



**Town Of Carleton Place Water
Treatment Plant Expansion, Town
of Carleton Place**

**Municipal Class Environmental
Assessment - Environmental Study
Report**

Final

January 25, 2023

Prepared for:
Town of Carleton Place

Prepared by:
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Project Number:
163401646

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The conclusions in the Report titled Municipal Class Environmental Assessment - Environmental Study Report are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

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Executive Summary

The Town of Carleton Place (Town) is situated in Lanark County, west of the City of Ottawa, and is accessible via Highways 7 and 15. Based on the Census of 2021, the Town has a population of 12,517 and occupies an area of 9.94 km². The Town has experienced a 17.6% increase in population growth between 2016 and 2021, and the population is expected to grow to 25,000 in 2041. The Mississippi River runs through the centre of the Town and serves as the source of water for the municipal drinking water system. The unprecedented population growth along with increased water demands, increased wastewater generation, and expanding development areas underpin the need for infrastructure expansion.

The Town's Water Treatment Plant (WTP) has a rated raw water intake capacity of 12,000 m³/d (max daily), including drinking water demand and process wastewater usage. It is understood that the low lift raw water pumps are rated at a capacity of 11,400 m³/d, however the actual maximum pumping capacity is only approximately 10,000 m³/d due to operational limitations on the pumps. The plant is capable of treating raw water at a rate of 8,500 m³/d. An operational benchmark of 7,700 m³/d is monitored by Ontario Clean Water Agency (OCWA) to potentially trigger water use by-law considerations.

Considering projected continued population growth, the assessment of the WTP's raw water intake capacity shows that an expansion to approximately 20,700 m³/d (i.e., 72% increase of current capacity) is needed in the long-term to accommodate population growth over a 20-year planning horizon. As the existing facility is approaching its current rated capacity, some expansion is already required to meet the maximum day demand without consuming any emergency storage from the facility's clearwells or from the existing water tower.

The preferred planning level solutions for the WTP's capacity and water storage constraints identified in the 2022 Water and Wastewater Master Plan (Master Plan) were to expand the existing WTP onsite and to provide additional clearwell storage as part of the WTP expansion to address the future water storage deficit. This preferred solution identified in the Master Plan, provides an opportunity to utilize existing Town infrastructure and a high potential to support future population needs to the 2041 horizon while limiting impacts to private property and health and safety of Town residents.

Stantec Consulting Ltd. was retained by the Town to undertake the Municipal Class Environmental Assessment (MCEA) process for the expansion of the WTP. The project was carried out in accordance with the Schedule C projects under the MCEA process. This Environmental Study Report (ESR) is the documentation of the MCEA process for the WTP expansion works to service the Town's community.



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A variety of technology alternatives were considered for the expansion evaluation (Phase 3) for each step in the treatment process. Ultimately, these were narrowed down during the high-level screening of options into two alternative designs for the filtration process. The evaluation of alternative designs includes consideration of potential environmental, social, and economic impacts and recognizes the need to design the facilities in such a way that they will honour the heritage value of the existing WTP. The preferred alternative for the WTP expansion based on the detailed evaluation is Alternative 2 - New concrete tank filters. Alternative 2 involves expanding the WTP with new concrete tank filters, including new filter backwash and backwash water reserve tanks. The new concrete filter tanks would be sized to treat the full capacity of the plant. Existing steel tank filters will be decommissioned and abandoned in place after new concrete tank filters would be operational.

Alternative 2 was preferred due to the following key advantages:

- Lower operation and maintenance (O&M) requirements and costs
- Increased longevity of concrete vs. steel tank will reduce future infrastructure replacement requirements
- Ability to customize new concrete filters' size to match future plant capacity needs
- Improved operator flexibility and control for process optimization

The preferred design alternative seeks to maintain use of the existing processes, including the existing raw water intake, Actiflo clarifiers, and clearwells, while providing new infrastructure where necessary to increase treatment capacity to accommodate the future growth. Alternative 2 will also preserve the original 1914 Carleton Place Waterworks building at the existing WTP which can continue to be used for chemical storage, maintenance activities and administrative purposes.

A series of environmental technical studies were undertaken as part of this MCEA process to identify existing conditions within the WTP expansion project footprint and adjacent lands within 120 meters of the site (the Study Area). Following such identification, potential environmental effects resulting from the construction and operation of the WTP expansion project were determined, analysed, and described based on potential changes to the natural, social, economic and cultural environments. Effects include potential to impact water quality and quantity due to increased water taking and the site's proximity to the Mississippi River and potential runoff during construction; potential to impact wildlife/habitat and SAR; potential to impact trees and vegetation; potential to noise and vibration nuisances; potential to impact traffic, cyclists, and pedestrians during construction; and potential to temporarily reduce the number of parking spaces at Carleton Place High School.



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Implementation of the study recommendations and preferred design alternative potentially results in minimal environmental impacts. In addition to employing 'best management practices', a number of environmental management measures have been identified to mitigate potential adverse environmental impacts. Means to monitor or verify the effectiveness of the proposed mitigation measures to reduce or eliminate adverse effects are also provided in Section 5 of this ESR.

Consultation with the public, stakeholders, Indigenous communities and government agencies was done as per the requirements of the MCEA process. The following are highlights of the consultation activities undertaken through each MCEA phase:

- A project contact list was compiled and maintained that included agencies, Indigenous Nations, special interest groups, and interested members of the public.
- Study notices were published in the local paper (*The Carleton Place Canadian Gazette*) and on the Town's website and mailed to those on the contact list.
- An online Public Information Centre (PIC) was held between December 5 to 19, 2022 as a recorded presentation available at the Town's website.

Comments received during the MCEA process related to WTP upgrade capacity, water quantity and conservation, and potential impacts to Carleton Place High School and adjacent parkland including the Riverside Trail.

The work undertaken in preparing this report represents the completion of the MCEA process for the WTP expansion after the public review and comment period. The ESR document will be made available for the mandatory 30-day public review period. Provided all stakeholder, agency, and Indigenous concerns are addressed, the Town may proceed to design and implementation.



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Acronyms / Abbreviations

AA	Archeological Assessment
AOO	Algonquins of Ontario
ASDB	Archaeological Sites Database
BHR	Built Heritage Resource
CHRECPIA	Cultural Heritage Report of Existing Conditions and Preliminary Impact Assessment
CHVI	Cultural heritage value or interest
CRZ	Critical Root Zone
EASR	Environmental Activity and Sector Registry
EST	Elevated storage tank
ESR	Environmental Study Report
FUS	Fire Underwriters Survey
GHG	Greenhouse gases
GMDP	Groundwater Management and Dewatering Plan
HLP	high lift pump
ICI	Institutional, Commercial, and Industrial
LIO	Land Information Ontario
Master Plan	Carleton Place Water and Wastewater Master Plan – Phase 2 Report
MEA	Municipal Engineers Association
MECP	Ministry of the Environment, Conservation and Parks
MCEA	Municipal Class Environmental Assessment
MCM	Ministry of Culture and Multiculturalism
MVCA	Mississippi Valley Conservation Authority
NHIC	Ontario’s Natural Heritage Information Centre
OCWA	Ontario Clean Water Agency
OPC	Opinion of probable construction cost
O&M	Operation and maintenance



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PTTW	Permission to take water
PIC	Public Information Centre
SAR	Species at Risk
SEMMP	Soil and Excavated Materials Management Plan
Town	Town of Carleton Place
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant
ZOI	Zone of Influence



1 Introduction

The Town of Carleton Place (the Town) is situated in Lanark County, west of the City of Ottawa, accessible via Highways 7 and 15. Based on the Census of 2021, the Town had a population of 12,517 inhabitants and occupied an area of 9.94 km². The Town has experienced a 17.6% increase in population growth between 2016 and 2021, and the population is expected to grow to 25,000 in 2041. The unprecedented population growth along with increased water demands, increased wastewater generation, and expanding development areas underpin the need for infrastructure expansion.

The Mississippi River runs through the centre of the Town and serves as the source of water for the municipal drinking water system and as the receiving stream for treated sewage effluent. The Mississippi River is also used for recreational purposes.

The Town's Water Treatment Plant (WTP) is located at 199 John Street (**Figure 1.1**). The existing WTP has a rated raw water intake capacity of 12,000 m³/d, including drinking water demand and process wastewater usage and is capable of treating raw water at a rate of approximately 8,500 m³/d.



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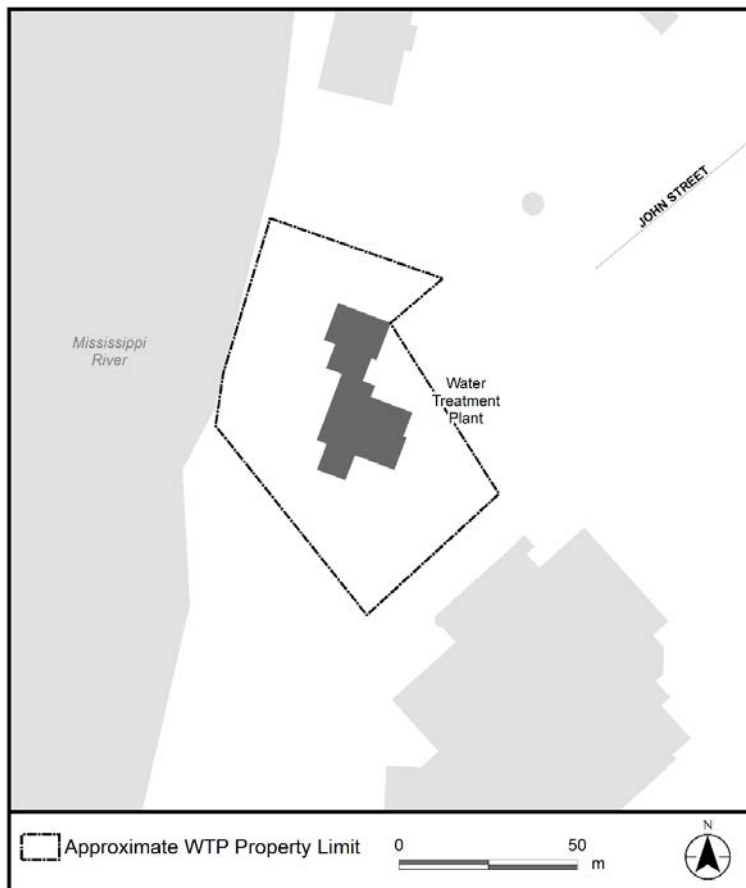


Figure 1.1: Approximate property limits of the Town of Carleton Place's Water Treatment Plant

The Carleton Place Water & Wastewater Master Plan - Phase 2 Report (Master Plan) identified that additional treatment capacity at the WTP is required to support the existing service areas and the anticipated future growth. The Master Plan was prepared in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA) process to implement the preferred solution which involves expansion of the Town's existing WTP for increased capacity and storage.

The Town has undertaken Phase 3 of the MCEA process which involves the identification and evaluation of alternative designs for the proposed WTP expansion and is carrying out Phase 4 with the release of this Environmental Study Report (ESR). This ESR documents the activities undertaken as part of the MCEA process and recommendations for the proposed expansion.



1.1 Municipal Class Environmental Assessment Process

1.1.1 General

The MCEA process provides a consistent method of identifying and assessing technical and environmental impacts and concerns before improvements or additions to municipal infrastructure are undertaken. Planning in this way provides reassurance that potential impacts from all municipal projects are addressed and mitigated, prior to implementation.

The MCEA document defines four schedules under which projects may be planned and the associated processes required for each. The four types of projects are referred to as schedules and projects can be classed as either Schedule A, A+, B or C, depending on the anticipated level of environmental impact, and for some projects, the anticipated construction costs.

Schedule A projects are minor operational and/or maintenance activities and may go ahead without further assessment once Phase 1 of the MCEA process is complete (i.e., the problem is reviewed, and a solution is confirmed).

Schedule A+ projects are limited in scale, have minimal adverse environmental impacts, and require no documentation. However, the public is to be advised of the project prior to implementation.

Schedule B projects must proceed through the first two phases of the process. Proponents must identify and assess alternative solutions to the problem, inventory impacts, and select a preferred solution. They must also contact relevant agencies and affected members of the public. Provided that no significant impacts are found, and no requests are received to undertake the project as an individual Environmental Assessment, the project may proceed to detailed design (Phase 5).

Schedule C projects require more detailed study, public consultation and documentation, as they may have more significant impacts. Projects categorized as Schedule C must proceed through the first four phases of assessment. Schedule C projects may potentially result in adverse impact(s), and as such, a public consultation program is needed to ensure that stakeholders and local residents within the study area are provided with the opportunity to provide meaningful input.

As per the MCEA guidelines, major expansions to existing facilities such as the WWTP fall under the classification of Schedule C projects.



1.1.2 Phases in the MCEA Process

The MCEA for municipal projects follows a five-phase planning process. Consultation is a key element of MCEA planning and is required during different phases to incorporate and consider public input. Details on the activities within each phase of the process is shown in **Figure 2.1**.

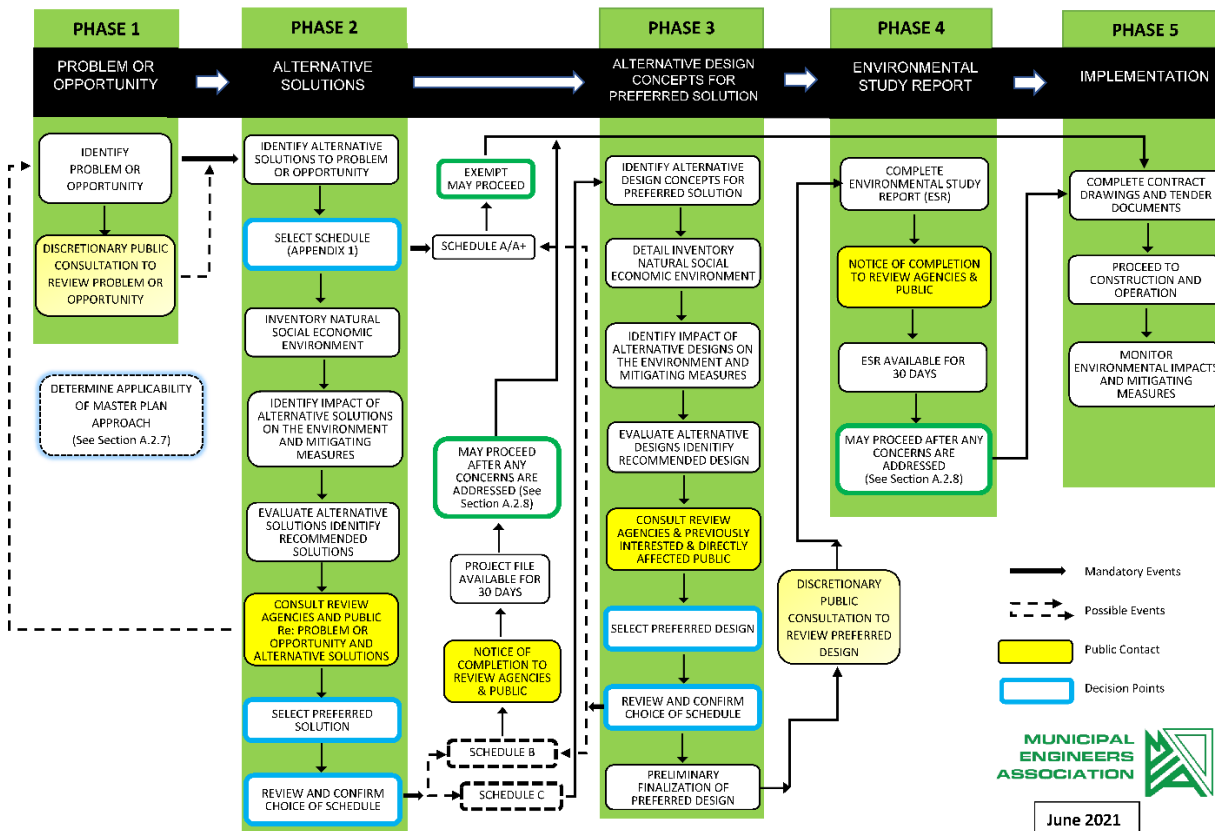


Figure 1.2: Municipal Class EA Planning and Design Process (Source: Municipal Engineers Association, 2021)

1.1.3 Intent of the Report

The intent of this report is to outline the steps that the Town has taken to satisfy the requirements of the MCEA process for a Schedule C project. The Environmental Study Report (ESR) details the following:

- A summary of background information including recommendations within the Master Plan
- The nature and extent of the problem or opportunity



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- The planning context in which the project is situated, including the existing conditions and population projections
- An inventory of the social, cultural, and natural environments
- Review of alternative servicing solutions and Master Plan recommendations
- Development and evaluation of alternative design concepts and selection of the preferred alternative design

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2 Background: Water and Waster Master Plan

The Master Plan (<https://carletonplace.ca/water-and-wastewater-master-plan.php#Documents>) was undertaken to develop and evaluate water and wastewater servicing strategies to address population growth within the Town. The Master Planning process was developed under the MCEA process where the need and justification for individual projects and the existing conditions are better defined. The Master Plan addresses Phases 1 and 2 of the MCEA process to fulfill the requirements for the recommended Schedule A and A+ projects and forms the basis for the recommended Schedule B and C water and wastewater projects identified within the Master Plan. Any Schedule B and C projects identified would be required to complete the remaining phases as applicable. The expansion of the existing WTP was identified as a Schedule C project, requiring the completion of Phases 3 and 4 of the MCEA planning process.

