Welcome!

Regional Water System Upgrades in Cambridge and North Dumfries
Public Consultation Centre 3
Virtual Public Consultation Centre

December 9th, 2020
Welcome!

The goals of this virtual Public Consultation Center

**Timeline**

- **December 9th, 2020 –** Presentation, video, and transcript posted
- **December 9th, 2020 to January 8th, 2021 –** Question, comment, and survey submission period

**Learn about what has been completed in support of this Study.**

**Provide input on the preliminary preferred recommendations.**

**Answer any questions you may have about the Study and its recommendations.**
The Regional water system upgrades in Cambridge and North Dumfries

**BLAIR ROAD WELLS**
Wells G4 / G4A are the only supply wells located within the study area.

**ST. ANDREWS PUMPING STATION AND TANK**
The St. Andrews Pumping Station supplies water needed for the study area by increasing the pressure from the neighbouring area of the water system.

**INVERNESS WATER TOWER**
The Inverness Elevated Tank provides storage for the study area and helps to maintain pressure.

**WATERMAINS**
Watermains are located underground throughout the study area to transfer water to your homes and businesses.
Future considerations for the water system components

Water system improvements to meet the community’s future water needs.

Supply and treatment

Q: How can the existing Blair Road Wells be managed sustainably to meet future needs?

St. Andrews Pumping Station and Tank

Q: What improvements are needed?

Water storage

Q: Where will a new water tower go?
Q: Do we need the existing Inverness Water Tower?

Watermains

Q: Where will new watermains go?
This project is following the Class Environmental Assessment process, which is a decision making process that all Ontario municipalities follow for building new infrastructure.

**Provincial process**

**Background Information Review**
- Collect and review data.
- Identify problem / opportunity.

**Public Consultation Centre 1**
- Introduce the project.

**Screening water tower sites**
- Review long list of options.
- Identify short list for detailed evaluation.

**Develop evaluation criteria**
- Identify criteria for detailed evaluation.

**Develop water tower and water supply options (Wells G4 / G4A)**
- Short list of options.
- Site visits and investigations.
- Review of advantages and disadvantages.

**Public Consultation Centre 2**
- Obtain input on evaluation criteria and options.

**Evaluate water tower and water supply options**
- Assign scores for options.
- Identify preferred options based on evaluation.

**Recommend system upgrades to support preferred option**
- Identify new / replacement watermains.
- Determine St. Andrews Pumping Station upgrades.
- Confirm future use of Inverness Water Tower.

**Public Consultation Centre 3**
- Obtain input on recommendations.

Waterloo Region Council
Steps for identifying the preferred option

How the Study identified the preferred water system upgrades servicing your community in the future.

A preferred option for a new water tower and the future water supply was selected.

This was done in two steps:

a) Screening the long list of water tower locations
b) Detailed evaluation of short listed water tower locations and water supply options (Wells G4 / G4A)

Upgrades to support the preferred new water tower and water supply option have been identified.

New watermains and upgrades at the St. Andrews Pumping Station are needed to make sure the different parts of the water system work well together. Options for these components were identified and evaluated based on the preliminary preferred water tower and water supply recommendations.
What was done to help identify the preferred options

| Technical analysis | • Condition assessment of existing facilities  
|                    | • Growth and demand analysis  
|                    | • Hydraulic modelling  
|                    | • Site visits  
|                    | • Operations and stakeholder consultation  
| Hydrogeological assessment | • Field program  
|                            | • Water budget assessment for Clean Water Act  
|                            | • Well head vulnerability analysis  
|                            | • Final analysis and report  
|                            | • Preparation of Category 3 Permit to take Water (PTTW) application  
| Archaeological investigation | • Desktop of study area  
|                             | • Field investigation of water tower areas  
|                             | • Stage 1 Archaeological Report  
| Natural heritage | • Desktop of study area  
|                  | • Field investigation of water tower areas  
|                  | • Natural Heritage Existing Conditions Report  
| Cultural heritage | • Desktop of study area  
|                   | • Cultural Heritage Assessment Report  
|                   | • Shadow analysis and 3D rendering  
| Geotechnical assessment | • Field investigation of preliminary preferred water tower area  
|                        | • Geotechnical Assessment Report
How the water tower and water supply options were evaluated

Criteria scoring

The short listed water tower sites and water supply options were evaluated according to the criteria shown below, with each category of criteria being considered equally. The highest score identifies the preferred option.

