Class EA are expected to provide the following long-term benefits for the City of Clarence-Rockland:

- Replacing aging, unreliable infrastructure with new, modern, and sustainable infrastructure that will increase the security and reliability of water supply in Clarence-Rockland and the expanded service areas.
- Providing flexibility for second phase expansion of the Rockland WTP and Caron BPS.
- Improving compliance with DFO guidelines for fish protection by decreasing the flow velocity at the mouth of the intake.
- Providing reliable water conveyance to Limoges and other neighbouring communities.
- Allowing for development opportunities in Clarence-Rockland, Limoges and other neighbouring communities.

17.6 Climate Change Considerations

Climate change adaptation and mitigation are important considerations and were incorporated within the preliminary preferred alternative. It is anticipated the City's water treatment system can expect to face a changing climate with respect to increased frequency of climatic events including more intense storms and the potential for more frequent drought conditions, changing temperatures, and uncertainty around wildfires and seismic events. More extreme events like intense rainfall, snowfall, drought, and wildfires may result in changes in source raw water quality.

The preliminary preferred solution provides climate mitigation benefits by selecting energy efficient alternatives:

- The ballasted flocculation pretreatment process provides safe and reliable drinking water treatment at comparatively lower energy requirements.
- Dual pressure zones implemented at the Caron BPS reduces energy losses in the distribution system.

The preliminary preferred solution provides adaptation and resiliency benefits through:

- The ballasted flocculation pretreatment process provides safe and reliable drinking water and is able to manage changes in source water quality that may occur as a result of more frequent intense rainfall events or due to more frequent drought conditions.
- Dual pressure zones implemented at the Caron BPS provides system redundancy increasing operational reliability.

18. Public, Agency, and Indigenous Communities Consultation and Engagement

Stakeholders in the MCEA process are any individual or party who can be affected by or have an interest in a project, including the general public, government agencies and other stakeholders such as special interest groups or utilities. All interested stakeholders must be consulted through the MCEA process. Indigenous communities who have treaty rights or the lands are within their traditional territory must also be consulted as part of the MCEA.

At the onset of the MCEA, the City identified stakeholders and Indigenous communities to be consulted with through the process and implemented a program to consult with these audiences and receive their input. Input was reviewed, responded to, and considered in the development of the expansion plan and mitigation measures.

This section provides a review of the goals of the consultation program, the stakeholders and Indigenous communities consulted with, consultation activities, input received, and how input influenced the MCEA process and the selection and development of the preferred design concept. Related consultation materials are provided in Appendix B.

18.1 Goals of the Consultation and Engagement Program

Consultation is an integral component of the MCEA process, enabling the City to inform the public, agencies, other stakeholders and Indigenous communities about the Study while eliciting their input throughout the Study process. The overall aim of the program is to build understanding and receive support for the project. Specific goals included:

- Providing accessible methods and opportunities for consultation and engagement.
- Addressing comments, questions, and concerns so they can be considered within the Study process.
- Garnering support for the Study from members of the public, agencies, other stakeholders and Indigenous communities through a process that is fair, transparent, and honest.

To achieve these goals, the following specific objectives were defined for the communications and consultation program:

- Provide adequate notice at the start of this Study to actively encourage inclusive and equitable participation.
- Clearly and effectively communicate information on each alternative the Study will consider, including:
  - Benefits and negative effects of each alternative.
  - Rationale for the recommended alternative.
  - Opportunities for sustainable solutions, particularly relating to energy efficiency and GHG emissions.
  - Recommendations to minimize adverse effects and maximize benefits.
- Foster public trust and confidence by:
  - Demonstrating the City is following a comprehensive process, with a team of specialists who have the experience and qualifications to complete a fair, transparent, and educated evaluation of all alternatives.
  - Providing consistent messaging to all interested and affected parties.

- Engaging all affected and interested parties in a manner that provides balanced and understandable information and elicits meaningful input.
- Demonstrating that input received is respected, responded to, and considered during the process to arrive at an informed decision about the Study.

Stakeholder and Indigenous Community Communications and Consultation Plans were developed at the MCEA Study outset to guide consultation and communications and are available in Appendix B. These plans outlined the broad range of consultation and engagement methods that were employed through the MCEA, including meetings and discussions, notices, comment forms at consultation opportunities included by email, web page, or public information centres (PICs). The method of communication used depended on the Stakeholder or Indigenous Community consulted based on their interest and knowledge.

