Schedule ‘B’ Municipal Class Environmental Assessment
Potable Water Storage
Town Meeting: Phase 2 Status Update

J.L. Richards & Associates Limited
Sarah Gore, P.Eng., Project Manager

Date: May 22, 2018
JLR No.: 27613-000.1
Town of Smiths Falls Water System

- ~9,130 serviced population
- 14,000 m$^3$/day dissolved air floatation (DAF) Water Treatment Plant (new 2010)
- 945 m$^3$ elevated potable water storage tank (420 m$^3$ ‘usable’ storage)
- ~60 km of watermain piping
Purpose of this Study

Phase 1 Problem/Opportunity Statement

“The Town of Smith’s Falls owns and operates a communal potable water supply system for the Town, including the Township of Montague (Atironto Subdivision), that generally consists of a new (2010) surface water treatment plant, an elevated potable water storage tank and a dedicated distribution system. While the system has been operating in accordance with all applicable legislation and is achieving all required water quality standards, the Town does not currently meet potable water storage requirements as defined by the Ministry of the Environment and Climate Change. Notwithstanding this, the Town’s current elevated potable water storage tank, at 90 years old, is in need of refurbishment or replacement and therefore the Town is in need of a solution that will address water storage constraints now and for the next 20 years and beyond.”

- System is generally achieving all required water quality standards
- System does not meet potable water storage requirements as defined by the MOECC
- Approx. 4 hours available during current maximum day demands
- Growth pressures in the Town’s Official Plan
- Elevated potable water storage tank (90 years old) is in need of refurbishment or replacement for compliance with the National Building Code and Ontario Building Code
- A potable water storage solution is needed for the next 20 years and beyond
Overview of the Schedule ‘B’ Class EA Process

Phase 1
Identification of Problem or Opportunity

Phase 2
Evaluation of Alternative Solutions and Identification of Recommended Solutions

Schedule B Report
Selection of Preferred Solutions Following Consultation Activities

Notice of Study Commencement
Issued August, 2017

Ongoing Public and Agency Consultation throughout Study

Public Information Centre No. 1
June 7, 2018

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✓ Phase 1 Report and updated WaterCAD® Hydraulic Model evaluated existing system and identified population growth projections and associated water storage requirements

✓ Alternative Solutions Concepts developed and reviewed against an evaluation matrix

✓ Preliminary assessment of Costing for each alternative solution

✓ Public Consultation with general public, review agencies and City staff
Population and Growth Projections (20-Year Period)

In accordance with Official Plan:

- Annual Growth Rate: 0.78%
- 25% in targeted growth areas
- 787 people draft approved subdivision (south between railway and Broadview Avenue W)
- Remaining will be infill and intensification
# Population and Water Demand Projections

<table>
<thead>
<tr>
<th>Parameter</th>
<th>2017</th>
<th>2037</th>
<th>Build-Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Population</td>
<td>9,130</td>
<td>10,679</td>
<td>14,601</td>
</tr>
<tr>
<td>Equivalent Service Population*</td>
<td>11,521</td>
<td>13,475</td>
<td>18,425</td>
</tr>
<tr>
<td>Average Day Demand (m$^3$/d)</td>
<td>6,253</td>
<td>7,313</td>
<td>10,000</td>
</tr>
<tr>
<td>Maximum Day Demand (m$^3$/d)</td>
<td>11,255</td>
<td>13,164</td>
<td>18,000</td>
</tr>
<tr>
<td>Peak Hour Demand (m$^3$/d)</td>
<td>16,883</td>
<td>19,746</td>
<td>27,000</td>
</tr>
</tbody>
</table>

* Equivalent service population is a “residential equivalent” that considers institutional, commercial and industrial contributors

## Design basis for storage requirements

**Build-out Approach:**

- 2010 WTP was designed with provisions for a build-out capacity of 18,000 m$^3$/d (after upgrades)

- To maintain continuity, potable water storage build-out review will be based on a projected maximum day demand of 18,000 m$^3$/d
Storage Projections

- Total storage capacity is significantly lower than current and future MOECC recommendations.
Existing Potable Water System Constraints