Environmental factors
- Protects environmental features.
- Protects wildlife and species-at-risk.
- Protects groundwater and well supplies.
- Minimizes climate change impacts.

Technical factors
- Meets existing and future needs.
- Aligns with existing system and strategy.
- Provides a reliable water supply.
- Minimizes and manages construction risk.
- Aligns with existing and future land use.
- Ability to adapt to climate change.

Financial viability
- Low lifecycle costs.

Social and cultural factors
- Minimizes disruptions to residents related to noise, traffic, and aesthetics.
- Minimizes disruptions to businesses.
- Manages and minimizes construction impacts.
- Protects cultural heritage features.
- Protects archaeological features.
- Minimizes source water protection impacts (G4 / G4A only).

Environmental factors
- Protects environmental features.
- Protects wildlife and species-at-risk.
- Protects groundwater and well supplies.
- Minimizes climate change impacts.
Preliminary recommendations for water tower location and water supply
These options look at where a new water tower will go. A new water tower is needed to provide the recommended amount of water storage for the community.

An area the size of 8-10 residential lots (or the size of this water tower icon ) is needed to support the construction and long term operation and maintenance of a water tower.
Option for new water tower location

Cedar Creek Road

Location: Cedar Creek Road
Municipality: Township of North Dumfries
Surroundings: Gravel extraction pits (existing and future)

Advantages
- Central location would provide the best overall system performance
- Water tower location would require the fewest watermain upgrades
- Lowest expected greenhouse gas production over the lifecycle of the water tower
- Location would minimize disruption and social impacts related to water tower and watermain construction

Disadvantages
- Potential for more complex foundation, site grading, and/or set backs may be needed to manage impacts of adjacent gravel extraction operations
- New trunk watermain would need to be built on Cedar Creek Road
- Additional mitigation measures may be necessary to manage potential impacts to aggregate extraction operations
- Potential impacts to businesses
## Cambridge West Lands Development

**Location:** Blenheim Road  
**Municipality:** City of Cambridge  
**Surroundings:** Within a future residential neighbourhood

### Advantages
- North location would improve system performance from existing conditions  
- Water tower location would require moderate amount of watermain upgrades  
- Moderate expected greenhouse gas production over the lifecycle of the water tower  
- Potential for water tower and watermain construction to be coordinated with development to minimize construction impacts

### Disadvantages
- North location would not provide optimal system operation compared to central location  
- Water tower construction timing would be dependent on development phasing  
- Depending on exact location selected, water tower site may be adjacent to a Provincially Significant Wetland (PSW)  
- Location would be within a future residential neighbourhood, which would require additional setbacks to minimize shadow impacts and would have a greater aesthetic impact to the community  
- Potential impact to businesses
Option for new water tower location

Spragues Road

Location: Spragues Road / St. Andrews Street
Municipality: Township of North Dumfries / City of Cambridge
Surroundings: Existing agricultural with planned or potential for future gravel extraction pits

Advantages

- Location likely to minimize disruptions related to water tower construction
- Potential to locate water tower where impacts to surrounding land uses are minimized
- Potential to minimize impacts to businesses

Disadvantages

- South system location does not improve the overall system performance from existing conditions
- Water tower location would require the most watermain upgrades
- Highest expected greenhouse gas production over the lifecycle of the water tower
- Water tower would be located on a designated Scenic Road and could potentially impact viewshed
- Additional mitigation measures may be necessary to manage potential impacts to aggregate extraction company, existing residential neighbourhoods, and communications tower
## Evaluation of potential new water tower locations

