Schedule 'C' Class Environmental Assessment Study New Supplementary Water Supply Source for the Palgrave – Caledon East Drinking Water System

Virtual Public Information Centre #1

Monday, May 23, 2022 to Friday, June 10, 2022



- The Region of Peel is undertaking a Municipal Class Environmental Assessment Study to identify infrastructure upgrades required to the existing Palgrave – Caledon East Drinking Water System.
- The objectives of this Virtual Public Information Centre #1 are:



Introduce the project and the reasons why it is being undertaken



Present the decision-making process and preliminary options



Provide an opportunity for the public to get involved in the project

We need your feedback!

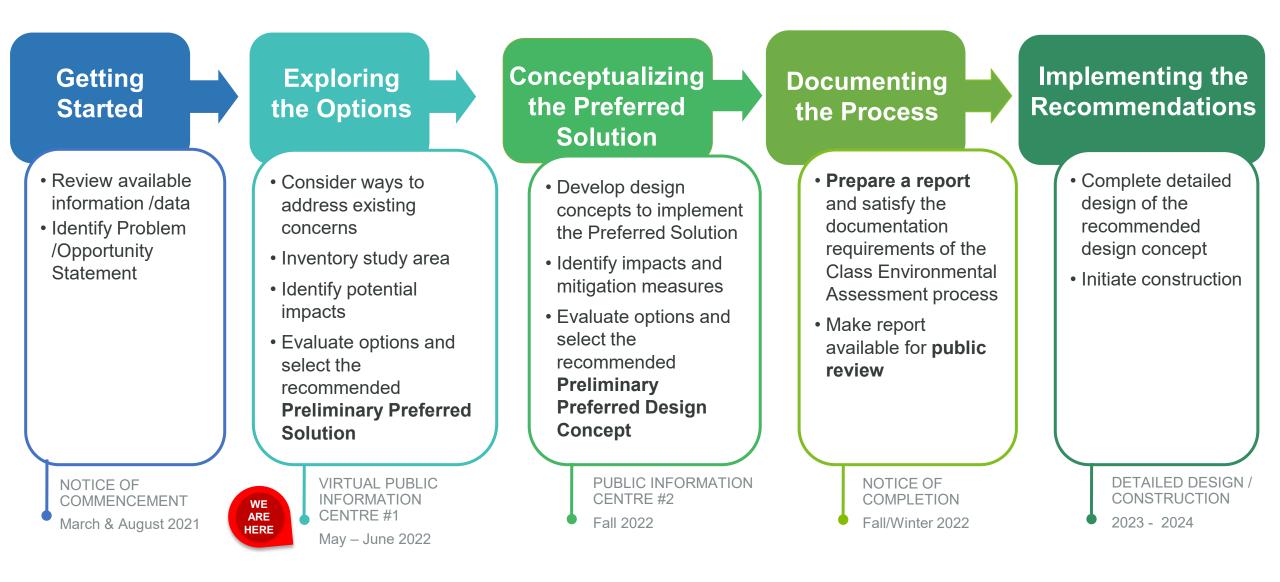
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Your feedback is important to this Class Environmental Assessment Study! Please review all materials on the webpage to learn about the process, the activities completed to date, and the **Preliminary Preferred Solution recommended for further examination.**

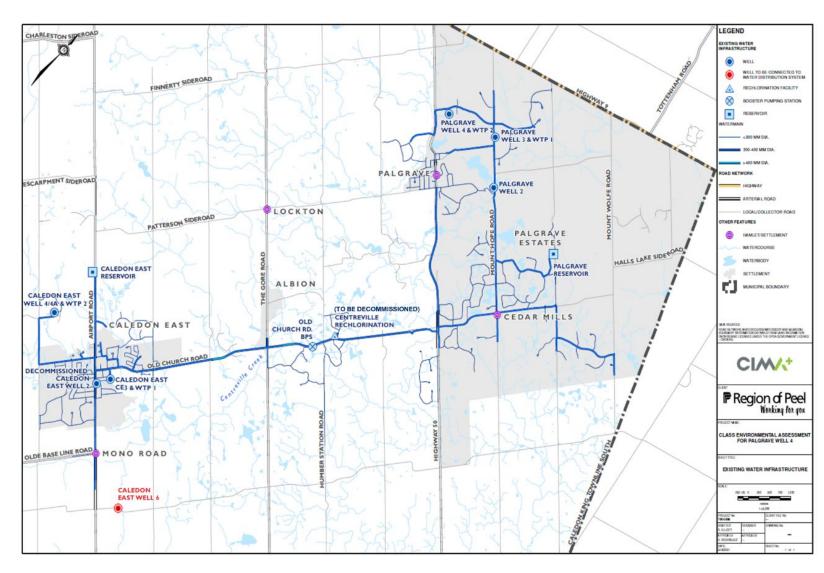
Your opinion is important to us! Members of the project team are available to answer questions via email or telephone.

Please complete the **Online Comment Form** after reviewing the materials.

Municipal Class EA Process and Timeline



- A **groundwater-based** system owned and operated by the Region.
- It supplies drinking water to the communities of Caledon East, Palgrave, Palgrave Estates, Mono Road, Albion, Centreville, and Cedar Mills.
- Major components:
 - 6 municipal groundwater wells (3 in Caledon East, 3 in Palgrave).
 - 4 treatment plants (2 in Caledon East, 2 in Palgrave).
 - 2 water storage facilities and 2 booster pumping stations.
 - An interconnected watermain allowing conveyance of treated water from Caledon East to Palgrave and vice versa.



