Arthur Water System Supply Redundancy & Storage

Schedule “B” Municipal Class Environmental Assessment

Public Information Centre
November 26, 2024

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Established 1964

Welcome

Thank you for your interest in this project. Your input on this project is a key element in the planning process.

This presentation slide deck is also available on the Township's Capital Projects webpage.

Please submit your input, questions and/or comments on or before December 20, 2024 to lscott@tritoneng.on.ca. A member of the Project Team will respond to any questions raised.

Comments and information received are collected under the authority of the Environmental Assessment Act and in accordance with the Freedom of Information and Protection of Privacy Act and, with the exception of personal information, will be included in the project documentation and become part of the public record.

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Municipal Class EA Planning Design Process

The Municipal Class EA process provides Municipalities with an approved-self assessment process for planning and implementing municipal sewage (sanitary and storm), potable water, road and transit projects that are routinely carried out, and have a common set of alternatives with recurrent, predictable environmental effects and mitigation measures.

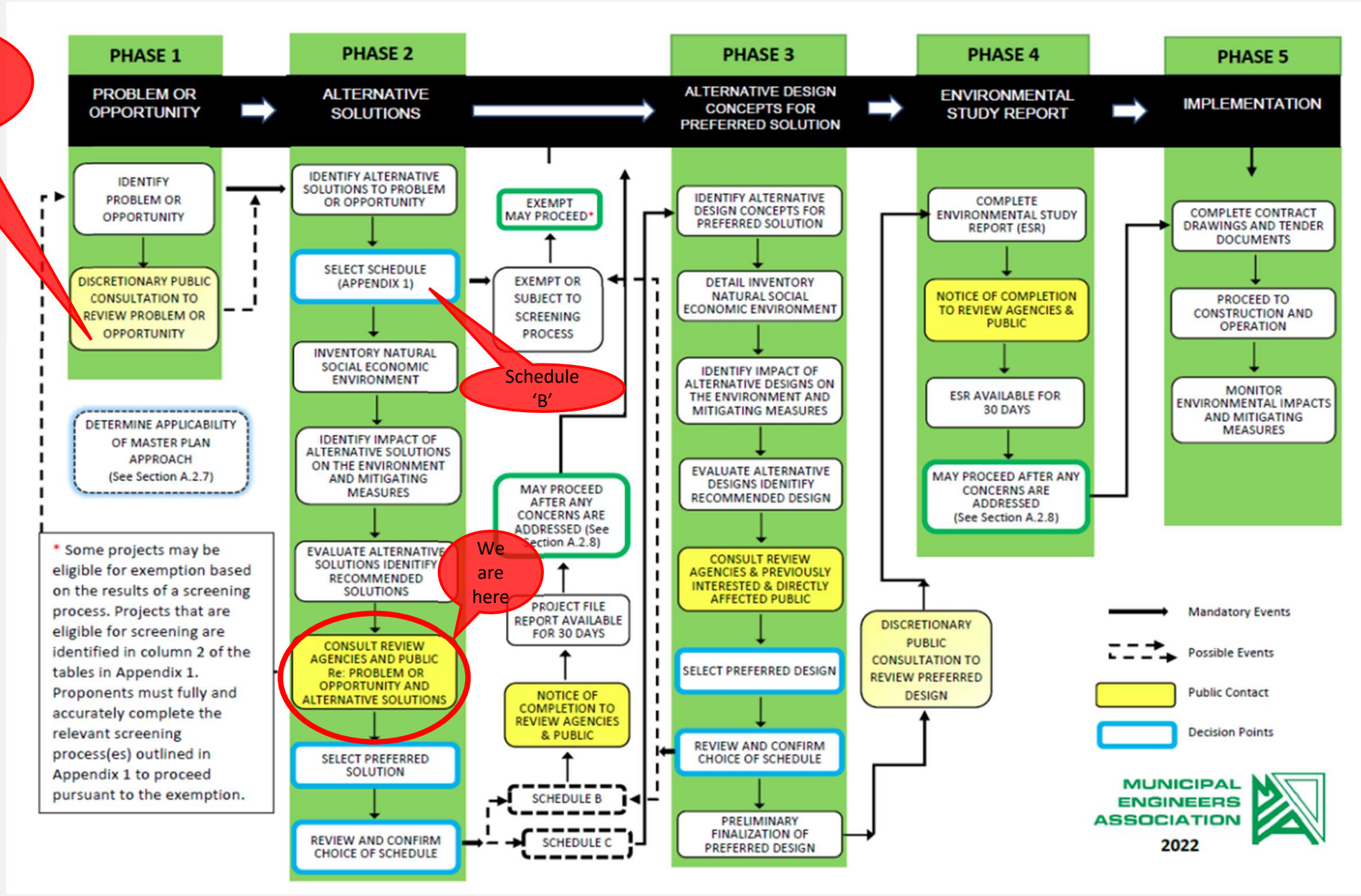
The Municipal Class EA process follows five key principles under the Environmental Assessment Act:

1. Consultation with affected parties early on and throughout the process to ensure planning is a cooperative venture.
2. Consideration of a reasonable range of alternatives.
3. Identification and consideration of the effects of each alternative on all aspects of the environment.
4. Systematic evaluation of alternatives in terms of their advantages and disadvantages to determine their net environmental effects.
5. Provision of clear and complete documentation of the planning process followed, to allow “traceability” of decision-making with respect to the project.

