



WELCOME

Town of Hanover 7th Avenue Water Tower Replacement

Public Information Centre

Purpose of PIC

- Provide rightsholders, residents and other agency stakeholders with information related to proposed locations and design aspects of a new water tower to replace the 7th Avenue water tower in the Town of Hanover
- Outline the Municipal Class Environmental Assessment (Class EA) Process
- Present the study area, purpose and objectives of the Class EA
- Present the problem/opportunity statement for the project along with the alternative sites and solutions
- Receive feedback on the evaluation of alternatives and recommended preliminary preferred site and solution
- Outline the project's next steps and proposed schedule

Project History and Purpose

- Water storage for the Town is currently provided by the 7th Avenue and 14th Street water towers.
- In 2021, the Town of Hanover (Town) completed a municipal service needs assessment for the Town's Special Policy Areas (SPAs) within the current municipal boundary.
- The assessment confirmed the need to replace the 66-year-old 7th Avenue water tower with one of a larger capacity.
- Growth and development is planned for the Town; as such, it is important to ensure that the new water tower has the ability to service the new growth within the Town's SPAs.
- A new water tower will provide increased access to potable water to the existing residents and ensure sufficient pressure and fire flow at all times.

Project History and Purpose (continued)

- The Town received funding up to \$2.0M (Federal) plus \$1.67M (Ontario) under the Green Stream of the Investing in Canada Infrastructure Program to support implementation of the water tower replacement.
- A funding condition requires completion by October 31, 2026
- In 2022 the Town retained the services of Ainley Group to complete a Schedule 'B' Municipal Class Environmental Assessment (Class EA).
- The purpose of the project (problem/opportunity) is to:
 - Identify and develop a preferred solution for a new water tower to replace the existing 7th Avenue Water Tower to improve water demand supply security and service new growth in the Town of Hanover.

Municipal Class EA Process

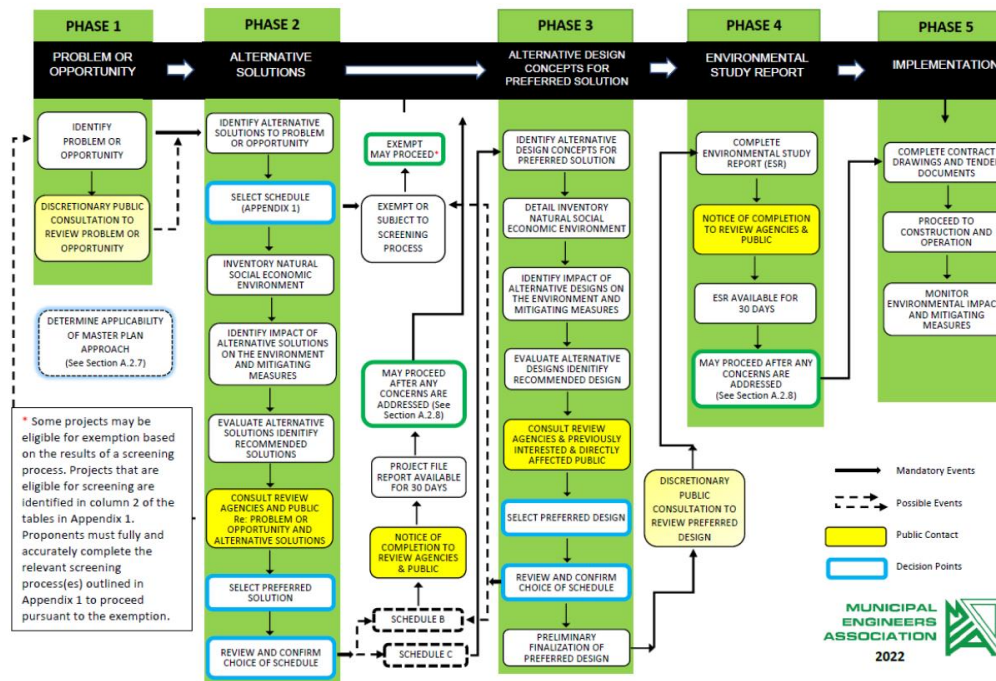
- The 2023 MCEA document outlines a planning process for municipalities to follow to complete infrastructure projects in an environmentally responsible manner and in accordance with the *Environmental Assessment Act (EA Act)*.
- The MCEA classifies projects in terms of schedules based on varying environmental impact.
 - **Exempt** – minimal adverse environmental impact; consider public notification
 - **Eligible for Screening to Exempt** – may have minimal adverse environmental impact; requires completing an Archaeological Screening Process (ASP) to determine if exempt or Schedule B; consider additional public notification even if exempt
 - **Schedule B** – potential for some adverse environmental effects, requires mandatory contact with public and review agencies
 - **Schedule C** – potential for significant environmental effects, requires mandatory contact with public and review agencies, requires completion of Environmental Study Report (ESR)

