Slide 1 - Welcome!

Hello everyone, and welcome to the Regional Water System Upgrades in Cambridge and North Dumfries Public Consultation Centre Three (3), hosted by the Region of Waterloo as part of a Schedule B Municipal Class Environmental Assessment. My name is Julien Bell and I will be presenting on behalf of GM BluePlan Engineering, the consulting firm selected by the Region to assist with this Study.

Slide 2 - Public Consultation Centre goals

In response to the advice of public health officials to limit in-person gatherings due to COVID-19, this virtual Public Consultation Centre has been developed. The goals of this virtual Public Consultation Centre, are as follows:

- 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

This video is available on the Region of Waterloo website and has been uploaded to the Region’s YouTube channel. A transcript of the presentation narration, a PDF copy of the slides, and the contact information for the Region’s project manager, Nicole Sapeta, can be found on the Region’s project website. If you have any questions or comments on the presentation, please send them to her or complete the online survey located on Engage Region of Waterloo. Any comments should be submitted to the project team before January 8, 2021.

Slide 3 - The Regional Water System Upgrades in Cambridge and North Dumfries

This slide provides an overview of the study area and the key infrastructure elements. The Region of Waterloo, (we’ll now refer to as the Region), and local municipalities work together to supply clean and safe drinking water to residents. The Region is responsible for the supply and transmission of water, which includes, treatment, pumping and storage, while the Cities and Townships are responsible for the distribution of water. The Region is completing this Study to identify potential upgrades to improve water supply within the Cambridge and North Dumfries water system.
The key Regional water facilities within the Cambridge and North Dumfries water systems include the Blair Road Wells located in the north of the study area, the St. Andrews Pumping Station and Tank located in the southeast of the study area, and the Inverness water tower located near the southern limit of the study area.

Slide 4 - Future considerations for the water system components

This Study is the continuation of progressive studies that have identified water system improvement needs for the Cambridge and North Dumfries water systems. The focus of the Study is to confirm the water system improvements needed to meet the community’s future water needs, with the goal to answer the following key questions:

- How will the long-term supply needs be met sustainably? What changes will be made to the existing Blair Road Wells?
- What is needed to meet our long term storage needs? Where will a new water tower go? What will happen to the existing Inverness water tower?
- What upgrades are needed at this location to meet the communities long term needs?
- What new or upgraded transmission watermains are needed to support the new facilities and to meet the communities long term needs?

Slide 5 - Project road map

This study is being completed as a Schedule B Class Environmental Assessment. A Class Environmental Assessment is a decision-making process that all municipalities in Ontario follow for building new infrastructure. This allows you to follow the process and provide opportunities for you to ask questions and provide input.

This virtual Public Consultation Centre is the study’s third (3rd) Public Consultation Centre and focuses on presenting and receiving input on the Study’s preliminary preferred recommendations. The Study’s first two (2) Public Consultation Centres have already been held to introduce the project and to obtain input on the evaluation criteria and potential options. Copies of the past Public Consultation Centres and project materials can be found on the project website.
Slide 6 - Steps for identifying the preferred option

This Study took a systematic approach to identifying the preferred water system upgrades. The Study first focused on identifying the preferred water tower location and water supply option. Once the preliminary preferred water tower location and water supply option were selected, required upgrades to support the new water tower location and water supply options were identified.

Slide 7 - What was done to help identify the preferred options

This slide provides an overview of the significant investigations and technical analysis that were completed to identify potential options as well as their benefits, impacts, mitigation requirements, constructability, and cost. These investigations and technical analysis informed the evaluation of options and identification of the preliminary preferred option.

Slide 8 - How the water tower and water supply options were evaluated

This slide outlines the framework that was used to evaluate the options and identify the preliminary preferred option.

Each short listed water tower location and water supply option was evaluated using four (4) major evaluation categories, which included technical factors, environmental factors, social and cultural factors, and financial viability. Under each evaluation category, multiple criteria were reviewed and scored on a scale from 0 to 4. Once each individual criterion was evaluated, a total evaluation category score was assigned for each option, with each evaluation category considered equal. The option with the highest overall score was identified as preferred.