The preferred solution for WTP included the expansion of the existing WTP and water storage on-site to service existing and future growth within the urban boundary of the Town. The preferred solution discussed in the Master Plan assumed the expansion would continue to use its existing treatment technology, adding additional process units as needed; however, other treatment options were evaluated in Phase 3 of the MCEA process as part of the assessment of alternative design concepts in order to consider new technologies and environmental considerations. The preferred solution also included additional clearwell storage volume as part of the expansion to address the potential future water storage deficit.

2.1 Phase 1 - Problem or Opportunity

The first step of the MCEA process is to identify the problem or opportunity under consideration. Factors leading to the conclusion that an improvement or change is needed are documented in the following section, resulting in the identification of the Problem/Opportunity Statement, which reflects the scope and objectives of the project.

2.1.1 Population Growth Projections

Based on the Census of 2016, the Town had a population of 10,644 inhabitants and grew to 12,517 in 2021 (17.6% increase). As the Master Plan process began when the 2021 census was not available, estimates were used.

Growth projections over multiple planning horizons were developed: baseline year 2021; short-term, or 5-year planning horizon, in the year 2026; medium-term, or 10-year planning horizon, in the year 2031; and long-term, or 20-year planning horizon, in the year 2041. The alternatives evaluated were specifically for the 20-year (2041) condition.



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2 Background: Water and Waster Master Plan

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The *Design Basis Memo* (appended to the Master Plan) provides detailed information on how population and area growth projections were developed. The resulting growth projections for the Town suggest that the population will be 17,000 in 2026 (35.8% increase), 20,500 in 2031 (63.7% increase), and 25,000 in 2041 (99.7% increase), when compared to the 2021 census population.

2.1.2 Existing Water Treatment Plant

Potable water is provided throughout the Town via a municipal water distribution system. Raw water is drawn from the Mississippi River, treated through a chemically assisted filtration process, and discharged to a pipe network through high lift pumps situated at the WTP. Within the distribution network, an existing elevated storage tank situated south of the river assists in providing balancing, fire flow and emergency flows. The clearwells in the WTP (used primarily for disinfection) also provide some limited operational storage capacity.

The existing WTP has a rated raw water intake capacity of 12,000 m³/d, including drinking water demand and process wastewater usage. It is understood that the low lift raw water pumps are rated at a capacity of 11,400 m³/d, however the actual maximum pumping capacity is approximately 10,000 m³/d due to operational limitations on the pumps. The plant can treat raw water at a rate of 8,500 m³/d. An operational benchmark of 7,700 m³/d is monitored by Ontario Clean Water Agency (OCWA) to potentially trigger water use by-law considerations.

The plant consists of two buildings. The original building, constructed in 1914, has been modified several times and is dedicated to raw water intake, screening, pumping and coagulant storage and injection. It also houses the water-cooled standby diesel generator and a portion of the motor control centre. Most of the treatment equipment (Actiflo clarifiers, filters, chemical feed systems, clearwells, and high lift pumps) is in a second plant building located adjacent to the original building. A flow diagram is presented in **Figure 2.1** to illustrate the water treatment process and existing location of treatment equipment.

The current raw water intake is a 600 mm diameter pipe drawing from the Mississippi River with a coarse screen and a chlorination system for zebra mussel control. From there it is pumped into two (2) parallel Actiflo treatment trains and then into three (3) dual media gravity filters. Filter backwash water and Actiflo residuals flow into a settling tank and are pumped into the sanitary sewer system.

Disinfection is provided through chlorine contact time in two underground clearwell reservoirs. Four vertical turbine high lift pumps force the treated water into the Town's potable water distribution system.



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2 Background: Water and Waster Master Plan

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2.1.2.1 Raw Water Intake Projections

Raw water intake projections from 2021, 2026, 2031 and 2041 were calculated as part of Phase 1 of the Master Plan process. During current (2021) maximum day demand estimates, the plant needs to draw 11,300 m³/d from the Mississippi River to factor in process water usage, which is near, but within, the WTP's rated capacity of 12,000 m³/d. This is also within the low-lift pumps' rated capacity of 11,400 m³/d; however, as described previously, these pumps' actual maximum operational capacity is closer 10,000 m³/d, which suggests a current deficit of approximately 1,300 m³/d. When demand exceeds the plant's capacity to deliver treated water, emergency storage within the water tower is consumed.

The average daily water intake needs are expected to remain within the WTP's rated capacity until approximately 2040, near the 20-year planning horizon.

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2 Background: Water and Waster Master Plan
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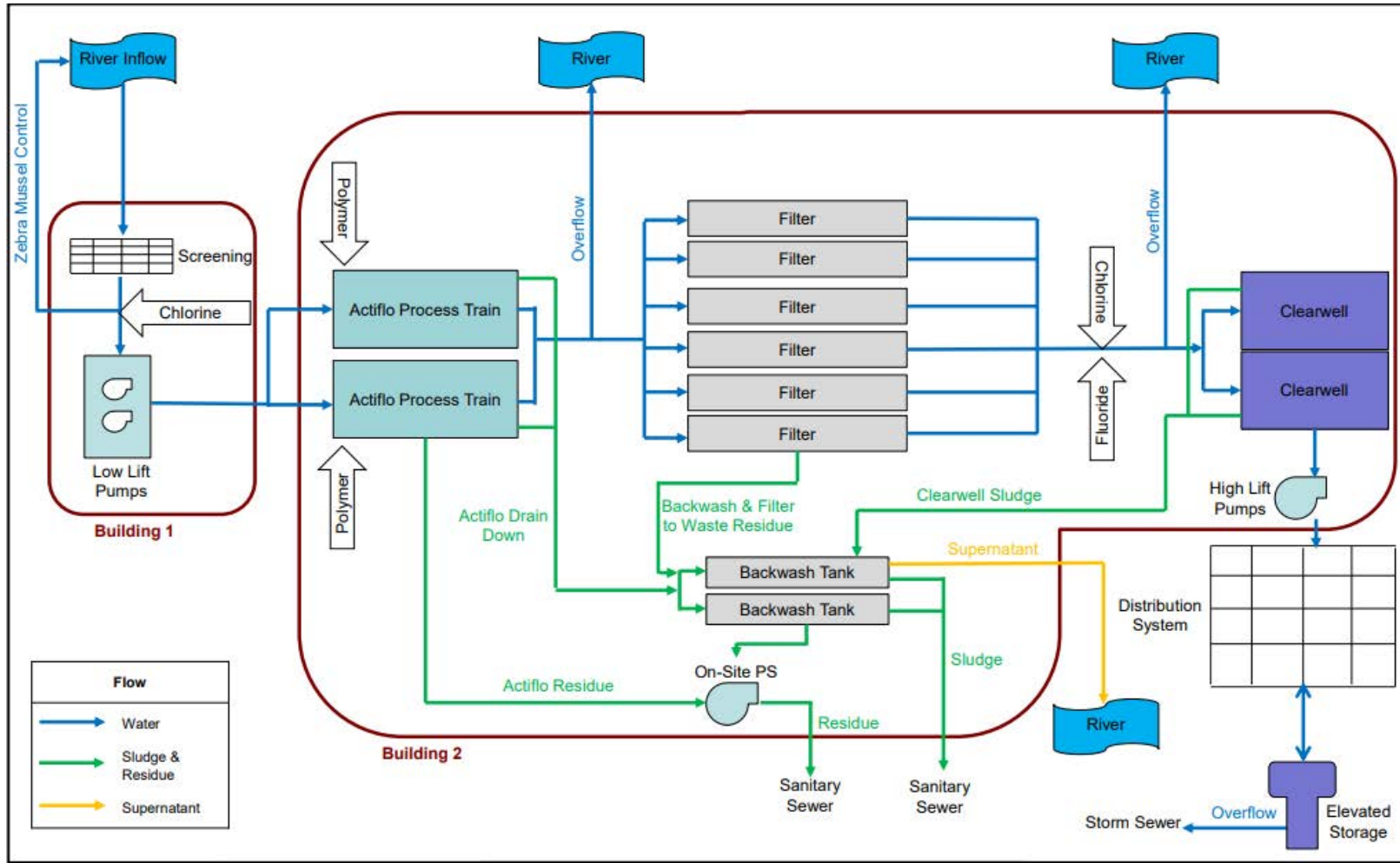


Figure 2.1: Town of Carleton Place Water Treatment Plant Process Flow Diagram (Adapted from Operational Plans for the Carleton Place Drinking Water System, August 28, 2018)



Based on the population projections, the maximum day demand in the 20-year planning horizon is 18,000 m³/d. Assuming a process water ratio of 15%, which has been observed through testing by OCWA, the total raw water intake would be 20,700 m³/d. This would therefore require a 73% increase in the WTP's current capacity, and all process equipment will need to be sized to meet the maximum day demand.

The total average day demand in a 20-year planning horizon is projected to reach 10,600 m³/d in 2041; accounting for process water, total raw water intake in the 20-year planning horizon would be 12,200 m³/d. This increase in average day raw water intake will need to be considered in sizing the chemical storage tanks.

The projected maximum day raw water intake of 20,700 m³/d in the 20-year planning horizon will also need to be evaluated in terms of the Mississippi River's capacity to supply these intake needs. This was analyzed in the Water Availability Assessment in Appendix A.

2.1.3 Existing Water Storage

Water storage in the system is currently provided at the WTP clearwell (3,180 m³) and at the elevated storage tank (EST) on Nelson Street East (3,200 m³), for a total system water storage of 6,380 m³.

The EST is equipped with an on-site re-chlorination facility, to boost chlorine residual when required. A single pipe interconnects the elevated reservoir to the water distribution system allowing water to circulate in both directions over a 24-hour cycle. Low water levels at this reservoir trigger the high lift pump operation at the WTP.

The system's storage capacity was assessed using the MECF formula, which accounts for fire flow storage requirements, for equalization volume based on maximum day demand, and for emergency storage. The existing storage requirements for existing conditions were assessed, and compared against available combined storage at the WTP and at the EST.

The required fire flow rate and duration was also determined as part of the Master Plan.

Considering additional storage provided at the WTP (1,590 m³), an additional storage volume of 340 m³ would be required in the 20-year planning horizon to accommodate population growth in the Town. This value depends on the geometry and configuration of the clearwell expansion and the volume that can be considered "usable" operational and emergency storage. This would need to be re-evaluated during design of the clearwell structure, which may ultimately require an additional 500 to 1,000 m³, rather than 340 m³.



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2 Background: Water and Waster Master Plan

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The Phase 1 Report also includes a water storage extended period assessment, analyzed using the Town's water distribution system model. The results show that under existing conditions volumes in the tank will fluctuate between 35% full and 96% full, and that the high lift pumps (HLPs) are able to maintain the target operating range. However, in the short-term planning horizon (2026) with the same setpoints, volumes in the tank fluctuate between being fully drained (i.e., 0% full) and 84% full. This highlights a need to adjust HLP operations to meet the target tank operating range. With the projected population and demand growth in the medium- (2031) and long-term (2041) planning horizons, similarly the tank volumes fluctuate between being fully drained and 78% and 71% full, respectively. Besides adjustments in HLP operations, this aligns with the need for increased HLP capacity as part of the WTP expansion.

2.1.4 Challenges and Constraints

In addition to above, several challenges and constraints associated with the existing WTP were noted during the Master Plan process, including:

- Space on the existing WTP property is limited and an onsite expansion must consider optimized use of the land.
- The existing intake pipe was found to have sufficient capacity for expansion, however, the new low lift pumping station wet well would need to be situated at a lower elevation; this work would occur on land within the existing WTP property and access road.
- The raw water screen needs to be cleaned manually once a day under extreme conditions in summer (lower river water, higher boat traffic resulting into higher turbulence, higher raw water instantaneous flow rate); automated screening options could be evaluated during future design stages.
- The raw water building is also used for chemical storage and cannot hold more than the current four coagulant solution storage tanks; chemical storage reserve (in terms of days and receiving capacity at time of delivery) should be revisited during design.
- The water-cooled standby diesel generator would likely not support future power demand once the plant is upgraded and should be replaced by a larger unit.
- The current Actiflo room cannot be extended unless the coagulant sludge pumping basin is relocated therefore a second separated Actiflo room could be considered; sealant coating in the current room concrete basin walls peels off and presents an issue at the clarifier and filter, thus renewal of the basins should be considered as part of the expansion work once a new treatment train is online.



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- Some operational and health and safety concerns were raised regarding the current chemical feed room, which houses the polymer mixing tank, fluoridation feed system / chemical storage, and ACTISAND™ micro sand storage.
- Clarifier sludge and filter backwash volumes and solids loading were assessed and it was found that there is no advantage, from a wastewater treatment perspective, to separate the waste stream from the Town's sanitary collection system. This should be revisited during design.
- Current clearwell and high lift pumping basin configuration does not provide optimized contact time for chlorine disinfection process and does not allow isolation of the higher capacity high lift pump and associated clearwell portion for maintenance.
- Configuration of pumps in the clearwells make it difficult to take one out of service for maintenance as the two larger pumps are both on the same clearwell.

2.1.5 Problem Statement/Opportunity

The assessment of the WTP's raw water intake capacity shows that an expansion to approximately 20,700 m³/d (i.e., 72% increase of current capacity) is needed in the long-term to accommodate population growth over a 20-year planning horizon. As the existing facility is approaching its current rated capacity, some expansion is already required to meet the maximum day demand without consuming any emergency storage from the facility's clearwells or from the existing water tower.

The plant's existing low-lift raw water pumps are currently under capacity for the maximum day demand due to operational limitations. The existing wet well is not deep enough to upgrade these pumps to meet the future flow due to net positive suction head requirements. Thus, a new wet well and low lift pumping station is likely required in any expansion option.

The high-lift pumps technically have sufficient firm capacity to meet the next 15 years of Town growth; however, the configuration of the clearwells (with two largest pumps in one tank) make it difficult for operators to take the larger clearwell out of service. The pump will eventually need to be upgraded to meet the 20-year maximum day demand of 208.5 L/s (18,000 m³/d).

Based on the framework provided by the Master Plan and constraints of the WTP's existing capacity, the Problem and Opportunity Statement for this project was developed as follows:



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The WTP has a current rated capacity of 12,000 m³/d. At present the WTPs capacity will not accommodate projected population growth over the 20-year planning horizon. Therefore, to accommodate both planned and future development as well as the impacts of climate change in a manner consistent with the recommendations of the Master Plan, the Town intends to plan for the future capacity expansion of the WTP.

2.2 Phase 2 – WTP Alternative Solutions

As part of the MCEA planning process, reasonable and feasible alternative solutions to the Phase 1 problem statement were identified and described in Phase 2. The magnitude of the net positive and negative effects of each alternative solution, as well as mitigating measures, were identified and evaluated. Based on this evaluation, a preferred alternative solution was selected and confirmed based on public, agency, Indigenous communities, and stakeholder consultation (refer to Master Plan for additional details).

Based on the review of alternatives for this project, the following were developed to address the water treatment needs for the Town:

- Alternative A: Do Nothing
- Alternative B: Water Conservation Measures
- Alternative C: Expand Existing WTP On-Site
- Alternative D: Build an Additional WTP (Off-Site)
- Alternative E: Municipal Groundwater Well

The full evaluation of alternative solutions undertaken is included in the *Alternatives Technical Memorandum* appended to the Master Plan.

2.2.1 Preferred Alternative Solution

Based on a comparative evaluation of impacts associated with the natural, social, economic, technical, and cultural impacts of each alternative, the expansion of the existing WTP was identified as the recommended alternative solution.

Alternative C was identified as the preferred alternative solution because it has:

- A moderate cost and provides opportunity to utilize existing infrastructure
- A high potential to support future population needs to the 2041 horizon
- A low potential to impact private property and health and safety of Town residents



- A moderate potential to avoid impacts to the natural and cultural heritage environments

2.3 Phase 2 – Water Storage Alternative Solutions

The following alternative solutions were identified to address the problems and opportunities associated with the Town’s existing water storage:

- Alternative A: Do Nothing
- Alternative B: Expand WTP Clearwell
- Alternative C: Add New Storage Off-Site

The full evaluation of alternative solutions undertaken is included in the Alternatives Technical Memorandum appended to the Master Plan.

2.3.1.1 Preferred Alternative Solution

Based on a comparative evaluation of impacts associated with the natural, social, economic, technical, and cultural impacts of each alternative, the combining of the water storage with the expansion of the WTP was identified as the recommended alternative solution

Alternative B was identified as the preferred alternative solution because:

- A WTP expansion is already required in the short-term
- It has high potential to accommodate future population growth to 2041
- It has a low potential to impact private property and high potential to increase the health and safety of Town residents by added fire flow capacity
- There are cost savings by choosing to expand vs. build a new facility off-site
- It has moderate potential to avoid impacts to the natural and cultural heritage environments

2.3.2 Source Water Protection

The project area for the new WTP expansion was reviewed for source water protection. The WTP intake itself is surrounded by an Intake Protection Zone. The project will not change or create a new vulnerable area. As per Mississippi-Rideau Source Protection Plan (2020), the expansion of the WTP and increase in water taking capacity may fall under Drinking Water Threat #19: “An activity that takes water from an aquifer or a



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surface water body without returning the water taken to the same aquifer or surface water body”. The Source Protection Plan (SPP) notes the following:

“Prescribed drinking water threats 19 and 20 are activities that could deplete, not contaminate, sources of drinking water. Since the Assessment Reports for the Mississippi-Rideau region concluded that there are no significant water quantity threats in this region, this Plan does not contain policies to address these activities in accordance with the Clean Water Act”.

Therefore, no specific policies from the SPP are applicable to this project.

Special considerations for preventing deterioration of the water quality at the intake will be taken into account during construction. The intake pipe was analyzed for hydraulic capacity and confirmed that it could service the expanded WTP if the new Low Lift Pumping Station was constructed with a deeper wet well basin. Therefore, this work (and all other work for the expansion) is expected to take place on land. A diver inspection video from 2001 was reviewed and did not find any other need for modifications at the planning level. It is recommended that the existing intake pipe be inspected during preliminary design to confirm any potential need for rehabilitation. The construction project will require erosion and sediment control plans and spill prevention / control plans to be developed to prevent contamination of the raw drinking water source.