18.2 Engagement with Indigenous Communities

Indigenous communities, including First Nations and Métis communities, are important stakeholders for municipal projects. The City recognizes the importance of building and fostering reciprocal relationships with First Nations, Métis and Inuit People and Communities around Clarence-Rockland and are committed to learning from Indigenous values and traditional knowledge and building opportunities for collaboration. Indigenous communities were contacted based on interests and potential impacts on established or asserted rights. The communities that were notified of the Study and included in engagement efforts throughout the Study process include:

- Algonquins of Pikwakanagan
- Algonquins of Ontario
- Mohawks of Akwesasne
- Kitigan Zibi Anishinabeg
- Huron-Wendat Nation

The Project Team sent the Notice of Study Commencement at Study initiation followed by the Notice of PIC #1 (September 2025) and Notice of PIC #2 (January 2026). The Project Team received a response from two communities. Information, details regarding notifications and communication with Indigenous communities is included in Appendix B.

18.3 Consultation with Review Agencies

The MECP is the main review agency associated with the Study. In addition, Appendix 3 of the MCEA guidance document, Recommended Agency Contacts, provides guidelines for establishing contact with appropriate review agencies for situations where varying environmental impacts are identified. The criteria were reviewed to identify the appropriate contacts, including conservation authorities (including source water protection), provincial ministries that may have an interest in the project (for example, Ministry of Heritage, Sport, Tourism and Culture Industries) and additional federal authorities (for example, Indigenous and Northern Affairs Canada).

A Stage 1 AA was submitted to the MCM.

The Project Team met with the MECP for a pre-consultation on February 13, 2026, prior to PIC #2 to present an overview of the project and the progress to date, to discuss the DWWP Amendment, and to highlight any concerns the MECP may have had that should be included in the ESR. A summary of the meeting can be found in Appendix B.

Details regarding notifications and communication with review agencies is included in Appendix B.

18.4 Project Mailing List

A Study-specific mailing list was compiled to track consultation activities as a record of all parties contacted regarding the Study. The mailing list is included in Appendix B.

18.5 Notice of Study Commencement

The Notice of Study Commencement was issued on June 13, 2025, outlining the Study purpose, process, and means of joining the Project Mailing List.

18.6 Project Webpage

A project webpage was established on the City's website. The purpose of the web page is to raise awareness of the purpose and objectives of the ongoing Study, share updates, and provide access to engagement opportunities. The webpage includes the following:

- Notices and general updates
- Consultation opportunities
- Project Team contact information

18.7 Public Information Centres

There were two PICs held throughout the Study.

- PIC #1 was held on September 24, 2025, as part of Phase 1 and 2 of the Class EA process.
- PIC #2 was held on February 18, 2026, to confirm the preferred solutions for the Rockland WTP and Caron BPS as part of Phase 3 of the Class EA process.

An overview of each PIC, including advertising, presentation, survey questions and feedback was received as included in Appendix B.

18.8 Newsletter Advertisements

Project notices were advertised in the City's newsletter within a few days of distribution to the Project Mailing List.

18.9 Notice of Completion

To announce the completion of the Study, a notice will be published advertising the completion of the ESR and 30-day public comment period. The notice will include provisions to request an Order under section 16 of the Ontario EA Act. A Section 16 Order may be requested if there are outstanding concerns that a project going through a Class EA process may have potential adverse impact(s) on constitutionally protected Indigenous and treaty rights. If no request for a Section 16 Order is received within the comment period, the CK PUC may develop the project based on the preferred solution.

18.10 How the Preferred Solution Incorporated Engagement Feedback

During Phase 1, a Communications Log was developed so that all comments, consultation, and communications could be directly linked and stored easily and efficiently. All comments received from the public, stakeholders and Indigenous communities during the MCEA were documented, addressed and considered in the assessment of alternatives and the development of the preferred design concept.

Detailed comments and responses are provided in Appendix B, while descriptions of how feedback has influenced the decision process are described in the following subsections.

18.10.1 Public Input

Input from the local community has helped the Project Team to understand local concerns and issues. Feedback received during the MCEA Study influenced the decision-making process by supporting the:

- Development of the detailed evaluation criteria and their importance weighting.
- Identification of measures necessary to mitigate impacts and the extent to which these measures must be implemented.