Slide 9 - New water tower and the future water supply

We will now present the new water tower location and future water supply evaluation and preliminary recommendations.
Slide 10 - Short listed areas for new water tower

A new water tower is needed to provide the recommended amount of water storage for the community. This map presents the three (3) short listed locations that were considered for the new water tower:

- As shown in green, the area along Cedar Creek Road
- As shown in blue, the area near Blenheim Road
- As shown in purple, the area along Spragues Road

A site of approximately 100 m by 100 m, or approximately 8-10 typical residential lots, is needed to support the water tower.

Slide 11 - Option for new water tower location – Cedar Creek Road

This slide provides an overview of the Cedar Creek Road location and its advantages and disadvantages.

The area of consideration consists of the lands north and south of Cedar Creek Road within North Dumfries, located just west of the City of Cambridge. This location generally consists of previously extracted and future gravel pits.

The primary advantages of the Cedar Creek Road location are:

- 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

The primary disadvantages of the Cedar Creek Road location are:

- Potential for more complex foundation, site grading, and/or set backs may be needed to manage impacts of adjacent gravel extraction operations
- New trunk watermains 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 business
Slide 12 - Option for new water tower location – Cambridge West Lands Development

This slide provides an overview of the Cambridge West Lands Development location and its advantages and disadvantages.

The area of consideration consists of the lands north and south of Blenheim Road within the City of Cambridge. This location is within the planned Cambridge West Lands Development.

The primary advantages of the Cambridge West Lands Development location are:

- 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

The primary disadvantages of the Cambridge West Lands Development location are:

- 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 business
Slide 13 - Option for new water tower location – Spragues Road

This slide provides an overview of the Spragues Road location and its advantages and disadvantages.

The area of consideration consists of the lands north and south of Spragues Road within Cambridge and North Dumfries. The location generally consists of existing agricultural lands with planned or potential for future gravel extraction.

The primary advantages for the Spragues Road location are:

- Location is 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

The primary disadvantages of the Spragues Road location are:

- 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 viewsheds
- Additional mitigation measures may be necessary to manage potential impacts to aggregate extraction company, existing residential neighbourhoods, and communications tower
Slide 14 - Evaluation of potential new water towers areas

This slide summarizes the evaluation of the three (3) water tower locations. The Cedar Creek Road location was determined to have the best overall rank, scoring the highest (or tied for highest) in all evaluation categories.

- The Cedar Creek Road Location has the highest technical factor score due to the optimal location for system hydraulics and supporting infrastructure needs
- The Cedar Creek Road Location has the highest environmental factor score due to the limited proximity to significant environmental features, limited presence of significant wildlife or species at risk, and limited impact on wildlife migration
- The Cedar Creek Road Location has the highest social and cultural factors score, due to its separation from existing/future residences, limited construction impacts, and limited impacts to the residential landscape
- The Cedar Creek Road Location has an equal financial viability score due to its similar overall life cycle cost to the other water tower alternatives

The Spragues Road Location had the second highest ranking while the Cambridge West Lands Development location had the lowest overall ranking.

Slide 15 - New water tower

The next steps for building and operating a new water tower include:

- Completing the next steps to acquire land within the preferred location area
- Additional investigations to support the detailed design for the water tower based on the exact site
- Determining construction methods to minimize potential environmental impacts
- Designing the site with space to provide a buffer between the tower and adjacent properties
- Designing an overflow pond on site to safely manage and treat any potential water tower overflows

It is expected the new water tower site will include a water tower that is approximately 40 to 50 metres tall and 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, an access road and parking spaces, and fencing and lighting for security.
Slide 16 - Water supply options

Water supply needs for this area of the community are expected to nearly double in the future. This slide highlights the two water supply options to support the long-term supply needs:

- The first option consists of increasing the water supplied from the existing Blair Road Wells.
- The second option consists of increasing the amount of water supplied to this area from the St. Andrews pumping station.

When considering these two (2) options, it is important to note that the increasing Blair Road Well supply option will increase the overall supply of water to the Cambridge system. However, increasing the reliance on the St. Andrews pumping station does not increase the overall supply of water to the Cambridge water system. As a result, new supply sources will be needed elsewhere in the system to address the City of Cambridge’s long-term water supply needs.