The design of the expansion should also consider best practices for spill containment from the generator, chemical storage areas and other potential contamination sources. These sources already exist at the existing facility. The project provides an opportunity to improve the safety and reliability of these existing features.

2.3.3 Water and Wastewater Master Plan Consultation (Notice of Study Completion)

To provide a complete public record of comments, the comments received upon posting the Master Plan as applicable to the WTP have been included here.

The Notice of Study Completion for the Master Plan report was placed in the local newspaper (Carleton Place Canadian Gazette) on June 2, 2022. The Notice was also available on the project website and distributed via mail and email to agencies, key stakeholders, Indigenous Nations and the public on the study mailing list. This notice briefly outlined the Recommended Solutions and noted that the Master Plan was posted to the project website for a 30-day public review period. A copy of this notice is provided in **Appendix F.2** of this document.



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Eight (8) comments relating to the recommended expansion of the Town’s existing WTP were received as a result of issuing the Notice of Study Completion. The comments and responses are summarized in Table 2.1 below.

Table 2.1: Summary of Notice of Completion (Master Plan) Comments and Responses

Topic	Question/Comment	Response
Water Contamination	Inquiry regarding potential contamination of water at the source	This will be discussed in the WTP Expansion Environmental Study Report (ESR) in Phase 4 of this project. Currently, water quality is continuously monitored, and accelerated degradation could be identified early. There have not been any detected contaminants to date. Current and proposed water treatment processes are proven to be effective at controlling toxins from cyanobacteria and other algae microorganisms. A recommendation of continuing this monitoring efforts will be made on the ESR.
Population Growth	Question regarding the study not considering future development plans South of the Town limits (Beckwith) to support the Town’s growth projections.	Comment regarding lands outside of the municipal boundary of the Town is acknowledged. A presentation to the Town Councillors will be provided to discuss growth projections and development plans.
	Comment regarding the growth forecast being too conservative and whether the proposed infrastructure will meet the Town’s water needs until 2041.	The new infrastructure will be designed to meet the 2041 population with current growth projections. Growth beyond this will require further expansion in the future if these growth projections are met.
	Question regarding population growth and whether the current water filtration system will meet	The Town has been working through a Water and Wastewater Master Plan and Environmental Assessments for the expansion of



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Topic	Question/Comment	Response
	the needs of the population in 10, 20, and 50 years.	our Wastewater Treatment Plant. These plans address growth until the year 2041. The Town has been diligent in ensuring that capacity is available to support growth as growth occurs.
Contingency Plan for Water Distribution	Concern regarding the W&WWMP not including a contingency plan for water distribution if water supplied by the WTP becomes unpotable/unavailable, or if water conditions on the river impair discharge from the WTP.	The Mississippi Valley Conservation Authority (MVCA) currently monitors river levels and data is reviewed continuously to anticipate any changes in drinking water supply and assimilative capacity. A detailed Water Availability Study and Assimilative Capacity Study are in the process of being finalized for the WTP and WWTP respectively as part of the current study.
Water Usage	Comment regarding the ability of the Town’s water metering approach to accurately charge for water/sewage usage.	Metering residential accounts would ultimately increase the cost of water and sewer services to residents. Thus, the Town continues working on educating the community on the responsible use of water resources as well as the implementation of restrictive measures for outdoor water use in the month of July.
Natural Hazards	Suggestion to consider the location of the floodplain needs throughout the planning and design phases of the proposed expansion of the WTP and WWTP. Also, a concern regarding the proposed expansion footprint extending into the regulation limit of the 1:100-year floodplain of Mississippi River.	The MVCA will be consulted during future planning and design stages regarding any potential upgrades to water and wastewater infrastructure within the MVCA regulated area and/or floodplain of the Mississippi River.



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Topic	Question/Comment	Response
Climate Change and Green Infrastructure	Question regarding whether the Town is preparing for impact of a changing climate as per the Provincial Policy Statement (2020) for managing growth and development.	Preparing for growth and the anticipated impacts of climate change are key objectives of this study and will continue to be for future planning and design stages.
Aquatic Environment	<p>Suggestion for additional aquatic environment impacts for:</p> <p>WTP - Alternative C (Expanding Existing Site): there is potential to impact water quantity during low flow conditions (resulting from increased extraction rate). The magnitude of this impact can be determined from Water Availability Study.</p> <p>WTP – Alternative D (Build New/Additional WTP behind Canoe Club): there is potential to impact water quantity during low flow conditions (resulting from increased extraction rate). The magnitude of this impact can be determined from Water Availability Study.</p> <p>WTP – Alternative E (Municipal Groundwater Well): there is the potential to contaminate groundwater with surface contaminants (if well is improperly sealed).</p>	The additional impacts, including negative impacts to surface water quality and fish and fish habitat, will be included in an edited version of the Alternative Evaluation Technical Memorandum and appended to the Water and Wastewater Environmental Study Reports (Appendix E).



3 Existing Environmental Conditions

An inventory of existing environmental conditions was undertaken for this project, as described herein. Information included in this section was taken directly from the Species at Risk Screening Report (**Appendix B**), the Cultural Heritage Report (**Appendix C**), and the Stage 1 Archaeological Assessment (**Appendix D**).

3.1 Natural Environment

3.1.1 Aquatic Environment

The Mississippi River is 200 km in length, flows northeastwards through the centre of the Town and is a tributary of the Ottawa River. The Mississippi Lake is located upstream (southwest) of the Town. The Mississippi River watershed encompasses an area of 3,750 km² and comprises various natural environment features including wetlands, wooded areas and Significant Ecological Areas (**Figure 3.1**).

Water levels in Mississippi Lake are controlled by the Carleton Place Dam, which is owned and operated by the Mississippi Valley Conservation Authority (MVCA). The dam is not intended for hydro-electric production, but rather, it maintains recreational levels in Mississippi Lake and provides some flood control benefits for Mississippi Lake and downstream municipalities. Operation of the Carleton Place Dam is important for maintaining water levels in Mississippi Lake during low flow conditions. Additionally, the Carleton Place Dam is operated to reduce shoreline damage and maintain stable ice levels in Mississippi Lake.



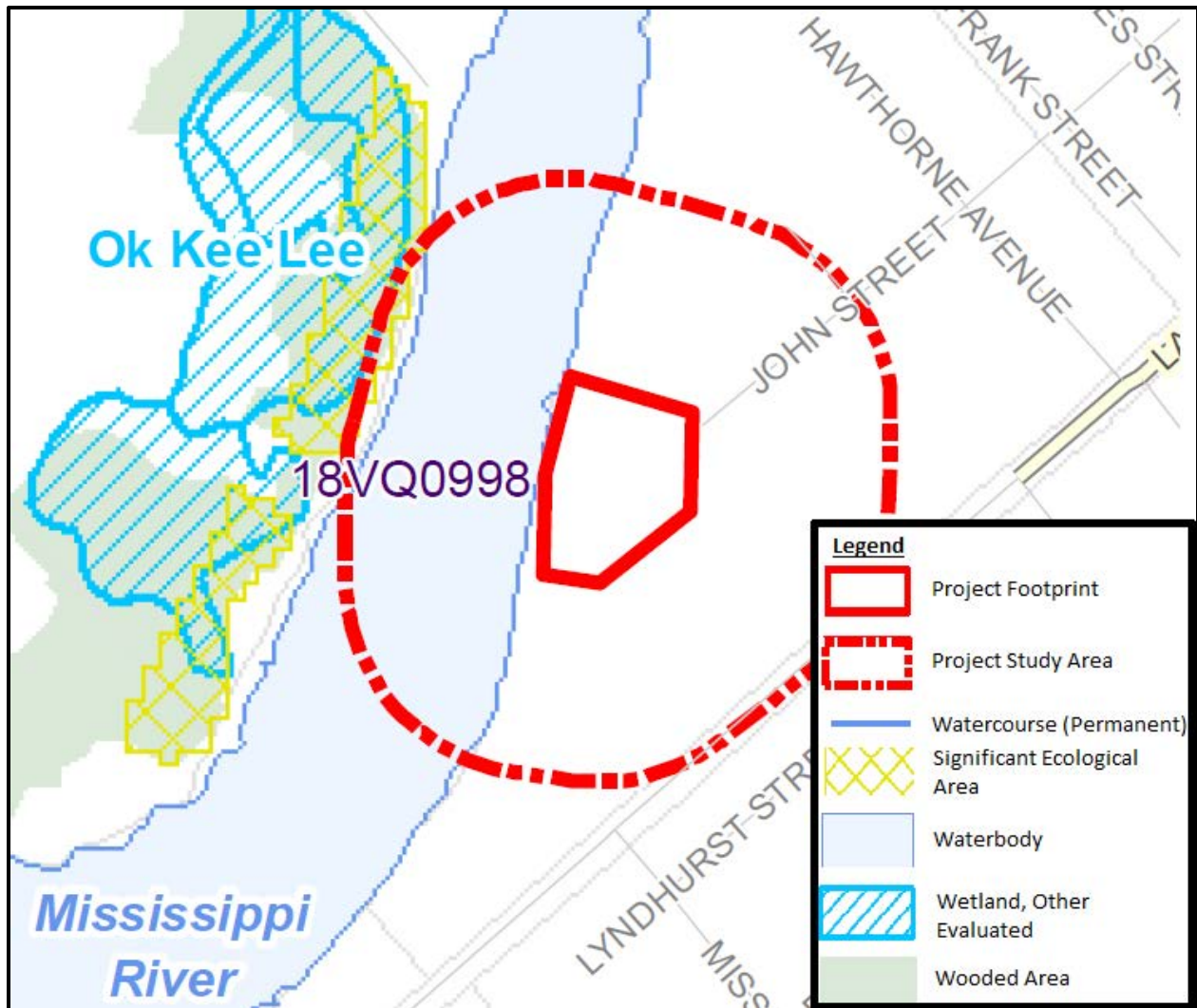


Figure 3.1: Natural Environment Features Located in the WTP Study Area

As the Town’s WTP draws water from the Mississippi River, a water availability assessment was completed to assess the impact of projected increased water taking needed to accommodate future growth on the river’s water levels. Findings of the water availability assessment study concluded that it is unlikely there will be issues with insufficient water supply or exposed water intake following expansion of the WTP to meet the 20-year capacity requirements (20,700 m³/d). The water availability assessment is presented in **Appendix A**.

The MVCA has identified a “Regulated Area” along the Mississippi River to protect the shoreline from construction due to risk of flooding, erosion, and other hazards per Ontario Regulation (O.Reg.) 153/06. Currently, some areas of the existing WTP are located within the Regulated Area.



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As in-water work was not identified in the Master Plan, an impact assessment of fish and fish habitat was not completed. In the event of any change during Detail Design, this will be revisited.

3.1.2 Terrestrial Environment

The terrestrial environment includes plants and the combination of land-based natural features that provide habitat for plant and animal species. The Study Area consists of several natural heritage features including wooded area, significant ecological area and the Mississippi River floodplain. These areas create habitats for all or a part of the life cycle of wildlife (i.e., mammals, amphibians and birds), which include breeding, feeding, or stopover during migration.

3.1.3 Species at Risk Screening

A preliminary Species at Risk (SAR) screening was conducted at the WTP site including a desktop review of potential SAR occurrences and/or habitat accompanied by a single site visit. The objective of the preliminary screening was to determine whether any SAR or their habitat exist or are likely to exist at or at or within 120 metres of the existing WTP site, and whether the proposed activities are likely to contravene the *Endangered Species Act*, 2007. Natural heritage features and potentially suitable habitat for SAR were observed and/or identified as occurring within the WTP onsite or within the Study Area. The five SAR considered to have suitable habitat within the Site and present with in the Study are Blanding's Turtle and four species of bat SAR (Small-footed myotis, Little Brown myotis, Northern myotis, and Tri-colored bat). A copy of the SAR report is provided in **Appendix B**.

3.1.3.1 Background Data Collection

Background studies using the provincial NHIC and LIO databases as well as the Town's Official Plan (2013) and MVCA's web-based screening portal identified the following natural heritage features as occurring at the WTP Study Area:

- Significant Ecological Area
- Waterbody – Mississippi River
- Wooded Area
- Mississippi River Floodplain
- MVCA Regulation Limits



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The following SAR protected under ESA, were identified as potentially occurring within the WTP Study Area:

- Eastern Meadowlark (*Sturnella Magna*)
- Bobolink (*Dolichonyx oryzivorus*)
- Butternut (*Juglans cinerea*)

Based on the findings of a desktop background review, 12 SAR have been previously documented as historically occurring or have the potential to occur within the Study Area (**Table 3.1**). Five of these species have been considered to have suitable habitat within the project footprint and no additional species have been considered to have suitable habitat within 120 metres of the existing WTP site.

Table 3.1: SAR with potential to occur within the Water treatment Plant Site

Species Type	Species	Status Ontario ESA	Status Federal SAR, Schedule 1	Suitable Habitat present on- Site (Y/N)	Suitable Habitat present within 120 m (Y/N)
Plants	Butternut (<i>Juglans cinerea</i>) ^{1,5}	Endangered	Endangered	N	N
Arthropods	Rusty- patched Bumble Bee (<i>Bombus affinis</i>) ¹	Endangered	Endangered	N	N
Reptiles	Blanding's Turtle (<i>Emydoidea blandingii</i>) ^{1,2}	Threatened	Threatened	Y	Y
Birds	King Rail (<i>Rallus elegans</i>) ³	Endangered	Endangered	N	N
	Least Bittern (<i>Ixobrychus exilis</i>) ^{1,3}	Threatened	Threatened	N	N
	Red- headed Woodpecker (<i>Melanerpes erythrocephalus</i>) ^{1,3}	Special Concern	Threatened	N	N
	Wood Thrush (<i>Hylocichla mustelina</i>) ^{1,3,6}	Special Concern	Threatened	N	N



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Species Type	Species	Status Ontario ESA	Status Federal SAR, Schedule 1	Suitable Habitat present on- Site (Y/N)	Suitable Habitat present within 120 m (Y/N)
	Canada Warbler (<i>Cardellina canadensis</i>) ^{1,3}	Special Concern	Threatened	N	N
Mammals	Small-footed myotis (<i>Myotis leibii</i>) ^{1,4}	Endangered	No Status, No Schedule	Y	Y
	Little Brown myotis (<i>Myotis lucifugus</i>) ^{1,4}	Endangered	Endangered	Y	Y
	Northern myotis (<i>Myotis septentrionalis</i>) ^{1,4}	Endangered	Endangered	Y	Y
	Tri-colored bat (<i>Perimyotis subflavus</i>) ^{1,4}	Endangered	Endangered	Y	Y

3.1.3.2 Field Investigations

A site investigation was conducted on August 19th, 2021, to assess for SAR occurrences and/or potential habitat(s) as well as to confirm the natural heritage features in the Study Area that were identified through the background data collection process.

Observations of potentially suitable habitat for the SAR outlined in **Table 3.1** is summarized herein.

Blanding's Turtle - Although no individuals were observed during the site visit, suitable habitat was observed at the WTP site. The WTP is immediately adjacent to the Mississippi River, which is known to contain Blanding's Turtle, with Ontario Nature observations from 2019. The Mississippi River is deep enough to provide suitable overwintering habitat and can also serve as a migration corridor. This Site's Study Area also includes an unevaluated wetland that could provide suitable habitat for Blanding's Turtle.



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Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-colored Bats (SAR bats)

-These bat species share similar habitat preferences during their active season and are described together. These species will use trees as small as 10 cm diameter at breast height (DBH) with cavities, loose bark, and leaves to nest and day roost as well as for maternity roosting purposes, usually >10 metres high on trees exhibiting early stages of decay. Additionally, these species are known to use anthropogenic structures for roosting as well. Suitable maternity roosting trees are present at the WTP site. The WTP site is immediately adjacent to the Mississippi River where there is a public walking trail with large, mature planted trees. In addition to this, the Site has greenspace that also contains large, mature planted trees that were identified during the Site visit as being potential bat maternity roosting trees. Given the proximity of the river it is also likely suitable foraging habitat is present for SAR bats as well.

3.1.4 Groundwater

There are no known private wells in the vicinity of the WTP. A contaminated groundwater plume (the Beckwith plume) exists southeast of the Town but is not expected to impact or be impacted by the project.

Groundwater testing has not been completed at the WTP as part of this project, however the Town has advised that there is no known contamination. A previous subsurface soil analysis was conducted by others in 2009 for the removal of an underground storage tank on the property. The soil verification report did not indicate any evidence of contaminated soil. Groundwater testing will be completed as part of Detail Design of the project. Due to the vicinity to the Mississippi River, it is likely that any deep excavation at the site would encounter groundwater infiltration.

3.1.5 Surface Water

The WTP site sits directly adjacent to the Mississippi River in a reach that is directly connected to the downstream section of the Mississippi Lake. A number of properties and cottages are situated on the shoreline of the Mississippi Lake. The Mississippi River runs through the centre of the Town and is used for recreation, including at Riverside Park Beach approximately 100 metres downstream of the WTP. The Carleton Place Dam is located downstream of the WTP intake and maintains recreational water levels in the Mississippi Lake, while providing flood control benefits for the Lake and downstream municipalities.

Part of the WTP site is in the 100-year floodplain of the river. Mississippi River water level is currently monitored by the MVCA at the Carleton Place Dam and in the Mississippi Lake. Flowrate is monitored at a Water Survey of Canada station at Appleton (ID 02KF006) approximately 7 km downstream of the intake. Surface water



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quality in the Mississippi River is also monitored by the MVCA in the Mississippi Lake, and further upstream on the Mississippi River at Fergusons Falls.