Detailed comments and responses are provided in Appendix B. Comments received from the public were supportive of the project, emphasized concerns regarding cost, and construction timelines.

18.10.2 Agency Input

The MECP and MCM played a critical role in the MCEA Study by providing:

- Information on government approvals, permits and standards the project must meet.
- Technical, regulatory, environmental and planning advice that helped identify impacts and mitigation measures.

Communications with key agencies also helped establish the basis for further consultation through the design and construction phases of the project. Table 18-1 provides a summary of the major comments received and the Project Team responses.

Table 18-1. Agency Comments and Responses

Comment	Response/Action
MCM provided an initial letter outlining the requirements for Archaeological and Cultural Heritage EA reporting.	The MCM has been provided with the Stage 1 AA. A Cultural Heritage Screening Report was completed and can be found in Appendix A. A Heritage Impact Assessment (HIA) was completed to evaluate the potential impacts of the proposed work on Du Moulin Park/former Edwards Sawmill and is available in Appendix A. The Project Team will continue to communicate with the MCM as required.
MECP provided an *Areas of Interest* document that provides guidance regarding the Ministry's interests with respect to the Class EA process.	A source water protection section was added to this ESR. Section 17.6 details how climate change was considered in the EA.
MNR provided the *MNR Southern Region Information Package – For External Proponent Environmental Assessments (October 2024)* in response to the Notice of PIC 1. The information package outlines the regulatory requirements of the MNR, including requirements under the Planning Act, Fish and Wildlife Conservation Act, Lakes and Rivers Improvement Act, and Public Lands Act.	A natural features desktop study and NFIA report were prepared for this Study and can be found in Appendix A. During the design stage, the Project Team will confirm whether additional natural heritage investigations are necessary to further characterize the environment and will continue to consult with MNR to receive approvals if necessary.

Responses to any written or media inquiries are included in Appendix B. Issues that require ongoing monitoring have been highlighted for Phase 5 of the Study: Implementation (for example, construction monitoring or permitting commitments).

18.10.3 Indigenous Community Input

Communications with Indigenous communities are summarized in Section 18.2 and are included in Appendix B. Communities expressing interest in the project are provided project information, background materials, and notifications in the manner requested by the community.

19. Implementation Plan and Mitigation Measures

This Section describes the implementation plan and mitigation measures for the preferred alternative solution.

19.1 Considerations for Implementation

Subsection 19.1 outlines the components of the recommended implementation plan.

19.1.1 Phasing Plan

The preferred solutions identified in this report will be implemented as the first of two phases of infrastructure upgrades and expansion required to meet the 2046 maximum day demand as identified in Section 6. The second phase of expansion will meet the ultimate maximum day demand and the timing will be determined by future WMPs which may be triggered earlier should neighbouring communities decide to proceed with purchasing water from the City.

The recommended preferred solution for the expansion of the Rockland WTP and Caron BPS is to account for the anticipated future expansion to 34 ML/d in the design and construction of the first phase of expansion to 27 ML/d. It is important to incorporate the flexibility to expand in the future in this expansion to reduce future capital costs and allow the City the flexibility to adjust the timeline for the second phase expansion neighbouring communities commit to purchase water from the City trigger the need to expand earlier. It is recommended that the design of the first phase of expansion includes the following to provide the flexibility to expand to 34 ML/d when required:

- The Rockland WTP intake should be sized for future expansion to at least 34 ML/d (depending on the findings of the intake investigations and discussions with regulatory agencies)
- Designing the Rockland WTP for a capacity of 27 ML/d with provisions to expand to 34 ML/d in the future such that expanding the building footprint is not required

19.1.2 Implementation Timing

The anticipated implementation timing for the preferred solution and triggers that could result in changes in the implementation timeline.

- Expansion of the Rockland WTP to 27 ML/d is required to meet the needs of the existing serviced area by 2032.
- Expansion of the Caron BPS to 11 ML/d is required in the near-term to meet the anticipated growth. The ongoing water transmission main twinning project will provide additional capacity to meet the immediate needs. Expansion of the BPS will address the servicing needs anticipated within the next 5 years.
- Expansion of the Rockland WTP to 34 ML/d and Caron BPS 17 ML/d is required in the near-term if neighbouring communities commit to purchasing water needs from the City or in 2046 to meet the needs of the existing serviced area.