<table>
<thead>
<tr>
<th>Constraint</th>
<th>Risk Associated with Constraint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Available Potable Water Storage Capacity</td>
<td>Significantly less than MOECC recommendations for storage presenting risk, particularly during a tower shut down and/or fire</td>
</tr>
<tr>
<td>2. Elevated Water Tower Condition</td>
<td>Failure of tank would result in significantly reduced water supply for the Town; it is anticipated that the frequency of unplanned work and costly repairs will increase over time</td>
</tr>
<tr>
<td>3. High Lift Pumping Configuration</td>
<td>Available capacity in the WTP reservoir is reduced to half due to the HLP pumping configuration, as the reservoir level is operated above the HLP impellers (located at mid-depth) to avoid losing their prime</td>
</tr>
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</table>
## Identification and Initial Screening of Alternative Solutions

<table>
<thead>
<tr>
<th>Approach</th>
<th>Do Nothing</th>
<th>Maintain Existing Tower + Construct New Storage</th>
<th>Decommission Existing Tower + Construct New Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>At Existing Water Treatment Plant</td>
<td>At Existing Water Tower</td>
<td>At New Location</td>
</tr>
<tr>
<td>Configuration</td>
<td>Below Grade Reservoir and Pumping Station</td>
<td>At Grade Reservoir and Pumping Station</td>
<td>Elevated Storage Tank</td>
</tr>
</tbody>
</table>

**Carried Forward ✓**
Option 1: Do Nothing

Concept
• The ‘Do Nothing’ alternative implies maintaining status quo
• Generally carried forward as a baseline for review of other alternatives
• This option considers rehabilitation and continued operation of the existing elevated tower, which includes full removal and replacement of existing lining systems, in addition to other structural modifications to make the tank compliant with the National and Ontario Building Codes

Key Considerations for Evaluation
• Does not address storage requirements as defined by the MOECC
• Rehabilitation requires significant tower shut-down leaving the Town to rely solely on the Water Treatment Plant and High Lift Pumps to service demand
• Cost is significant - limited value in rehabilitating to secure a fraction of the required water storage
• Marginal improvement to tank’s lifespan, but still possible that frequency of unplanned work and costly repairs will increase over time given the tank’s age
Option 2: Decommission Existing Tower and Construct New Elevated Tower

Concept
• Construction of a new elevated storage tank at three potential locations within the Town as well as a new vacuum priming system for the existing High Lift Pumps to maximize the WTP reservoir’s available water storage

Key Considerations for Evaluation
• Addresses potable water storage requirements as defined by the MOECC
• Improves operational flexibility
• Significantly increases fire flow storage volume, improving the reliability of the system to fight a fire and continue to service demands
• Maximizes the WTP reservoir’s available potable water storage
• Potential commercial and residential impacts during construction and operation of a larger tower
• Initial cost of new elevated storage tank is significant
Option 2: Potential Locations for Future Storage

- Initial Screening Requirements:
  - Town-owned land or leased
  - Located north of the river to avoid significant watermain upgrade
  - Lot larger than 2 ha
  - Compatible land use and zoning

- 8 locations (Sites A-H) further narrowed down based on a review of land attributes, existing development, proximity to trunk water main, adjacent lands, etc.

- 3 locations carried forward to detailed evaluation (Sites ‘B’, ‘D’ and ‘E’)
### Opinion of Probable Costs

<table>
<thead>
<tr>
<th>Option</th>
<th>Opinion of Probable Costs*</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Rehabilitate</strong></td>
<td><strong>New Tower</strong></td>
</tr>
<tr>
<td>1</td>
<td>Do Nothing (Rehabilitate Existing)</td>
<td>$1.9M</td>
</tr>
<tr>
<td>2</td>
<td>Decommission Existing Tank and Construct New Elevated Tank</td>
<td></td>
</tr>
<tr>
<td>2A</td>
<td>Site B – Confederation Drive (At Existing Water Tower)</td>
<td>-</td>
</tr>
<tr>
<td>2B</td>
<td>Site D – Air Care Drive</td>
<td>-</td>
</tr>
<tr>
<td>2C</td>
<td>Site E – Second Street (adjacent Atironto)</td>
<td>-</td>
</tr>
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*Class ‘D’ Opinion of Probable Costs for this Class EA:
- Work Definition: A description of the intended solutions with such supporting documentation as is available
- Intended Purpose: To aid in the screening of various options proposed prior to recommending a preferred solution (not intended to establish or confirm budgets)
- Level of effort is limited and expected accuracy could range from -30% to +30%
- Opinion of Probable Costs reflect a ‘2018’ dollar value
Evaluation of Servicing Alternatives