Municipal Class EA Process (continued)

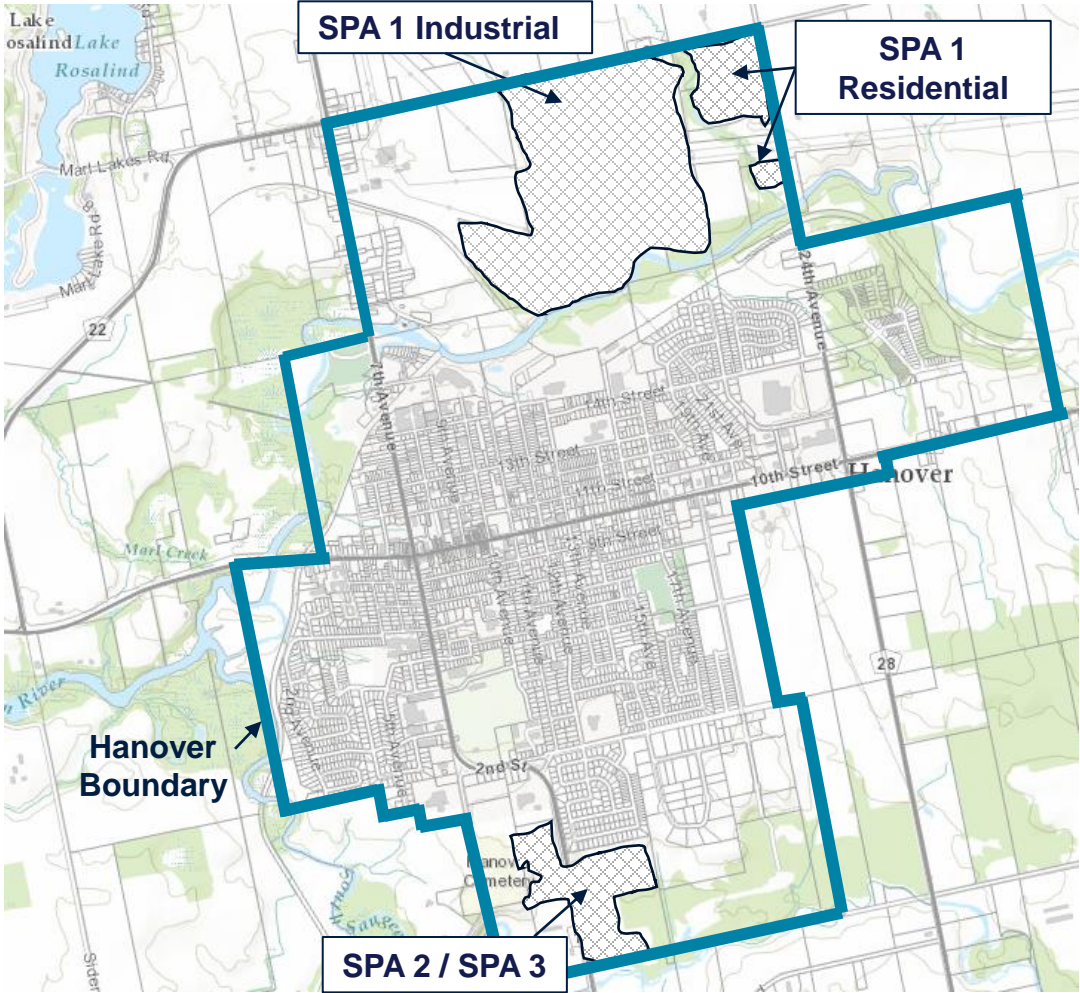
- A new water storage facility is a Schedule B project under the MCEA. A Schedule B project requires completion of Phases 1 & 2 of the Class EA process.

