Angus Infrastructure Master Plan Class EA Addendum - Water Supply and Storage

Public Information Centre

November 21st, 2024

Background

The Township of Essa completed an Infrastructure Master Plan (IMP) for the community of Angus in 2022, identifying preferred solutions for Water, Wastewater, Transportation, and Stormwater infrastructure to support development over the next 25 years. The Notice of Completion was filed on September 12, 2022.

Angus currently has a water supply capacity shortfall of approximately 350 equivalent residential units (ERU) relative to the remaining wastewater system capacity, along with inadequate fire-flows in numerous areas.

There is a total water supply deficit of 4,635 m^3/d and water storage deficit of 4,200 m^3 to meet population demands to 2046.

To prioritize the Township's progression toward implementing the preferred solutions, an EA Addendum to the Schedule 'B' Class EA IMP is being completed. This Addendum specifically focuses on water supply and storage, while leaving other components of the IMP unchanged.

Background

IMP Recommended Water Supply and Storage Servicing Solutions:

- Short term: Increase the current PTTW and well capacity to supply as much of the ultimate demand increase of 4.64 million L/d as possible; Long term: develop new well(s) at an existing location with expanded treatment, booster pumps, storage, and fire protection.
- Construct water storage facilities (elevated, in-ground, or at grade) at three (3) locations (the Southwest, Northwest, and Northeast areas) of the study region.
- The IMP required additional technical analysis to validate and confirm details of the preferred solutions. This has been completed during the EA Addendum.