The Municipal Class EA categorizes projects according to their potential impact on the environment. This project is being undertaken as a Schedule ‘B’, Class EA, which follows Phases 1 and 2 of the Class EA Planning Process.

MUNICIPAL CLASS EA PLANNING & DESIGN PROCESS

Notice of Commencement first issued July 13, 2023



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Project Background

- Arthur is a growing urban community within the Township of Wellington North that is serviced by municipal water, sanitary and stormwater systems.
- A Technical Study was completed in November 2020 to review the adequacy of the water and sanitary systems to meet the needs of the existing community and to service future development.
- In regards to the Arthur water system, The Technical Study concluded that:
  - Water supply redundancy is required within the next 15 years
  - The existing water storage facilities are aging and may limit service in outlying areas
  - Additional water storage capacity is required within the next 5 to 15 years

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Existing Arthur Water System

Watermain Distribution Network:

- 21 km of watermain that currently services all existing developed areas within Arthur's urban boundary, and includes approximately 1,340 service connections

Water Storage:

- 1,364 m^3 total system storage volume is provided by two elevated water storage facilities
    - Charles St (Multi-Leg) Tower and Freud (Spheroid) Tower

Water Supply and Pump Houses:

- 4,216 m^3/day total available (source) water supply capacity is provided by three bedrock wells
    - Well No. 7B (housed in Pumphouse #7) and Wells 8A and 8B (both housed in Pumphouse #8)

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Multi-Leg Tower

- Located at 195 Isabella St E, near the intersection of Charles Street East and Isabella Street, in the southeast part of the system
- A Multi-legged steel tank with a storage volume of 227 m^3 and operational water level range of 494.2 m to 499.6 m ASL.
- The tower was commissioned in 1932 and has reached the end of its reasonable service life.
- The current Multi-leg storage is excluded from future capacity projections because it has reached the end of its service life.
- The most recent inspection report (May 3, 2021) noted signs of structural deterioration and coating failure.

Spheroid Tower

- Located at 460 Smith St, just north of Smith Street between Preston Street and Wells Street in the northwest part of the system
- An all-steel spheroid tank with a storage volume of 1,137 m^3 and operational water level range of 494.0 m to 499.2 m ASL.
- The tower was commissioned in 1970 and is expected to reach the end of its service life in 2050.
- The current Spheroid storage can be included in the near-term future capacity projections because it has some remaining service life.
- The most recent inspection report (May 27, 2024) noted good condition with suggestions to replace interior/exterior coating.

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Well 7B

Located at 109 Wells Street West near the Conestogo River

A deep overburden well with a rated capacity of 22.7 L/s (1,961 m^3/day)

The well was commissioned in 1998.

Housed in Pumphouse #7.

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Wells 8A & 8B

Located on Part of Lots 20 and 21, Concession A, 1.15 km south of County Rd 109 and 235 m east of Highway 6.

Each well has a rated capacity of 26.1 L/s

(2,255 m^3/day); however, both wells cannot be pumped concurrently.

These deep overburden wells were commissioned in 2005.

Housed in Pumphouse #8

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Existing System Capacity

Storage Capacity:
The combined storage capacity of the existing treated water storage facilities
= Multi-leg Tower capacity (227 m^3) + Spheroid Tower capacity (1,137 m^3)
= 1,364 m^3

Supply Source Capacity:
The system capacity represents the cumulative sum of all the wells rated capacities
= Well 7B (1,961 m^3 /day) + Well 8A/Well 8B (2,255 m^3 /day)
= 4,216 m^3 /day

Supply Firm Capacity:
The source capacity of the system with the largest pump or source out of service. Consideration of Firm Capacity ensures sufficient redundancy in the system supply and treatment in case of an equipment failure.
= Source Capacity (4,216 m^3 /day) – [largest] pump/source out of service (since Wells 8A/8B is a dual system with backup power, it is less likely to experience failure and therefore Well 7B is the most likely source to be out of service (1,961 m^3 /day)
= 2,255 m^3 /day