Serviced Population and Water Demands		Existing	Future	
	People	~12,000	~18,000	
	Max. Day Demands (L/s)	105	~200	

	I Supply Capacity - All 6 wells from grave and Caledon East	Existing
ľ	Total Capacity (L/s)	204
ļ	Available Capacity (L/s) (assumes 15% reserve capacity)	173

- The total available supply capacity of the existing wells cannot satisfy the future system demands.
- A few municipal wells have experienced a decline in efficiency due to changes in aquifer pressure.
- There is a need to increase the system supply capacity and improve the security of supply to meet the long-term needs.

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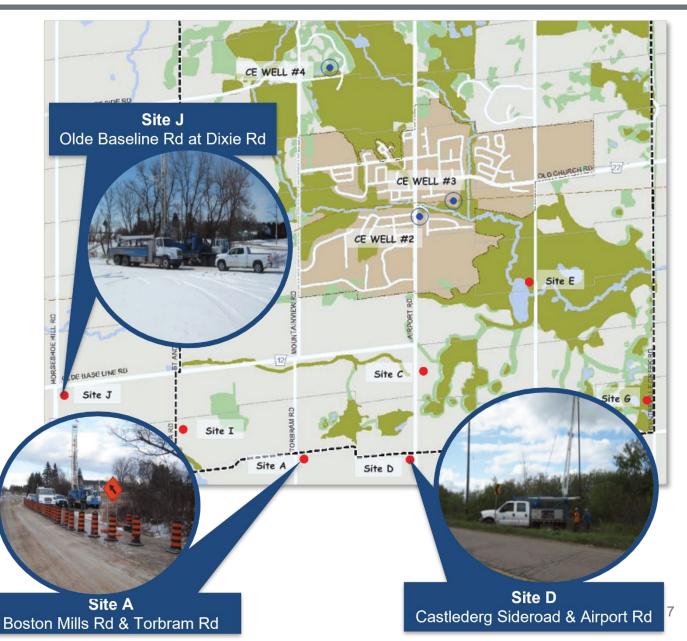
Study Context – Groundwater Exploration Program

- A Groundwater Exploration Program was undertaken in 2019 to find an additional new source of water supply in the Caledon East area.
- 10 possible sites were identified and ranked in order of drilling sequence. Three (3) test wells were drilled at the most promising sites (Sites A, D and J) to assess viability for a new permanent groundwater municipal supply source.

Key Findings:

- Site A produced limited quantity of water.
- Site D revealed favorable aquifer conditions with high water quality and sufficient quantity. A Test Well at site D (TWD) was developed about 2,000 metres east of Airport Road, north of Castlederg Road.
- Site J No water encountered.
- An aquifer performance test was conducted on **TWD** to assess aquifer sustainability, potential interference with surface and groundwater sources including domestic wells and identify treatment requirements.

Test results confirmed viability and sustainability of a new production well.



Study Context – Construction and Testing of New Well

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- A new production well Caledon East #6, CE6, was constructed and tested in 2019/2020 on the TWD site – east of Airport Road, north of Castlederg Sideroad.
- Long-term aquifer performance test and monitoring included:
 - 23 groundwater and surface water monitoring stations: 2 observation wells, 6 surface water locations, 14 domestic wells, and CE6.



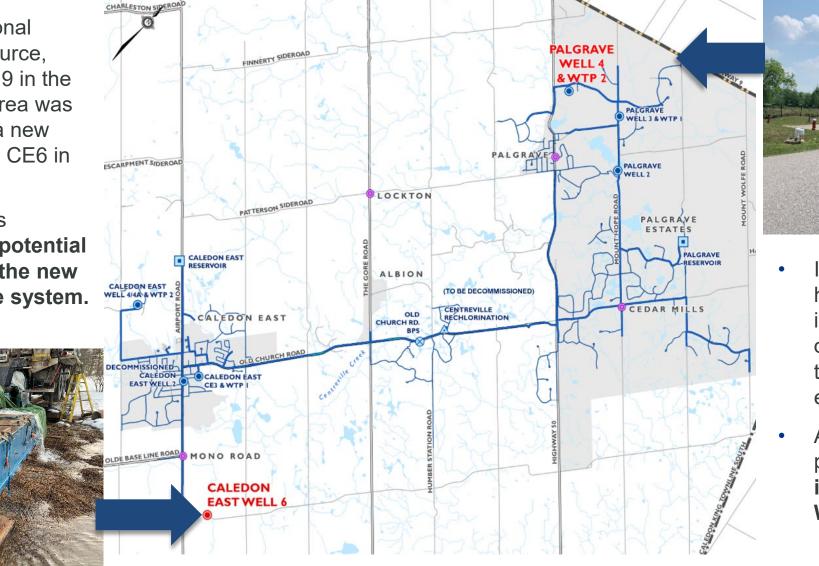
Key Test Findings:

- CE6 can sustainably produce 50 L/s for extended periods without interference to existing domestic wells or surface water features in the area.
- CE6 is a true Groundwater source, not Under the Direct Influence of surface water (Non-GUDI).
- CE6 raw water requires only treatment for disinfection



Enhancing Security of Supply in the System

- The new additional groundwater source, identified in 2019 in the Caledon East area was converted into a new production well, CE6 in 2020.
- This Class EA is addressing the potential connection of the new well CE6 to the system.