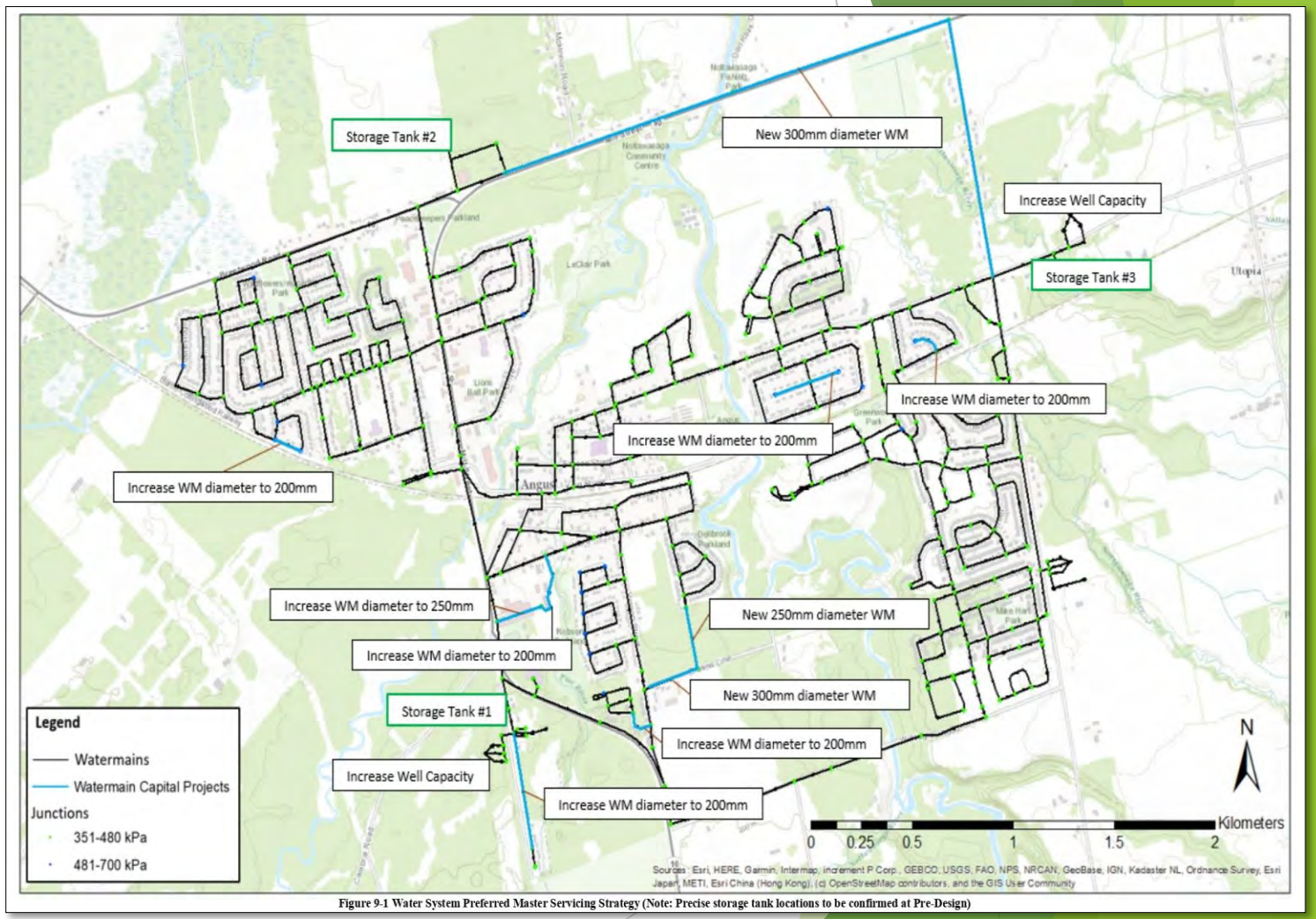


Figure 9-1 Water System Preferred Master Servicing Strategy (Note: Precise storage tank locations to be confirmed at Pre-Design)

EA Addendum Study Purpose

- Prioritize and validate water supply and storage strategies to address immediate growth demands in Angus.
- Revisits and re-evaluates IMP water supply and storage solutions, incorporating additional data, field studies, and concept designs for effective implementation
- Conduct additional investigations to assess well capacity expansion and determine feasibility for the ultimate build-out of Angus.
- Assess the appropriateness of different water storage solutions (e.g., in-ground vs. elevated tanks, multiple tanks) and determine the best fit for the municipality's near-term and ultimate needs.
- Complete site evaluations for shortlisted options to confirm space for required infrastructure.
- Address current servicing gaps in water supply and storage capacity to meet the growing needs of the community.

Problem / Opportunity Statement

The 2022 Infrastructure Master Plan (IMP) identified several water supply and storage options, acknowledging that no single solution could fully address Angus's long-term needs. This Addendum focuses on prioritizing and evaluating immediate water supply and storage strategies to support current growth. It includes additional hydrogeological studies to assess well capacity expansion, examines potential water storage solutions, and confirms the pre-design and technical requirements for near-term municipal servicing.