EXHIBIT A.2. MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the MCEA



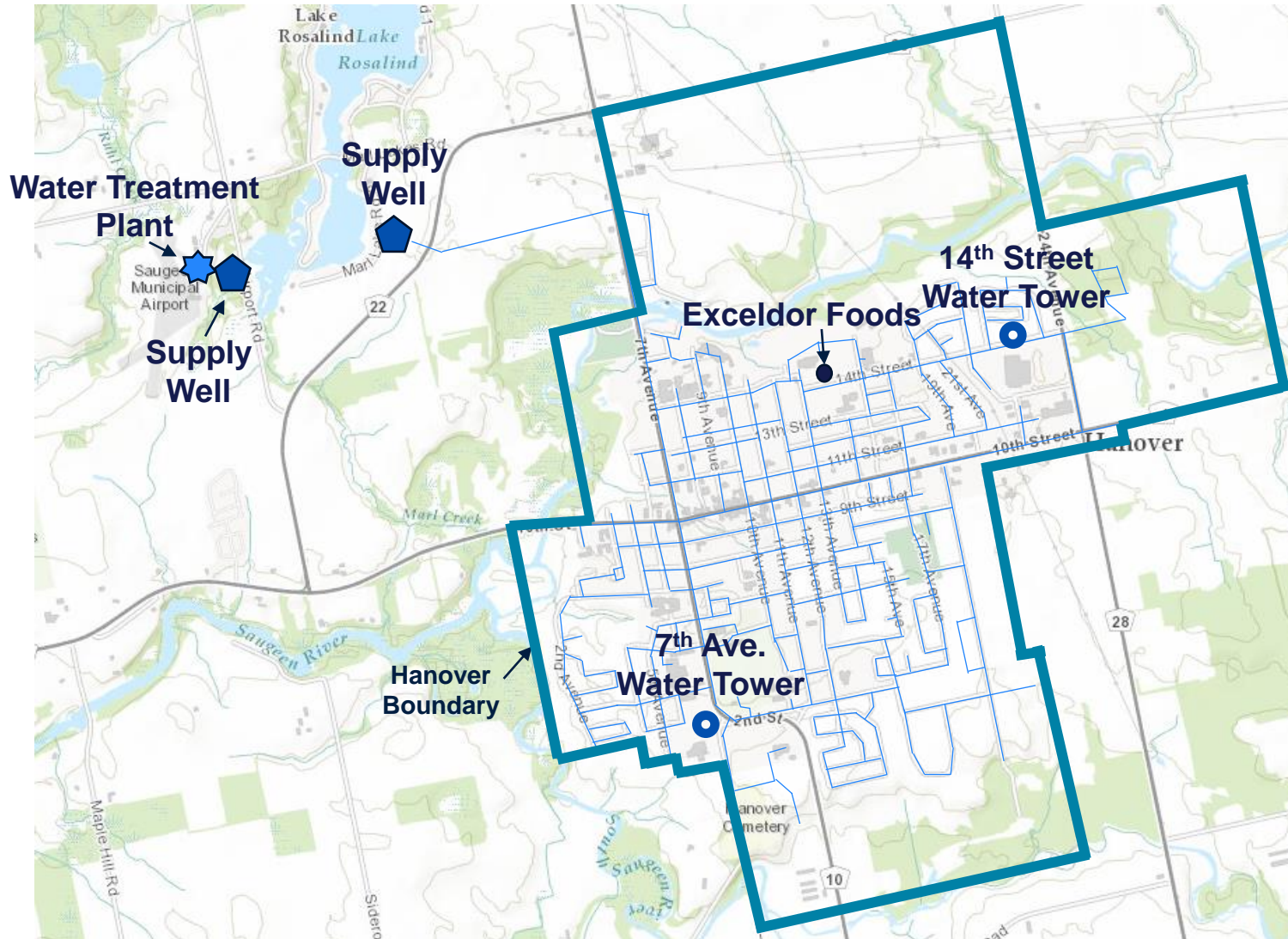
Study Area



Existing Water System

- The Hanover Water Treatment Plant (WTP) located at 36 Airport Road:
 - is a direct filtration plant with a rated capacity of 15,405 m³/d;
 - draws water from Ruhl Lake and 2 wells.
- Treated water from the WTP is pumped directly into the distribution system, providing potable water through 55 km of watermain to the Hanover population within the serviced area.
- Storage is provided by two elevated water tanks:
 - 941 m³ multi-column water tower at 140 7th Avenue
 - 3,507 m³ composite water tower at 710 14th Street
- There are no additional booster stations or storage tanks within the existing distribution system.

Existing Water System (con't)



2021 – 2046 Growth Projections and Storage Requirements



| | 2021 | 2046 |
|---|------------------------------------|--|
| Number of Households | 3,650 | 4,240 * |
| Population (2.25 persons per household) | 7,967 | 9,540 * |
| Industrial | Exceldor Foods | Exceldor + 93.1 ha (New Industrial) |
| Maximum Day Demand (MDD) per household | 1.07 m ³ /d | 1.07 m ³ /d |
| Total Residential MDD | 3,915 m ³ /d | 4,768 m ³ /d |