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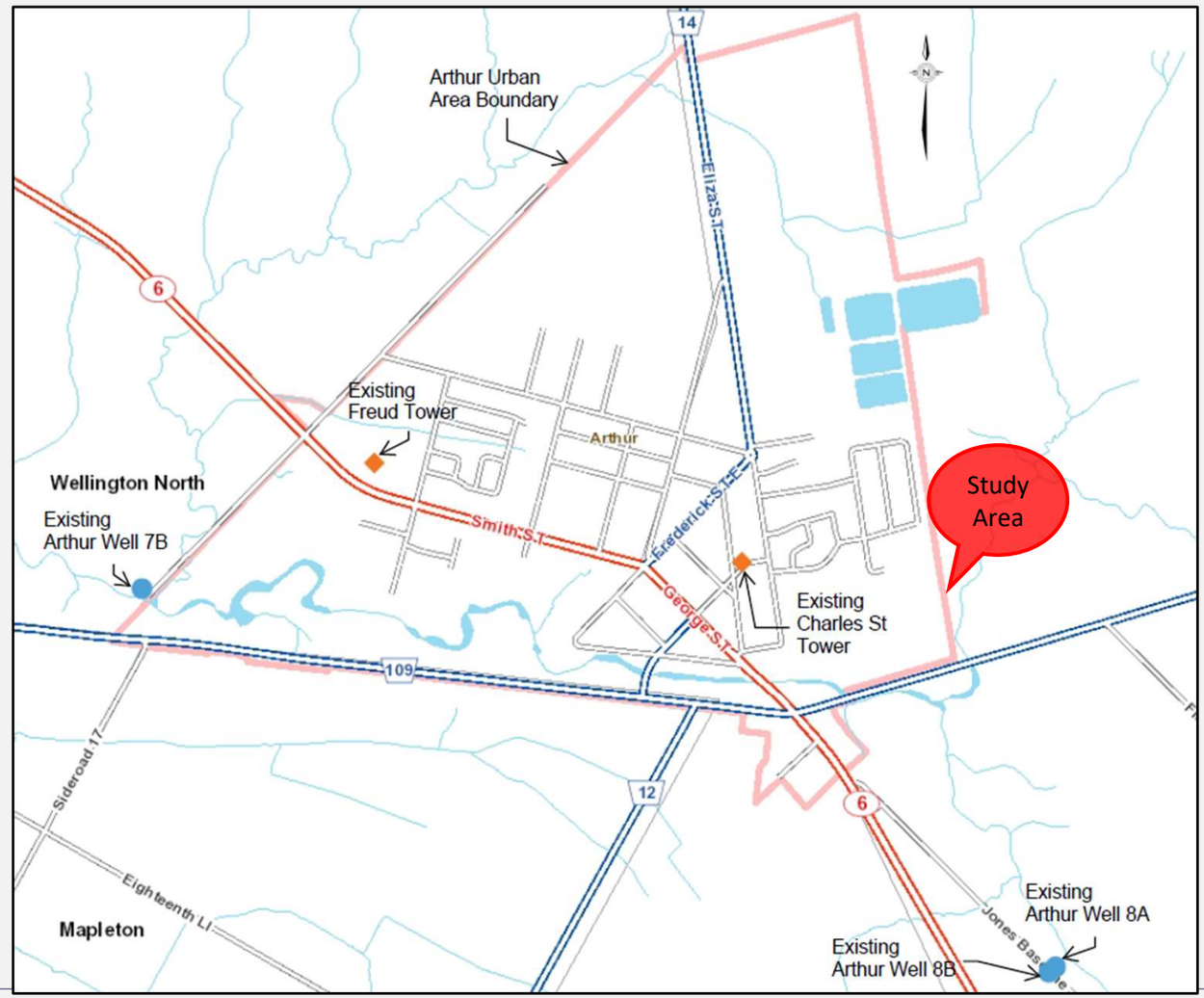
Phase 1: Problem (Opportunity) Statement

The Township initiated this Schedule 'B' Class EA, to address the following Problem/Opportunity Statement:

"The existing Arthur water system requires water supply redundancy and additional water storage to support expected population growth."

Study Area

The Study Area includes approximately 460 ha of land, bounded by the urban area limits of Arthur



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Inventory of Existing Conditions

The Class EA requires existing environmental conditions of the Study Area to be defined to determine the magnitude of potential effects (positive or negative) to these features resulting from implementation of the alternative solutions.

The Class EA divides the environment into five categories as follows:

1. Natural Environment
2. Economic Environment
3. Technical Environment
4. Social Environment
5. Cultural Heritage Environment

A description and general inventory of the environments within the Study Area was completed to identify any factors that could influence the identification of the preferred alternative.

Existing Conditions: Natural Environment

Defined based on a desktop review of online resources (Natural Heritage Information Centre, Grand River Conservation Authority [GRCA], Atlas of Breeding Birds, Source Water Protection, etc., as follows:

- Majority of the area is “built-up”.
- Regulated areas include floodplain, slope erosion, slope valley and regulated watercourse.
  - Any work proposed within GRCA regulated limits requires approval from GRCA prior to implementation
- Four provincial Species at Risk and two others considered rare in Ontario were identified within or proximate to (within 1km of the Study Area)
- Field observations have not been completed to determine the presence of SAR or breeding birds and their habitat within the Study Area
- Deep overburden (Lower Sediments) are typical for producing high-capacity wells with high iron and manganese concentrations due to mineralization within the sediments
  - Lower Sediments tend to thin out in the NE portion of the Study Area
- Deep bedrock is generally characterized by low hydraulic conductivity due to presence of silt, clay, glacial till and unfractured bedrock
- Located within Zones A, B, C and D of the existing Wellhead Protection Area for the existing municipal wells
- Groundwater provides water supply to the municipal water system and majority of private residential wells (abandoned), industrial and commercial wells, and surrounding Arthur