3.2 Cultural Environment

3.2.1 Cultural Heritage

A Cultural Heritage Report of Existing Conditions and Preliminary Impact Assessment (CHRECPIA) was carried out to determine the potential for properties having cultural heritage value of interest, based on an assessment using the criteria outlined in O.Reg. 9/06 and the Ministry of Citizenship and Multiculturalism (MCM) Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes. A copy of the CHRECPIA is provided in **Appendix C**.

Based on the findings of the assessment, the WTP (199 John Street) was identified as a built heritage resource (BHR-1) and is considered to have CHVI. The property is also listed on the Town of Carleton Place Municipal Heritage Register. The identified resource is shown in Error! Reference source not found. **Figure 3.2**. A summary of the evaluation is provided in **Appendix C**.



Figure 3.2: Photograph of Previously Identified or Potential Built Heritage Resource – 199 John Street – Carleton Place Waterworks (BHR-1)



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The existing WTP is a rare and early example of a WTP still in use. Constructed in 1914, this building is symbolic of the Town's progress in the early 1900s. The pumping station and attached infrastructure provided a significant improvement in the quality of life for the Town. The building's classically inspired elements echo the civic gift of providing running water. Despite an addition to the building, the form of the original 1914 waterworks building is not compromised by the contemporary addition.

Elements that contribute to the design value of the property include:

- Two storey massing, including the brick and stonework
- Large rectangular windows at the lower level (20-pane) and upper level (4-pane)
- Stone cornice that wraps the building
- Regularly placed columns and bays
- The setback of the 1983 addition

Elements that contribute to the historic value of the property include:

- The association with the growth of the Town of Carleton Place through the construction of water systems

3.2.2 Archaeology

A Stage 1 Archaeological Assessment was conducted in accordance with the Ministry of Citizenship and Multiculturalism (MCM) 2011 *Standards and Guidelines for Consultant Archaeologists* to determine the potential for the presence of known and/or potential archaeological resources within the study area. Based on the findings of the assessment, two archaeological sites have been registered within a 1 kilometre radius of the Study Area; however, neither site is within 50 m of the existing WTP site. In addition, the Study Area demonstrates potential for the recovery of pre- and post-contact Indigenous and Euro-Canadian archaeological resources. However, the WTP property has been widely disturbed from previous construction, grading and landscaping activities. The WTP was identified as having low to no archaeological potential and no further archaeological assessment of the study area was recommended.

3.3 Social & Economic Environment

3.3.1 Social Environment

The WTP is located next to Carleton Place High School and several of the high school's parking spaces back on to the lawn behind the WTP off John Street. The Riverside Trail network connects to John Street south of the WTP and extends parallel to Lake Street and the shore of the Mississippi River for approximately 500 metres, providing recreational opportunities to the community. The Carleton Place Canoe Club is situated



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north of the WTP at 179 John Street and offers programming and summer camps focused on flatwater recreation to the Town and the surrounding communities.

3.3.2 Economic Environment

Along with the Town's population, employment and institutional, commercial, and industrial (ICI) areas are also projected to grow. The Town's major economic sectors include the manufacturing industry, the health industry and retail trade. The proposed WTP expansion will help ensure that future ICI sites supporting the economic development growth with the Town can be appropriately serviced with municipal water services.

3.3.3 Air Quality

Air Quality refers to the presence or absence of substances in the air that could cause harm to humans in large quantities. This includes substances in gaseous or solid (particulate) form. The operation of the existing WTP does not produce hazardous substances that may be harmful to humans outside of the plant, with the exception of; treatment chemicals and silica sand that are in use at the existing WTP.

3.3.4 Utilities

There are several utilities that exist in the Study Area, these include gas (Enbridge), electricity (Hydro One), communications (Bell), and Town water/sewer. Confirmation of location of utilities and identification of utility conflicts will occur in Detail Design.

3.3.5 Health and Safety

The WTP stores and collects various chemicals for its treatment operation and has been proven effective at controlling toxins from cyanobacteria and other algae microorganisms. The handling of treatment chemicals and silica sand within the plant presents a hazard to the WTP operators. The WTP operators have a standard operating procedure in place for monitoring, sampling and reporting potentially harmful algal blooms. This includes visual observations, routine seasonal sampling and testing and adjustments to treatment operations.

3.4 Climate Change Considerations

Climate change can lead to more frequent and/or more intense extreme weather events, which can stress water infrastructure. For the Town of Carleton Place's WTP, notable historical weather events include the very dry summer of 2016 which put stress on the water facility. With climate change, high and low extreme water levels are more likely to occur. Low water levels can pose issues with water-taking quantity and quality at the WTP while high water levels can create risks of flooding at the WTP site.



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The 2014 Provincial Policy Statement issued under the *Planning Act* advises of the need to consider climate change adaptation and mitigation. The MECP provides further guidance on considering climate change adaptation and mitigation in the environmental assessment process ([Considering climate change in the environmental assessment process | ontario.ca](#); *MECP Guidance on Considering Climate Change*). With climate change leading to highly variable conditions, adaptation measures may be required in the future to ensure the infrastructure's resiliency and mitigate the impact of extreme weather events. Climate change and the potential impact to infrastructure is highly uncertain. This uncertainty should be considered in engineering planning and design initiatives.

As recommended in *the MECP Guidance on Considering Climate Change*, the **Phase 1 Report** appended to the Master Plan presents the historical means, trends and projected trends in average total precipitation and average mean temperature for the Pembroke region, and potential impacts to the WTP are identified. The *MECP Guidance on Considering Climate Change* also highlights the importance of considering and understanding the potential impacts that a project may have on climate change. This can be done qualitatively and includes reviewing measures that could contribute to climate change mitigation.

Potential climate adaptation and mitigation measures were considered in the evaluation of alternatives and are outlined in the Alternatives Technical Memo appended to the Master Plan.

The impacts of climate change and extreme weather events on the WTP include:

- Increased runoff's impact on source water quality due to increased precipitation
- Flooding during higher river flows due to increased precipitation
- Low flows impact on water intake and water quality due to decreased precipitation/prolonged droughts
- Increase in water demand linked to temperature increases
- Water quality issues linked to temperature increases
- Formation of frazil ice at intake structure during low water levels
- Severe storms interrupting deliveries or leading to power outages

To address potential climate change impacts and increase resilience to climate change, different measures could be integrated in the selected alternative. Opportunities for climate change adaptation include:

- Adaptation to flooding risks
 - Build new process structures and buildings above the floodplain limit, with a buffer to accommodate future floods
 - Relocating equipment away from flood-prone areas



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- Verify and update emergency measures for flooding
- Adaptation to increased precipitation and impact on source water quality
 - Design processes to allow for increase in chemical dosing and other operational parameters in case of degraded source water quality
 - Adapt chemical supply planning based on modified usage
 - Consider changes in proportion of process wastewater
- Adaptation to low water levels due to drought
 - Design low-lift pumps and basin considering potential low water levels
 - Ensure that existing raw water intake (or any new proposed raw water intake) is at the deepest point, minimizing the risk of frazil ice formation
- Adaptation to degraded source quality due to drought
 - Design robust treatment processes which can handle increased solids loading
- Adaptation to increased potable water demand with increased temperatures
 - Integrate process water usage efficiency in design
 - Encourage water conservation in the Town
- Adaptation to impacts of severe storms
 - Design chemical storage capacity to provide additional reserve and minimize impacts of delayed deliveries on plant operation
 - Size backup power generators for all critical plant processes

The MECP Guidance on Considering Climate Change also highlights the importance of considering and understanding the potential impacts that a project may have on climate change. Opportunities for climate change mitigation (GHG emissions reduction) and energy savings are considered in the evaluations of alternatives include:

- Upgrading pumps and other processes to increase their efficiency (or selecting new high-efficiency pumps and motors)
- Optimizing pump operation and other processes to reduce energy consumption and process water usage
- Upgrading backup generator with energy efficient model
- Using renewable energy sources, where practical



4 Phase 3 - Alternative Design Concepts for Preferred Solution and Evaluation

Phase 3 of the MCEA process involves identifying alternative design concepts for implementation of the preferred alternative solution; to expand the existing WTP on the existing site and to add water storage at the WTP site as part of the expansion. The recommendations and scope of the expansion is determined based on an updated review of existing conditions, and alternative design concepts are identified and evaluated to determine the net impacts to the natural, socio-economic, cultural, and technical environments, while taking into consideration input from the public, agencies, and Indigenous Nations.

4.1 WTP Expansion Needs and Constraints

The following is a summary of WTP planning constraints and needs, further to those discussed in the Master Plan:

- A WTP expansion to approximately 20,700 m³/d of raw water intake (i.e., 72% increase of current capacity) is needed in the long-term to accommodate population growth over a 20-year planning horizon. As the existing facility is approaching its current rated capacity, some expansion is already required to meet the maximum day demand without consuming any emergency storage from the facility's clearwells or from the existing water tower.
- The plant's existing low-lift raw water pumps are currently under capacity for the maximum day demand due to operational limitations. The existing wet well is not deep enough to upgrade these pumps to meet the future flow due to net positive suction head requirements. Thus, a new wet well and low lift pumping station is likely required in any expansion option.
- The high-lift pumps technically have sufficient firm capacity to meet the next 10 years of Town growth; however, the configuration of the clearwells (with two largest pumps in one tank) make it difficult for operators to take the larger clearwell out of service. The pumps will eventually need to be upgraded to meet the 20-year maximum day demand of 208.5 L/s (18,000 m³/d) on a regular basis, and the peak hour demand of 313 L/s (27,000 m³/d) under extreme condition, when the elevated water storage tank is isolated for repair or maintenance purpose.



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Some key features of the existing WTP site that relate to the evaluation criteria and were considered in the evaluation of alternatives include:

- The existing water intake pipe is near the deepest part of the Mississippi River between the Mississippi Lake and the Mississippi Dam in downtown Carleton Place. A 2022 water availability study concluded that it is unlikely there will be issues with insufficient water supply or exposed water intake following expansion of the WTP to meet the 20-year capacity requirements (20,700 m³/d).
- A geotechnical investigation was not completed at the existing site, however based on background document review and the proximity to the river, it is expected that any deep excavations would encounter both rock conditions and high groundwater levels. A previous subsurface soil analysis was conducted by others in 2009 for the removal of an underground storage tank on the property. The soil verification report did not indicate any evidence of contaminated soil.
- A SAR review was completed at the existing site and did not identify any SAR on the existing property but found several potentially suitable habitats for Blanding's Turtles and SAR Bats. These should be considered at the design stage.
- A Stage 1 Archaeological Assessment was completed at the existing site and evaluated the site as having no archaeological potential, with no need for further investigation recommended.
- The original WTP building (constructed in 1914) was registered locally by the Town in 2021 as a "property of cultural heritage value or interest" and should be preserved and protected in all alternatives. This building currently houses the intake screens, low lift pumps and backup generator.
- Some opportunities for improvement or optimization of the existing facility have been identified by the operators, specifically related to existing process efficiency and health and safety concerns (i.e., chemical storage and handling capacity). Expansion construction should consider these issues during design.
- The circular steel tank filters installed in 1984 may reach the end of their service life over the next 10 years.



4.2 Long List of Water Treatment Options

4.2.1 Development of the Long List of Water Treatment Options

A long list of water treatment options potentially suited to expand the existing WTP was developed. The WTP Expansion Options Evaluation Memo (**Appendix B**) provides a general process description for each treatment option, based on process area (clarification, filtration, and disinfection), their relative advantages/disadvantages and the screening process.

The long list of water treatment options included:

Clarification Options:

- Actiflo
- Dissolved Air Flotation
- Conventional Clarifier
- Miox

Filtration Options:

- Steel Tanks
- Concrete Tanks

Disinfection Options:

- Chlorine Gas
- Sodium Hypochlorite Solution
- Ultraviolet

4.2.2 Screening of Long List Water Treatment Options

A series of critical questions were identified to screen the various expansion options (**Figure 4.1**) to help identify a short-list of feasible treatment process options for further evaluation. The questions selected for screening the options are as follows:

1. Is there sufficient space for a new process?
2. Does the option improve health and safety (H&S) conditions for operators and/or the public?
3. Will MECP approve the new process and issue a letter of conformance?
4. Are there other proven installations in Ontario?
5. Does the process maximize and optimize the use of existing infrastructure?



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Table 4.1: Long List of Water Treatment Options Screening

Options	Process	Sufficient Space	Improve H&S	MECP Approval	Proven Installs	Use Existing Infrastructure	Pass / Fail - Comments
Clarification Options	Actiflo	Yes	N/A	Yes	Yes	Yes	Pass: carried forward for further evaluation
	DAF	No	N/A	Yes	Yes	No	Fail: much larger footprint requirement, poor use of existing treatment plant infrastructure
	Clarifier	No	N/A	Yes	Yes	No	Fail: much larger footprint requirement, poor use of existing treatment plant infrastructure
	Miox	Yes	N/A	Yes	Yes	No	Fail: poor use of existing treatment plant infrastructure, would need costly additional steps
Filtration Options	Steel Tanks	Yes	N/A	Yes	Yes	Yes	Pass: carried forward for further evaluation



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Options	Process	Sufficient Space	Improve H&S	MECP Approval	Proven Installs	Use Existing Infrastructure	Pass / Fail - Comments
	Concrete Tanks	Yes	N/A	Yes	Yes	Yes	Pass: carried forward for further evaluation
Disinfection Options	Chlorine Gas	Yes	No	Yes	Yes	Yes	Fail: technically, keeping the existing gaseous chlorine system would not increase the risk to the public and the operator, but that risk is high. Most municipalities have abandoned this technology to reduce the risk. On this basis, Stantec considers this as FAIL.
	Sodium Hypo-chlorite	Yes	Yes	Yes	Yes	Yes	Pass: carried forward for further evaluation
	UV	Yes	No	Yes	Yes	Yes and No	Fail: Does not provide any substantial benefit, as chlorine injection would still be required for



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Options	Process	Sufficient Space	Improve H&S	MECP Approval	Proven Installs	Use Existing Infrastructure	Pass / Fail - Comments
							secondary disinfection purpose. Volume dedicated to chlorine contact will be used as emergency volume, and be made available under emergency conditions, using a sluice gate at bottom of water reservoir compartment.

The initial screening of clarification and disinfection options resulted in the selection of **Actiflo clarifiers** and use of **sodium hypochlorite disinfection** as the preferred alternatives for those unit processes. The short-list of options identified based on the results of the screening assessment for the Filtration process are:

- **Alternative 1** – New Circular Steel Tank Filters
- **Alternative 2** – New Concrete Tank Filters

These alternatives were further explored and evaluated, as described in the following sections. The full evaluation of design concepts is included in the *WTP Expansion Options Evaluation Memorandum (Appendix F)*.



4.3 Short List of Water Treatment Options

4.3.1 Upgrades Common to Both Alternatives

Both proposed alternatives would maintain the existing WTP site footprint and involve expanding processes to meet planned growth. A high-level review of the required process expansion footprints indicates that the 2041 demand could be met by expanding the existing facility on the current property.

Both options seek to maintain use of the existing processes, including the existing raw water intake, and Actiflo clarifiers while providing new infrastructure where necessary to increase treatment capacity to accommodate future growth. It is recommended that the condition of existing infrastructure be inspected prior to the planned upgrades regardless of the preferred alternative option.

For both alternative designs, the following upgrades will be required to meet the 20-year WTP capacity:

- New low lift pumps with a larger and deeper basin than the existing one, within a new chemical feed building to safely store process chemicals. An extension to the raw water intake line will direct raw water to the new low lift pumping and chemical building, situated north of the original plant building, to minimize pumping requirements for the expanded plant. The proposed location for the new low lift pumping and chemical building is near the Mississippi Valley Conservation Authority (MVCA) regulation limit and will require consultation during detailed design.
- New Actiflo clarifiers, installed adjacent to the existing Actiflo clarifiers.
- A new backup generator to meet increased demand for the expanded WTP.
- Additional below-grade clearwell cells and increased high lift pump capacity to meet peak water demands and future storage requirements, which may result in the temporary loss of parking spaces for the Carleton Place High School during construction.
- Preservation of the original 1914 building, which has cultural heritage value. This building may continue to be used for chemical storage, maintenance activities and administrative purposes. All new buildings and tanks are proposed to be detached from the original building and will match the height of existing buildings or have a lower profile to minimize visual impact changes to the site.
- Chlorination may also be required with the upgrades to the WTP pending raw water quality analysis to be performed during future design stages.



4.3.2 Alternative 1 – New Circular Steel Tank Filters

In addition to the required upgrades, Alternative 1 involves expanding the WTP with similar treatment technology to the existing, including the addition of new circular steel tank filters. A preliminary site plan of this alternative is shown in **Figure 4.1**.

As reported by the Operating Authority (OCWA), the net rating of each of the three steel vessels is 3,000 m³/d. As plant rated capacity is to be increased to 20,700 m³/d, at least seven such vessels are required, and an eight one is required for redundancy. The total number of filters would therefore be 16, with 10 of them new as part of the expansion (5 new dual tanks). The existing steel filter tanks may need replacement within the existing filter room within the 10-year planning period as they approach the end of their useful life.

This alternative takes up a smaller footprint on the existing site, as compared to the other alternative, because of the steel filters having their own built-in backwash reserve and requiring a smaller overall backwash settling tank volume (due to the smaller filter units). However, operating and maintaining steel filters is labour intensive and generally provides less process control. The sheer number of filters presents a high operational and monitoring burden. Also, the filter backwash flow rate and duration cannot be controlled with the steel tanks and the dual-filter system requires both filters to be taken offline during backwash. Although initial capital expenditure for this alternative is low, it has increased operation and maintenance (O&M) costs and more frequent filter replacement requirements.