| Total Industrial MDD (Exceldor; New Industrial at 25 m³/ha/d) | 2,975 m ³ /d (Exceldor) | 2,975 m ³ /d (Exceldor) 2,328 m ³ /d (New Industrial) |
| TOTAL MDD | 6,890 m³/d | 10,120 m³/d |
| STORAGE: | | |
| A Fire Storage (284L/s for 4 hours):Industrial requirement governs) | -- | 4,090 m ³ |
| B Equalization Storage (25% of MDD) | -- | 2,530 m ³ |
| C Emergency Storage (25% of A+B) | -- | 1,655 m ³ |
| Total Storage Requirement | -- | 8,275 m ³ |
| Less Existing Storage (14th St Water Tower) | -- | (3,507 m ³) |
| REPLACEMENT WATER TOWER STORAGE | -- | 4,768 m³ |

* These 2046 values are based on the population that can be accommodated within the Study Area, and does not include the Potential Expansion Areas outside of the Town of Hanover boundaries

2021 – 2046 Growth Projections and Storage Requirements (con't)

- The Town has experienced significant system deficiencies when the 3,507 m³ 14th Street water tower is out of service due to maintenance.
- No similar deficiencies have occurred when the smaller 941m³ 7th Avenue water tower is out of service.
- In addition, there is significant risk if an emergency such as a fire coincides with the 14th Street water tower being out of service.
- Therefore, the Town requires the storage that replaces the 7th Avenue water tower to be equal to or greater than the storage in the 14th Street water tower.