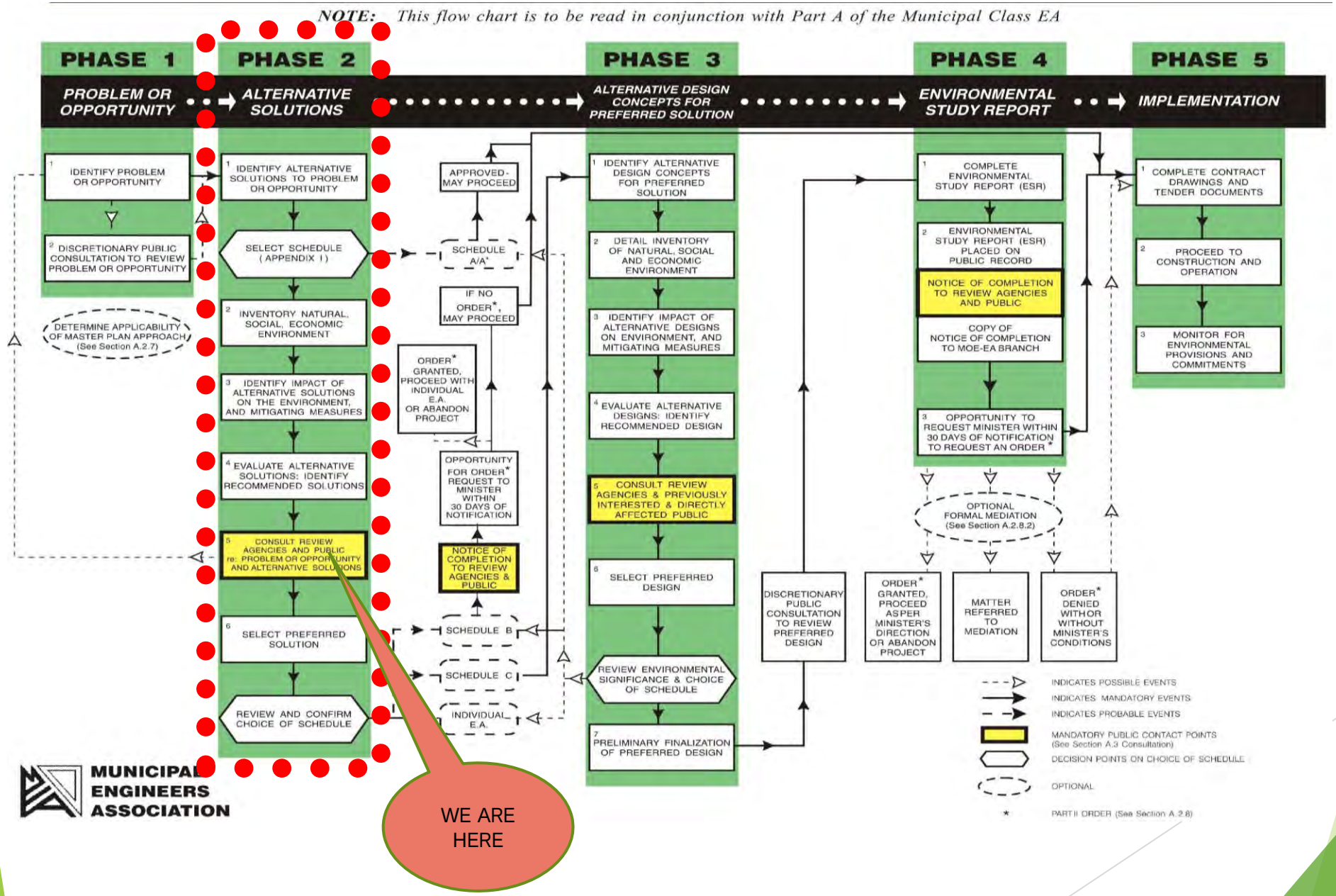
EA Process

The IMP was a Schedule “B” Environmental Assessment prepared in accordance with the requirements of the Municipal Class Environmental Assessment (Class EA) process. Alternative Solutions were evaluated, selected, and recommended for implementation. The Addendum revisits and expands on this evaluation process.

Schedule “B” Projects

- Generally, include improvements and minor expansions to existing facilities where there is potential for some environmental impacts.
- These projects require screening of alternatives for their environmental impacts and completion of Phases 1 and 2 of the Class EA planning process.
- Provided no significant impacts are identified, Schedule “B” projects are approved and may proceed directly to Phase 5.