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Figure 4.1: Alternative 1 – WTP New Circular Steel Tank Filters (preliminary site plan)

Figure 4.2 provides a summary of the advantages and disadvantages of a circular steel tank filter expansion.

Table 4.2: Summary of Advantages and Disadvantages of Alternative 1 – New Circular Steel Tank Filters

Advantages	Disadvantages
<ul style="list-style-type: none"> • Smaller expansion footprint • Makes use of remaining life of existing steel tanks • Lower initial capital cost • Proven technology • Well understood capital and long-term O&M requirements • New infrastructure can be constructed offline while the existing WTP remains in operation, reducing complexity of maintaining service during construction 	<ul style="list-style-type: none"> • Higher O&M requirements and reduced longevity of steel tank vs concrete tank • Steel tanks are only available in standardized diameters which limits customization of new infrastructure to match future plant capacity • Circular tanks do not optimize footprint of new filter room (circular tanks within rectangular building)



Advantages	Disadvantages
	<ul style="list-style-type: none"> • Overall number of filter valve set and filter turbidity meters (16) is much higher than number at the concrete tank filters (4) • New filter room may need to be separated from the existing one, on opposite side of the ACTIFLO room • Limited operator flexibility and control for process optimization (as backwash reserve and flow rate cannot be adjusted) • Increased compliance deviation risk based on the addition of several smaller filters

4.3.3 Alternative 2 – New Concrete Tank Filters

Alternative 2 involves expanding the WTP with new concrete tank filters, including new filter backwash and backwash water reserve tanks. A preliminary site plan of this alternative is shown in **Figure 4.2**. The new concrete filter tanks would be sized to treat the full capacity of the plant. Existing steel tank filters will be decommissioned and abandoned in place after new concrete tank filters are operational.

This alternative improves plant operator control and decreases maintenance requirements as compared to Alternative 1, since it requires only a quarter of the automated valves and turbidity meters to maintain with four concrete filters than with eight steel tank (each with two filters). However, concrete filter tanks do not have a built-in backwash water reserve, unlike the steel filter vessels, and thus will require an expanded clearwell volume with dedicated pumps to supply this reserve water, resulting in a larger overall footprint and further temporary loss of Carleton Place High School parking spaces during construction compared to circular steel tank filters. An advantage of new concrete tank filters is greater operational flexibility and the ability to control backwash flowrate and duration to each unit. The rectangular shape also makes it possible to optimize distribution piping for more efficient backwashing, which is more difficult in circular steel tanks.

The new concrete filter room would be larger than the supplemental steel filter room (as in Alternative 1) as it needs to be sized for the full plant capacity to compensate for decommissioning the existing steel tank filters. The new concrete filters would be side by side, to optimize footprint, but this imposes some limitations for the rest of the site. In addition, more recreational space on the WTP site will be lost to allow for the installation of the new filter backwash settling tank; this one would be larger than the one for steel



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tank filter, because each concrete filter unit would generate about four times more backwash wastewater at every cycle compared to the smaller steel tank filters.

Having four concrete filters as opposed to eight steel filter vessels also makes it possible to allocate more time between consecutive backwash cycles, which means more time for settling and transferring clarified water to the river and transferring sludge to the communal sewage collection system. This would provide overall flexibility not possible with steel tank filters, which have more intensive backwash sequences during some periods of the year, as reported by OCWA.



Figure 4.2: Alternative 2 – WTP New Concrete Tank Filters (preliminary site plan)

Table 4.3 provides a summary of the advantages and disadvantages of a concrete tank filter expansion.



Table 4.3: Summary of Advantages and Disadvantages of Alternative 2 – New Concrete Tank Filters

Advantages	Disadvantages
<ul style="list-style-type: none"> • Proven technology • Well understood capital and long-term O&M requirements • Lower O&M requirements (due to reduced number of automated valves and other instruments) and increased longevity of concrete vs. steel tank • Can be built to any dimension to fit the plant expansion needs • Opportunity to repurpose existing filter room area in the future • Improved operator flexibility and control for process optimization • New infrastructure can be constructed offline while the existing WTP remains in operation, reducing complexity of maintaining service during construction 	<ul style="list-style-type: none"> • Higher initial capital cost, attributed mainly to requirement for a separate backwash reserve and duplex backwash pump system • Temporary loss of additional parking spaces for Carleton Place High School during construction • Large expansion footprint due to additional clearwell volume and larger backwash settling tank needed • Does not make use of remaining service life of existing steel tanks

4.3.4 Life Cycle Cost Analysis

An opinion of probable construction cost (OPC) and preliminary 20-year life cycle cost analysis were developed for both alternatives, including associated required upgrades described in Section 5.3.1. The OPC (Class 4 estimate (-30% to +50%) in \$CAD 2022) evaluated upgrades that were common to both alternatives as well as individual requirements for each. These will be confirmed and further refined during the design phase.

Common upgrades assumed for both alternatives include:

- Upgraded Power Supply, Backup Generator and SCADA system (note that SCADA upgrades are expected to be more expensive for Alternative 1 due to the higher number of monitoring points)
- New Low Lift Pumping Station & Chemical Feed Building
- Additional Actiflo Basins with Chemical Feed System Upgrades



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- Backwash Settling Tank (size and cost varies for each option depending on number of filter units)
- New Clearwell Cells (additional clearwell volume required for Alternative 2 for Filter Backwash Reserve)
- High Lift Pumping Station Upgrades
- Other Site / Yard Piping and Civil Works (more piping required under Alternative 1 for flow splits between new and existing filter rooms)

While the estimated construction cost for Alternative 2 was slightly higher than Alternative 1 (\$21.9M vs \$21.2M), the 20-year O&M cost was lower (\$19.3M vs \$26.4M). The resulting 20-year lifecycle costs were lower for Alternative 2 (\$43.9M for Alternative 1; \$41.2M for Alternative 2).

Detailed calculations and assumptions for the life cycle cost analysis are provided in the **WTP Expansion Options Evaluation Memo (Appendix E)**.

4.4 Evaluation Methodology

The criteria for the evaluation of the alternative designs fall into four main environmental factors outlined in **Table 4.4** below which represent a broad definition of the environment as described in the *Environmental Assessment Act*.

Table 4.4: Evaluation - Environmental Components

Environmental Component	Description
Natural Environment	Component having a regard for protecting significant natural and physical elements of the environment (i.e., air, land, water, and biota) including natural heritage and environmental features and functions.
Cultural Environment	Component that evaluates potential effects on historical/archaeological and heritage components.
Socio-Economic Environment	Component that evaluates potential effects on residents, neighbourhoods, businesses, community character, social cohesion, community features.
Technical Environment	Component that considers technical suitability and other engineering aspects of the alternative solutions.



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A qualitative evaluation was used to consider the suitability of the different alternative designs and to identify significant advantages and disadvantages with respect to specific set of evaluation criteria identified for each environmental component. The evaluation criteria identified for the project are summarized in **Table 4.5** below. Each alternative is then qualitatively assessed against each criteria using a reasoned argument approach, resulting in a determination identifying each option as preferred or least preferred.

Table 4.5: Alternatives Evaluation Criteria

Category	Criteria
Natural Environment	Aquatic Environment <ul style="list-style-type: none"> • Potential to impact fish and fish habitat; and • Potential to impact surface water quality and quantity.
	Terrestrial Environment <ul style="list-style-type: none"> • Potential to impact wildlife/habitat (i.e., Species-at-Risk, spawning areas, significant ecological areas, etc.); • Potential to affect vegetation (i.e., wooded areas, wetlands, conservation areas, etc.); and • Potential to impact individual trees or landscaped features.
Cultural Environment	Archaeological Resources <ul style="list-style-type: none"> • Potential to impact undisturbed lands.
	Built Heritage Resources / Cultural Landscape <ul style="list-style-type: none"> • Potential to impact known built heritage resources or cultural landscapes/features.
Socio-Economic Environment	Noise/Vibration & Air Quality <ul style="list-style-type: none"> • Potential to impact noise sensitive areas (i.e., residential dwellings, daycares, etc.) during construction; • Potential to affect local air quality during construction; and • Potential to affect local air quality during operational phase.
	Property Requirements <ul style="list-style-type: none"> • Requires acquisition of private property.
	Aesthetics <ul style="list-style-type: none"> • Potential to impact visual aesthetics of study area.
	Land Use <ul style="list-style-type: none"> • Potential to impact existing and future designated land use and/or community use.



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Category	Criteria
	<p>Consistency with Municipal Planning Objectives and Existing/Proposed Development</p> <ul style="list-style-type: none"> • Satisfies the goals and objectives of the Town’s Official Plan. • Consistency with municipal/regional policies. • Potential to support existing and future development within the area.
	<p>Health & Safety</p> <ul style="list-style-type: none"> • Potential to impact health and safety of residents • Potential to impact health and safety of employees • Potential impacts to groundwater quality (i.e., wells, effect Source Water Protection area, etc.) • Potential to encounter contaminated subsurface conditions.
	<p>Community Access</p> <ul style="list-style-type: none"> • Disruption to existing traffic, private property and business access during construction • Disruption to existing traffic, private property and business access during operation
Technical Environment	<p>Functionality/Reliability of Water Treatment</p> <ul style="list-style-type: none"> • Quality of source water at intake • Treated potable water quality • Reliability of the treatment process
	<p>Monitoring Requirements & Efficiencies</p> <ul style="list-style-type: none"> • Impacts to operational monitoring requirements and efficiency.
	<p>Cost</p> <ul style="list-style-type: none"> • Relative capital, operational and maintenance costs (\$).
	<p>Utilities</p> <ul style="list-style-type: none"> • Potential to impact existing utilities.
	<p>Constructability & Feasibility</p> <ul style="list-style-type: none"> • Potential to disrupt existing traffic, property access or functionality of existing facilities during construction; and • Location, depth of excavation, soil conditions, rock removal, groundwater control, in-water works, workable construction area, construction duration.



Category	Criteria
	Expandability <ul style="list-style-type: none"> • Potential to be expanded or flexible to meet future population needs.
	Climate Change <ul style="list-style-type: none"> • Ability to increase resilience to climate change (i.e., severe weather events) within the study area; and • Impacts to known climate change contributors (i.e., GHG emissions).

4.5 Evaluation of Alternative Design Concepts

A qualitative evaluation of the alternative design concepts considered is shown in **Table 4.6**. Based on this comparative evaluation, the two alternative design concepts were ranked from least preferred, (represented by a black circle) to preferred (represented by a white circle) in consideration of the criteria and measures presented above. The elements considered for the evaluation are discussed in the sections following the Table.

Table 4.6: Evaluation Summary of Alternative designs for WTP

	Alternative 1 New Circular Steel Tank Filters	Alternative 2 New Concrete Tank Filters
Natural Environment	○	○
Cultural Environment	○	○
Socio-Economic Environment	○	○
Technical Considerations	●	○
Conclusion	Moderately Preferred	Preferred

Least Preferred ● → ○ → ○ Preferred



4.5.1 Natural Environment

As the expansion footprint of both alternative concepts are relatively similar, from a natural environment perspective, there are no significant differences between net effects.

4.5.2 Cultural Environment

As the expansion footprint of both alternative concepts impact the cultural environment in a similar way, there are no significant differences between net effects.

4.5.3 Socio-Economic Environment

Alternative 1 is preferred as it has a shorter construction timeframe, creating less temporary noise and land use impacts on the adjacent high school parking spaces during construction, when compared to Alternative Design 2.

4.5.4 Technical Considerations

Alternative2 provides higher improvement in monitoring efficiency and reliability of water treatment process with the addition of concrete filters with backwash pumping to control backwash flows and through the optimization of disinfection and filtration processes. Alternative 2 additionally offers a higher improvement to the WTP's resiliency to climate change compared to Alternative 1 through the implementation of more robust and efficient treatment processes, increased chemical storage and generator capacity, and flood-resistant facility design.

4.6 Preferred Alternative Design Concept

The preferred WTP filtration process alternative design concept based on the detailed evaluation is **Alternative 2: New Concrete Tanks Filters** due to the following key advantages:

- Lower O&M requirements and costs
- Increased longevity of concrete vs. steel tank will reduce future infrastructure replacement requirements
- Ability to customize new concrete filters' size to match future plant capacity needs
- Improved operator flexibility and control for process optimization

It is recommended that the Town inspect the existing infrastructure that is proposed to be reused, including the water intake and existing Actiflo clarifiers to confirm their condition is adequate for future use.



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It should be noted that the preliminary preferred alternative was presented in an online Public Information Centre to solicit comment and input from stakeholders, including review agencies, the public, and those who previously expressed interest in the Master Plan. Input from review agencies and the public was necessary and important at this stage to assist the Town by providing additional information, in reviewing the evaluation and in arriving at the preferred decision. Input from stakeholders is documented in Section 6 of this Environmental Study Report.

The following section provides further details on the proposed construction of the preferred alternative design.

4.7 Implementation and Phasing

Since the proposed expansion of the Carleton Place WTP features mostly single unit additions, or construction of new buildings to accommodate the full upgraded capacity, phasing of the main expansion project to meet the 20-year demand is not necessarily practical. Completion of all required upgrades as part of one construction project is more cost-effective and will minimize the total duration of impacts to the public and surrounding environment, including traffic, dust, noise, erosion / sediment, reduction in adjacent parking spaces and disruptions to current treatment facility operations. Constructing the expansion in one phase will also allow for the existing space to be optimized, rather than needing to reserve space for connections between different phases of the expansion. Some consideration was given to keeping the existing steel tank filters operational until the reach end of service life, allowing for a smaller concrete filter tanks construction in the short-term. However, through discussions with the operators, it was deemed that operating the existing steel tanks and new concrete tanks in tandem would be very challenging and inefficient.

5 Effects Assessment, Mitigation and Monitoring

Phase 3 of the MCEA process involves identifying the impact of the preferred design concept on the environment as well as corresponding mitigation measures and monitoring activities. The construction and operation of the WTP expansion has potential impacts on the natural, social, economic and cultural environment which are described in the following sections. Potential impacts were determined based on the environmental inventory described in Section 3 and the evaluation criteria discussed in Section 4.4.

In general, the operation of the preferred design will have limited effect on the environment. Environmental effects due to construction activities will be limited and temporary.



5.1 Natural Environment

5.1.1 Aquatic Environment

Potential effects to the aquatic environment from the WTP expansion project include runoff and sedimentation to the Mississippi River and fish habitat from excavation and construction activities. Runoff and sedimentation can impact water quality and quantity as well as local fish species by changing aspects of their local environment such as the water velocity, water temperature, food supply, and nutrient concentration. A Fish and Fish Habitat Assessment will be completed during the Detailed Design Phase.

As the Town's WTP draws water from the Mississippi River, a water availability assessment was completed to assess the impact of projected increased water taking needed to accommodate future growth on the river's water levels. Findings of the water availability assessment study concluded that it is unlikely there will be issues with insufficient water supply or exposed water intake following expansion of the WTP to meet the 20-year capacity requirements (20,700 m³/d). The Water Availability Assessment is presented in **Appendix A**.

Impacts to the aquatic environment shall be mitigated through design and construction management measures including:

- Construction activities will maintain the buffers established during the design phase to reduce potential negative impacts to the Mississippi River.
- As construction works are required within 30 m of the watercourse, a Fish and Fish Habitat Impact Assessment shall provide appropriate mitigation measures, in accordance with legislation and through consultation with the relevant authorities including Fisheries and Oceans Canada (DFO). All requirements of the *Fisheries Act* will be met.
- Consideration will be given to mitigating short and long-term water quality impacts to the Mississippi River. Impacts will be mitigated through, for example, the implementation of an Erosion and Sediment Control Plan and a Spill Response Plan.
- Additional water storage will provide some buffer during short term low flow conditions.
- The Town's outdoor water use restrictions will be used to limit demand on the system.



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Furthermore, corresponding monitoring activities include:

- On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
- Water level measurements in the new low lift pumping station indicate water availability with direct correlation to river levels. This data is tracked and trended.
- MVCA river level monitoring station provide additional data and trends.

5.1.2 Terrestrial Environment

5.1.2.1 Wildlife and SAR

Potential effects to the terrestrial environment from the WTP expansion project include the disturbance, displacement, or mortality of SAR species including Blanding's turtle and Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-colored Bat (SAR bats) as planted trees are anticipated to be removed surrounding the existing WTP during construction. There is also potential for the loss of migratory bird nests, eggs and/or nestlings if tree cutting or other vegetation impacts due to excavation and construction of the WTP expansion occurs during the general nesting period (i.e., between April 1 and August 31).

Impacts to wildlife and SAR shall be mitigated through design and construction management measures including:

- If wildlife is encountered, measures will be implemented to avoid death, injury, or interference with the species, and its habitat. For example, construction activities will cease, or be reduced, and wildlife will be encouraged to move off-site and away from the construction area on its own. A qualified biologist will be contacted to advise on the appropriate actions for the situation.
- Prior to construction, investigation of the project Footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken by a qualified biologist, as appropriate.
- All works must comply with the *Migratory Birds Convention Act*, 1994, including timing windows for the nesting period (April 1 to August 31).
- Construction will occur outside of the nesting period where feasible. However, if construction must occur during the general nesting period, then a breeding bird and nest survey will be undertaken prior to required activities. Nest searches are



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required and will be completed by a qualified wildlife biologist or ornithologist no more than 48 hours prior to vegetation removal.