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- In 2020, a hydrogeological investigation identified an opportunity to increase the capacity of the existing Palgrave Well #4.
- A separate Class EA to plan for the capacity increase of Palgrave Well #4 is ongoing.

Service Water Needs	Additional water supply is needed to meet the desired levels of service and long-term water needs of the Palgrave – Caledon East Drinking Water System.
Impact from operation of the New Supply Well CE6	Testing and monitoring of new production well, CE6, has demonstrated that the new well can sustainably produce 50 L/s for extended periods. No interference to existing domestic wells or surface water features in the area are anticipated from long-term well operation.
Water Treatment	Water from the new well CE6 will require treatment for disinfection to meet provincial requirements for a municipal water source. Connection of the new supplementary supply well CE6 to the existing Palgrave – Caledon East Drinking Water System is necessary.
What's Next?	The Region is undertaking this Class EA study to evaluate alternatives and select the preferred solution. 10

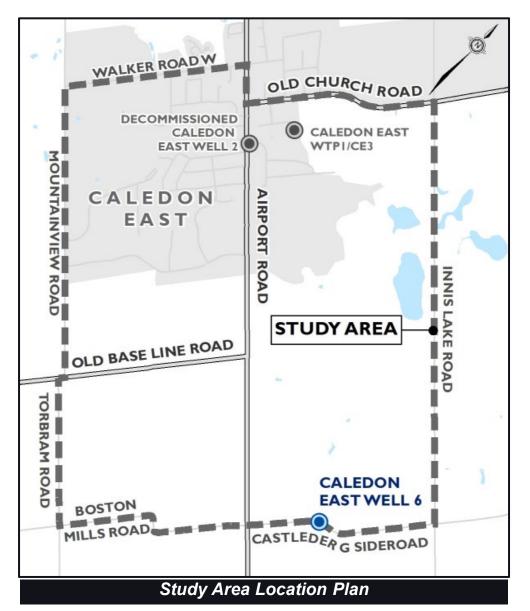
Infrastructure improvements to the Palgrave / Caledon East Drinking Water System are required to:

- Increase supply capacity and enhance the security of water supply.
- Minimize potential risks associated with declined well efficiency.
- Provide an appropriate level of service while meeting the long-term water needs of the serviced area.

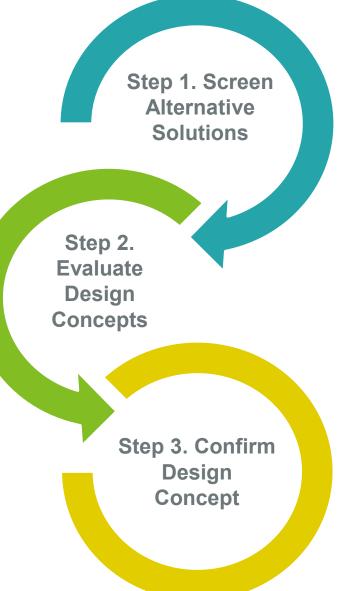
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Class EA Objective and Study Area

To evaluate and identify the necessary upgrades/modifications to the Palgrave – Caledon East Drinking Water System required to enhance the security of water supply through addition of the new supplementary water supply source, CE6.



Selecting the Preferred Solution – The Process



1. Identify and Screen Alternative Solutions

- Alternatives to address the Problem/Opportunity Statement were identified and screened against "must-meet criteria":
 - ✓ Potential contribution to a water supply increase
 - ✓ Ability to meet drinking water standards, policies and permitted land uses in the area
 - Compatibility with existing infrastructure
 - ✓ Ability to balance benefits and costs relative to other options
- Alternatives that met the criteria were developed further; all others were eliminated. A Preliminary Preferred Solution was selected for further evaluation. Step 1 results are shown in the next panels.

2. Identify and Evaluate Design Concepts

- The Preliminary Preferred Solution will be developed into design concepts and evaluated against a range of criteria to maximize benefit and minimize impacts to:
 - ✓ Technical and Operational
 - ✓ Natural Environmental
 - Community / Social
 - ✓ Cost

3. Confirm Preferred Design Concept

- A Preferred Design Concept will be selected through a detailed evaluation process.
- Steps 2 and 3 will be completed in the next phases of the Class EA study. Results to be presented at PIC#2.

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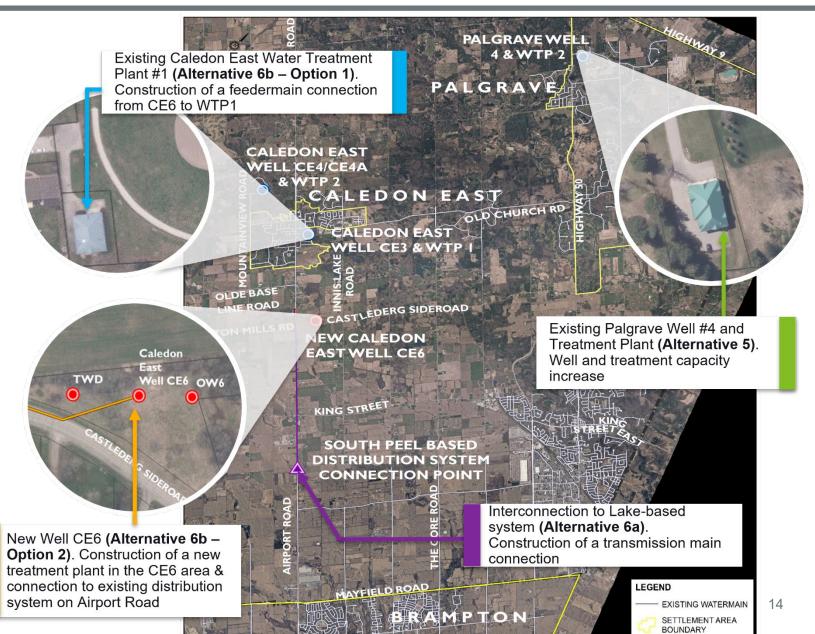
Step 1 – Identification of Alternative Solutions