EA Process


NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA
PHASE 1
PROBLEM OR OPPORTUNITY
PHASE 2
ALTERNATIVE SOLUTIONS
PHASE 3
ALTERNATIVE DESIGN CONCEPTS FOR PREFERRED SOLUTION
PHASE 4
ENVIRONMENTAL STUDY REPORT
PHASE 5
IMPLEMENTATION
1 IDENTIFY PROBLEM OR OPPORTUNITY
2 DISCRETIONARY PUBLIC CONSULTATION TO REVIEW PROBLEM OR OPPORTUNITY
DETERMINE APPLICABILITY OF MASTER PLAN APPROACH (See Section A.2.7)
1 IDENTIFY ALTERNATIVE SOLUTIONS TO PROBLEM OR OPPORTUNITY
SELECT SCHEDULE (APPENDIX 1)
2 INVENTORY NATURAL, SOCIAL, ECONOMIC ENVIRONMENT
3 IDENTIFY IMPACT OF ALTERNATIVE SOLUTIONS ON THE ENVIRONMENT, AND MITIGATING MEASURES
4 EVALUATE ALTERNATIVE SOLUTIONS: IDENTIFY RECOMMENDED SOLUTIONS
5 CONSULT REVIEW AGENCIES AND PUBLIC re: PROBLEM OR OPPORTUNITY AND ALTERNATIVE SOLUTIONS
6 SELECT PREFERRED SOLUTION
REVIEW AND CONFIRM CHOICE OF SCHEDULE
APPROVED - MAY PROCEED
SCHEDULE A/A*
IF NO ORDER*, MAY PROCEED
ORDER* GRANTED, PROCEED WITH INDIVIDUAL E.A. OR ABANDON PROJECT
OPPORTUNITY FOR ORDER* REQUEST TO MINISTER WITHIN 30 DAYS OF NOTIFICATION
NOTICE OF COMPLETION TO REVIEW AGENCIES & PUBLIC
SCHEDULE B
SCHEDULE C
INDIVIDUAL E.A.
1 IDENTIFY ALTERNATIVE DESIGN CONCEPTS FOR PREFERRED SOLUTION
2 DETAIL INVENTORY OF NATURAL, SOCIAL AND ECONOMIC ENVIRONMENT
3 IDENTIFY IMPACT OF ALTERNATIVE DESIGNS ON ENVIRONMENT, AND MITIGATING MEASURES
4 EVALUATE ALTERNATIVE DESIGNS: IDENTIFY RECOMMENDED DESIGN
5 CONSULT REVIEW AGENCIES & PREVIOUSLY INTERESTED & DIRECTLY AFFECTED PUBLIC
6 SELECT PREFERRED DESIGN
REVIEW ENVIRONMENTAL SIGNIFICANCE & CHOICE OF SCHEDULE
7 PRELIMINARY FINALIZATION OF PREFERRED DESIGN
DISCRETIONARY PUBLIC CONSULTATION TO REVIEW PREFERRED DESIGN
1 COMPLETE ENVIRONMENTAL STUDY REPORT (ESR)
2 ENVIRONMENTAL STUDY REPORT (ESR) PLACED ON PUBLIC RECORD
NOTICE OF COMPLETION TO REVIEW AGENCIES AND PUBLIC
COPY OF NOTICE OF COMPLETION TO MOE-EA BRANCH
3 OPPORTUNITY TO REQUEST MINISTER WITHIN 30 DAYS OF NOTIFICATION TO REQUEST AN ORDER*
OPTIONAL FORMAL MEDIATION (See Section A.2.8.2)
ORDER* GRANTED, PROCEED AS PER MINISTER'S DIRECTION OR ABANDON PROJECT
MATTER REFERRED TO MEDIATION
ORDER* DENIED WITH OR WITHOUT MINISTER'S CONDITIONS
1 COMPLETE CONTRACT DRAWINGS AND TENDER DOCUMENTS
2 PROCEED TO CONSTRUCTION AND OPERATION
3 MONITOR FOR ENVIRONMENTAL PROVISIONS AND COMMITMENTS
INDICATES POSSIBLE EVENTS
INDICATES MANDATORY EVENTS
INDICATES PROBABLE EVENTS
MANDATORY PUBLIC CONTACT POINTS (See Section A.3 Consultation)
DECISION POINTS ON CHOICE OF SCHEDULE
OPTIONAL
* PART II ORDER (See Section A.2.8)
MUNICIPAL ENGINEERS ASSOCIATION
WE ARE HERE

Study Area

- Angus has an existing population of ~13,669 people
- Primary Settlement Area for Essa Township
  - Complete community providing full municipal services and a full range and mix of services and facilities
  - Majority of future growth in Essa Township will be directed toward Angus