Slide 17 - Water supply option – Increase supply from Wells G4/G4A

The Blair Road Wells (or the Wells G4/G4A) are existing groundwater wells located on Dianne Avenue. This option consists of increasing the existing well’s Permit to Take Water and upgrading the existing wellhouse and process equipment to accommodate the increase of flows.

The primary advantages of increasing the supply from Wells G4/G4A are:

- Alignment with the Region’s long-term water supply strategy
- Optimizing the operation of local water systems
- Minimizing 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
The primary disadvantages for the Increase Supply from Wells G4/G4A were:

- Expansion of the existing building would be needed to accommodate the new equipment
- Greatest short-term construction impacts (cost and community disruption)

**Slide 18 - Water supply option – Increase supply from St. Andrews Pumping Station**

The St. Andrews pumping station is an existing pump station located on St. Andrews Street. This option consists of increasing the amount of water pumped from other supply sources within the City of Cambridge to support the local water system and requires upgrades to the existing pump station to accommodate the increase in flows.

The primary advantage for increasing the supply from the St. Andrews Pumping Station is:

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

The primary disadvantages for increasing the supply from the St. Andrews Pumping Station are:

- It does not align with the Region’s long term water supply strategy to meet future water supply needs
- Operational flexibility of the local water systems would be reduced
- A new water supply source would need to be found elsewhere in Cambridge:
  - This new supply source capacity and quality are unknown;
  - Future environmental, social, and cultural impacts are unknown; and
  - Cost of the 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 based on asset renewal requirements
- Highest expected lifecycle cost
Slide 19 - Evaluation of water supply options

This slide summarizes the evaluation of the two (2) water supply options. The Increase Supply from Wells G4/G4A option was determined to have the best overall ranking, scoring the highest in all evaluation categories.

- Increasing supply from Wells G4/G4A has the highest technical factors score, as it increases the water supply in Cambridge to meet the objectives of the Region's overall water supply strategy as well as improves the water system’s operational flexibility, and enhances the systems ability to adapt to climate change. While increasing the reliance on St. Andrews Pumping Station does not increase the water supply within Cambridge, and additional water supply will still be necessary elsewhere.

- Increasing supply from Wells G4/G4A has the highest environmental factor and social and cultural factor scores due to the uncertainty of future impacts related to securing the additional supply as a result of increasing the reliance on the St. Andrews Pumping Station option.

- Increasing supply from Wells G4/G4A has the highest financial viability score as there is a need to account for the future costs related to securing additional supply. The cost related to rehabilitating the existing Blair Well Fields wellhouse structure and equipment are needed for both options based on asset renewal needs.

Slide 20 - Increasing supply from Wells G4/G4A

Increasing the pumping rates from Wells G4/G4A will draw more water from the deep bedrock; however, 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; and,
- Shallow groundwater levels and stream flows in Devil’s Creek.
Slide 21 - Protecting the water supply
Increasing the pumping rate will expand the size of the Wellhead Protection Areas. Significant activities where the policies of the Grand River Source Protection Plan apply are limited within Wellhead Protection Areas-C (the 5-year capture zone). Vulnerability scoring has been completed as part of this Study but will be refined as part of the update to the Grand River Source Protection Plan.

Slide 22 - Completing the second step
We will now present the remaining water system upgrades that are needed to support the new water tower location and water supply.

Slide 23 - Improvements needed at St. Andrews Pumping Station
New pumps are needed to accommodate the future system demands and other planned upgrades to the Cambridge and North Dumfries water system. Three (3) pump upgrade options were considered:

- Status Quo – maintains the existing pump station as is.
- Supply Maximum Day Demand - would consist of replacing the existing pumps with three (3) equally sized pumps capable of meeting the future non fire flow demand. This option also includes the installation of a new standby power generator.
- Supply Maximum Day Demand and Fire Flow – would consist of replacing the existing pumps with two (2) duty pumps and one (1) fire pump capable of meeting the future demands and supplementing fire flow demands. This option also includes the installation of a new standby power generator.