Alternatives

- 1. Do Nothing Status quo. No changes to existing system
- 2. Limit Community Growth to the extent of the existing capacity in the system
- 3. Reduce Water Demands through water conservation measures
- 4. Improve Operation and Maintenance of Existing Supply Wells
- 5. Obtain Additional Supply Capacity from an Existing Source Palgrave Well #4 has potential for water taking increase
- 6a. Obtain Additional Supply Capacity from another Source – through an interconnection to the Region's Lake-based system

6b. Obtain Additional Supply Capacity from another Source – through a connection to the new well on Caledon East, CE6

- Option 1 Connect CE6 to existing Water Treatment Plant #1 on Caledon East
- Option 2 Connect directly to existing distribution system after on-site treatment



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Step 1 – Screening of Alternative Solutions

Eliminated – Not Recommended

Options do not address limitations identified with the redundancy of supply and/or projected growth.

1. Do Nothing

2. Limit Community Growth

3. Reduce Water Demands

6a. Obtain Additional Supply Capacity from Region's South Lake-based System

Feasible, Recommended for Implementation in Conjunction with Preferred Solution

Options alone cannot fully address the existing supply limitations. Not recommended as stand-alone solution. Recommended for implementation in combination with preferred solution.

4. Improve Operation and Maintenance of Existing Supply Wells

5. Obtain Additional Supply Capacity from existing Palgrave Well #4

Feasible, Recommended for Further Consideration

Options were short-listed, developed and assessed further.

6b. Obtain Additional Supply Capacity from new well CE6

- Option 1 Connection to existing Water Treatment Plant #1 on Caledon East
- Option 2 Connection to existing distribution system after on-site treatment

Alternative Solutions considered feasible and recommended for implementation in **Combination with Preferred Solution**:

- Alternative 4. Improve Operation and Maintenance of Existing Supply Wells
 - Region will continue implementing activities under its Regional Production Well Management Program.
- Alternative 5. Obtain Additional Supply Capacity from an Existing Source, Palgrave Well #4
 - ✓ The water taking increase from the Palgrave Well #4 is being reviewed through a separate Class EA Study.

Alternative Solutions short-listed and recommended for **further development and assessment**:

- Alternative 6B. Obtain Additional Supply Capacity from New Well CE6
 - ✓ Option 1 Connect CE6 to existing Caledon East Water Treatment Plant, WTP#1
 - Option 2 Connect CE6 directly to existing distribution system after on-site treatment

6B Option 1 Connect CE6 to existing Caledon East WTP #1



Option 1 – Additional Supply Capacity through a connection between new Well CE6 and existing Caledon East Water Treatment Plant #1 (WTP #1). Raw water to be treated at WTP #1.

Key Components:

- New well CE6, with a supply capacity of 50 L/s, is located on Town of Caledon property.
- Wellhead protection areas (WHPAs) for new well CE6 need to be delineated. Source water protection policies will apply to WHPAs.
- Potential raw water pipeline routes between CE6 and WTP1 were identified within the study area (*see adjacent map*):
 - ✓ Route 1A 3.7 Km
 - ✓ Route 1B 4.1 Km
 - ✓ Route 1C 3.8 Km
 - ✓ Route 2A 3.8 Km
 - ✓ Route 2B 5.5 Km
 - ✓ Route 3A 6.3 Km
 - ✓ Route 3B 7.4 Km



6B Option 2 - Connect CE6 to existing Distribution System

Option 2 – Additional Supply Capacity through a connection between new Well CE6 and existing distribution system. Raw water to be treated at a new treatment plant, to be built in the vicinity of CE6.

Key Components:

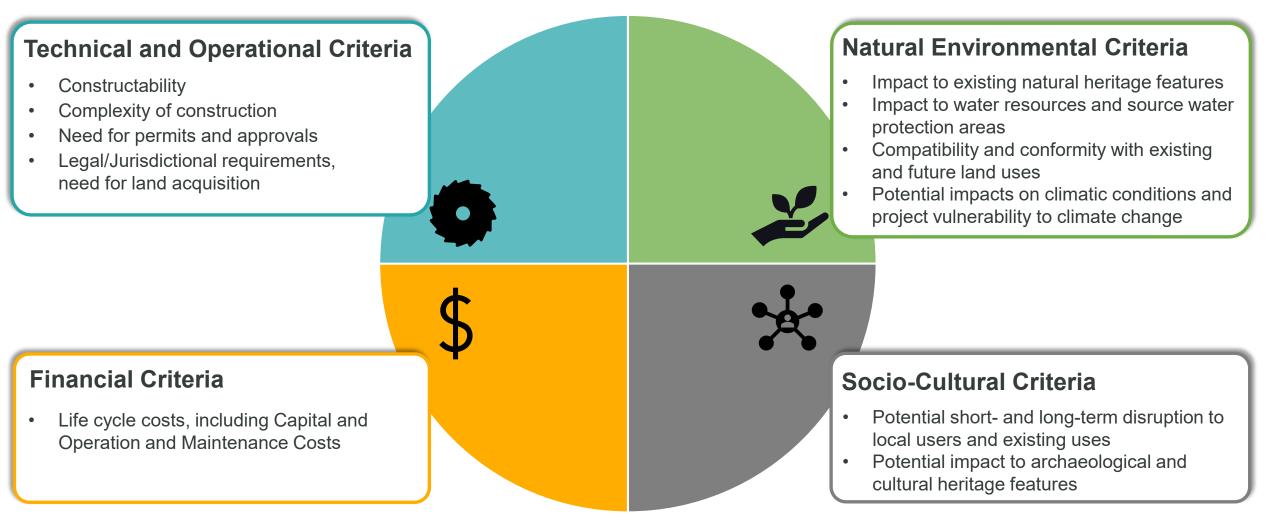
- New well CE6, with a supply capacity of 50 L/s, is located on Town of Caledon property.
- Wellhead protection areas (WHPAs) for new well CE6 need to be delineated. Source water protection policies will apply to WHPAs.
- New treatment plant for treatment of CE6 raw water. Potential areas for new plant were identified near CE6 (*see adjacent map*). Property acquisition is necessary to accommodate the new plant.
- Approximately 1 km feedermain between New treatment plant and distribution system on Airport Road.



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Evaluation Criteria

Evaluation criteria were developed to assess alternatives. All criteria have been weighed equally. The criteria below will be updated, as necessary, based on your input from this Virtual Public Information Centre and used to evaluate the design concepts.



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Alternatives are assessed relative to each other, and assigned a score based on potential net impact and available mitigation measures. Scores are based on the following scoring approach:

Potential impacts are significant, implementation of substantial mitigation measures are required. Risk cannot be completed eliminated.	Potential impacts are major, implementation of extensive mitigation measures required to reduce/eliminate risks.	Potential impacts are moderate, implementation of many mitigation measures required to reduce/eliminate risks.	Potential impacts are minor and can be easily mitigated through implementation of standard mitigation measures.	Potential impacts are negligible, no mitigation required.

Least Preferred

Most Preferred

The following desktop studies have been undertaken to inventory existing conditions, inform the evaluation of alternatives and provide input into identification of impacts and mitigation measures:



- **Baseline Natural Features Assessment**
- Hydrogeological Assessment



Geotechnical Study



Stage 1 Archaeological Assessment



Cultural Heritage Assessment

Traffic Assessment



Source Water Protection Update

A summary of existing conditions and key findings from major desktop studies are provided in the next slides.

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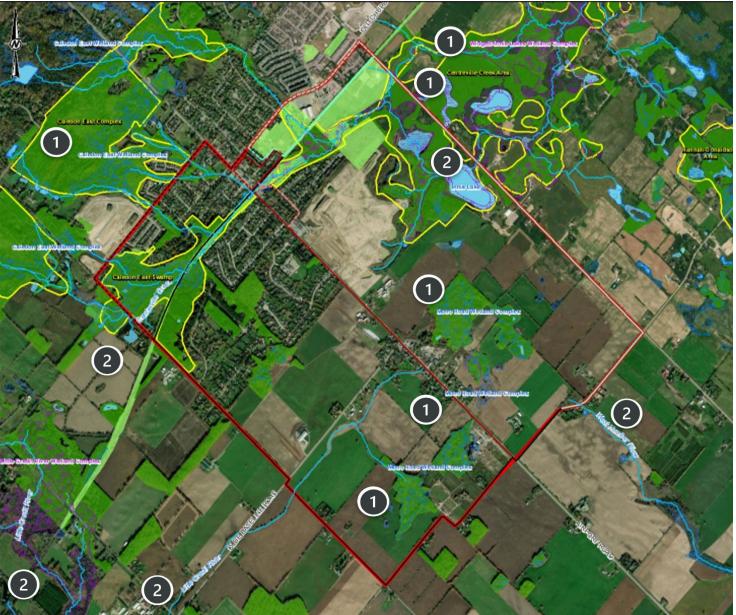
Baseline Natural Feature Conditions

- Most of the study area is classified as agricultural land with pockets of developed urban areas in the north and central portions.
- Northern portion of the study area within the Oak Ridges Moraine Conservation Plan area. Southernmost portion of the area – around Boston Milles Rd and Castlederg Rd, within the Greenbelt Plan area.
- Areas south of Old Baseline Road and along Innis Lake Road designated as part of the Natural Heritage System.
- Key features:

3

- wetlands/woodlands and associated wildlife habitats
- Surface water features and associated fish habitats

Potential for occurrence of Species at Risk within study area – to be confirmed through field investigations