Study Area - Existing & Proposed (Ultimate) Population & Servicing Demands Summary

	Residential Units	Residential Population (Persons)
Existing Population	4,581	13,669
Ultimate Population (2046)	7,390	22,096

Existing Municipal Systems
Water

- 62 KM of watermain
- 3 well sites, each containing a pump station and reservoir
  - Water supply residual capacity of 789 m^3/d or 599 Equivalent Residential Units
  - Water storage is beyond 80% of total capacity (1,010 m^3 residual capacity)

Ultimate Conditions - Water

- Ultimate Water supply shortfall of 4,635 m^3/d
- Ultimate Water Storage shortfall of 4,199 m^3
- Meeting the new 150 L/s fire flow standard for all of Angus was technically unfeasible without major infrastructure upgrades, as existing systems were originally designed to a lower 37 L/s standard.
- At a 100 L/s fire flow standard for existing and future residential areas, 24 out of 312 locations still fail to meet pressure requirements in a fire flow scenario (shown in Red)

Evaluation Process

As part of the final evaluation process, “short listed” alternative solutions will be ranked against one another in relative terms for each of the evaluation criteria presented below.

Natural Environment Impacts:

- Impacts of the option to vegetation, wildlife & the Natural Environment; and,
- Surface/groundwater quality and quantity implications;

Social/Cultural Environment Impacts:

- Land Use & Archaeological Considerations (Including First Nations);
- Required Inter-Municipal agreements & infrastructure; and,
- Visual landscape/aesthetic impacts and Interruption to residents.

Technical/Operational Considerations:

- Difficulty to construct/implement the Option relative to other alternatives; and
- Operation & Maintenance Efficiency.

Economic Impacts:

- Capital/construction costs, flexibility & phasing; and,
- Long term/operation & maintenance cost burden.