The timeline for implementing the Rockland WTP and Caron BPS includes the following assumptions:

- ESR completion in spring 2026
- 6 months for Design of the Caron BPS expansion and 12 months for the Design of the Rockland WTP expansion
- 3-month Tendering Period for each construction contract
- 18 months for Construction for the Caron BPS expansion and 24 months for Construction for the Rockland WTP expansion

Table 19-1 summarizes the implementation timeline for the preferred solution.

Table 19-1. Implementation Timeline

Capacity Required By	Identified Solution	Triggers
<5 years	Expansion of Caron BPS to 11 ML/d	Additional capacity is required to service the existing serviced area.
2032	Expansion of Rockland WTP to 27 ML/d	Additional capacity is required to service the existing serviced area.
2046	Expansion of Caron BPS to 21 ML/d	Growth is realized more quickly than anticipated. Neighbouring communities commit to purchasing water from the City.
2046	Expansion of Rockland WTP to 54 ML/d to meet Maximum Day Demand	Growth is realized more quickly than anticipated. Neighbouring communities commit to purchasing water from the City.

19.2 Permits and Approvals

Table 19-2 outlines the permitting and approval requirements for implementing the preferred solution following the completion of the Schedule C Class EA.

Table 19-2. Permitting and Approvals

Parameter	Value
Rockland WTP	PTTW for Operation PTTW for Construction DWWP Schedule C Amendment Environmental Compliance Approval – Air and Noise Approval Endangered Species Act Permit or Letter of Advice Building Permit Package Site Plan Control Approval SNCA Approval Application including Source Water Protection Planning to revise IPZs ESA Plan Review Electrical Safety Standards & Safety Authority (TSSA) – Chemicals Electrical Safety Standards & Safety Authority (TSSA) – Generator Designated Substance Survey Stage 1 and 2 Archaeological Assessment
Intake upgrade to 34 MLD	Department of Fisheries and Oceans Project Authorization Transportation Canada Approval under the Canadian Navigable Waters Act MNR Work Permit
If the intake pipe needs to be replaced	Schedule C EA (or addendum to this Schedule C EA if required within 10 years of ESR filing) Environmental Impact Study Marine AA Cultural Heritage Department of Fisheries and Oceans Project Authorization Transportation Canada Approval under the Canadian Navigable Waters Act MNR Work Permit
Caron BPS	PTTW for Operation PTTW for Construction DWWP Schedule C Amendment Environmental Compliance Approval – Air and Noise Approval Building Permit Package Site Plan Control Approval SNCA Approval Application Electrical Safety Authority (ESA) Plan Review Stage 1 and 2 AA

19.3 Potential Impacts and Mitigations

This section presents the potential effects and mitigation measures for the preferred solution and design concept identified in this Class EA. Construction activities are anticipated to include the following:

- Excavation
- Dewatering
- Soil storage and management
- Sediment and erosion control
- Grading and landscaping
- In-water work to either modify/upgrade the existing intake or add bell mouths

The following subsections describe potential effects and mitigation and monitoring measures for various components of the Study Area, both during and post-construction.

19.3.1 Aquatic & Terrestrial Vegetation and Wildlife

A Natural Heritage and Impact Assessment Report was completed to identify potential direct and indirect impacts resulting from the implementation of the preferred design concept and to provide mitigation measures for these impacts. Direct impacts are typically associated with the physical removal or alteration of natural features that could occur during construction (that is, tree and vegetation removals). Indirect impacts include changes or effects that relate to hydrological, noise and disturbance occurring due to activities being completed as part of the future construction scope. While not physically altering or removing habitat, these indirect impacts can introduce some level of disturbance or degradation to natural features and function.

As the design advances, both direct and indirect impacts on natural heritage may change and will be reassessed to update recommended mitigation strategies. Where warranted, updated natural environment field surveys and an environmental impact assessment will be completed during detailed design to confirm natural features and refine impact predictions and mitigation measures.

Direct impacts on SAR are not anticipated; however, direct impacts on the FOD3-1 woodland community are expected. These include tree removals or injuries and vegetation clearing within this feature. Such removals constitute direct impacts on the natural environment and may affect migratory birds.