Source Water Protection

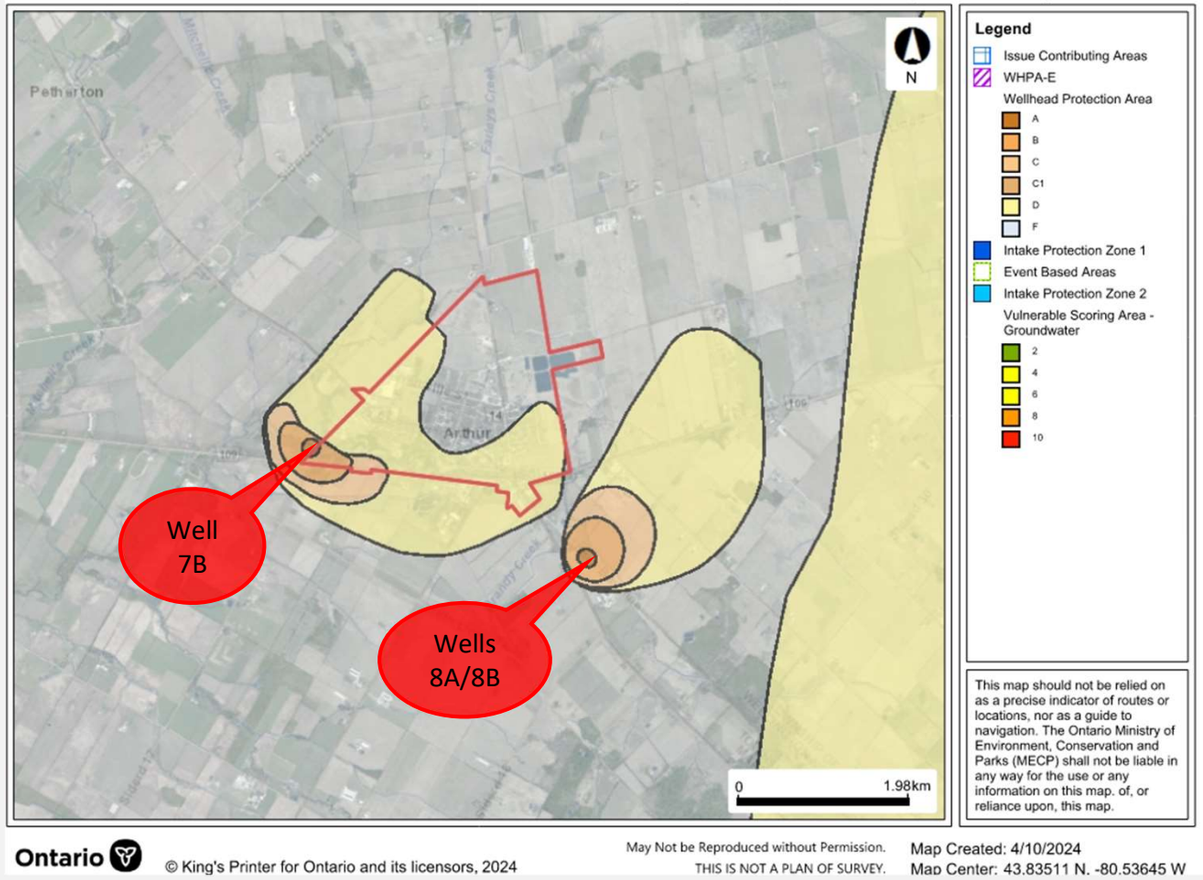
- The study area is located within the Grand River Source Protection Area of the Lake Erie Source Protection Region and is subject to Grand River Source Protection Plan, Chapter 7 - County of Wellington Source Protection Plan.

- As per the *Safe Drinking Water Act* and *Clean Water Act* municipal wells are required to have wellhead protection areas (WHPAs). Zones around the well indicate proximity and travel time of for groundwater to reach the well.

- Zone A = 100m radius surrounding the well
- Zone B = less than or equal to 2-years travel time
- Zone C = between 2- and 5 – Year travel time
- Zone D = between 5- and 25 –year travel time

Vulnerability of each well is scored from 2 (least vulnerable) to 10 (most vulnerable)

Wellhead Protection Areas for the Existing Municipal Wells (7B, 8A/8B)



Existing Conditions: Economic and Technical Environment

Economic Environment

Defined based on a review of various studies (development, County Municipal Comprehensive Review, Community Growth Plan, Water and Wastewater Rate Study, etc). as follows:

- Arthur has experienced strong average annual rate of growth over the last three years
- Municipal Comprehensive Review provides growth projections to calendar year 2051, to be used in planning for growth and growth related facilities
- Operation and maintenance costs of the municipal water system are recovered from operating (non-rate) revenues and direct billing of customers

Technical Environment

- Water storage capacity is based on the storage volume of the Spheroid Tower and Multi-Leg Tower
- Multi-Leg Tower has reached the end of its service life
- Pressures and flow within the watermains (distribution network) is a factor of the water storage operating ranges and demands within the water system, as well as the land topography within the serviced area
- Pressure within the system is maintained within the optimal design range to ensure it is sufficient for domestic use and fire protection
- Future development areas require watermain extensions and lands at higher elevations may experience sub-optimal flows and pressures based on the operating range of the existing system

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Existing Conditions: Social and Cultural Heritage Environment

Social Environment

- Arthur is designated as “Canada’s Most Patriotic Village” by the Toronto Star in November 2, 1942
- Community services within the Township include emergency, environmental, arts and culture, recreation, transportation and business support
- Per the Township’s 2024 Strategic Plan, the three strategic priorities of the Township to “build a safe, sustainable and welcoming community” are as follows:
    1. Shape and support sustainable growth
    2. Deliver quality, efficient community services aligned with Township’s mandate and capacity
    3. Enhance information sharing and participation in decision-making.