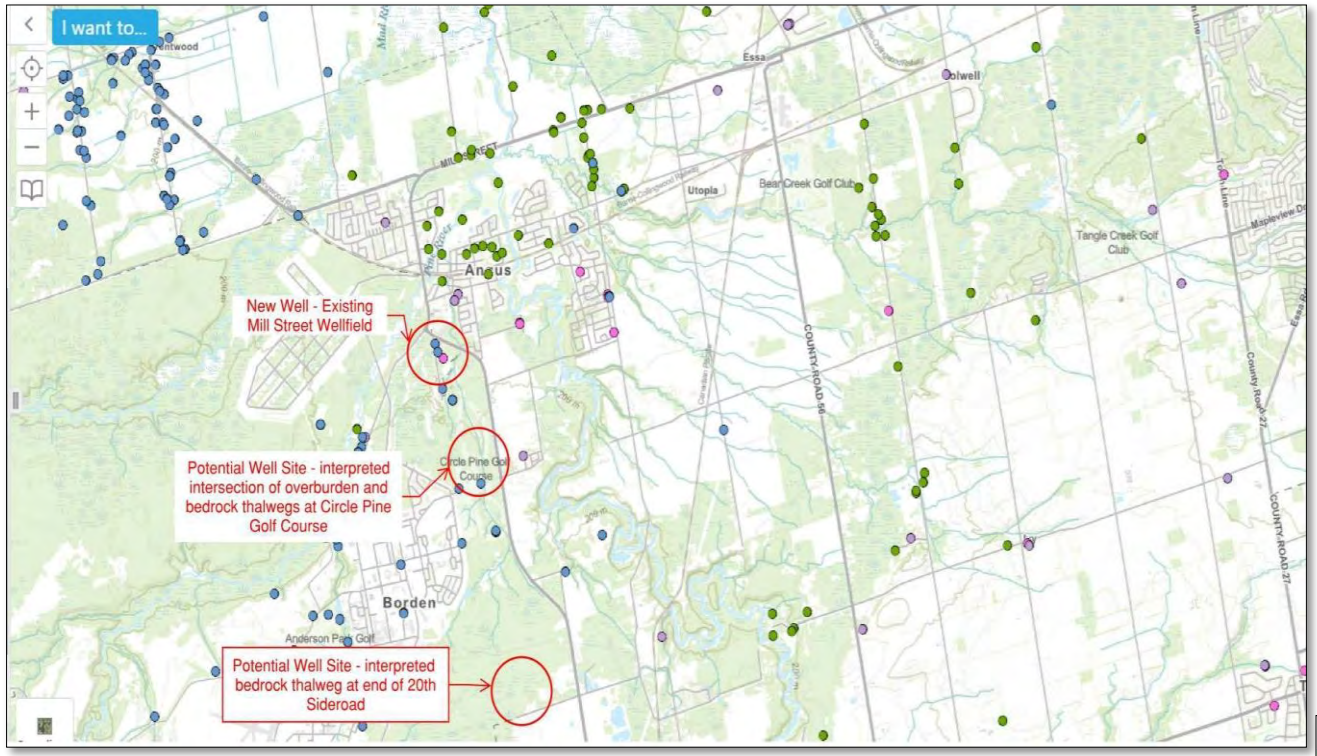
Evaluation Process

- Preliminary screening of servicing options for the IMP included high-level review of all alternative solutions against the following criteria within the updated context of new Hydrogeological & Technical Review completed as part of the Addendum.
- Any solution which did not satisfy one or more of these criteria were eliminated without further detailed analysis.
- Alternative solutions that appeared to be feasible within the context of these criteria were selected as potential **"short-listed"** alternative solutions and evaluated further in terms of their relative advantages and disadvantages within each evaluation criteria category.

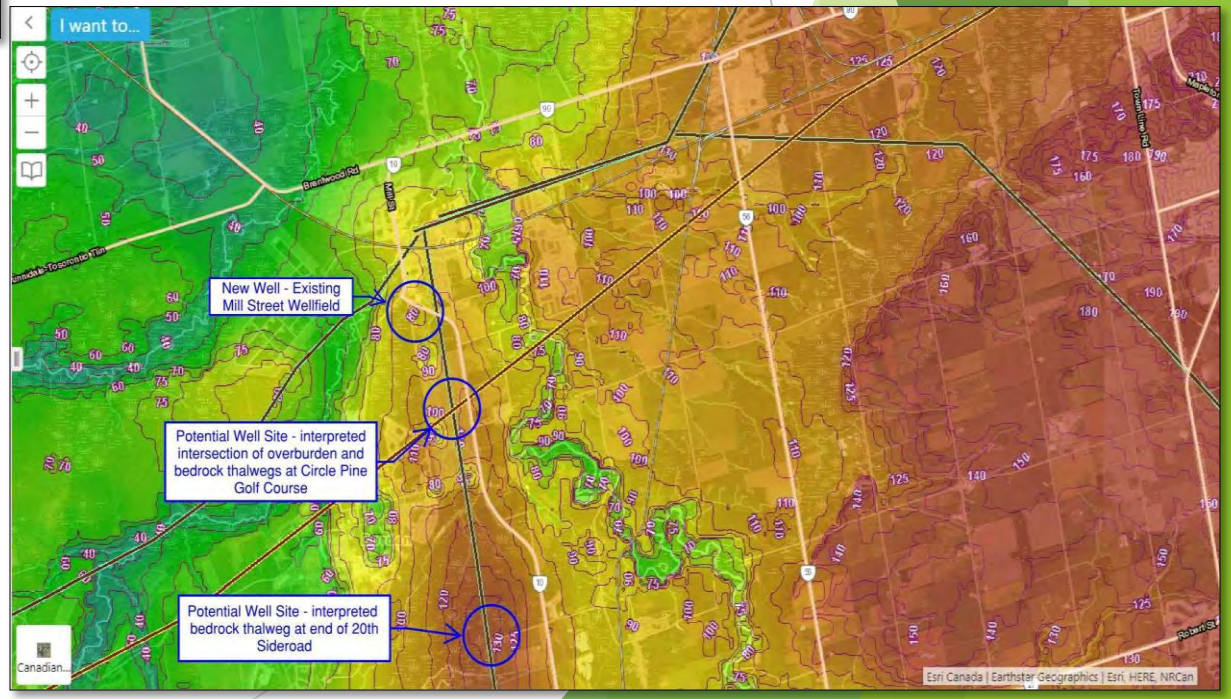
Screening Question	Screening Decision By Answer	
	Pass	Fail
1. Can the proposed solution satisfy the Class EA Problem Statement?	Proceed	Eliminate
2. Does the solution have detrimental environmental, social, technical or economic impacts (i.e. prohibitive costs, agreement or land requirements, or technical difficulty)?	Proceed	Eliminate
3. Can impacts associated with the solution be mitigated?	Proceed	Eliminate