2021 – 2046 Growth Projections and Storage Requirements (con't)

- Minimum required storage based on the 2046 MDD and fire flow requirement is greater than 3,507 m³ due to the industrial (Exceldor) fire flow exceeding that of the residential fire flow
- Proposed size of the 7th Avenue replacement water tower when governed by the requirement to fully accommodate industrial fire flow is **4,768 m³**.
- Note if the Exceldor facility had a sprinkler system the total storage required would be reduced to 5,698 m³ (vs 8,275 m³ un-sprinklered) and the new water tower could be reduced to **3,507 m³**
- A 3,507 m³ water tower is sufficient to accommodate Exceldor fire flow for 3 hours (rather than 4 hours per their requirements)
 - In lieu of the additional cost for a 35% larger tank, fire flow for Exceldor can be provided from storage for 3 hours and then via pumper truck for the subsequent hour, if required

New Water Tower Alternative Sites

- A minimum of 0.5 ha is required to accommodate elevated water storage.
- The existing site (140 7th Ave) was not considered as it is too small to construct a new tower while keeping the existing tower in operation before the new tower can be commissioned.
- Two potential short-listed sites were considered:
 - 95 7th Avenue (north of cemetery)
 - 66 14th Avenue (industrial vacant lot south of Public Works)

New Water Tower Alternative Sites (continued)



Evaluation & Preliminary Recommended Site

- To assess the site alternatives, a criteria assessment table was developed.
- A rating system assigned numeric values to each of the identified criteria; 1 = Worst; 2 = Moderate; 3 = Best.
- The criteria incorporated the advantages and disadvantages of each site.
- Based on the evaluation, Site 1 – 95 7th Avenue (north of cemetery) is the best alternative site with the highest score of 47.

New Water Tower Alternative Sites (con't)





| Criteria | Sub-Criteria | Site 1 (95 7 th Avenue – N of Cemetery) | Site 2 (66 14 th Avenue – Vacant Industrial S of Public Works) |
|---------------------------------|---|--|--|
| Land Use Planning | | | |
| | Existing Land Use | 3 | 3 |
| | Proposed/Potential Land Use | 3 | 1 |
| Natural Environment | | | |
| | Groundwater (Dewatering) | 3 | 3 |
| | Surface Water/Drainage | 3 | 3 |
| | Ground Stability | 3 | 1 |
| | Natural Habitat, Species Protection, Trees | 3 | 3 |
| Social Environment | | | |
| | Residential Impact | 2 | 3 |
| | Traffic Impact | 2 | 3 |
| | Visibility of Water Tower | 2 | 2 |
| Cultural Environment | | | |
| | Archaeological Impact | 1 | 3 |
| | Cultural Heritage Impact | 1 | 3 |
| | Supporting Town Policies | 3 | 1 |
| Technical Considerations | | | |
| | Site Servicing (Power, Water) | 3 | 3 |
| | Adequate Size | 3 | 3 |
| | Tank Hydraulics Performance | 3 | 2 |
| | Access to Site | 3 | 3 |
| Economic Considerations | | | |
| | Cost | 3 | 3 |
| | Commercial/Industrial Impact | 3 | 2 |
| TOTAL | | 47 | 45 |



New Water Tower Details

- Height of tower ~ 37- 40 metres
- Capacity of tower = 3,507 m³ (equal to existing)
- Long-list of water tower type alternatives:
 - Spheroid
 - Multi-column
 - Composite
 - Bolted glass-lined

Long-List of Water Tower Alternatives

| | ADVANTAGES | DISADVANTAGES | RECOMMENDATION |
|---|--|--|--|
| <p>SPHEROID</p>  | <ul style="list-style-type: none"> Small base allows for a reduced surface area for site selection | <ul style="list-style-type: none"> Small base does not allow for interior access Safety issues (with exterior access) Not capital cost competitive for >2,000 m³ capacity Costly recoating compared with alternatives with concrete support columns Currently no Ontario supplier | Do not carry forward as a short-listed option. |
| <p>MULTI-COLUMN</p>  | <ul style="list-style-type: none"> Well-established design history (100 years+) Capital Cost Competitive | <ul style="list-style-type: none"> No interior access Safety issues (with exterior access) Aesthetically less pleasing Costly recoating compared with alternatives with concrete support columns | Do not carry forward as a short-listed option |