Cultural Heritage Environment

- The Study Area contains several natural heritage and cultural heritage assets, as follows:
    - 181 Tucker St is designated as being of architectural and historical value or interest under the Ontario Heritage Act
    - The Grand River is a designated Canadian Heritage River System, with cultural heritage features
    - Arthur River Trails, MacPherson Park structure and Arthur Cenotaph are important cultural features
    - Jones Baseline Mural, Patriotic Mural, Canada’s Most Patriotic Village Mural, Pioneer Mural and Freedom Isn’t Free Mural
    - Intangible assets are local stories that contribute to arts and culture and include “Canada’s Most Patriotic Village, Wellington North as a Fashion Destination, The Roxy Theatre and The History of Hotels
- The potential for archaeological resources exist, since agricultural areas and historic transportation routes are commonly high potential areas.

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Phase 2: Alternative Solutions

Phase 2 of the Class EA requires identification and assessment of a reasonable range of feasible alternatives to address the Problem/Opportunity Statement and includes the following:

Alternative Solution		Description	Details
Baseline/General Alternatives	1a	"Do Nothing"	Considered for all Municipal Class EA projects and is only implemented when the costs of all other alternatives significantly outweigh the benefits and negative impacts.
	1b	Limit Community Growth	Population growth would be limited to what the existing water system can sustain. Does not include improvements or changes to increase supply redundancy or water storage capacity.
	1c	Reduce Water Demand/Implement Conservation Measures	Includes the reduction of water demand through conservation, efficiency and demand management. Does not include improvements or changes to increase supply redundancy or water storage capacity. Extends the timeline of when the existing system would be insufficient to service the future population.
Water Supply Alternatives	2a	Increase Water Taking from Existing Municipal Wells	Considers increasing the permitted water taking from the existing municipal wells to provide supply redundance for the future population.
	2b	Addition of New Well(s) to the Existing Municipal System	Includes the addition of a new municipal well(s) to increase supply capacity and achieve additional supply redundancy. Also requires the need to meet water quality requirements.
Water Storage Alternatives	3a	Construct a New Water Storage Facility to Supplement the Existing Municipal Water Storage Facilities	Provides additional water storage capacity through the construction of a new water storage facility, in addition to maintaining the existing two water storage facilities.
	3b	Construct a New Water Storage Facility and Decommission the Existing Multi-Leg Storage Facility	Provides additional water storage capacity through the construction of a new water storage facility, while maintaining the spheroid tower and decommissioning the multi-leg tower.
	3c	Construct a New Water Storage Facility and Decommission Both Existing Water Storage Facilities	Includes the construction of a new water storage facility to meet the water storage capacity needs of the existing and future population and decommission both of the existing water storage facilities.

Projected Supply Requirements

- The Source Capacity of a water supply system should be greater than the Maximum Daily Demand (MDD) so that daily demand can be met if storage is offline.
- Municipal Comprehensive Review provides population projections to calendar year 2051, which were used to project future population needs (water demand and storage capacity).
- Exceedance of the Firm Capacity indicates there is insufficient redundancy in the system for water supply and treatment in case of an equipment/facility failure.
- Expansions typically take 5- 10 years to develop, therefore, planning for long-term needs must occur accordingly.

Calendar Year	2023 (Existing)	2051
Source Capacity (m^3/day)	4,216	
Firm Supply Capacity (m^3/day)	2,255	
Serviced Population	3,195	4,800
Persons per Residential Unit (Each)	2.6	2.57
Equivalent Residential Units (ERU)	1,229	1,868
Total Water Demand (Max. Day Demand, MDD) (m^3/day)	1,545	2,321
Utilization (%)	69	103
Firm Reserve Capacity (m^3/day)	710	-66

- 75% utilization anticipated by 2026.
- Firm Capacity deficit anticipated by 2046.

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Projected Storage Requirements

- Storage Capacity designed to maintain adequate flows and pressures in the distribution network during peak hour demand and to meet MDD during fire and emergency events.

Calendar Year	2023 (Existing)	2051
Existing Storage	1,364	1,137
Serviced Population	3,195	4,800
Total Storage Required (m^3)	1,482	1,958
Storage Remaining	-118	-821

Multi-leg tower is not considered beyond year 2023 since the facility has reached the end of its service life

Given that there is currently surplus supply Firm Reserve Capacity, the system maintains a sufficient water supply to service the existing population.

A storage volume of at least 900 m^3 is needed to ensure there is sufficient storage capacity to service the projected future population to at least calendar year 2051.

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Shortlist Evaluation of Alternative Solutions

Alternative solutions are evaluated based on the ability to address issues identified in the Problem/Opportunity Statement.