Long List of Servicing Strategies Water Supply

Servicing Strategy Alternative	Description
Option W-1 - Increase Capacity Of Mill Street Well 1	• Increase capacity from 3,928 m^3/d to 4,300 m^3/d. • Upgrade Pump, distribution Treatment system, and Electrical components. • Conduct additional landfill investigation.
Option W-2 - Rehabilitate the Center Street Well 2 and 3	• Estimated capacity increase of 335,000 L/d. Maintenance options like wire brushing and acid flushing may be limited due to artesian conditions. • Eliminated from further evaluation due to minimal gains vs. similar Option W-3.
Option W-3 - Replace the Center Well 2 and 3	• Increase capacity of each well from 1,296 m^3/d to 2,246 m^3/d. Refurbish/replace equipment in the well pumphouse, Assess the reservoir for potential refurbishment, rebuild chemical storage, and Replace diesel generator.
Option W-4 - Increase Water Taking from Brownley Well 5	• Maximize water extraction from Brownley Well 5, increasing capacity from 654,000 L/d to 1,086,000 L/d. Challenges include potential sand production, limited pump size due to well casing, and insufficient space for a new well. • Eliminated from further evaluation due to feasibility challenges identified above.
Option W-5 - Develop a New Well (1A) at the Mill Street Wellfield	• Increase current discharge rate from 3,928 m^3/d to a potential maximum of 8,328 m^3/d. • Conduct additional landfill investigation. • New Pumps, Expand Treatment, Replace/Refurbish electrical components.
Option W-6 - Develop a new well field at a new site	• New well, new pumphouse & pumps, additional storage capacity, treatment system and potentially extensive distribution infrastructure. • Requires a sodium silicate system and chlorine contact tank.