- If a nest of a migratory bird is found outside of this nesting period (including a ground nest), it still receives protection.
- Conduct a daily pre-construction search of the work area to identify presence of SAR.
- If threatened or endangered species are seen in or near the work area, stop work immediately.
- All requirements of the *Endangered Species Act (ESA)*, 2007 will be met.
- Erect exclusion fencing (e.g., silt fence) prior to activities occurring in areas of suitable habitat (e.g. Mississippi River) to reduce the risk of turtles entering the work area.
- Install exclusion fencing prior to the sensitive nesting season if activities are anticipated to occur throughout this period to prevent turtles from entering and/or nesting:
 - Prior to 15 March if activities are occurring within or adjacent to overwintering habitat.
 - Prior to 1 June if activities are occurring within or adjacent to nesting habitat.
- If erecting exclusion fencing, the contractor shall use a type that will last the duration of the project. Check that stakes are securely driven into the ground on the inside of the working area. Place stakes 2 metres apart and drive them to a depth of 30 cm, with the fabric pulled tight to reduce sagging, and the bottom of the fabric buried 10-20 cm down within an additional fabric lip extending outwards 90 degrees:
 - Backfill and compact the fabric lip
 - Inspect any fenced off areas daily to identify compromises in the fence and to remove any turtles that may be trapped in the fence
 - Install fencing so that it prevents construction sediment from entering into wetlands.
- Have a qualified person conduct a pre-construction sweep and monitor the work area for active turtle nests during the turtle nesting season (May-July).



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- Implement a worker awareness program for construction staff that includes species at risk identification and habitat characteristics.
- Take photographs, if possible, but do not interact with the animal.
- If turtles have established nests in construction areas, stop work immediately and notify the MECP, depending on the species encountered, of the occurrence and ask for further direction. The nests are to be protected from disturbance until the nestlings have hatched and dispersed, approximately in late September, and permit from the MECP, depending on the species encountered, will most likely be required.
- Disturbance to bat roosting habitat/tree removal of trees ≥ 10 cm DBH will be avoided during the bat roosting period of April 1 to November 1. If SAR bat habitat is impacted, an Information Gathering Form (IGF) and an Avoidance Alternatives Form (AAF) will be required to be submitted to MECP during the Detailed Design phase to confirm impact and compensation requirements.
- Mitigation measures to reduce adverse impacts of Project activities on SAR bats will comply with the ESA, 2007.

Furthermore, corresponding monitoring activities include:

- Regular monitoring will be undertaken during construction to confirm that activities do not encroach into nesting areas or disturb active nesting sites.
- On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required.
- Monitoring activities to reduce adverse impacts of Project activities on Blanding's Turtle will comply with the ESA, 2007
- Monitoring activities to reduce adverse impacts of Project activities on SAR Bats will comply with the ESA, 2007.

No impacts to wildlife or SAR are expected during the WTP's operation.



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5.1.2.2 Vegetation

Cutting, digging, or trimming ground covers, shrubs and trees during the project's construction may have the potential to impact trees and vegetation. Impacts to trees and vegetation shall be mitigated through design and construction management measures including:

- Vegetation removal will be reduced to the extent possible and limited to the construction footprint.
- Where adjacent trees and naturalized areas are to be retained, the following management practices should be followed when construction activities occur near trees:
 - Erect a fence at the minimum critical root zone (CRZ) of trees (i.e., 25m radius from stem)
 - Do not place any material or equipment in the CRZ of the tree
 - Do not raise or lower the existing grade in the CRZ
 - Tunnel or bore when digging in the CRZ of any tree
 - Do not damage the root system, trunk, or branches of any tree
 - Ensure that exhaust fumes from all equipment are not directed towards any tree's canopy.
- Vegetation removals will also consider and mitigate potential impacts to sensitive species (e.g., migratory birds and SAR) and features (e.g., significant wildlife habitat).

Furthermore, corresponding monitoring activities include:

- On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required.
- Monitoring activities to reduce adverse impacts of Project activities on trees and vegetation will comply with the *ESA, 2007*.
- New trees will be planted post-construction to replace trees removed at a 1:1 ratio.

No impacts to vegetation and trees are expected during the WTP's operation.



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5.1.2.3 Soils and Groundwater

Despite no known source of groundwater and soil contamination on or adjacent to the WTP property, excavation and construction for WTP expansion at the WTP site may have the potential to encounter contaminated materials and/or result in the spreading of contaminated materials. Also, there is the potential to encounter contaminated groundwater or exposing groundwater to contamination. Groundwater testing will be completed as part of Detail Design of the expansion project.

Impacts to soils and groundwater resources shall be mitigated through design and construction management measures including:

- Develop a Soil and Excavated Materials Management Plan (SEMMP) for the handling, management, and disposal of all excavated material (i.e., soil, rock and waste) that is generated or encountered during construction. The plan will be overseen by a Qualified Person pursuant to O.Reg. 153/04 under the EPA and will comply with O.Reg. 406/19 (On-Site and Excess Soil Management), the MECP, formerly the Ministry of the Environment and Climate Change (MOECC)'s *Management of Excess Soils: A Guide for Best Management Practices*, and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, and contaminated materials, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the construction and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable.
- Non-soil materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per O.Reg. 347 (as amended) and All Applicable Law.
- The SEMMP will be reviewed and approved by the Town prior to construction.
- Develop a **Groundwater Management and Dewatering Plan** (GMDP) to guide the handling, management, and disposal of groundwater encountered during construction in compliance with O.Reg. 406/19 (On-Site and Excess Soil Management), 64/16 and 387/04, as amended under the *Ontario Water Resources Act*.
- The GMDP will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the construction and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. The GMDP will outline general groundwater monitoring considerations during construction and provide guidance for groundwater monitoring following construction where considered applicable.



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- The GMDP will describe the anticipated groundwater quantity and dewatering Zone of Influence (ZOI) that will be encountered during construction, and if approvals are needed for the water taking, such as a Permit to Take Water (PTTW) from the MECP, or an Environmental Activity and Sector Registry (EASR).
- The GMDP will describe the storage, transfer, and disposal and or treatment of the groundwater collected during construction, and approvals for the water disposal, and or treatment if applicable based on the quantity and quality.
- The GMDP will be reviewed and approved by the Town prior to construction.
- Potential impacts to groundwater-dependent natural features and/or private groundwater supply wells (if present) can be mitigated with measures such as avoidance of dewatering requirements, minimizing dewatering, and/or utilizing groundwater cut-off techniques to physically exclude groundwater from flowing into excavations advanced for construction.

Monitoring and reporting will be conducted in accordance with applicable O.Reg. requirements.

No impacts to soils and groundwater are expected during the WTP's operation.

Overall, the impact of the WTP's construction on the terrestrial environment is anticipated to be limited as development is within previously disturbed areas.

5.2 Social & Economic Environment

5.2.1 Noise and Vibration

The Project has the potential to result in temporary noise and vibration effects during construction activities (e.g., operation of heavy machinery and construction vehicles, etc.). The excavation and construction of the WTP expansion will require grade preparation activities including vegetation removal, earth moving, excavation, and backfilling which uses heavy construction equipment. Heavy equipment use related to construction activities may have noise and vibration impacts on nearby recreational and institutional areas including the Carleton Place High School, and the Riverside Trail and park.

Potential noise and vibration effects will be mitigated through design and construction management measures including:

- Noise emissions of the construction equipment should be reviewed during detailed design to confirm that they are within the NPC-115 and NPC-118 limits. If they are expected to exceed the limits, quieter equipment should be considered



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for the project. Alternatively, noise control options, such as silencers/mufflers should be investigated and implemented for specific equipment.

- Construction related noise emissions shall adhere to the Town's Noise By-Law No. 29-2017. The by-law currently states that no person shall cause or permit noise arising from construction between the hours of 10pm to 6am the following day, except in the case of urgent necessity or emergency.
- The potential vibration effects from construction equipment can be controlled by increasing the setback distance. Therefore, construction operational changes (e.g., maintaining setback distance and switching to lesser impactful equipment, etc.) are recommended. Select construction/ maintenance methods and equipment with the least vibration impacts.
- In the presence of persistent complaints and subject to the results of an investigation, identify reasonable alternative vibration control measures, where possible.

Corresponding monitoring activities include establishing a **Complaints Protocol** to respond to issues that develop during construction.

No increases in noise and vibration are expected during the WTP's operation.

5.2.2 Air Quality

Operation of the expanded WTP is not expected to impact air quality, however the Project has the potential to temporarily impact local air quality due to construction-related air pollution as a result of increased fugitive dust emissions, construction equipment tailpipe emissions, vehicle emissions and associated dust.

Potential effects to air quality shall be mitigated through design and construction management measures including:

- All construction equipment to be maintained and in good working order in accordance with operational manual.
- Employ dust control measures.

Furthermore, corresponding monitoring activities include establishing a **Complaints Protocol** to respond to issues that develop during construction.

5.2.3 Aesthetics and Light Pollution

The expanded WTP is expected to impact visual aesthetics of the heritage attributes of the existing WTP structure as it will block two of three sides of the existing WTP heritage building. There is also potential for visual aesthetic impacts through reduction



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of park land and construction of new WTP structures which will change the existing views/landscape of the area. Moreover, construction activities may have the potential for light trespass, glare, and light pollution effects in nearby commercial and residential areas.

Potential effects to aesthetics and light pollution shall be mitigated through design and construction management measures including:

- Development and staging areas will be limited to the land surrounding the existing facility, currently owned by the Town.
- Design guidelines for the expansion will include a holistic approach to heritage conservation as achieved through the implementation of compatible massing, setbacks, setting of the expansion, and materials.
- The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.

Corresponding monitoring activities include establishing a **Complaints Protocol** to respond to issues that develop during construction.

5.2.4 Land Use and Community Access

No permanent impacts to private property or existing or designated land use are expected, as the footprint of the WTP expansion will remain within Town owned property. During construction, it is anticipated that several parking spots in the Carleton Place High School parking lot will be temporarily lost for the construction of the new Clearwell compartments and additional Clearwell volume for filter backwash reserve, both of which will be constructed below grade. Temporary impacts to community access and disruption of traffic to the Riverside Trail, Carleton Place High School and the Canoe Club are also expected during construction and will be consulted with during detail design.

If modifications to the WTP water intake are required to accommodate increased extraction rate, water levels of the Mississippi river may be impacted, however the Water Availability Assessment (**Appendix A**) concluded low potential to impact water quantity during low flow conditions.

Potential effects to land use and community access shall be mitigated through design and construction management measures including:

- Minimize the number of parking spaces impacted to the greatest extent possible and reassess throughout construction.



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- Review water taking impacts in compliance with *Canadian Navigable Waters Act* (CNWA) (i.e., no impact to vessel size using river).
- Stakeholders will receive construction notification and schedule and traffic / safety information; the Town will work with local stakeholders (i.e., Carleton Place High School, Carleton Place Canoe Club) to locate appropriate laydown and parking areas.
- Developing a **Traffic Management Plan** prior to construction to maintain reasonable access through work zones, to the extent possible.
- Access to nearby land uses will be maintained for vehicular, pedestrian and cyclist traffic, to the extent feasible. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to these schedules as they occur.
- Construction schedules will be shared with the public in advance of any construction works to reduce traffic during peak hours.
- Potential effects to pedestrian and cyclist activities during construction will be mitigated through the installation of appropriate wayfinding, regulatory, and warning signs.
- Existing sidewalks and crossings will be maintained to the extent possible.
- Temporary pedestrian facilities will comply with accessibility and applicable municipal standards.

Furthermore, corresponding monitoring activities include:

- Pedestrian, cyclist, and vehicular traffic impacts are to be monitored in accordance with a Traffic Management Plan and adjusted as necessary during the construction period.
- Trail access to be monitored in accordance with the Traffic Management Plan and adjusted as necessary during the construction period.
- No impacts to land use and community access are expected during the WTP's operation.

5.2.5 Utilities

Excavation and construction for wastewater treatment facilities at the WTP site may have the potential to impact existing utilities. Potential effects to utilities shall be mitigated through design and construction management measures including:

- Obtain permits and consents from and with all utility companies with respect to the design, construction, installation, servicing, operation, repair, preservation, relocation, and/or commissioning of utility infrastructure.



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Furthermore, corresponding monitoring activities include:

- Maintain regular communication with applicable utility companies.
- In the event of potential effects to critical utilities, instrumentation and monitoring shall be carried out to protect the critical utilities and structures and reduce risks of damage due to construction activities.

Also, an upgraded hydro connection may be required due to the increased energy requirements to operate a larger facility. To mitigate potential impacts to utilities, plans for addressing utility conflicts are required.

No impacts to utilities are expected during the WTP's operation.

5.2.6 Health and Safety

There is low potential to impact the health and safety of Town residents due to construction nuisance such as noise and vibration, reduced air quality and traffic safety. Mitigation and monitoring measures described in Sections 5.2.1, 5.2.2 and 5.2.4 will be implemented to address such impacts.

While there is low potential for the expansion of the WTP to impact groundwater quality (including private wells) and to encounter contaminated subsurface conditions, mitigation measures and monitoring activities are described in Section 5.1.2.3 to minimize risk, including the development of a **Soil and Excavated Materials Management Plan**.

The Project is anticipated to improve the health and safety of employees through improvements in chemical storage and transfer processes. The current and proposed water treatment process are proven to be effective at controlling toxins from cyanobacteria and other algae microorganisms, continued monitoring efforts are recommended. The WTP operators already have a standard operating procedure in place for monitoring, sampling, and reporting potentially harmful algal blooms. This includes visual observations, routine seasonal sampling and testing and adjustments to treatment operations.

As the WTP intake is located upstream of the Carleton Place Dam, water availability could be impacted in the event of a dam failure. Mitigation measures to protect health and safety in the event of a dam failure at the Carleton Place Dam include:

- The Town will review its Emergency Response Plan for "Loss of Supply" at the WTP.



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Furthermore, corresponding monitoring activities include:

- Water level measurements in the new low lift pumping station indicate water availability with direct correlation to river levels. This data is tracked and trended.
- MVCA river level monitoring station provide additional data and trends.

5.3 Cultural Environment

5.3.1 Built Heritage Resources/ Cultural Landscape

The construction of new buildings to accommodate the fill upgraded capacity of the WTP will alter the cultural heritage landscape of the existing WTP. Impacts to the cultural heritage value of the existing WTP shall be mitigated through the following design and construction management measures:

- Development and staging areas will be limited to the land surrounding the existing facility, currently owned by the Town.
- Design guidelines for the expansion will include a holistic approach to heritage conservation as achieved through the implementation of compatible massing, setbacks, setting of the expansion, and materials.
- Materials used on the exterior of the building will be compatible with, but subordinate to, the existing building. The design of the expansion may echo the design of the original building with architectural detailing that speaks to a contemporary adaptation of the historic style.
- The height and density of the expansion will be designed in such a way that the original 1914 building can still be viewed in its three-dimensional form.
- Proposed expansion shall consider reversibility in its design.
- Proposed expansion shall minimize the number of penetrations into the masonry walls or the removal of wall sections.
- The condition of the existing building will be confirmed prior to any site work.
- Description of the heritage value shall be included in plans and specifications for the project and on all documents provided to contractors and subcontractors.

No monitoring activities are recommended for the built heritage resources and cultural landscape of the WTP.

5.3.2 Archeological Resources

Based on the findings of Stage 1 Archeological Assessment (Section 3.2.2), the Study Area was determined to be composed of previously disturbed area and the WTP expansion was determined to have low potential to impact undisturbed lands. However,



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in the event that unassessed or documented archaeological materials are encountered during construction, the following mitigation measures shall be implemented:

- It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the *Ontario Heritage Act*.
- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act*.
- *The Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33* (Government of Ontario 2002) requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services.

Furthermore, corresponding monitoring activities include:

- Performance of the work will occur in land previously subject to an Archaeological Assessment.
- Any site personnel responsible for carrying out or overseeing land-disturbing activities will be informed of their responsibilities in the event that an archaeological resource is encountered.

No impacts to archaeological resources are expected during the WTP's operation.

5.4 Climate Change and Technical Factors

5.4.1 Climate Change

The WTP expansion provides opportunities to improve resiliency to climate change through the implementation of more robust and efficient treatment processes, increased chemical storage and generator capacity, and a flood-resistant facility design. As such the expansion of the WTP will increase the resilience of the municipal infrastructure to extreme weather events that are projected to occur more frequently.



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While the expansion of the WTP will improve resiliency to climate change, the construction materials (i.e., concrete tank filters) and energy necessary for the expansion have potential to increase known climate change contributors (i.e., GHG emissions).

Impacts to climate change contributors shall be mitigated through design and operations management measures:

- Upgrading pumps and other processes to increase their efficiency (or selecting new high-efficiency pumps and motors)
 - Optimizing pump operation and other processes to reduce energy consumption and process water usage
 - Upgrading backup generator with energy efficient model
 - Using renewable energy sources
- Using concrete filter tanks to provide better control and optimization of filter backwash processes than the current steel tank filters. This requires less energy use and results in less wasted water during the backwash process.
- Implement adaptation measures to low water levels due to drought
 - Design low-lift pumps and basin considering potential low water levels.
 - Ensure that existing raw water intake (or any new proposed raw water intake) is at the deepest point, minimizing the risk of frazil ice formation.
- Implementing additional water storage will provide some buffer during short term low flow conditions.
- Using the Town's outdoor water use restrictions to limit demand on the system.

Furthermore, corresponding monitoring activities include:

- Water level measurements in the new low lift pumping station indicate water availability with direct correlation to river levels. This data is tracked and trended.
- MVCA river level monitoring station provide additional data and trends.

5.4.2 Technical Factors

The WTP expansion is expected to improve the functionality and reliability of the WTP through optimization of some operation processes (i.e. disinfection and filtration) as well as improve the efficiency of treatment with the addition of concrete filters with backwash pumping to control backwash flows. No mitigation measures and monitoring activities are required.