- **If the Problem Statement is satisfied (i.e., "Yes"), then the Alternative is shortlisted for further evaluation.**

Alternative Solutions		Problem Statement Components		Problem Statement Addressed?
		Increase Water Supply Redundancy to Support Expected Population Growth	Increase Water Storage to Support Expected Population Growth	
Baseline/General Alternatives	1a – "Do Nothing"	No	No	No
	1b – Limit Community Growth	No	No	No
	1c – Reduce Water Demand/Implement Conservation Measures	Partially	Partially	No
Water Supply Alternatives	2a – Increase Water Taking from Existing Municipal Wells	Yes	Not Applicable	**Yes**
	2b – Addition of New Well(s) to the Existing Municipal System	Yes	Not Applicable	**Yes**
Water Storage Alternatives	3a – Construct a New Water Storage Facility to Supplement the Existing Municipal Water Storage Facilities	Not Applicable	Yes	**Yes**
	3b – Construct a New Water Storage Facility and Decommission the Existing Multi-Leg Storage Facility	Not Applicable	Yes	**Yes**
	3c – Construct a New Water Storage Facility and Decommission Both Existing Water Storage Facilities	Not Applicable	Yes	**Yes**

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Evaluation of Water Supply Alternatives

Alternative 2a – Increase water taking from existing wells:

- It is expected that the existing deep overburden well sites can produce more water than is currently permitted, which would need to be confirmed through drilling and testing.
- There are no records of deep bedrock wells in the Wells 8A/8B area.
- Existing wells have elevated iron (Well 7B) and manganese (Wells 8A/8B), which affect aesthetic water quality
- Water from Wells 7B and 8A/8B may require treatment if the proposed Health Canada guidelines for Canadian Drinking Water Quality are adopted as a standard.
- Expansion of Wells 7B, 8A/8B would likely be a significant expense given the required pump house expansion and construction of a treatment system to remove iron and manganese and wastewater discharge process, which would also require additional operation and maintenance costs.
- A second well would also be required at the Well 7B site, in addition to expanding supply capacity, to provide mechanical duplication and improve redundancy.
- Increasing pumping and adding a back-up well at Well 7B is likely to increase the size of the existing WHPA and area of WHPA-A, and affect several new properties that may have potential DNAPL threats (i.e., properties that handle or store DNAPLs)
- Increasing pumping at Wells 8A/8B is likely to increase the size of the WHPA, but not WHPA-A, and affect several new properties that may have potential DNAPL threats
- Infrastructure already extends and connects to existing well sites.
- Given the methodology of calculating Firm Capacity, increasing capacity at existing wells without the addition of a new well supply will not increase Firm Capacity, even with mechanical duplication at the Well 7B site and therefore is not considered feasible.

Evaluation of Water Supply Alternatives

Alternative 2b – Addition of New Well(s):

- Siting of a new well would increase supply capacity and improve system redundancy.
- The new well would be required to have a capacity of at least 864 m^3/day and water quality that meets or exceeds current and future Ontario Drinking Water Standards (ODWS).
- Siting of a new well would change the size and orientation of the WHPA and could affect many properties within and outside the urban boundary.
- Water system infrastructure would be required to connect to the existing water system (i.e., new watermain, wellhouse, etc.).
- A bedrock water source would be preferred over the deep overburden, given that it is expected to contain less iron and manganese and therefore not require construction of a treatment system and connection to the sanitary sewers for wastewater discharge.
- Well Exploration directed to the north end of the Study Area on Township property at the intersection of the unopened Macauley St and Wells St intersection, which is expected to contain less iron and manganese given the understood hydrogeology of the area.

Next Steps in Evaluation:

- Begin Well Exploration for new water source.

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Well Exploration and Testing

Test Well Drilling:

- Test Well TW1-21 was drilled in November 2021 on Township property at the southeast corner of the Macauley St and Wells St intersection.
- TW1-21 drilled to a depth of 42.4 m below grade, with a water well screen installed between 42.7 m and 47.5 m below grade.
- The test well was terminated in the deep overburden given the aquifer production (>864 m^3 /day) is representative of a regional bedrock aquifer.
- Short- and long-term pump testing and associated monitoring was completed.

TW1-21 Pumping Test and Monitoring Results:

- Only one private well, located within 1 km of TW1-21, experienced interference during the pumping test and is expected to be mitigated through upgrades or new well.
- No observed impacts to surface water quality and levels in Farley Creek.
- Water quality results were stable and iron and manganese levels are below concentrations produced at existing municipal wells. Hardness is comparable.
- Concentration of arsenic was less than the Ontario Drinking Water Standard (ODWS) Maximum Allowable Concentration (MAC); however, above half MAC, which would require quarterly sampling and monitoring. The Township may also consider design of a treatment system to remove or minimize arsenic in the water.
- It is noted that arsenic can change over a distance of 5 m, so a final production well constructed at the site may produce water with a different arsenic concentration.
- The deep aquifer is a secure source of groundwater (not directly influenced by surface water).
- TW1-21 should be considered as a potential municipal water source.

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TW1-21 Well Location

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Evaluation of Potential Impacts