Potential indirect impacts associated with the preferred design concept include sedimentation and erosion beyond the Study Area. This is of particular concern near off-site natural features at the eastern limits of the Study Area and in areas adjacent to the Ottawa River on the north side. Erosion and sedimentation could also lead to concentrated runoff flows discharging into adjacent natural features, especially during rain events.

Table 19-3 identifies mitigation strategies that should be implemented to address potential impacts to natural features, SAR and wildlife within the Study Area and 120 m adjacent lands.

Table 19-3. Potential Impacts to Natural Features and Recommended Mitigation Strategies

Potential Impacts to Natural Features	Mitigation Strategies
Erosion and sedimentation/runoff	▪ At the detailed design stage, an Erosion and Sedimentation Control (ESC) plan shall be developed by a qualified person and be Site specific. The ESC plan shall be treated as a live document and updated as required. ▪ Multibarrier ESC measures (that is, Filter Socks and heavy-duty silt fencing) should be erected directly adjacent to the proposed works which abut natural features i.e. Woodlands FOD3-1, fish habitat (that is, Ottawa River if the work is not setback by more than 30 m), PSWs and Rockland Marsh and unevaluated wetlands if the proposed works are within 30 m of these features. ▪ Vegetation removal, grading, and heavy equipment use shall only occur within the Study Area where these areas have been previously demarcated and approved to allow construction works. Silt fencing should be erected along the extremities of the Excavation Limits. These measures and structures should be maintained and enhanced as needed until construction has been completed and the site has stabilized. ▪ Stockpiled material shall be covered to prevent erosion and potential sedimentation from entering Natural Features. ▪ Staging and access areas should be planned to be located primarily within existing, open, and disturbed areas. ▪ If feasible, grading activities should be scheduled to avoid times of high runoff volumes (spring and fall) to prevent erosion and potential sedimentation. ▪ An environmental inspector should monitor for sediment plumes. The contractor should be prepared to carry out Turbidity/total suspended solids monitoring if there is a risk that sedimentation from near water works may occur or if plumes are observed.
Accidental spills from heavy equipment and site vehicles	▪ A designated and lined refuelling area with appropriate spill containment shall be established a minimum of 30 m from any watercourse/water feature. A spill response team member will be designated as a point of contact in the case of an accident or spill to verify the proper and timely implementation of Site response controls. Contractor shall provide a spill control plan. ▪ Absorbent materials and equipment required to control and clean up spills of deleterious substances shall be available onsite. Spills and leaks of deleterious substances shall be immediately contained and cleaned up in accordance with regulatory requirements and reported immediately to the Ontario Spills Action Centre at 1.800.268.6060.

Potential Impacts to Natural Features	Mitigation Strategies
Accidental introduction of invasive species	▪ Access and movement of vehicles and equipment must be controlled to limit the introduction and spread of invasive species. Vehicles and equipment shall be inspected prior to entering and leaving the Project Location to verify the equipment is clean and free of invasive species. Equipment shall be inspected and used only if in good working order. The contractor is to follow and implement the Clean Equipment Protocol for Industry Inspecting and cleaning equipment for the purposes of invasive species prevention (Ontario Invasive Plant Council, 2013). This document should be added to the Projects Contract Specifications.
Vegetation and tree removals	▪ Vegetation removal, grading, and heavy equipment use shall only occur within the Project Location where these areas have been previously demarcated and approved to allow construction works. Silt fencing should be erected along the extremities of the disturbance limits. ▪ Limit the amount of tree, shrub and groundcover vegetation removals to the extent possible. ▪ Submit an arborist report - Tree Preservation Plan and Landscape Architectural drawings at the detailed design stage. Provide compensation for tree removals and injury as required, preferably within or directly adjacent to the Study Area. ▪ If feasible, vegetation removal should be scheduled to avoid times of high runoff volumes (that is, spring) to prevent erosion and potential sedimentation. ▪ The Project Location shall be revegetated with native species as soon as possible following disturbance.
Noise disturbances and impacts to SAR avifauna, general wildlife (including herptiles) and migratory birds' habitats	▪ Tree and vegetation removals should be avoided from April 15 – August 31, conforming to the Project Location's general nesting period (Zone C3), corresponding to the MBCA (Government of Canada, 2018). If the mid-April to late August construction timing window cannot be applied for construction, the following should be implemented: - Have a qualified avifauna biologist sweep areas of proposed construction and flag any nests observed. - Implement appropriate buffers and timing windows based on type of nests observed per the MBCA. - Nest sweeps are valid for 1 week from the date of survey. ▪ If general construction occurs within the April 15 to August 31 timing window, an environmental inspector shall perform daily audits to ensure birds are not nesting during construction and that birds are not harassed from the work. If any of these observations are made, work is to halt, and a qualified avifauna biologist is to be retained to survey the Site.