5.5 Summary of Potential Effects, Mitigating Measures and Monitoring Activities

Table 5.1 summarizes the effects, mitigation measures and proposed monitoring for the various components of the environment described in the previous sections of the ESR. The Town is responsible for confirming that the recommendations are met but may direct a third party to undertake future activities (i.e., contractor, technical consultant). The intent of this table is to provide a summary of those commitments and responsibility of third parties where the Town determines applicability. These are recommendations that will be confirmed as Project planning advances.



Table 5.1: Summary of Potential Effects, Mitigation Measures, and Monitoring Activities

Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measures	Monitoring Activities
Natural Environment	Aquatic Environment	Excavation and construction for water treatment expansion at the WTP site	Potential to impact fish and fish habitat.	<ul style="list-style-type: none"> All requirements of the Fisheries Act will be met. Construction activities will maintain the buffers established during the design phase to reduce potential negative impacts to the Mississippi River As near water construction works are required, a Fish and Fish Habitat Impact Assessment shall provide appropriate mitigation measures, in accordance with legislation and through consultation with the relevant authorities including Fisheries and Oceans Canada (DFO). 	<ul style="list-style-type: none"> On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include, additional site maintenance and alteration of activities to reduce impacts. Monitoring of process effluent discharges will be undertaken according to the Ontario <i>Environmental Protection Act</i>.
			Potential to impact water quality and quantity due to site's proximity to the Mississippi River and potential runoff during construction.	<ul style="list-style-type: none"> Construction activities will maintain the buffers established during the design phase to reduce potential negative impacts to the Mississippi River. Consideration will be given to mitigating short and long-term water quality impacts to the Mississippi River. Impacts will be mitigated through, for example, the implementation of an Erosion and Sediment Control Plan and a Spill Response Plan. 	<ul style="list-style-type: none"> On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include, additional site maintenance and alteration of activities to reduce impacts.
		Operation of expanded WTP	Potential to impact water quantity during low flow	<ul style="list-style-type: none"> Additional water storage will provide some buffer during short term low flow conditions. 	<ul style="list-style-type: none"> Water level measurements in the new low lift pumping station indicate water



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measures	Monitoring Activities
			conditions (resulting from increased extraction rate)	<ul style="list-style-type: none"> The Town's outdoor water use restrictions will be used to limit demand on the system. 	availability with direct correlation to river levels. This data is tracked and trended. <ul style="list-style-type: none"> MVCA river level monitoring station provide additional data and trends.
	Terrestrial Environment (Wildlife)	Excavation and construction for water treatment expansion at the WTP site	Potential for disturbance, displacement, or mortality of wildlife	<ul style="list-style-type: none"> If wildlife is encountered, measures will be implemented to avoid death, injury, or interference with the species, and its habitat. For example, construction activities will cease, or be reduced, and wildlife will be encouraged to move off-site and away from the construction area on its own. A qualified biologist will be contacted to advise on the appropriate actions for the situation Prior to construction, investigation of the Project footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken by a qualified biologist, as appropriate. 	<ul style="list-style-type: none"> On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include, additional site maintenance and alteration of activities to reduce impacts.
Potential to impact wildlife/habitat, including bird nesting			<ul style="list-style-type: none"> All works must comply with the <i>Migratory Birds Convention Act, 1994</i> (MBCA), including timing windows for the nesting period (April 1 to August 31). Construction will occur outside of the nesting period where feasible. If construction must occur during the general nesting period, then a breeding bird and nest survey will be undertaken prior to required activities. Nest searches are required and will be completed by a qualified wildlife biologist or ornithologist no more than 48 hours prior to vegetation removal. 	<ul style="list-style-type: none"> Regular monitoring will be undertaken by a qualified biologist to confirm that activities do not encroach into nesting areas or disturb active nesting sites. 	



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measures	Monitoring Activities
	Terrestrial Environment (SAR-Blanding's Turtle)	Excavation and construction for water treatment expansion at the WTP site	Potential loss of overwintering habitat and migration corridor, disturbance and/or mortality to Blanding's Turtles	<ul style="list-style-type: none"> • If a nest of a migratory bird is found outside of this nesting period (including a ground nest), it still receives protection. • All requirements of the ESA, 2007 will be met. • Erect exclusion fencing (e.g., silt fence) prior to activities occurring in areas of suitable habitat (e.g.) Mississippi River) to minimize the risk of turtles entering the work area • Install exclusion fencing prior to the sensitive nesting season if activities are anticipated to occur throughout this period to prevent turtles from entering and/or nesting: <ul style="list-style-type: none"> – Prior to 15 March if activities are occurring within or adjacent to overwintering habitat. – Prior to 1 June if activities are occurring within or adjacent to nesting habitat. • If erecting exclusion fencing, use a type that will last the duration of the project. Check that stakes are securely driven into the ground on the inside of the working area. Place stakes 2 m apart and drive them to a depth of 30 cm, with the fabric pulled tight to reduce sagging, and the bottom of the fabric buried 10-20 cm down within an additional fabric lip extending outwards 90 degrees. • Backfill and compact the fabric lip. • Inspect any fenced off areas daily to identify compromises in the fence and to remove any turtles that may be trapped in the fence. 	<ul style="list-style-type: none"> • On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include, additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on Blanding's Turtle will comply with the ESA, 2007.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measures	Monitoring Activities
				<ul style="list-style-type: none"> • Install fencing so that it prevents construction sediment from entering into wetlands. • A qualified person shall conduct a pre-construction sweep and monitor the work area for active turtle nests during the turtle nesting season (May-July). • Implement a worker awareness program for construction staff that includes SAR identification and habitat characteristics. • Conduct a daily pre-construction search of the work area to identify presence of SAR. • If threatened or endangered species are seen in or near the work area, stop work immediately. • Take photographs, if possible, but do not interact with the animal . • If turtles have established nests within construction areas, stop work immediately and notify the MECP or NDMNRF, depending on the species encountered, of the occurrence and ask for further direction. The nests are to be protected from disturbance until the nestlings have hatched and dispersed, approximately in late September, and permit from the MECP or NDMNRF, depending on the species encountered, will most likely be required. 	
	Terrestrial Environment (SAR-Bats)	Tree removal, excavation, and construction for water treatment expansion at the WTP site.	Potential for impacts to SAR bats (Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-colored	<ul style="list-style-type: none"> • All requirements of the ESA, 2007 will be met. • Prepare and submit IGF and AAF to MECP during Detailed Design phase to determine compensation requirements for impacts to bat SAR habitat due to tree removal. 	<ul style="list-style-type: none"> • On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include,



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measures	Monitoring Activities
			Bat) and/or SAR bat habitat	<ul style="list-style-type: none"> • Disturbance to bat roosting habitat/tree removal will be avoided during the bat roosting period of April 1 to November 1. • Mitigation measures to reduce adverse impacts of Project activities on SAR bats will comply with the ESA, 2007. 	<p>additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required.</p> <ul style="list-style-type: none"> • Monitoring activities to reduce adverse impacts of Project activities on SAR bats will comply with the ESA, 2007.
	Terrestrial Environment (Trees/ Vegetation)	Tree and vegetation removal, excavation and construction for water treatment expansion at the WTP site.	Potential to impact trees and vegetation adjacent to construction	<ul style="list-style-type: none"> • Vegetation removal will be reduced to the extent possible and limited to the construction footprint. • Where adjacent trees and naturalized areas are to be retained, the following management practices should be followed when construction activities occur near trees: <ul style="list-style-type: none"> - Erect a fence at the minimum critical root zone (CRZ) of trees. - Do not place any material or equipment within the CRZ of the tree. - Do not raise or lower the existing grade within the CRZ. - Tunnel or bore when digging within the CRZ of any tree. - Do not damage the root system, trunk, or branches of any tree. - Ensure that exhaust fumes from all equipment are not directed towards any tree's canopy. 	<ul style="list-style-type: none"> • On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on trees



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measures	Monitoring Activities
				<ul style="list-style-type: none"> Vegetation removals will also consider and mitigate potential impacts to sensitive species (e.g., migratory birds and SAR) and features (e.g., significant wildlife habitat). Tree removal will be avoided during the bat roosting period of April 1 to November 1. 	and vegetation will comply with the ESA, 2007. <ul style="list-style-type: none"> New trees will be planted post-construction to replace trees removed at a 1:1 ratio.
Soils and Groundwater	Soils	Excavation and construction for water treatment expansion at the WTP site.	Potential to encounter contaminated materials and/or result in the spreading of contaminated materials	<ul style="list-style-type: none"> Develop a Soil and Excavated Materials Management Plan (SEMMP) for the handling, management and disposal of all excavated material (i.e., soil, rock and waste) that is generated or encountered during the construction. The plan will be overseen by a Qualified Person pursuant to O. Reg. 153/04 under the Environmental Protection Act and will comply with O. Reg. 406/19 (On-Site and Excess Soil Management), the MECP, formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management Practices, and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, and contaminated materials, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. 	Monitoring and reporting will be conducted in accordance with applicable O.Reg. requirements.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measures	Monitoring Activities
				<ul style="list-style-type: none"> • Non-soil materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per O. Reg. 347 (as amended) and All Applicable Law. • The SEMMP will be reviewed and approved by the Town prior to construction. 	
	Groundwater resources	Excavation and construction for water treatment expansion at the WTP site.	Potential to expose groundwater associated contamination and impact groundwater quality including private wells	<ul style="list-style-type: none"> • Develop a Groundwater Management and Dewatering Plan (GMDP) to guide the handling, management, and disposal of groundwater encountered during construction. The GMDP will be overseen by a QP and will comply with O. Reg. 406/19 (On-Site and Excess Soil Management), 64/16 and 387/04, as amended under the Ontario Water Resources Act. • The GMDP will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the expansion and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. The GMDP will outline general groundwater monitoring considerations during the construction of the Project and provide guidance for groundwater monitoring following the Works where considered applicable. • The GMDP will describe the anticipated groundwater quantity and dewatering Zone of Influence (ZOI) that will be encountered during the Works, and if approvals are needed for the water taking, such as a Permit to Take Water (PTTW) from the MECP, or an Environmental Activity and Sector Registry (EASR). 	Monitoring and reporting will be conducted in accordance with applicable O.Reg requirements.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measures	Monitoring Activities
				<ul style="list-style-type: none"> • The GMDP will describe the storage, transfer, and disposal and or treatment of the groundwater collected during the Works, and approvals for the water disposal, and or treatment if applicable based on the quantity and quality. • The GMDP will be reviewed and approved by the Town prior to construction. • Potential impacts to groundwater-dependent natural features and/or private groundwater supply wells (if present) can be mitigated with measures such as avoidance of dewatering requirements, minimizing dewatering, and/or utilizing groundwater cut-off techniques to physically exclude groundwater from flowing into excavations advanced for construction. 	
Socio-Economic Environment	Noise	Use of construction equipment and vehicles	Potential for temporary noise impacts/disturbance of surrounding environment (including Carleton Place High School, Riverside Trail and Park) caused by construction vehicles and machinery.	<ul style="list-style-type: none"> • Noise emissions of the construction equipment should be reviewed during Detailed Design to confirm that they are within the NPC-115 and NPC-118 limits. If they are expected to exceed the limits, quieter equipment should be considered for the Project. Alternatively, noise control options, such as silencers/mufflers should be investigated and implemented for specific equipment. • Construction related noise emissions shall adhere to the Town's Noise By-Law No.29-2017. 	The contractor shall establish a Complaints Protocol to respond to issues that develop during construction.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measures	Monitoring Activities
	Vibration	Excavation and construction for water treatment expansion at the WTP site	Potential for vibration impacts that may result in public annoyance and complaints. Vibration may cause damage to buildings and other structures.	<ul style="list-style-type: none"> The potential vibration effects from construction equipment can be controlled by increasing the setback distance. Therefore, construction operational changes (e.g., maintaining setback distance and switching to lesser impactful equipment, etc.) are recommended. Select construction/ maintenance methods and equipment with the least vibration impacts. In the presence of persistent complaints and subject to the results of a field investigation, identify alternative vibration control measures, where reasonably available. 	The contractor shall establish a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.
	Air Quality	Use of construction equipment and vehicles Excavation and construction for water treatment expansion at the WTP site	Potential for temporary impacts to local air quality due to construction-related air pollution (such as dust emissions, vehicle exhaust)	<ul style="list-style-type: none"> All construction equipment to be maintained and in good working order in accordance with operational manual. Employ dust control measures. 	The contractor shall establish a Complaints Protocol to respond to issues that develop during construction.
	Aesthetics	Excavation and construction for water treatment expansion at the WTP site	Potential for visual aesthetic impacts through reduction of park land and construction of new WTP structures which will change the existing views/landscape of the area.	<ul style="list-style-type: none"> Development and staging areas will be limited to the land surrounding the existing facility, currently owned by the Town. Design guidelines for the expansion will include a holistic approach to heritage conservation as achieved through the implementation of compatible massing, setbacks, setting of the expansion, and materials. See mitigation measures for Built Cultural Heritage Resources. 	No monitoring required.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measures	Monitoring Activities
			Potential impacts to the visual aspect of the heritage attributes of the existing WTP structure.		
	Light Pollution	Excavation and construction for water treatment expansion at the WTP site	Potential for light trespass, glare, and light pollution effects	<ul style="list-style-type: none"> The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining community uses. 	The contractor shall establish a Complaints Protocol to respond to issues that develop during construction.
	Land Use / Recreation	Excavation and construction for water treatment expansion at the WTP site	Impact to existing land use / river and use of open space for recreation; temporary loss of many parking spaces (including at Carleton Place High School) during construction	<ul style="list-style-type: none"> Minimize the number of parking spaces impacted to the greatest extent possible and reassess throughout construction. Review water taking impacts in compliance with CNWA (i.e., no impact to vessel size using river). 	The contractor shall establish a Complaints Protocol to respond to issues that develop during construction.
	Community Access	Excavation and construction for water treatment expansion at the WTP site	High potential to increase existing traffic near adjacent high school and Canoe Club during construction	<ul style="list-style-type: none"> The Town will work with local stakeholders (i.e., Carleton Place High School, Carleton Place Canoe Club) to locate appropriate laydown and parking areas. A Traffic Management Plan will be developed prior to construction to maintain reasonable access through work zones, to the extent possible. Access to nearby land uses will be maintained for vehicular, pedestrian and cyclist traffic, to the extent 	<ul style="list-style-type: none"> Pedestrian, cyclist, and vehicular traffic impacts shall be monitored in accordance with a Traffic Management Plan and adjusted as necessary during the construction period.



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				feasible. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to these schedules as they occur. <ul style="list-style-type: none"> • Construction schedules will be shared with the public in advance of any construction works to reduce traffic during peak hours. • Installation of AODA compliant access for affected pedestrians and cyclists through wayfinding, warning signs and municipal requirements 	<ul style="list-style-type: none"> • Trail access shall be monitored in accordance with the Traffic Management Plan and adjusted as necessary during the construction period.
	Utilities	Excavation and construction for water treatment expansion at the WTP site	Potential impact to existing utilities	<ul style="list-style-type: none"> • Obtain permits and consents from and with all utility companies with respect to the design, construction, installation, servicing, operation, repair, preservation, relocation, and or commissioning of utility infrastructure. 	<ul style="list-style-type: none"> • Maintain regular communication and coordination through issuance of regular progress reports and updates to applicable utility agencies. • In the event of potential effects to critical utilities, instrumentation and monitoring shall be carried out to protect the critical utilities and structures and reduce risks of damage due to construction activities.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measures	Monitoring Activities
	Health and Safety	Operation of WTP	Potential for water availability issues to arise in the event of dam failure the Carlton Place Dam	<ul style="list-style-type: none"> The Town will review its Emergency Response Plan for “Loss of Supply” at the WTP. 	<ul style="list-style-type: none"> Water level measurements in the new low lift pumping station indicate water availability with direct correlation to river levels. This data is tracked and trended. MVCA river level monitoring station provide additional data and trends.
			Low potential to impact health and safety of residents	<ul style="list-style-type: none"> Current and proposed water treatment process are proven to be effective at controlling toxins from cyanobacteria and other algae microorganisms, continued monitoring efforts are recommended. 	<ul style="list-style-type: none"> The WTP operators already have a standard operating procedure in place for monitoring, sampling and reporting potentially harmful algal blooms. This includes visual observations, routine seasonal sampling and testing and adjustments to treatment operations.
Cultural Environment	Built Heritage Resources/ Cultural Landscape	Excavation and construction for water treatment expansion at the WTP site	Alteration of surrounding landscape, or part of BHR-1 (199 John Street) and alteration that is not sympathetic, or is incompatible, with the historic	<ul style="list-style-type: none"> Development and staging areas will be limited to the land surrounding the existing facility, currently owned by the Town. Design guidelines for the expansion will include a holistic approach to heritage conservation as achieved through the implementation of compatible massing, setbacks, setting of the expansion, and materials. 	<ul style="list-style-type: none"> No monitoring required



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measures	Monitoring Activities
			fabric and appearance	<ul style="list-style-type: none"> • materials used on the exterior of the building will be compatible with, but subordinate to, the existing building. The design of the expansion may echo the design of the original building with architectural detailing that speaks to a contemporary adaptation of the historic style. • The height and density of the expansion will be designed in such a way that the original 1914 building can still be viewed in its three-dimensional form. • Proposed expansion shall consider reversibility in its design. • Proposed expansion shall minimize the number of penetrations into the masonry walls or the removal of wall sections. • The condition of the existing building will be confirmed prior to any site work. • Description of the heritage value shall be included in plans and specifications for the project and on all documents provided to contractors and subcontractors. 	
	Archaeological Resources	Excavation and construction for water treatment expansion at the WTP site	Potential for the disturbance of unassessed or documented archaeological resources.	<ul style="list-style-type: none"> • Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the <i>Ontario Heritage Act</i>. The proponent or person discovering the archaeological resources shall cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the <i>Ontario Heritage Act</i>. 	<ul style="list-style-type: none"> • Performance of the work will occur within land previously subject to an Archaeological Assessment. • Any site personnel responsible for carrying out or overseeing land-disturbing activities will be informed of their



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measures	Monitoring Activities
				<ul style="list-style-type: none"> • The <i>Funeral, Burial and Cremation Services Act, 2002</i>, S.O. 2002, c.33 (Government of Ontario 2002) requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services. 	responsibilities in the event that an archaeological resource is encountered.
Technical Factors	Climate Change	Construction materials and operations of expanded WTP contributing to climate change	Potential to increase known climate change contributors through the construction of concrete tank filters and increased energy consumption, although there are opportunities to implement more energy efficient processes.	<ul style="list-style-type: none"> • Upgrade pumps and other processes to increase their efficiency); <ul style="list-style-type: none"> ○ Optimize pump operation and other processes to reduce energy consumption and process water usage; ○ Upgrade backup generator with energy efficient model. ○ Use renewable energy sources. • Apply adaptation measures to low water levels due to drought: <ul style="list-style-type: none"> - Design low-lift pumps and basin considering potential low water levels. - Ensure that existing raw water intake (or any new proposed raw water intake) is at the deepest point, minimizing the risk of frazil ice formation. • Additional water storage will provide some buffer during short term low flow conditions. • The Town’s outdoor water use restrictions will be used to limit demand on the system. 	<ul style="list-style-type: none"> • Water level measurements in the new low lift pumping station indicate water availability with direct correlation to river levels. This data is tracked and trended. • MVCA river level monitoring station provide additional data and trends



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measures	Monitoring Activities
	Functionality & Reliability	Operation of expanded WTP site	High improvement in functionality/reliability of treatment plant through optimization of some operation processes (disinfection and filtration).	<ul style="list-style-type: none"> No mitigation measures required 	No monitoring required



6 Consultation

The MCEA process provides a minimum of three points of contact for a Schedule C undertaking where members of the public and review agencies have the opportunity to review the project findings and submit comments for consideration in development of the project. The following sections summarize the approach that has been taken with respect to public participation during this project.