### Technical Factors

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### Overall Ranking

- **Cedar Creek Road**: 1 Most aligned
- **Cambridge West Lands Development**: 3 Least aligned
- **Spragues Road**: 2 Aligned

### Scoring Results

- **Least aligned with criteria**: 1 2 3 4
- **Less aligned with criteria**: 1 2 3 4
- **Somewhat aligned with criteria**: 1 2 3 4
- **Aligned with criteria**: 1 2 3 4
- **Most aligned with criteria**: 1 2 3 4
New water tower

Building and operating the new water tower

- The Region will complete the next steps to acquire land within the preferred location area
- Additional investigations will be completed to support the detailed design for the water tower based on the exact site
- Construction methods will be used to minimize potential environmental impacts
- The site for the new water tower will be designed with space to provide a buffer between the tower and adjacent properties
- An overflow pond will be constructed on site to safely manage and treat any potential water tower overflows

What will be built at the new water tower site?
The new water tower, which will be approximately 40 to 50 meters tall, will be the main structure on the site. The site will also include an overflow pond to manage the site’s runoff or any potential water tower overflows, access road and parking spaces, and fencing and lighting for security.
These options look at how the existing Blair Road Wells can be managed sustainably to meet future needs. Water supply needs for this area of the community are expected to nearly double in the future.
Increase supply from Wells G4/G4A

Location: Dianne Avenue
Municipality: City of Cambridge
Surroundings: Residential neighbourhood backing onto Devil’s Creek

Advantages
• Aligned with Region’s long-term water supply strategy
• Optimizes the operation of local water systems
• Minimal impacts on local groundwater (including existing permitted wells) and surface water features
• Changes to wellhead protection area will not cause new restrictions to existing businesses
• Project phasing could be timed with required major rehabilitation to the existing wellhouse structure and equipment
• Lowest expected lifecycle cost

Disadvantages
• Expansion of existing building would be needed to accommodate new equipment
• Greatest short-term construction impacts (cost and community disruption)
Increase supply from St. Andrews Pumping Station

Location: St. Andrews Street
Municipality: City of Cambridge
Surroundings: Residential neighbourhood

Advantages

- Fewer short-term construction needs compared to increasing supply from Wells G4/G4A (cost and community disruption)

Disadvantages

- Does not align with Region’s long-term water supply strategy to meet future water supply needs
- Operational flexibility of the local water systems would be reduced
- New supply source would need to be found elsewhere in Cambridge
  - New supply source capacity and quality are unknown
  - Future environmental, social, and cultural impacts are unknown
  - Cost for new supply source are expected to be higher than increasing supply at Wells G4/G4A
- Major rehabilitation works to the existing Blair Well Fields wellhouse structure and equipment would still be required
- Highest expected lifecycle cost
# Evaluation of Water Supply Options

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## Overall Ranking

- **1 Most aligned**
  - **2 Aligned**

### Scoring Results

- **Least aligned with criteria**
- **Less aligned with criteria**
- **Somewhat aligned with criteria**
- **Aligned with criteria**
- **Most aligned with criteria**
Increasing supply from Wells G4/G4A

Increasing the pumping rate from Wells G4/G4A will draw more water from the deep bedrock.

Testing indicates minimal impacts to surface water features from increased pumping. Changes in pumping would occur gradually to allow monitoring for:

- Groundwater levels in the bedrock and overburden
- Shallow groundwater levels and stream flow in Devil’s Creek
Increasing the pumping rates will expand the size of the Wellhead Protection Areas (WHPA)

Grand River Source Protection Plan policies could affect how some chemical handling activities occur within WHPA-C (5-year capture zone). Vulnerability scoring, which determines whether policies apply to activities, has been completed to meet the objectives of the EA but will be refined as part of the update to the Grand River Protection Plan.
Completing the second step

Upgrades to support the preliminary recommendations for the water tower location and water supply
Improvements needed at St. Andrews Pumping Station

