

Project Brief - 2023 Rate Supported Capital Budget and Forecast

Project:

Highway #6 Water Transmission Main Twinning (Haldimand Road 55 to Parkview Road) – Wards 1 and 4

Description:

Installation of a 6,400 m second (twin) water transmission line to be constructed within the existing road allowance along Highway #6 between Haldimand Road 55 and Parkview Road (see Figure 1). Installation of a second 450 mm water transmission line has been identified as necessary since 2009 and will meet the water demand needs of proposed growth in the community of Hagersville and provide redundancy in the event of a transmission line break.

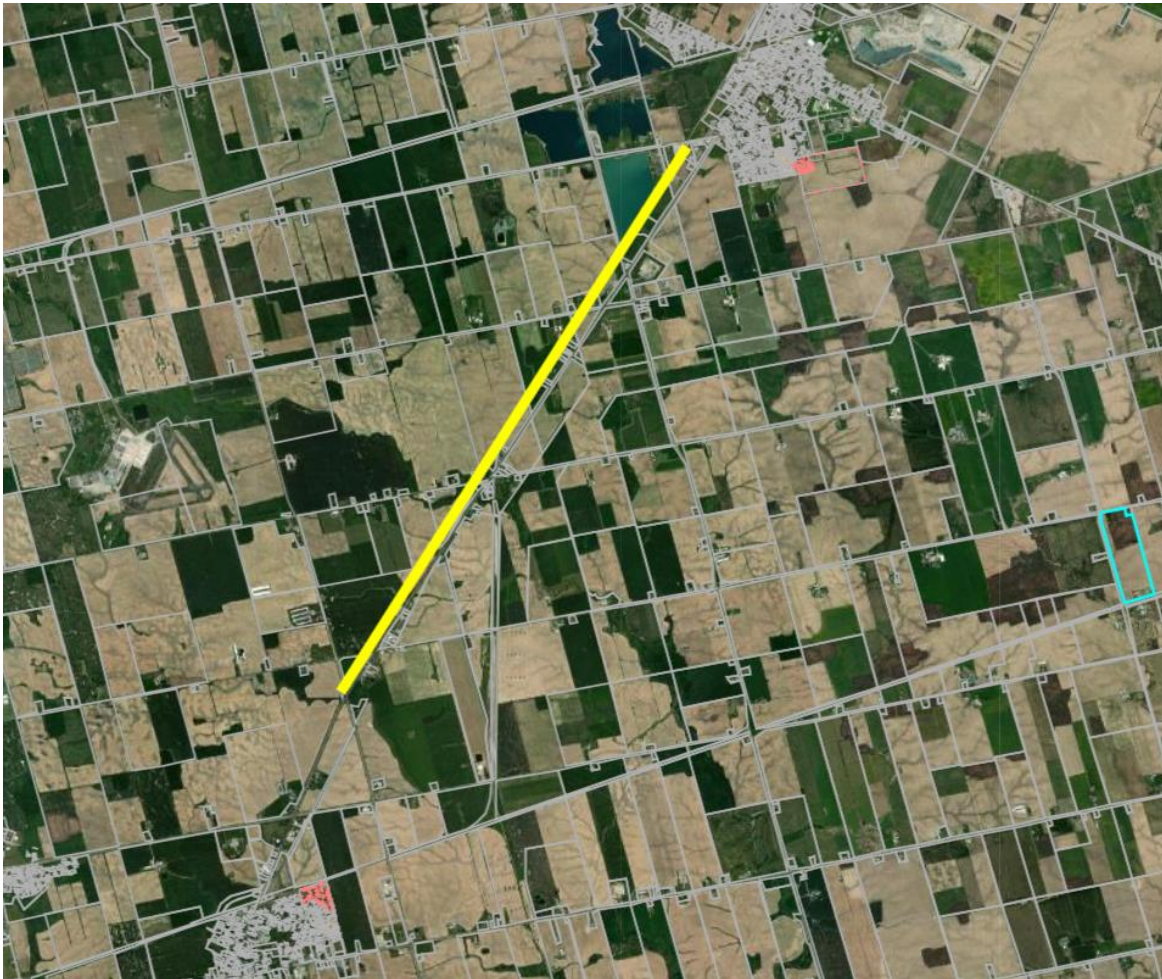


Figure 1 – Proposed Water Transmission Main Twinning

Background:

There is currently a single 300 mm water transmission line that connects the Hagersville Booster Station (located at the northwest corner of Haldimand Road 55 and Highway 6) to the local distribution system in the community of Hagersville. The existing 300 mm water transmission line was constructed in 1981 and has a maximum design flow of 60 L/sec.

The 2009 Hagersville Master Servicing Plan (MSP) identified a future project to twin the existing 300 mm water line in order to meet a projected increase in water flow demands based on forecasted growth in the community. At the time of the Hagersville MSP, the max day flow demand was 48 L/sec. While there has been modest growth in Hagersville over the past thirteen years, the max day water demand has remained relatively unchanged, largely in part due to water loss mitigation efforts (leak detection) by the County.

To help illustrate existing conditions, Figure 2 shows daily flows for the most recent twelve months, plotted with the max day flow, the 95th percentile maximum day flow (meaning 95% of the time, flow is below this value) and the maximum flow capacity of the pipe. Currently, the 95th percentile flow value (used to eliminate outliers such as system flushing, standpipe filling and fire responses) represents approximately 60% of the pipe capacity, with the max day flow value indicating that 75% of the pipe capacity is in use. Typically, infrastructure upsizing/expansion is triggered when 80% of the design capacity is in use.

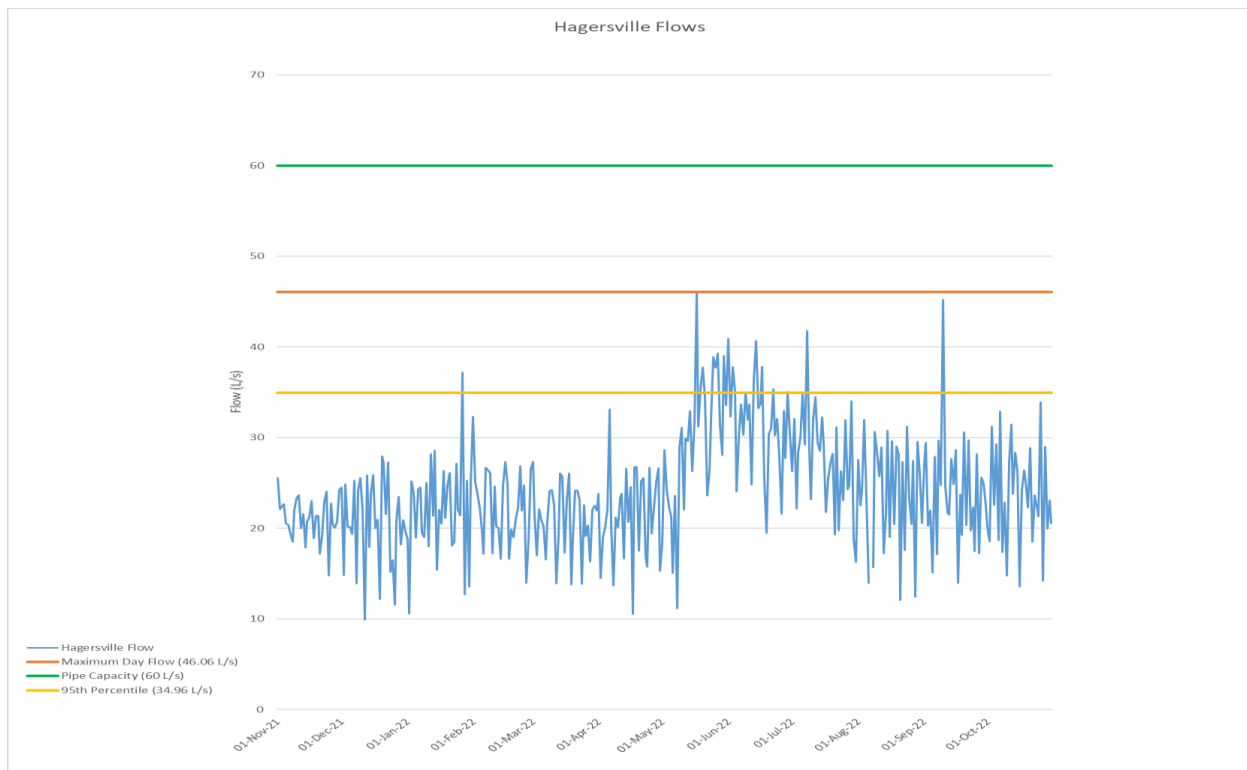


Figure 2 – Hagersville Daily Water Flows

Late in 2021, the water model for Hagersville was updated to reflect growth that has occurred since the 2009 Hagersville MSP. As part of the water modelling work and in preparation of the 2022 Hagersville MSP update study, planned growth for the community was also entered into the model. Modelling results of the water system with these updates indicated that there is a need to move forward in 2023 with the water transmission main twinning project.

The relative urgency to move forward with this project is largely attributable to the recent increase in development proposals received by the County and the rate at which growth is occurring in Hagersville.

In addition to addressing maximum day water demand strains on the system, a secondary transmission line will provide a level of operational redundancy should a transmission line break occur on either one of the lines. The twinning of the transmission line to Hagersville will also provision for the opportunity to extend water servicing to Caledonia and Cayuga in the future.