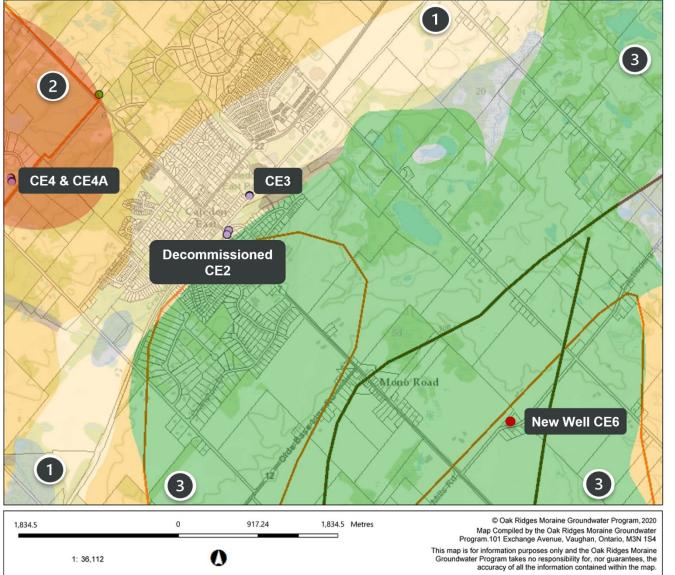
Hydrogeology and Geotechnical Conditions

- Study area is located within the Credit and Humber River watersheds.
- The bedrock valley, part of the buried Laurentian River Valley, traverses the study area west to east.
- Presence of three (3) sand and gravel aquifers in the area:
 - **Caledon East Meltwater Channel** well depths relatively shallow (40m). Challenging dewatering concerns.
 - **Granite Stones** Well depths relatively shallow (55m) with historically significant flow rates (30 L/s). Potential flowing conditions.
 - **Buried Bedrock Valley** Deep, confined and relatively well protected aquifer. Aquifer for new well CE6.
- Surface soil conditions generally suitable for conventional construction.

2

3

• Several private wells in the study area. Any impacts from construction to be assessed.



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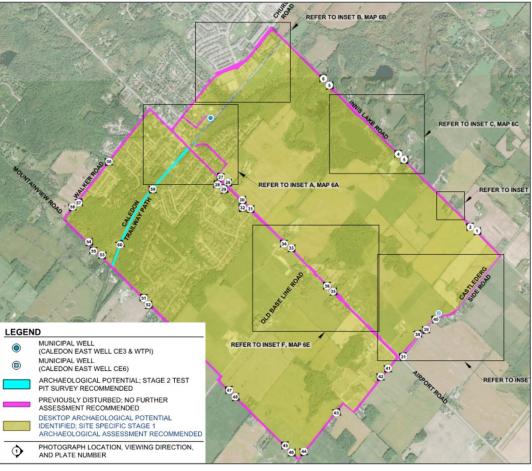
Cultural Heritage and Archaeological Conditions





Cultural Heritage

- Some properties and parcels in the area listed in the Municipal Register with potential for cultural heritage.
- Cultural Impact Assessment to be completed.



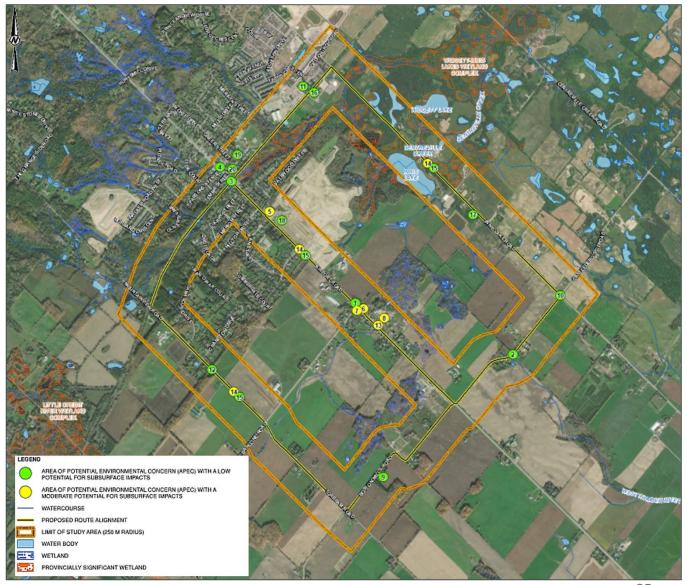
Archaeology

- Major corridors free from archaeological potential ٠
- Areas that retain archaeological potential will undergo further investigation if future work is to ۲ occur in the vicinity

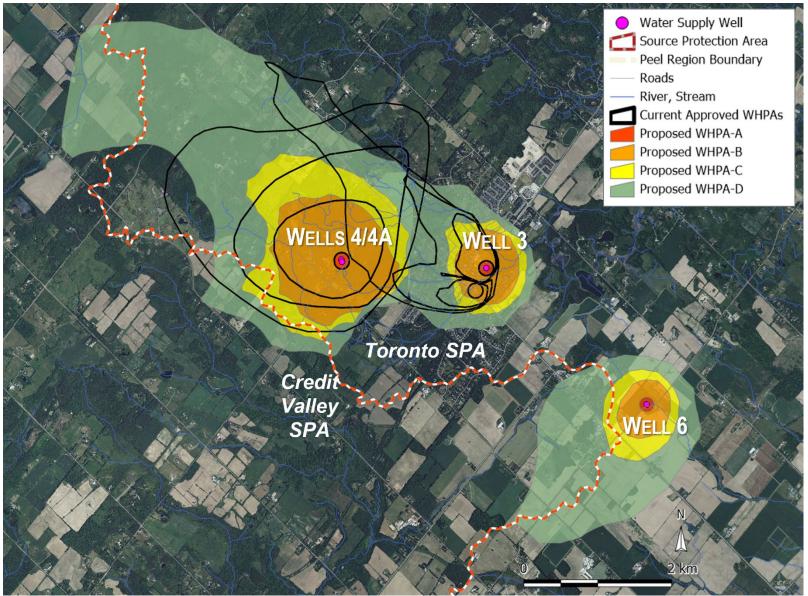
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Contamination Overview Study