6.1 Public Consultation

6.1.1 Study Website

Study background information, notifications, updates, and links to online PIC presentation recordings were provided on the project webpage, as they became available. The consultation materials for Phases 3 and 4 published on the study webpages are provided in **Appendix F**. Through the project webpage, users were invited to contact study team members through their email account. The website for the WTP expansion is: <https://carletonplace.ca/wwtp-expansion-eas.php>.

6.1.2 Study Contact List

A comprehensive study contact list consisting of government agencies, Town staff, utilities, emergency service providers, Indigenous Nations, Indigenous Organizations, local organizations and special interest groups and members of the public who expressed interest in the study was developed at the onset of the study. This list was updated as the study progressed. The latest version of this contact list is provided in **Appendix F.1**.

6.1.3 Notice of Commencement and Online Public Information Centre (PIC)

The purpose of the Notice of Study Commencement and online PIC was to inform the public that the Town had initiated Phases 3 and 4 of the MCEA process to complete the planning and preliminary design of this Project. The notice briefly outlined the objective of the study, the study area location map, and contact information for project team representatives. Additionally, the Town announced the start of an Online Public Information Centre (PIC) available for public review and comment from December 5 to 19, 2022. The PIC informs the public about the purpose, format, and how to access the PIC materials, and provide the study team's contact information.



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The Notice of Study Commencement and Online PIC was communicated via the local newspaper, the Carleton Place Canadian Gazette on December 1 and December 8, 2022, and was also posted on the Town’s website. Additionally, a copy of the notice was mailed and emailed to the contact mailing list. A copy of this notice is provided in **Appendix F.3** of this document.

6.1.3.1 PIC

A PIC was held to share information and solicit feedback from the public, agencies, Indigenous Nations and other stakeholders on the study background, evaluation criteria, alternative and recommended design concepts for the WTP expansion Project, and next steps in the MCEA process. The PIC was held on an online platform on the study website using the Articulate Storyline platform. This platform included a pre-recorded presentation which shared the study materials on a set of slides, along with a transcript, which was available both audibly and visually next to each slide. This format allowed participants to read/listen to the presented information, as well as pause the presentation, or skip ahead to the section that interests them most.

The PIC was held on the study website from December 5, 2022, and made available to Councillors two days prior. All participants were encouraged to provide their feedback over the course of 2 weeks directly to the Project Team. Six (6) comments were received as a result of issuing the Notice of Study Commencement and PIC. The comments and responses are summarized in **Table 6.1** below.

Table 6.1: Summary of Notice of Study Commencement and PIC Comments and Responses

Topic	Question/Comment	Response
Upgrades Capacity	Question regarding whether the development of the UG-50 lands in included in the upgrade designs for the WTP and WWTP and whether capacity that has allotted for the UG-50 lands has been considered in proposed upgrades.	Confirmation that the UG-50 development lands were included in the 20-year (2041) total population projections used for the upgrade treatment plants’ design capacities. Provided detailed break down of how the UG-50 development lands’ 20-year (2041) population was estimated.



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Topic	Question/Comment	Response
Online Public Information Centre	Question regarding whether the request for participation sent by the municipality would be understood by the general public.	The material intended for the general public will be uploaded to the website later in the week. Additional questions about the project can be sent to the Director of Public Works.
	Comment on how the online presentation material was clear and appeared to be comprehensive. However, the judgement of the effectiveness and comparative advantages of the proposed technologies is challenging for the general public.	Comment regarding the online presentation material acknowledged.
	Question regarding the process to provide comments on the Online Public Information Centre	Comments can be sent by email to either Kevin Alemany or Guy Bourgon
Water Quantity	Question regarding the assumption that the Mississippi River will always be capable of providing water of a quality that the WTP will be able to process into potable water. Also, a comment on how water quality and quantity will be affected by climate change.	A comprehensive water availability study associated with the water taking for the WTP was prepared. The study concluded that there will be sufficient water quantity and quality both now and in the future for this expansion of the WTP. The study will form part of the Environmental Study Report (ESR) that will be posted for public review later.
	Question regarding the consideration of water and sewage usage metering as well as water conservation strategies within the EA process.	The Town promotes water conservation from May through September on our website and through social media and restricts lawn watering. Water metering has



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Topic	Question/Comment	Response
		<p>been considered in the past, but it has been shown that doing so will increase the cost of water and sewer services to residents.</p>
<p>Socio-Economic and Cultural Environment Impacts</p>	<p>Comment regarding the inclusion of a breakdown of how much the various treatment options would cost, and what those costs would mean for residents in the short and long term.</p>	<p>Cost estimates have been presented to the public in the Water and Wastewater Master Plan Report and during a public accessible meeting with Council in August 2022. Construction cost details will be available in the ESR early in the New Year.</p>
	<p>Question regarding what the adverse socio-economic impacts of Alternative 2 would be.</p>	<p>Alternative 2 is expected to involve a slightly higher impact to noise/vibration and air-quality due to slightly lengthier construction period, and a slightly larger impact to land use due to larger clearwells required. Timing associated with temporary reduction of parking spaces will also be slightly longer.</p>
	<p>Comment that it is important that the expanded WTP integrates as well into the surrounding park as the existing one does.</p>	<p>The expanded facility will be designed with aesthetics in mind to minimize visual impact, as much as possible. Tying in the new architecture with the existing facility, protecting existing trees and compensating with new ones will all be considered. New building heights will be lower than or equal to existing where possible.</p>



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Topic	Question/Comment	Response
Mature Tree Protection	Comment that care in protecting mature trees is needed and compensation should be considered for trees that will need to be removed for the expansion of below grade components of the WTP.	Tree protections and compensations will be an important part of the expanded facility during Detail Design, and will include a Landscape Plan where the public can provide input. The Environmental Study Report that will be released in the new year for public review outlines mitigation measures associated with tree protection and 1:1 compensation for any healthy trees removed.

6.1.4 Notice of Publication of Environmental Study Report

The Notice of Completion for the Environmental Study Report (ESR) was placed in the local newspaper (Carleton Place Canadian Gazette) on January 26th, 2023. The Notice was also available on the project website and distributed via mail and email to agencies, key stakeholders, Indigenous Nations and the public on the study mailing list. This notice briefly outlined the Preferred Design Concept and noted that the ESR will be posted to the project website for a 30-day public review period between January 26th, 2023 and February 28th, 2023. A copy of this notice is provided in **Appendix F.5** of this document.

6.2 Agency Consultation

The MCEA provides for the involvement in the project by the MECP's various branches as well as other provincial and federal ministries and outside agencies. The list of Review Agencies varies depending upon the scope of the project, its location and the potential environmental impacts.

All applicable agencies were provided with the Notices are listed in the Contact List which can be found in **Appendix F.1**.



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6 Consultation

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6.2.1 Consultation Meetings

Following the publication of the Notice of Study Commencement, pre-consultation meetings were held during the Master Plan process with the Mississippi Valley Conservation Authority (MVCA) and with the Ontario Ministry of the Environment, Conservation and Parks (MECP). The MVCA and MECP were also consulted throughout subsequent steps of the study. The following provides a summary of the discussion.

6.2.1.1 Meetings with the MVCA

Following the Notice of Study Commencement, the MVCA shared comments and questions on the consideration of climate change in the Town's MCEA process. A pre-consultation meeting was held with the MVCA on July 5th, 2021. The study team gave a brief presentation providing an overview of the Master Plan project, followed by a discussion of the MVCA's questions and comments regarding the uncertainty in historical streamflow data and potential drought conditions, and the impacts of increasing water taking from the plant. The MVCA provided some input regarding available streamflow data, which was later considered by Stantec in developing the Water Availability Assessment (**Appendix A**). The MVCA also shared data on the Carleton Place Dam (rating curve). The meeting with the MVCA also helped identify climate change considerations, which helped inform potential resilience measures in the evaluation, selection, and development of the preferred alternatives.

Comments from the MVCA on the Water Availability Assessment were received on May 5, 2022. The report was revised accordingly and supplemental comments from the MVCA were received on July 8, 2022. Stantec met with the MVCA on July 26, 2022 to discuss the comments and the report was then further revised to address them. All comments by the MVCA and responses by the project team are appended to the report. These included technical comments and questions mostly related to the impact of increase water-taking from the WTP on the Mississippi Lake levels and river flows.

It should be noted that part of the WTP site is within the MVCA regulation limit, and therefore may require permit for construction and demolition works, depending on the expansion layout proposed during detailed design. The MVCA will be consulted with throughout the design phase to confirm permitting requirements.

6.2.1.2 Meetings with MECP

The study team organized a pre-consultation meeting with the MECP on December 16th, 2021, to review regulatory requirements which might impact the study. The study team gave a presentation providing an overview of the Master Plan project, during which the MECP's questions and comments were discussed. Following this meeting, the study team prepared a Water Availability Assessment (i.e. water-taking study) for



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the increased intake from the Mississippi River, which was finalized in Phase 3 of this project. The Water Availability Assessment was distributed the MECP. The MECP acknowledged the report but no specific comments were received.

MECP was also provided with an advanced copy of the ESR in December 2022.

6.3 Indigenous Consultation

The following Indigenous communities and organizations are considered to be interested parties of the project and were provided with a Notice of Request to Consult at the time of study commencement:

- Algonquins of Ontario
- Algonquins of Pikwàkanagàn
- Sharbot Obaadjiwan First Nation
- Alderville First Nation
- Mississaugas of the Scugog Island First Nation
- Hiawatha First Nation
- Mississaugas of Curve Lake First Nation
- Métis Nation of Ontario
 - Ottawa Métis Council
 - High Land Waters Métis Council
- Haudenosaunee Development Institute EAST

Given that the Town is within the Algonquins of Ontario (AOO) Settlement Area, and that AOO and the Provincial and Federal governments are currently working together to resolve a claim to this area, AOO was regarded as a key participant within the consultation process.

An Indigenous Consultation Log can be found in **Appendix F1** following the Contact List. Throughout Phases 1 – 4, Notices and Letters of Request to Consult were sent by email and mail. Follow-up was provided through telephone calls to community Lands & Resource Coordinators on two occasions to confirm that the Notices had been received and the community wished to continue receiving updates on the study. In instances where the Lands & Resource Coordinators were unavailable, voicemails were left.

Apart from acknowledging the notification and wishing to continue receiving updates on the Study via email and not Canada Post mail from Métis Nation, no responses from Indigenous Nations or Organizations were received. The contact list was updated throughout the study anytime email bounce backs and an alternate contact was noted.



7 Conclusions

The MCEA process enables the planning of municipal infrastructure to be undertaken in accordance with an approved procedure designed to protect the environment. The MCEA process provides a decision-making framework that enables the requirements of the *Environmental Assessment Act* to be met in an effective manner. Experience has demonstrated that considerable social, economic, and environmental benefits are achieved by applying the MCEA concept to municipal infrastructure projects.

The following summarizes the results of the WTP Expansion Project MCEA.

7.1 Recommendations

Alternative 2: WTP New concrete tank filters was the preferred design alternative as it offers lower operation and maintenance requirements and overall 20-year lifecycle costs, and provides improved operator flexibility and control for process optimization. Additionally, concrete tank filters have a longer lifespan (compared to steel tank) and will reduce future infrastructure replacement requirements while providing the Town the ability to customize new concrete filters' size to match future plant capacity needs.

It is recommended that the Town inspect the existing infrastructure that is proposed to be reused as a part of this design alternative, including the water intake, existing Actiflo clarifiers, and existing steel filters, to confirm their condition is adequate for future use.

At this time, the proposed design concept does not require in-water work, nor impact SAR habitat. However, during Detail Design, if it is found that SAR habitat will be impacted due to construction occurring in close proximity to potential SAR habitat, a Natural Environment, a Terrestrial Existing Conditions and Impact Assessment Report and a Fish and Fish Habitat Existing Conditions Report is recommended. If it is found that SAR habitat is impacted an Information Gathering Form (IGF) and an Avoidance Alternatives Form (AAF) will be required to be submitted to MECP to confirm impact and compensation requirements. For example, installation of bat boxes for impacts to SAR bat roosting habitat.

7.2 Cost Opinion

The cost estimate for the expansion of the WTP is \$21,900,000, including engineering and excluding H.S.T. The cost estimate of the 20-year life cycle including O&M is \$41,200,000. Additional details on Cost Opinion can be found in the **WTP Expansion Options Evaluation Memo (Appendix E)**.



7.3 Permit and Approval

The permit and approval requirements for the preferred WTP expansion design are outlined in **Table 7.1**. The permit requirements are based on studies undertaken during this MCEA and feedback received during consultation with review agencies. As the design develops and additional environmental investigations are completed, this list may change at the discretion of the applicable regulatory agency.

Table 7.1: Permit and Approval Requirements for Preferred WTP Expansion Design

Agency	Description of Permit / Approval
Fisheries and Oceans Canada	<ul style="list-style-type: none"> • Any proposed modifications to the WTP water intake may result in impacts to the aquatic environment of the Mississippi River and should be assessed through a Fisheries Act self-screening. A project review (RFR) or Fisheries Act Authorization (FAA) may apply if impacts to fish and aquatic habitat cannot be avoided or mitigated during design and construction.
Transport Canada	<ul style="list-style-type: none"> • Registry of the project under the <i>Canadian Navigable Waters Act</i> through the Navigation Protection Program may be required as modifications to the WTP water intake may result in impacts to water levels of the Mississippi River.
Ontario Ministry of Environment, Conservation and Parks	<ul style="list-style-type: none"> • An updated Drinking Water Works Permit and Permit to Take Water (PTTW) will be required for the WTP if the plant capacity is increased. • If new standby power generators are expected to be less than 700 kW, there will be Environmental Activity and Sector Registry (EASR) eligible activities. • A temporary PTTW or EASR may be required during construction activities if dewatering activities are required. • Relocation permits, for wildlife or fish, may be required if removals are needed during construction and timing window restrictions cannot be accommodated. • Permit or other authorization may be required to conduct an activity that could permanently impact an endangered or threatened plant or animal or its habitat through an Information Gathering Form (IGF).



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Agency	Description of Permit / Approval
Mississippi Valley Conservation Authority (MVCA)	<ul style="list-style-type: none">Planned construction or alterations of land (e.g. excavate or fill) near a wetland, watercourse, or along a shoreline, may require a permit from MVCA. Permits are issued in accordance with the provincial <i>Conservation Authorities Act</i> and Ontario Regulation 153/06: <i>Mississippi Valley Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses</i>.
Town of Carleton Place	<ul style="list-style-type: none">A Building Permit may be required to receive approval for new building construction from the Town's Building Department.Should any trees require removal, their removal will comply with applicable municipal by-laws.
Electrical Safety Authority	<ul style="list-style-type: none">All electrical installations, repairs, replacements or alterations in Ontario need to be done in compliance with the Ontario Electrical Safety Code, and all necessary Notifications ("permits") must be taken out. This creates a permanent record of the work and triggers a review process by the Electrical Safety Authority.
Local Utilities	<ul style="list-style-type: none">Utility clearance from local utilities, as required.

7.3.1 Treatment and Compliance Requirements

The WTP and elevated water storage tank must conform to the requirements of O.Reg. 169/03 Ontario Drinking Water Quality Standards, January 1st, 2020 version (<https://www.ontario.ca/laws/regulation/030169>), for drinking water quality standards, and O.Reg. 170/03 Drinking Water Systems April 1st, 2020 version (<https://www.ontario.ca/laws/regulation/030170>), for water sampling program and disinfection requirement. These also must meet the requirements of Procedure for disinfection of drinking water in Ontario, updated on April 17th, 2021 (<https://www.ontario.ca/page/procedure-disinfection-drinking-water-ontario>).