The transmission line twinning project will consist of three project stages. The first stage will comprise of planning and environmental approvals. Following the Municipal Class Environmental Assessment (MCEA) Schedules, this project is considered an A+ Class EA and will require notification to the public. The second stage will consist of design and construction approvals. In order to construct a new pipe within the Highway 6 road allowance, talks with the Ministry of Transportation will be required in order to obtain approvals. The third stage will be construction. The identified budgets and timing take into consideration the three project stages.

Timeframe:

Upon approval of the 2023 Rate Supported Budget, procurement of engineering services to support MCEA study and design work will be initiated. It is anticipated that all approvals and design work will be completed in 2023 and that the project will be ready to tender for construction in early 2024. Construction of the 6,400 m transmission line is expected to take approximately ten months. Based on these milestones, the transmission line twinning project is anticipated to be completed by the spring of 2025.

Estimated Cost:

The estimated project cost is \$5,400,000.

Budget Impact:

It is anticipated that this project would be fully funded from Development Charges

Operating Cost Impacts:

There may be a slight increase in operating costs over time that are associated with operating and maintaining a second transmission line and its associated valving and chambers.

Impact on other Projects:

None

Impact on Staff Workload:

The project support and management for this initiative has been identified and accommodated within the Water and Wastewater Engineering 2023 staffing work plan.

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Project:

Caledonia Water Storage Capacity Expansion – Ward 3

Description:

To meet future water storage needs for the community of Caledonia, two projects to add water storage capacity have been identified in the Rate Supported Capital Budget for a number of years. The two water storage projects are:

- New South Elevated Tank – Construction of a new 5,000 m³ elevated tank to be built within the vicinity of the existing standpipe, on County owned property associated with the Haldimand County Caledonia Centre.
- North Reservoir Expansion – Construction of an additional 6,000 m³ of in-ground reservoir capacity at the existing Caledonia reservoir and pumping station. Project includes the decommissioning and removal of the existing standpipe located on the same property.

Background:

Existing water storage in Caledonia is provided from two facilities. The first facility is the Caledonia reservoir and pumping station, located halfway between Greens Road and Unity Road on Highway 6, that has 2,000 m³ of storage. The second facility is the Caledonia standpipe, located at the HCCC property, that has 4,420 m³ of storage, although only 2,200 m³ of that volume is considered floating storage due to elevations in Caledonia. The remaining 2,200 m³ of storage can only be accessed through pumping that would boost discharge pressure in the event of an emergency.