Environment Category	Alternative 2a – Increase Water Taking from Existing Well(s)	Alternative 2b – Addition of a New Well
Cultural	The heritage attributes of natural heritage and cultural heritage assets will continue to exist with or without the installation of proposed infrastructure. Mitigation measures to continue to conserve cultural heritage value or interest will limit potential impacts.	
	Archaeological assessment is not required at existing well sites.	Archaeological assessment (Stage 1) is required at TW1-21 site given that the site is located within 300 m of a water source.
Social	Will provide increased supply redundancy, which is a requirement for continued growth to meet the requirements of the Provincial Policy Statement.	
Natural	Potential impacts to vegetation, wildlife and their habitat is rated as minor. Impacts to surface/groundwater quality and quantity not anticipated as Wells 7B, 8A/8B are existing and based on monitoring results at TW1-21.	
	Increasing pumping and adding a back-up well at Well 7B or increasing pumping at Wells 8/8B is likely to increase the size of the existing WHPA and area of WHPA-A and affect several new properties that may have potential DNAPL threats. Further study is required to delineate vulnerable areas and amend the respective Source Protection Plan.	The new well would change the size and orientation of the WHPA and could affect many (future) properties within and outside the urban boundary. Properties within a 100 m radius may be subject to requirements including septic inspections, manure application prohibitions, risk management plans for agricultural activities. Further study is required to delineate vulnerable areas and amend the respective Source Protection Plan.
Technical	Existing wells have elevated iron (Well 7B) and manganese (Wells 8A/8B), which affect aesthetic water quality. Water may require treatment if the proposed guidelines for iron and manganese are adopted as a standard and will include wellhouse expansion and treatment systems. Mechanical duplication would be required at Well 7B, to improve system redundancy. Given the methodology of calculating Firm Capacity, increasing capacity at existing wells without the addition of a new well supply will likely not increase Firm Capacity, even with mechanical duplication at the Well 7B site. Volume of additional capacity is unknown and requires investigation.	The site is located in a future development area that will eventually require water system infrastructure regardless of siting a municipal well at the proposed location and is not considered to be in a relatively remote location like existing Wells 7B, 8A/8B. Construction of a new wellhouse and treatment system for arsenic will be required. Can likely achieve a rated capacity of 2332 m3/day, which will satisfy project demands beyond calendar year 2051.
Economic	Will require the expansion of well houses, treatment facilities, sanitary sewers for discharge of wastewater from treatment process, drilling and development of a new well. It is uncertain if expansion of existing facilities would provide sufficient firm capacity for future development and therefore, additional water supply capacity at a new source may also be required, at additional cost. It is expected that costs will be comparable to those anticipated for Alternative 2b.	Will require development of two production wells at TW1-21 site, construction of a well house and associated appurtenances including treatment facilities, watermain extensions and sanitary sewer extensions for discharge of wastewater from treatment process. Estimated Capital Cost: $3.3M - $4M, including treatment system, wellhouse, infrastructure extensions.

Water Supply Preliminary Preferred Alternative

The preliminary preferred alterative is selected based on the alternative that is most prepared to meet the requirements of the future growth scenario.

Alternative 2b – Addition of a New Well is the Preliminary Preferred Alternative to address the Water Supply Redundancy requirement, based on satisfaction of the following criteria and evaluation of impacts (previous slide):

- Can produce at least 864 m^3/d (likely 2,332 m^3 /day).
- Produces water quality that meets or exceeds ODWS for sulphate, iron and manganese.
- Improves system redundancy and reliability in the supply system by having another source in addition to the existing wells.
- Impacts to cultural heritage, natural, social, technical and economic environments are similar between both alternatives.

Recommendations:

- TW1-21 is a potential municipal water source.
- Consider Alternative 1c – Reduce Water Demand/Implement Conservation Measures as a component in the implementation of the preferred alternative to extend the service life of the existing and future water supply.

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Evaluation of Water Storage Alternatives

Alternative 3a – Construct a New Water Storage Facility to Supplement Existing Storage Facilities:

- A new water storage tower would be constructed to provide additional storage capacity for the water system.
- The existing multi-leg tower has reached its end of service life and requires decommissioning.
- This alternative is not feasible given the condition of the existing multi-leg tower.

Alternative 3b – Construct a New Water Storage Facility and Decommission the Existing Mult-Leg Tower:

- A new water storage facility would be constructed to provide additional storage capacity for the system (in addition to the existing spheroid tower).
- A new elevated storage facility would provide an opportunity to improve pressures within the existing water distribution network and future development areas.
- Requires consideration of system operation, i.e., single or multiple pressure zones, which affects operating complexity and infrastructure requirements.

Alternative 3c – Construct a New Water Storage Facility and Decommission Both of the Existing Water Storage Facilities:

- A new tower would be designed to provide sufficient storage capacity to address the immediate and future population.
- The new tower would provide sufficient pressures within the system for all areas within the urban boundary.
- Requires decommissioning of both existing water storage facilities, which sacrifices remaining service life of the spheroid tower and operation advantage of a two tower system.

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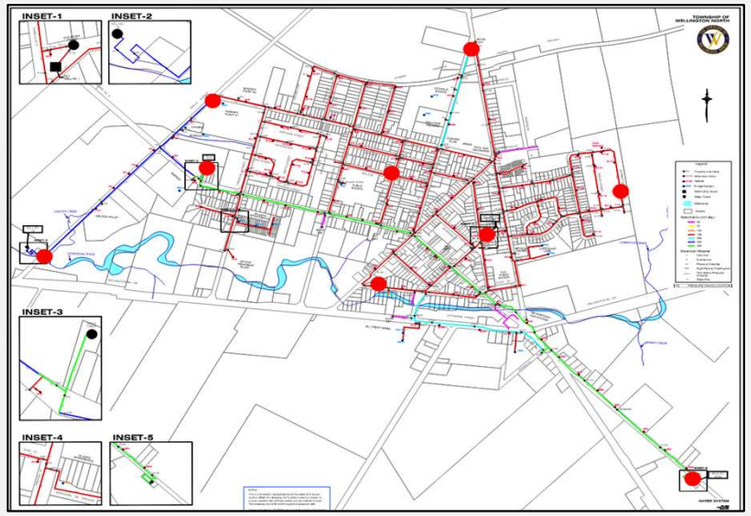
Evaluation of Water Storage Alternatives

System Pressure Test

- A system pressure test was conducted in Arthur on July 23rd, 2024.
- The Spheroid tower was filled to the maximum water level to determine the maximum pressures within the water distribution network for the existing system.
- The pressure readings from this test identified the design for the high-water level in the new tower which was found to be **501.703 m above sea level,** to ensure minimum acceptable pressures and flow within the system would be maintained in future development areas.