- All servicing alternatives were evaluated against their impact to the natural and cultural environments, social/community well being, engineering and technical considerations, and economic environments.

### Impact Level

<table>
<thead>
<tr>
<th>Impact Level</th>
<th>Score</th>
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<tbody>
<tr>
<td>Strong Positive Impact</td>
<td>6</td>
</tr>
<tr>
<td>Moderate Positive Impact</td>
<td>5</td>
</tr>
<tr>
<td>Slight Positive Impact</td>
<td>4</td>
</tr>
<tr>
<td>No Impact</td>
<td>3</td>
</tr>
<tr>
<td>Slight Negative Impact</td>
<td>2</td>
</tr>
<tr>
<td>Moderate Negative Impact</td>
<td>1</td>
</tr>
<tr>
<td>Strong Negative Impact</td>
<td>0</td>
</tr>
</tbody>
</table>

- The relative impact for each criterion relative to each potential solution was assessed based on a scoring system.
- Each criteria was weighted (1 to 5) to reflect relative importance. For example: public health and initial cost were more ‘heavily’ weighted.
# Identification of Preferred Alternative

<table>
<thead>
<tr>
<th>Option</th>
<th>Score</th>
<th>Rank</th>
<th>Comments</th>
</tr>
</thead>
</table>
| **Option 1: Do Nothing (Rehabilitate Existing Tower)**                  | 99    | 4    | • Does not address potable water storage requirements as defined by the MOECC  
|                                                                       |       |      | • Limited value in rehabilitating to secure a fraction of the required water storage  
|                                                                       |       |      | • Maintenance costs are unpredictable with the old tank  |
| **Option 2: Decommission Existing Tower and Construct New Elevated Tower** |       |      | • Addresses potable water storage requirements as defined by the MOECC and improves operational flexibility  |
| 2A: Site B – Confederation Drive (At Existing Water Tower)              | 135   | 2    | • Commercial and residential impacts from a larger tower (i.e., scale of tower may be overbearing)  
|                                                                       |       |      | • Construction required near central downtown and Rideau River  |
| 2B: Site D – Air Care Drive                                            | 143   | 1    | • Relocates tower away from residents/commercial areas  
|                                                                       |       |      | • Requires upgrades to distribution system  |
| 2C: Site E – Second Street (adjacent Atironto)                         | 129   | 3    | • Relocates tower away from downtown core but near residents in Atironto  
|                                                                       |       |      | • Requires upgrades to distribution system  |
# Project Schedule and Next Steps

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Date</th>
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<tbody>
<tr>
<td>Notice of Study Commencement</td>
<td>August, 2017</td>
</tr>
<tr>
<td>Completion of Phase 1 – Identify Problem / Opportunities</td>
<td>February, 2018</td>
</tr>
<tr>
<td>Completion of Phase 2 – Evaluation of Alternatives</td>
<td><strong>WE ARE HERE</strong></td>
</tr>
<tr>
<td>Public Information Centre</td>
<td>June, 2018</td>
</tr>
<tr>
<td>Schedule B Wrap-Up</td>
<td>July, 2018</td>
</tr>
</tbody>
</table>

- Obtain and evaluate public, stakeholders and agency comments and confirm preferred solution
- Post Schedule ‘B’ Report and advise stakeholders and public
- Issue Notice of Completion
- Following 30-day public review period, finalize Class EA
- Commence preliminary design of preferred solution
Thank you!

Contact Information:
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