The 2019 Caledonia Master Servicing Plan (MSP) update study calculated water storage needs in accordance with the Ministry of the Environment (MOE) Design Guidelines for Drinking Water Systems and confirmed that additional water storage capacity was required. Recommended storage alternatives from the study included construction of a new 5,000 m³ elevated tank and decommissioning of the existing standpipe, and construction of an additional 6,000 m³ of in-ground reservoir storage at the existing Caledonia reservoir and pumping station.

Forecasted growth at the time of the 2019 MSP update study indicated sizeable development occurring within the southern limits of the Caledonia urban boundary. Based on this forecasted growth, the water modelling supported an approach that would see the construction of a new elevated tank on the south side of Caledonia as a priority, in order to enhance distribution flow to the southern end of the community while systematically increasing storage capacity.

Following the elevated tank construction project, the remaining and future storage needs would be satisfied through the reservoir expansion project. This servicing strategy was reflected in the 2022 Rate Supported Budget.

Recently, growth projections for Caledonia have been revised and as a result of the urban boundary expansion now include an increase in units in the north and a projected delay in development timelines in the south. As a result, the water modelling now recommends an approach that would see storage added to the system at the existing reservoir and pumping station as a priority, followed by the addition of water storage capacity through a new elevated tank. Following this approach, the immediate and mid-term water storage needs would be met earlier and the future water storage needs would be satisfied as they are realized, currently forecasted to be over the next 10 to 15 years (see Figure 1).