Potential Impacts to Natural Features	Mitigation Strategies
	▪ If nests are observed onsite, prior to, during or after construction, retain a qualified avifauna biologist to investigate if these nests are considered a hindrance and cannot be protected due to Site operations or construction. ▪ An Environmental Inspector in conjunction with a qualified biologist shall inspect the adjacent Natural Features for evidence of SAR birds and herptiles during construction and within the Study Area. Stop work procedures may need to be executed, and wildlife relocation permits could be required if these species occur within the Study Area or harassment of the species is identified. ▪ Site personnel shall be trained on the identification of SAR avifauna and herptiles. If these species are identified during or prior to construction, they should be allowed to move from the area freely and all work activities must be halted. If a SAR is identified within the work areas, contact the MECP. SAR herptiles are not to be relocated without direct permission from the MECP/MNR. Non-SAR herptiles would also require a collection permit as per the Fish and Wildlife Conservation Act. ▪ Site personnel shall also monitor for amphibians, if species are observed within the work areas, stop work and procure a qualified biologist for next steps. If these species are identified during or prior to construction, they should be allowed to move from the area. SAR herptiles are not to be relocated without direct permission from the MECP. ▪ Exclusion fencing is recommended to prevent herptiles from entering the Construction Footprint proximal to the Ottawa River/woodlands corridor and wetland habitat as Snapping Turtle and Midland Painted Turtle was listed in the background review. Hardware cloth, chain link fence (¼" mesh or smaller), concrete, aluminum, vinyl wall, or prefabricated plastic wildlife fence should be utilized (MNRF, 2016). MNRF's Best Management Practices for Mitigating the Effects of Roads on Amphibian and Reptile SAR in Ontario should be followed for installation and methodology for erecting exclusion fencing.

19.3.1.2 Source Water Protection

The Raisin-South Nation Source Protection Plan (Raisin-South Nation Source Protection Region 2016) identifies that the Rockland WTP and intake are located in two IPZs, IPZ-1 (score of 9) and IPZ-2 (score of 7.2). Therefore, source protection policies apply to the intake, LLPS, and WTP expansion site. The delineation of these IPZs are based on the current delineation for the existing intake. The delineation of these IPZs will be effective through the construction at the LLPS and Rockland WTP site. The intake and IPZ boundaries may change following IPZ delineation for the new intake and PTTW and these boundaries would apply following commissioning of the Rockland WTP.

While the Rockland WTP and Caron BPS expansions are not direct drinking water threats, it is anticipated that both facilities will continue to include the use of emergency backup power systems that require onsite fuel storage. This activity is a potential drinking water threat and, therefore, source protection policies outlined in the Raisin-South Nation Source Protection Plan may apply. The applicable policy in this case would be Policy FUEL-3 – Future and existing fuel oil storage at a drinking water facility subject to a prescribed instrument. Activities required under this policy include various risk management measures including secondary containment, spill/leak detection and spill response procedures, collision protection, and protection of oil lines from physical damage (Raisin-South Nation Source Protection Region 2016). These policies have been implemented by the City at other facilities in the areas and are expected to have little to no impact on operations.

Based on discussions with the City, there are no private drinking water systems in the area that would be impacted by the preferred solution identified in this Class EA.

The Project Team will continue to consult with Raisin-SNCA through design to receive approvals. This includes developing A Stormwater Management Plan with an Erosion and Sedimentation Plan during the design phase of the project to ensure the development activities do not affect adjacent water courses and valley lands.

19.3.3 Heritage Resources

A Stage 1 AA was completed within the Study Area and included a review of the MCM's archaeological site database, a review of relevant environmental, historical, and archaeological literature, and primary historical research (Matrix Heritage 2025a). The report recommended a Stage 2 AA be conducted by a licensed consultant using the test pit survey method at 5 m intervals in the areas deemed to have archaeological potential. Should previously undocumented archaeological resources be discovered during construction, the City will cease construction until the MCM is contacted, and appropriate mitigation or resource recovery is implemented.