Location Review

- A review of WaterCAD software modelling of the Arthur system was used to determine the optimal location to place the new tower.
- Based on model results and consultation with the Township of Wellington North, the preferred location was determined to be near Macauley St and Wells St (TW1-21 Site).

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Evaluation of Potential Impacts

Environment Category	Alternative 3b - Construct a New Water Storage Facility and Decommission the Existing Multi-Leg Tower	Alternative 3c - Construct a New Water Storage Facility and Decommission Both of the Existing Water Storage Facilities
Cultural	The heritage attributes of natural heritage and cultural heritage assets will continue to exist with or without the installation of proposed infrastructure. Mitigation measures to continue to conserve cultural herniate value or interest will limit potential impacts.	
Social	Will provide increased water storage capacity, which is a requirement for continued growth to meet the requirements of the Provincial Policy Statement.	
Natural	Potential impacts to vegetation, wildlife and their habitat is rated as minor.	
Technical	Addresses problem statement. Retaining spheroid tower allows operational advantage of a two-tower system to be retained once the multileg tower is decommissioned. Allows remaining service life of the spheroid tower to be realized.	Addresses problem statement. Single tower system reduces storage redundancy. Sacrifices remainder of spheroid tower service life.
Economic	Estimated New Tower (1,000m^3) Capital Cost: $5.0 - $6.5 Million Estimated Spheroid Refurbishment Capital Cost: $2.0 – 2.5 Million Operational Cost: No change from existing as the system would have no additional facilities to operate.	Estimated New Tower (2,000m^3) Capital Cost: $7.0 - $8.5 Million Estimated Existing Spheroid Demolition Costs: $1.0 Million Operational Cost: Marginal operational cost reduction due to only needing to operate one storage facility.

Water Storage Preliminary Preferred Alternative

The preliminary preferred alterative is selected based on the alternative that is most prepared to meet the requirements of the future growth scenario.

Alternative 3b – Construct a New Water Storage Facility and Decommission the Existing Multi-leg Tower is the preliminary preferred alternative to address the Water Storage requirement, based on satisfaction of the following criteria and evaluation of impacts (previous slide):

- Can provide upwards of 900 m^3 of storage at an elevation that will allow for operational flexibility in the future.
- Reduces operational costs and investment needed for the refurbishment of the existing Multi-Leg.
- Improves system reliability as the new tower would be outfitted with modern monitoring and operations to allow for increased system oversight and control.
- Impacts to cultural heritage, natural, social, technical and economic environments are similar between both alternatives.

Recommendations:

- Decommission the multi-leg tower.
- Retain the spheroid tower until the end of its service life.
- Construct a new elevated storage facility within the same parcel of land as TW1-21 to improve efficiency, and allow for operational flexibility
- Construct and design the new elevated storage facility with the option to increase the water pressure in the future, when the Spheroid tower has reached the end of its service life.
- Consider Alternative 1c – Reduce Water Demand/Implement Conservation Measures as a component in the implementation of the preferred alternative to extend the service life of the existing and future water storage.

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Preliminary Preferred Alternative

<u>The preliminary preferred alterative to address the Problem/Opportunity Statement:</u>

Alternative 2b – Addition of a New Well

- Includes the addition of a new municipal well at TW1-21 site to increase supply capacity and achieve additional supply redundancy.

Alternative 3b – Construct a New Water Storage Facility and Decommission the Existing Multi-leg Tower

- Provides additional water storage capacity through the construction of a new elevated water storage facility at the TW1-21 site, while maintaining the spheroid tower and decommissioning the multi-leg tower.

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Implementation Strategy

Following this PIC, we will:

- Receive input/questions/comments on or before December 20, 2024 for consideration and incorporation into the planning and assessment of this project.
- Complete Stage 1 Archaeological Assessment for TW1-21 site.
- Notify all stakeholders of Class EA Notice of Completion and filing of Project File Report for public review for a period of 30 calendar days.
- Subject to comments received as a result of the Notice of Completion, proceed to next phase of the project, which includes detailed design.

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Next Steps

It is anticipated that the next phase of the Project will include but not be limited to the following tasks:

- Work with the Township to develop a workplan for water system upgrades, considering phasing, scheduling, development timing, and funding sources.
- Proceed with the development of the new well and water tower site.
- Satisfy requirements of Wellington Source Water Protection.
- Applications for PTTW approvals for the test site well (TW1-21).
- Design of required infrastructure including well pumping/treatment facilities, transition watermains, storage facilities and associated control facilities.

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Thank You!

We welcome your comments & questions.

Please provide comments & questions by December 20, 2024

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