- The following potential sources of environmental contamination were identified within the study area based on current and historical land usage:
 - ✓ 2 gas stations, 1 potential dry cleaner, 2 automobile salvage facilities, 1 vehicle repair facility and former railway tracks.
 - Several properties with a former or current private and retail fuel tanks onsite.
 - ✓ 6 historical orchards contamination potential by pesticides.
- Additional investigation recommended if future work is proposed in the vicinity of these areas.



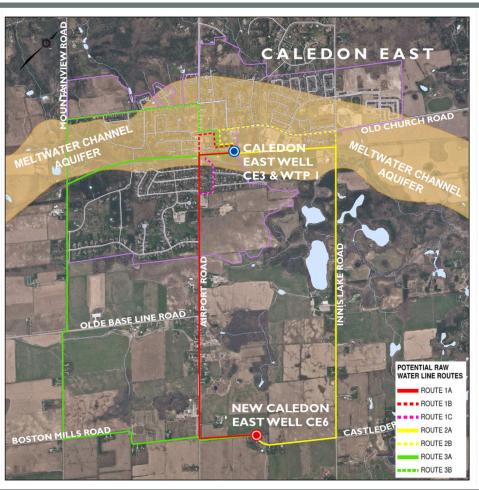
Source Water Protection Update / Wellhead Protection Areas



- CE6 is a new proposed water supply well in Caledon East.
- Wellhead Protection Areas (WHPAs) allow the Region to protect the short and long-term quality of the drinking water sources based on local policies outlined in <u>https://ctcswp.ca/</u>.
- WHPAs are created using a mathematical model that predicts the movement of groundwater from its source area to a municipal drinking water well.
- WHPA shape changes as new subsurface data are collected (e.g., thickness and continuity of aquifers) or as the future municipal pumping rates change, or future water supply wells change.
- DRAFT limits of WHPAs have been delineated (*see adjacent map*) for CE6.

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Option 1 – Connect CE6 to existing Caledon East WTP#1



Common to all Raw Water Pipeline Routes:

- Construction of new treatment plant is eliminated. Upgrades to the existing plant would be necessary.
- Major disturbance and challenges with Centreville Creek crossing.
- Major technical complexity, longer project duration from crossing of Meltwater Aquifer. Significantly higher design and construction costs.
- Crossing of highly vulnerable aquifers and groundwater recharge areas.

Key Advantages and Disadvantages

Routes 1A, 1B and 1C

- ✓ Shortest pipeline (~4 Km)
- Major dewatering challenges with crossing of Meltwater Aquifer.
 Route 1A has higher impact due to longer crossing.
- Major congestion of underground infrastructure on Airport Road near Caledon East Village.
- Disruption to recreational activities along Trailway Path. Route 1B avoids such impacts.
- Significant traffic impacts along Airport Road. Traffic control management plan to be implemented.
- Sew creek crossings to be accommodated through trenchless installation methods.

Routes 2A and 2B

- ✓ Moderate pipeline length (4 5 km)
- ✓ Reduced conflict with underground utilities on Innis Lake Road.
- ✓ Reduced traffic impacts on Castlederg and Innislake Roads
- Major dewatering challenges with crossing of Meltwater Aquifer and Innis Lake. Route 2A has higher impact due to longer crossing.

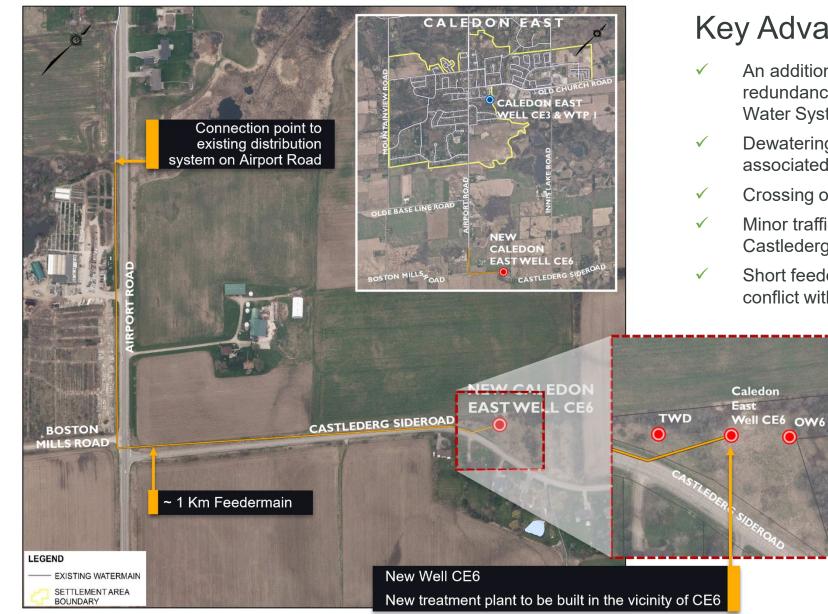
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- ⊗ Disruption to recreational activities along Trailway Path. Route 2B avoids such impacts.
- ⊗ Multiple creek crossings to be accommodated through trenchless installation methods.
- Opportunity to service Innislake Road is outweighed by associated costs of two separate lines (raw and treated water)

Routes 3A and 3B

- ✓ Reduced conflict with underground utilities on Torbram/Mountanview Road
- Reduced traffic impacts along Castlederg and Torbram /Mountanview Road. Traffic control measures required along Walker Road West due to increased traffic volume and overhead utilities.
- ⊗ Longest pipeline (6 7 Km)
- ⊗ Major dewatering challenges with crossing of Meltwater Aquifer. Route 3A has higher impact due to longer crossing.
- Solution Section 2018 Sectio
- Multiple creek crossings to be accommodated through trenchless installation methods.