A Cultural Heritage Screening Report was completed within the Study Area, as well as the properties immediately adjacent to the proposed work within 250 m (Matrix Heritage 2025b). The report concluded that the expansion of the Rockland WTP requires an HIA to evaluate the potential impacts of the proposed undertaking on the following:

- Du Moulin Park (former Edwards Sawmill)
- Ottawa River

An HIA was completed to identify potential impacts of the project on heritage resources and recommend mitigation measures to reduce the likelihood of impacts (Matrix Heritage 2026). The HIA identified the following potential impacts:

- Potential direct adverse impacts in the form of possible accidental damage to the three heritage plaques located towards the north-east corner of Du Moulin Park from construction vehicles.
- The proposed expansion of the Rockland WTP may have a temporary adverse impact on the ability of residents to access the Ottawa River as a place of recreation if the boat launch is inaccessible during construction.
- The proposed expansion of the Rockland WTP may have a temporary adverse impact on the ability of residents to access the Du Moulin Park as a place of recreation if the Park is inaccessible during construction.

The Project Team will implement the recommended mitigation measures outlined in the report. These mitigation measures include:

- The proposed expansion of the Rockland WTP and adjacent Low Lift Pump Station currently calls for the use of the same or similar cladding materials. These are generally visually inoffensive, low maintenance and long-lasting, contributing to less waste. The use of either the same cladding materials in the same colours (brick on the Low Lift Pump Station, brick and/or beige metal siding on the Rockland WTP) as proposed, OR the use on the Rockland WTP of cladding materials in colours that blend into the background of the landscape (such as muted blue siding) is recommended.
- It is recommended that the municipal and provincial plaques in Du Moulin Park along Edwards Steet be marked on plans and avoided.
- It is recommended that steps be taken to ensure safe access to Du Moulin Park by pedestrians for the duration of construction activities if possible.
- It is recommended that public access to the Ottawa River via the boat launch be maintained for as much of the duration of construction activities as can be safely accommodated.

The Cultural Heritage Screening Report, HIA, and Stage 1 AA Report are presented in Appendix A.

19.3.4 Social and Cultural

Potential effects from construction and operation of the preferred solutions on the social, economic, and cultural environment are generally expected to be negligible and short-term in duration.

The following measures will be taken to mitigate potential impacts to the community from the recommendations, both during and following construction:

- **Community Health and Safety:** Development and construction activities may increase the type and volume of traffic on surrounding roadways (for example, construction vehicles and equipment) or introduce additional hazards to the environment (for example, material spill). A traffic management plan should be established, as needed, for the construction crew. The construction workforce should adhere to local speed limits, and carpooling should be encouraged to reduce the number of vehicles on and around the site.
- **Infrastructure and Services:**
  - Traffic: During construction, a small increase in traffic in the Study Area may be anticipated to transport crews and equipment. Little to no increase in traffic is expected during operations.
  - Utilities: Additional utilities are likely needed to support the operation of the preferred solutions. In the event existing utilities are disrupted during construction activities, it is expected that this will be short-term in duration, temporarily disturbing services.
  - Service: Construction will be sequenced such that the Rockland WTP, LLPS and Caron BPS will remain in operation during construction.
- **Viewshed:** The visual and aesthetic impact of the proposed Rockland WTP and Caron BPS expansions will be mitigated by designing the proposed buildings to completement the architectural design of the existing facilities. Overall, permanent infrastructure changes within the existing site are expected to present a negligible change to the existing viewshed.

19.3.5 Air Quality and Noise

Qualitative air quality and noise studies were conducted for the Rockland WTP and Caron BPS as part of this Study (Jacobs 2025d; Jacobs 2025e).

Neither the Rockland WTP or Caron BPS expansions are expected to contribute materially to increases in air emissions or expected to be adversely impacted by operations. Greenhouse gas emissions are expected to be minor and will not contribute materially to hinder federal emission targets. During construction, fugitive dust emissions will be localized and of short duration and will be mitigated through dust control measures and best practices.