Long-List of Water Tower Alternatives (con't)

| | ADVANTAGES | DISADVANTAGES | RECOMMENDATION |
|---|---|--|---|
| COMPOSITE  | <ul style="list-style-type: none"> Most common current design Established history (70+ years) Interior access Column can house piping to tank, re-chlorination pumps, instruments, etc. Competitive capital cost Low maintenance cost Highest life expectancy (80 years) | <ul style="list-style-type: none"> Requires repainting inside and out every 20 years Requires full coating removal and repainting every 40 years | Carry forward as a short-listed option. |
| BOLTED GLASS-LINED  | <ul style="list-style-type: none"> Lowest maintenance costs (never requires repainting) Column can house piping to tank, re-chlorination pumps, instruments, etc. Competitive capital cost Individual panels can be replaced in case of damage Reduced construction time (no field welding required) | <ul style="list-style-type: none"> New technology (few installations and standards) Safety issues (with exterior access) Shorter life expectancy than composite (40 years) More susceptible to wind, ice and seismic activity Wide tank base requires larger support column | Carry forward as a short-listed option |

Representations of Short-Listed Alternative Solutions

Alternative 1 - Composite



Alternative 2 - Glass-Lined



Cost Comparison of Short-Listed Elevated Storage Alternatives

| | Alternative 1 Composite | Alternative 2 Glass-Lined |
|---------------------------------|----------------------------|------------------------------|
| Capital Cost | \$ 8,350,000 | \$ 10,000,000+/- |
| Operation and Maintenance Costs | \$1,050,000 | \$ 1,100,000 |
| Major Maintenance Costs | \$ 4,800,000 | \$ 7,000,000 |
| Total Cost (2023\$) | \$14,200,000 | \$18,100,000+/- |

- Capital costs and operation and maintenance costs were estimated over an 80-year life.
- Estimates are based on quotes provided by industry manufacturers of composite welded and glass-lined tanks.
- Additional operation and maintenance costs not included by the manufacturer was calculated based on similar, recently completed projects.

Evaluation & Preliminary Recommended Solution

- To assess the water tower alternatives, a criteria assessment table was developed.
- A rating system assigned numeric values to each of the identified criteria; 1 = Worst; 2 = Moderate; 3 = Best.
- The criteria incorporated the advantages and disadvantages of each type of elevated storage as well as the costs associated with each of the alternatives.
- Water quality, access to storage and capital cost criteria were weighted double values as these were considered of higher importance.