The recommended option is to supply maximum day demand for the following reasons:

- The existing pumps cannot meet the long-term needs;
- Providing standby power is aligned with the Region Standby Power Master Plan recommendations; and,
- Fire flow capacity will be provided through the volume increase for the new water tower and is not needed from the St Andrews Pumping Station.
Slide 24 - Improvements needed at St. Andrews Tank

Due to planned upgrades and changes in system operational strategy, there is a reduced need for the existing St. Andrews Tank. Four (4) upgrade options were considered:

- Status Quo – which would maintain the existing Tank as is;
- Remove Standpipe – which would remove all storage at the St. Andrews site;
- Modify Existing Standpipe – which would modify the existing standpipe to better match the water system’s future operational needs;
- New Standpipe – which would replace with the existing standpipe with a new standpipe to better meet the water system’s future operational needs.

The recommended option is to construct a new standpipe for the following reasons:

- The standpipe provides protection from pressure spikes and improves operations;
- A new standpipe will be sized appropriately for volume and height;
- Long term maintenance will be lower for a smaller tank; and,
- Timing of the construction of the new standpipe can optimize costs by maintaining the existing tank

Slide 25 - Plan for Inverness Water Tower

The Inverness Water Tower is in need of major rehabilitation; however, due to the size of the existing site, major water tower rehabilitation is challenging and costly. The existing site does not have capacity to support a new water tower or the expansion of the existing water tower, which is why a new site was identified through this Study. The new water tower will have enough volume to meet the future needs of the study area, which means that the existing Inverness Water Tower could be taken down.

This Study recommends the Inverness Water Tower be decommissioned and removed once the new water tower is operational. The Region will evaluate post decommissioning site options at a later date.
Slide 26 - Location of new watermains

To support the new water tower and water supply, new and upgraded watermains are needed. These include:

- A new trunk watermain on Cedar Creek Road to connect the new water tower to the existing water system;
- Upgrades to the existing watermains connecting the Wells G4/G4A to the water system to accommodate the increased flows; and,
- New and upgraded watermains to help transfer water from the supply sources to where water is being used

As shown on this slide two watermain options have been identified for some watermain connections. The recommended alignments will be determined based on constructability and coordination with planned projects.

Slide 27 - Preliminary recommended strategy

This slide summarizes the preliminary recommended strategy for the Cambridge and North Dumfries water system, which generally consists of:

- A new water tower located on Cedar Creek Road to address the long-term water storage needs. This includes a new watermain along Cedar Creek Road to connect the new water tower to the existing water system;
- Increasing the water supplied by the Blair Road Wells to address the long-term water supply needs. This includes upgrades to the existing wellhouse, process equipment, and existing watermains connecting the Wells G4/G4A to the water system to accommodate the increased flows;
- Replacing the existing pumps at the St. Andrews Pumping Station to meet the future flows and pressure needs;
- Replacing the existing St. Andrews Tank with a new smaller tank to better align with the planned upgrades and changes in system operational strategy;
- Decommissioning and removing the existing Inverness Tank, as it is in need of major rehabilitation and will not be needed once the new water tower is constructed; and,
- New and upgraded watermains to support improved system performance and operations.
Slide 28 - Schedule for preliminary projects

The schedule to implement the preliminary recommended projects includes:

- Detailed design of the new water tower will be completed between 2023 and 2024 with construction between 2025 and 2027;
- Detailed design for upgrades to the Blair Road Wells or Wells G4/G4A will be completed between 2022 and 2023 with construction between 2024 and 2025;
- Detailed design for the upgrades at the St. Andrews Pumping Station and Tank will be completed in 2023 with construction between 2023 and 2024;
- The demolition plan for the Inverness Water Tower will be completed in 2027 and the demolition will be completed in 2028.

The implementation timeline to complete these preliminary recommended projects may change as future investigations are completed.

Slide 29 - Thank you for your participation

This concludes the virtual Public Consultation Centre. If you have any questions, comments, or want to stay up to date please contact either:

- Nicole Sapeta, the Project Manager at the Region of Waterloo, or
- Julien Bell, the Project Manager for GM BluePlan Engineering.

Again, the contact information is available on this slide and on the Region’s project website. More information, including copies of the project notices and Public Consultation Centre materials, like the transcript of this virtual presentation, can be found on the Region’s project website. Thank you very much for your participation in the virtual Public Consultation Centre.