Temporary construction noise impacts are anticipated for neighbouring houses and recreational spaces (ex: Du Moulin Park) adjacent to the Study Area and will be limited in extent, confined to active construction and daytime periods only. Construction noise impacts will cease once construction is completed and the noise from the WTP and BPS expansions during operation will not significantly increase as noise sources will be indoors and mitigated as appropriate. Standard construction noise management practices are recommended to minimize the potential noise impacts. Construction activities will be conducted in accordance with applicable municipal bylaws, such as the noise bylaw.

19.3.6 Technical and Economic Considerations

The Rockland WTP and Caron BPS expansions are being designed to meet or surpass all legislative requirements, ensuring the facilities operate effectively, reliably, and maintain high performance standards. The expansion works are compatible with the existing processes, allowing opportunities to streamline implementation, operation and maintenance in a cost-efficient manner. The preferred design concepts also allow the City flexibility to meet future regulations and adapt to potential changes in economic and climate conditions as:

- ActiFlo provides safe and reliable drinking water and is able to manage changes in flows and source water quality.
- Dual pressure zones implemented at the Caron BPS provide system redundancy, increasing operational reliability.

19.3.7 Excess Soil and Waste Management

Management of any excess soils during construction should be completed in accordance with O. Reg. 406/19 and the MECP's current guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2014). All waste generated during construction must be disposed in accordance with MECP requirements.

19.3.8 Preliminary Utility Impact Assessment

Subsection 19.3.8 describes the preliminary utility impact assessment.

19.3.8.1 Rockland WTP Site

No utility relocations are required to install the preferred alternative for the Rockland WTP site. The raw water and transmission watermains will cross underneath the storm, Bell, and gas main. Minimum clearances will be maintained for parallel installations and utility crossings.

Power is supplied by Hydro One. The existing Hydro One service to the WTP has a maximum available capacity of 500 kW, which is insufficient to support the planned station upgrades. Following consultation with Hydro One, it was determined that a new pole line and feeder will be required to meet the increased electrical demand. An upgraded service connection will be required to service the WTP expansion. This includes a new utility transformer, metering, and main breaker.

19.3.8.2 Caron BPS Site

No utility relocations are required to install the proposed works. The proposed watermains will cross under the storm and sanitary sewer, and under the Bell conduit and gas main. For all parallel installations and utility crossings, minimum required clearances will be maintained.

Power is supplied by Hydro One. It is anticipated that a new electrical service will be required from Hydro One to support the new BPS (including the relocation of one of the power pole in front of the existing BPS). Coordination will be required during detailed design to confirm transformer sizing, metering, and service entrance configuration.

19.3.9 Preliminary Property Impact Assessment

Subsection 19.3.9 discusses the preliminary impact assessment.

19.3.9.1 Rockland WTP Site

The preliminary preferred solution to expand the Rockland WTP is to expand the existing WTP building on the east side where the existing generator is currently located and expand eastward. The City recently acquired approximately 1,600 square metres of additional land north of the existing WTP to allow for the proposed expansion. Figure 19-1 illustrates the recent property acquisition.

Figure 19-1. Rockland WTP Property Impacts

The property that was acquired is in zoning group R1S-h (Urban Residential First Density – Special – Holding Group), while the WTP property is located in zoning group CF (Community Facilities). Therefore, a rezoning application will be completed by the City and Jacobs during detailed design in accordance with the City of Clarence-Rockland Zoning Bylaw No. 2016-10.

The LLPS is located north of the existing WTP at the Du Moulin Park between the playground and parking lot. The expansion of the LLPS will be to the east of the existing building and be similar to the existing LLPS building in terms of size and layout.

19.3.9.2 Caron BPS Site

The existing Caron BPS is located in a mixed residential and agricultural area. The City of Clarence-Rockland recently acquired additional property surrounding the existing Caron BPS to allow for the proposed expansion. The land acquisition includes an additional 1,200 square metres of land extending north and east of the Caron BPS taken from property parcel 1443 Caron Street. Figure 19-2 illustrates the recent property acquisition.

Figure 19-2. Caron BPS Property Impacts

Rezoning is not required for this site as 1441 Caron Street and 1443 Caron Street are located within the same zoning group, R1-h (Urban Residential First Density – General – holding zone).

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Appendix A
Supportive Studies

Appendix B
Engagement Record