Status Quo – Do Nothing

- Duty Pump
- Lag Pump
- Diesel Fire Pump

Max Day Demand + Fire Flow

Supply Maximum Day Demand

- Duty Pump
- Lag Pump
- Standby Pump
- Standby Power

Max Day Demand

Supply Maximum Day Demand and Fire Flow

- Duty Pump
- Lag Pump
- Fire Pump
- Standby Power

Max Day Demand + Fire Flow

Recommended Option: Supply Maximum Day Demand

- New pumps sized appropriately for flow and pressure needs based on reconfigured system
- Standby power provided for station as recommended in the Region of Waterloo Water Supply System Standby Power Master Plan
- Fire flow is provided through volume in new water tower

What is Maximum Day Demand? Maximum Day Demand (MDD) is the most amount of water used within a day. MDD is used to estimate the volume of water that is required to supply your community.
Improvements needed at St. Andrews Tank

- **Status Quo – Do Nothing**
- **Remove Standpipe**
- **Modify Existing Standpipe**
- **New Standpipe**

**Recommended Option: New Standpipe**

- Standpipe provides protection from pressure spikes and improves operations
- New standpipe will be sized appropriately for volume and height
- Long term maintenance will be lower for smaller tank
- Timing of new standpipe to optimize the costs of maintaining the existing tank

**What is a standpipe?** A standpipe is a type of water storage tank where the diameter of the tank is the same at the bottom and the top of the tank.
Plan for Inverness Water Tower

A new water tower would mean the existing Inverness Water Tower could be taken down.

- Inverness Water Tower is in need of major rehabilitation
- The size of the existing site makes major tower rehabilitation work project more challenging and costly
- The existing site does not have capacity to support a new water tower or the expansion of the existing water tower
- Recommendation for Inverness Water Tower to be decommissioned and removed once the new water tower is operational
- Region will evaluate post decommissioning site options at a later date

View of the Inverness Water Tower from Oak Hill Drive
Alternative Alignments

Two alignment options have been identified for some watermain connections. The recommended alignment will be determined based on constructability and coordination with planned projects.
Preliminary recommended strategy

**WATER SUPPLY**
Increase supply from Blair Road Wells G4/G4A to 53 L/s

**WATERMAINS**
New and upgraded watermains to support improved system performance and operations

**NEW WATER TOWER**
Proposed new water tower location at Cedar Creek Road

**ST. ANDREWS PUMPING STATION AND STANDPIPE**
Replace pumps to meet flow and pressure needs of reconfigured system. Replace existing standpipe with a new smaller standpipe

**INVERNESS WATER TOWER**
To be decommissioned and removed

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Region of Waterloo, Water Services
www.regionofwaterloo.ca/water

Get engaged and sign up for updates
westcambridge@regionofwaterloo.ca
Schedule for preliminary recommended projects

The implementation timeline to complete the preliminary recommended projects may change as further investigations are completed.

New Water Tower
- **Detailed Design**: 2023 - 2024
- **Construction**: 2025 - 2027

Blair Road Wells (Wells G4/G4A)
- **Detailed Design**: 2022 - 2023
- **Construction**: 2024 - 2025

St. Andrews Pumping Station and Tank
- **Detailed Design**: 2023
- **Construction**: 2023-2024

Inverness Water Tower
- **Demolition Plan**: 2027
- **Demolition**: 2028
Thank you for your participation!

Get Engaged!

We want to hear from you!
Please let us know your thoughts by:
- Filling out an online comment form
- Filling out an online survey (regionofwaterloo.ca/engage)
- Contacting the project team directly

Your feedback regarding the evaluation of alternatives and the preliminary recommendations is important, as it will be incorporated into the final evaluation process and mitigation plan.

Results of the public consultation and final recommendations will be made available as part of the project file anticipated to be available for public input in early 2021.

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Please note that information related to this study will be collected in accordance with the Freedom of Information and Protection of Privacy Act. All comments received will become part of the public record and may be included in the study documentation prepared for public review.