Option 2 – Connect CE6 to existing Distribution System



Key Advantages:

- An additional treatment facility improves security and redundancy of the entire Palgrave - Caledon East Drinking Water System.
- Dewatering challenges and technical/construction costs associated with crossing of Meltwater Aguifer are eliminated.
- Crossing of key natural and hydrologic features is avoided
- Minor traffic impacts resulting from feedermain installation on Castlederg Sideroad and section on Airport Road.
- Short feedermain length (1 Km) reduces project cost and conflict with underground infrastructure.

A

Key Considerations:

Property acquisition for new water treatment plant. Consultation with private property owners to be undertaken as part of the study.

Possible areas for new water treatment plant in proximity to TRCA regulated areas. Additional investigations will be required to confirm extent of regulated areas and any limitations / design considerations.

Alternatives were assessed relative to each other against the 4 groups of criteria. Scores were assigned to reflect advantages/disadvantages and the anticipated impact on existing features, with the following results:

Least Preferred



Option 1 – Connect CE6 to existing Caledon East WTP#1 through Route 1A	Option 1 – Connect CE6 to existing Caledon East WTP#1 through Route 1B	Option 1 – Connect CE6 to existing Caledon East WTP#1 through Route 1C	Option 1 – Connect CE6 to existing Caledon East WTP#1 through Route 2A	Option 1 – Connect CE6 to existing Caledon East WTP#1 through Route 2B	Option 1 – Connect CE6 to existing Caledon East WTP#1 through Route 3A	Option 1 – Connect CE6 to existing Caledon East WTP#1 through Route 3B	Option 2 – Connect CE6 to existing Distribution System
					Preliminary Preferred – Recommended		

Recommended for further investigation

Preferred Recommended Alternative Solution



Potential Location for New Water Treatment Plant

- Potential areas for the New Water Treatment Plant have been identified (as shown in the map) with consideration to the following criteria:
 - Proximity to the location of the raw water source (New Well CE6) and area to be serviced
 - ✓ Proximity to existing infrastructure
 - Land uses
 - Suitability of soil and subsurface conditions
 - Susceptibility of the site to flooding (floodplain areas)
 - Potential to minimizing adverse environmental impacts during both construction and operation.
- Lands in the immediate vicinity of the New Supply Well CE6 are currently vacant.
- Opportunities for property acquisition of these lands will be explored in the next steps of the study.
- Floodplain area limits will be confirmed through modelling to identify areas available for development. Consultation with conservation authority (TRCA) currently underway.



New Water Treatment Plant Site will comprise:

- Treatment / pumping / control building Approximate building footprint 10m x 15m.
- Underground piping including connection to new supply Well CE6 and distribution system.
- Access driveway
- Buffer zones

Typical Regional Water Treatment Facilities

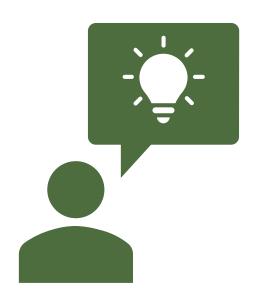


Palgrave Wells #2 & #3 Water Treatment Plant Palgrave Well #4 Water Treatment Plant

Alton Wells #3 & #4 Water Treatment Plant

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What Are We Doing Next?



- Feasibility of acquiring property for the new treatment plant will be assessed through land acquisition process. Discussions with private property owners will be initiated.
- Field investigations on feasible area(s) for new treatment plant will be completed.
- Preliminary site layouts will be conceptualized to show location of major infrastructure. Design concepts for the new treatment plant will be developed to reflect options for treatment and establish building/site footprint requirements.
 - Design concepts will be evaluated in detail against the criteria shown in Slide 19.
 - ✓ The design concept that scores the highest will be selected as Preliminary Preferred and recommended for implementation.
- Results from these activities, including the Preliminary Preferred Design Concept will be presented at a second Public Information Centre for review and feedback.



Thank you for Participating!

After the virtual PIC, the Project Team will:

- Review and consider input received during the virtual Public Information Centre #1.
- Confirm the recommended preferred Alternative Solution: Alternative 6B, Option 2: Obtain Additional Supply Capacity through a connection to the New Well CE6. Connect directly to existing distribution system after on-site treatment.
- Initiate Property Acquisition Process.
- Continue with the next phases of the study and hold Public Information Centre #2.

Stay Involved!

Please complete the **Online Comment** Form available on the webpage by Friday, June 10, 2022



For more information about this project, please visit our webpage:

https://www.peelregion.ca/publicworks/environmentalassessments/caledon/revised-project-name.asp

 Should you have any questions or comments at any time during the project, please contact:

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