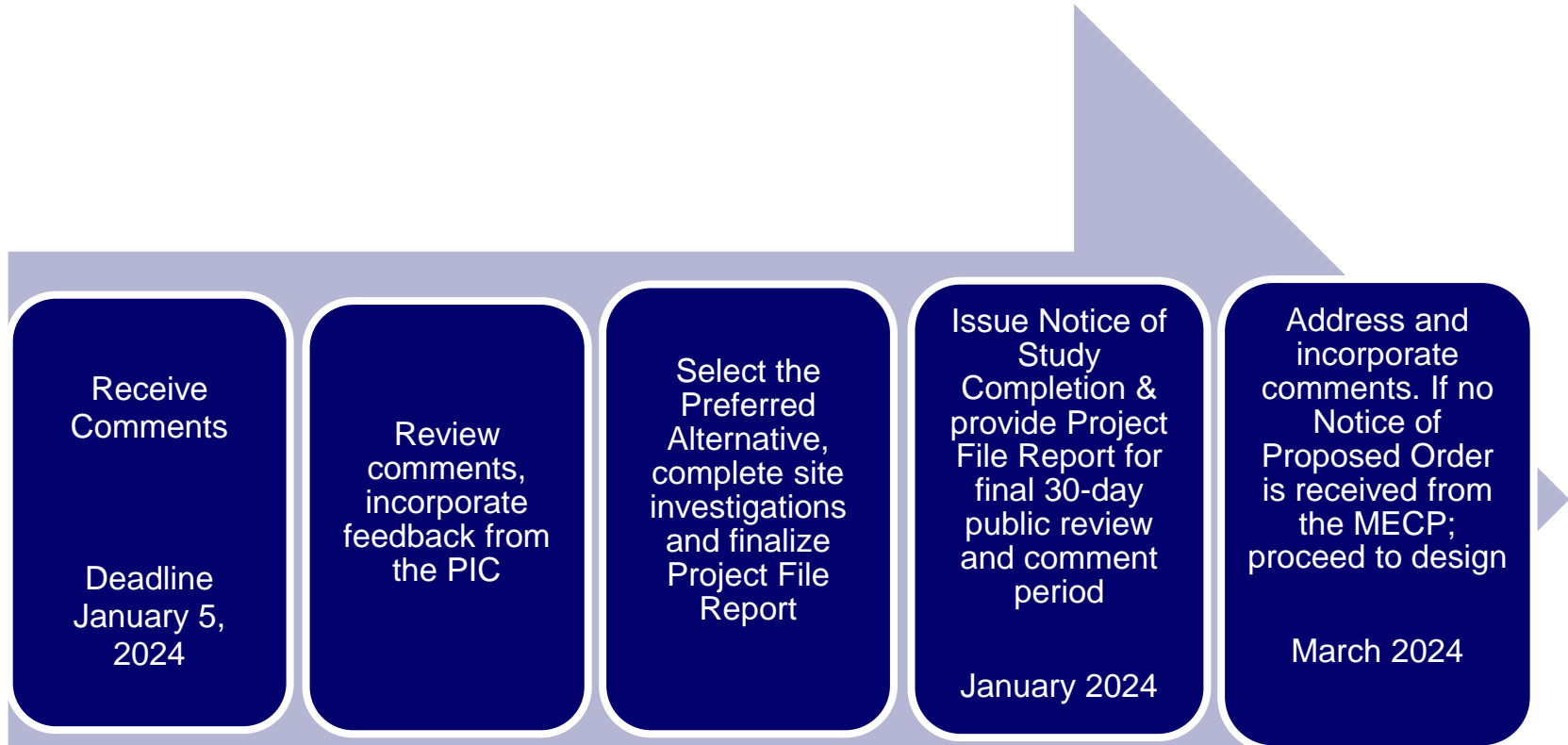
Evaluation & Preliminary Recommended Solution (con't)

| Criteria | Alternative 1 Composite | Alternative 2 Composite Glass-lined |
|--------------------------------|-------------------------|-------------------------------------|
| Land Requirement | 3 | 3 |
| Construction Time | 2 | 3 |
| Maintenance | 2 | 3 |
| Aesthetics | 3 | 1 |
| Opportunity to Create Landmark | 3 | 2 |
| Security of Supply | 3 | 3 |
| Water Quality ¹ | 6 | 6 |
| Access to Storage ¹ | 6 | 2 |
| Capital Cost ¹ | 6 | 4 |
| Long Term O&M/Lifecycle Cost | 3 | 2 |
| Normal O&M Cost | 2 | 2 |
| Total | 39 | 31 |

1. A double weighting is applied because these criteria are considered of higher importance resulting in ratings of: Worst = 2, Moderate = 4 and Best = 6

- From the cost comparison and evaluation completed Alternative 1 is the best alternative with the highest score of 39.
- Therefore a 3,507 m³ water tower north of the cemetery is the recommended solution.

Next Steps & Proposed Schedule



Your Comments are Important

- Public input is encouraged throughout the process and will be given consideration during planning and design of this project.
- Please use the PIC Comment Form posted to the Town's website when providing your comments or to be added to this project's contact list.
- Comment may be sent to the study team by email or regular mail.

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The deadline for submitting comments is January 5, 2024.