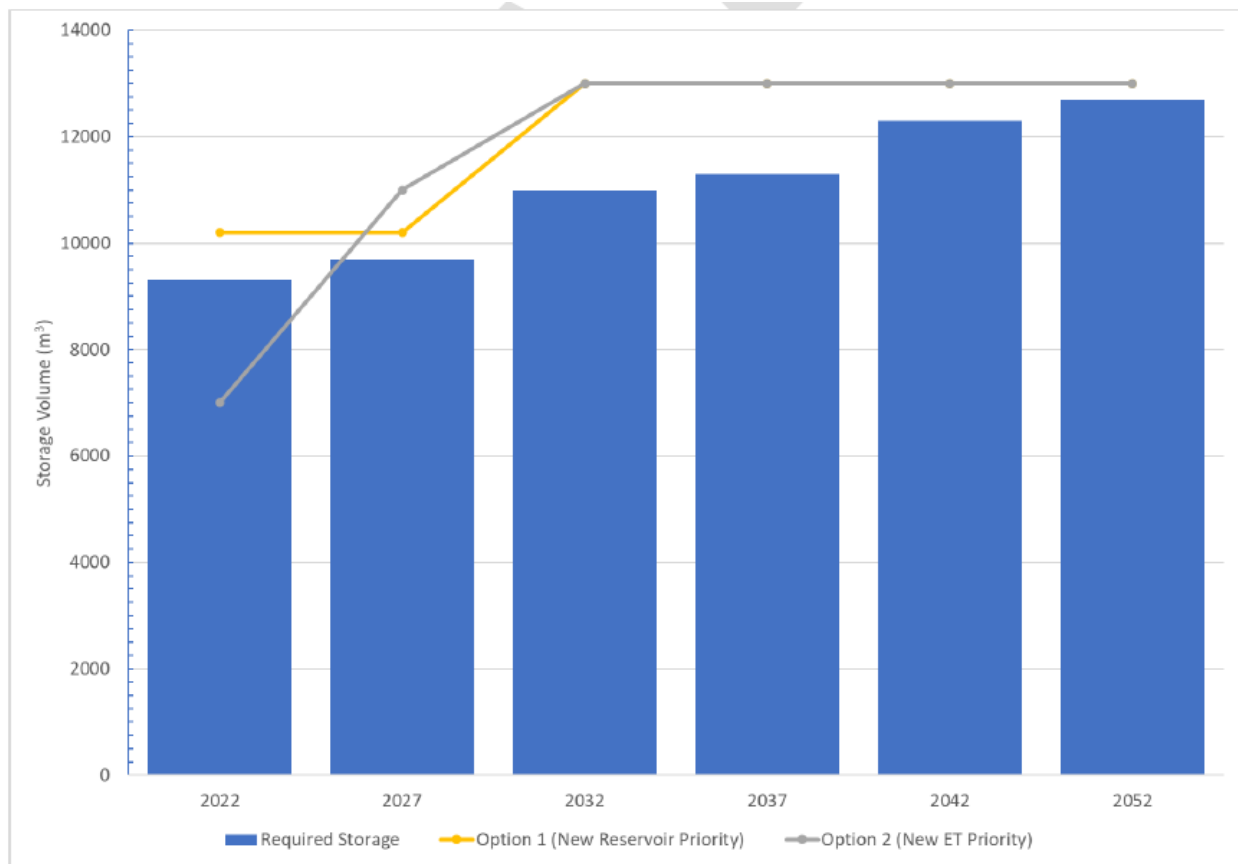


Figure 1 – Proposed Storage Phasing

Note: For illustrative purposes, storage requirements are reflective of the planned growth for the subsequent years between bars and are shown in advance of the development occurring for conservative planning reasons. For example, the 2022 storage requirement is based on growth forecasted to occur up until 2027.

In order to accommodate the proposed change in servicing strategy, the timing of the two discussed projects have been revised in the 2023 Rate Supported Capital Budget with the underground reservoir project scheduled to be completed first followed by the standpipe replacement project.

Timeframe:

Upon approval of the 2023 Rate Supported Budget, procurement of engineering services to support Municipal Class Environmental Assessment (MCEA) study and design work for the proposed north reservoir expansion will be initiated. Upon completion of the MCEA study and in parallel with the design work, staff will engage in the property acquisition process in order to acquire additional lands around the existing facility to facilitate the reservoir expansion.

It is anticipated that all land acquisition, approvals, and design work will be completed midway through 2024 and that the project will be ready to tender for construction later that year.

Construction of the 6,000 m³ reservoir expansion is anticipated to take approximately 16 months. Based on these milestones, the Caledonia north reservoir expansion project is anticipated to be completed by the spring of 2026.

Estimated Cost:

North Reservoir Expansion project: \$8,729,000

- Fully funded from Development Charges debt

New South Elevated Tank and Standpipe Decommissioning: \$8,025,500

- Funded from Development Charges debt, Canada Community-Building Fund (CCBF, formerly Federal Gas Tax), and the Capital Replacement Reserve Fund (CRRF-Water)

Budget Impact:

Staff have reviewed the budget impacts and have incorporated the funding requirements to the 2023 Rate Supported Capital Forecast.

- **Development Charges:** Adjusting the timing of these two projects impacts when the County will issue the related debt, and thus changing the time available to receive development charges required to pay off this debt.
- **Canada Community-Building Fund (CCBF):** The New South Elevated Tank and Standpipe Decommissioning includes a portion funded from CCBF which has funding agreement requirements that must be met in order to remain compliant.
- **Capital Replacement Reserve Fund (CRRF-Water):** Shifts in the use of CRRF-Water must be monitored and managed to ensure adequate funds are available to meet asset replacement needs.

Operating Cost Impacts:

There may be a slight increase in operating costs over time that are associated with operating and maintaining a larger reservoir.

Impact on other Projects:

These projects are closely related to the Caledonia Booster Station (reservoir pumping station) Upgrades project and the 450 mm Water Main Twinning on Highway #6 from the Caledonia Booster Station to Greens Road, that are both identified in the 10 year forecast of the 2023 Rate Supported Capital Budget and are planned to be initiated in 2026.

Impact on Staff Workload:

The project support and management for this initiative has been identified and accommodated within the Water and Wastewater Engineering 2023 staffing work plan.