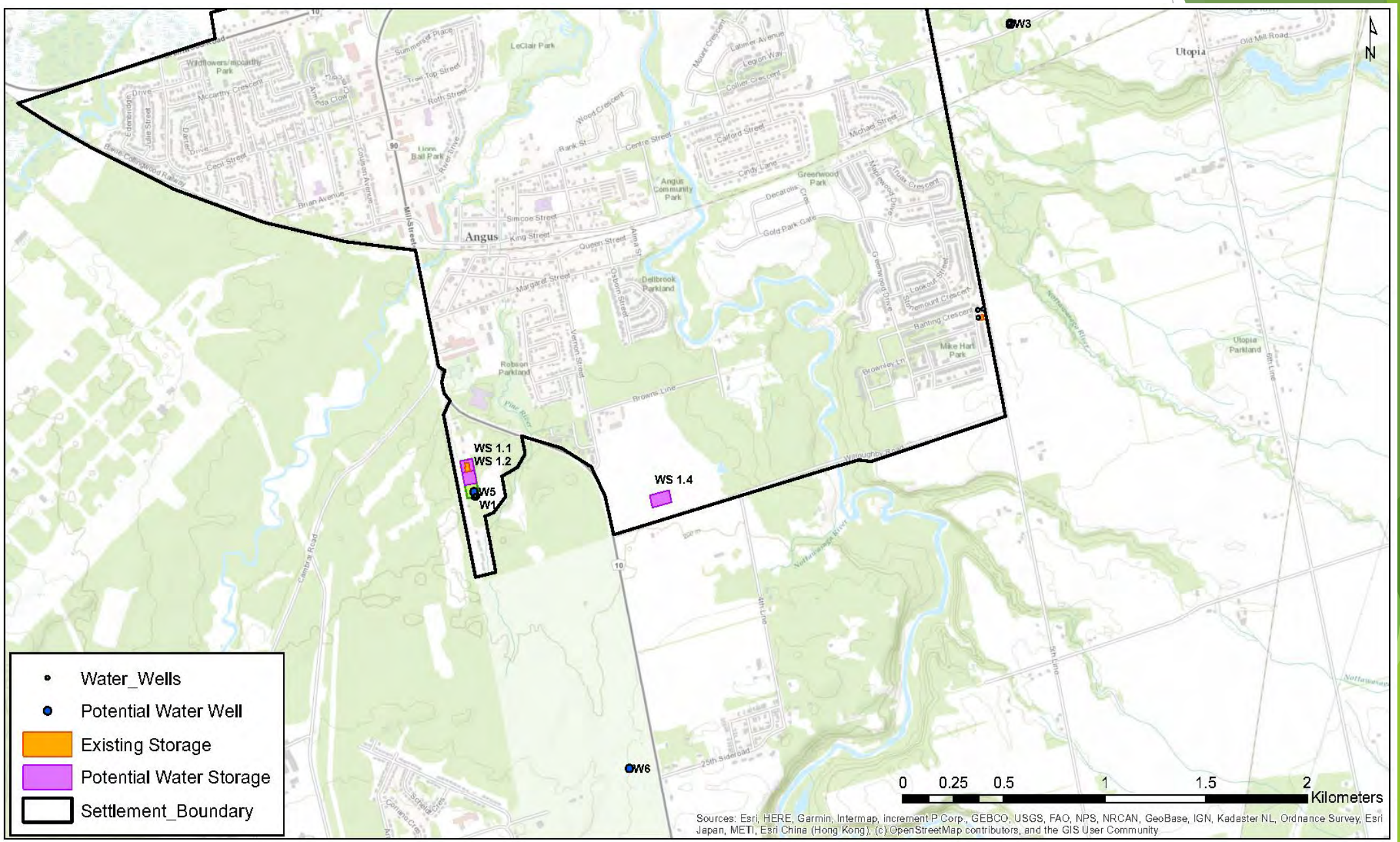
Potential New Wellfield Location (West & East Angus)



Water Supply Short List Options

Ultimate Buildout Additional Capacity Required	4,635,000 L/d		
Options	Additional Capacity (L/d)	Timeline to Approved	Capital Cost
Option W-1 - Increase Capacity Of Mill Street Well 1	400,000	2.1 years (25 months)	$ 1,219,500
Option W-3 - Replace the Centre St Wells 2 and 3	950,000-1,900,000	2 years (24 months)	$ 4,653,750
Option W-5 - Develop a New Well (1A) at the Mill Street Wellfield	4,400,000	2.25 years (27 months)	$ 2,227,500
Option W-6 - Develop a New Well Field at a New Site	TBD	TBD	TBD
Total (W1 and W5 may be combined)	5,750,000- 6,700,000; + capacity from W6	2-5+ Years to implement all options (longer for W6)	

Water Supply Short List Options



Evaluation Criteria	Option W1 Increase Capacity of Mill Street Well 1	Option W3 Replace Centre Street Well 2 and 3	Option W5 Construct Additional Mill Street Well 1A	Option W6 Development of a New Wellfield(s)
Natural Environment Impacts				
Impacts of the option to vegetation, wildlife & the Natural Environment	Low to medium, minimal change in impact area vs. existing conditions.	Low impact. Reuse of existing site.	Low to medium. The area of potential impact would increase vs. W1 but would provide higher overall supply.	Low to medium, but will require changes to a greenfield site, making this the highest potential impact of all four choices.. Higher uncertainty.
Surface/groundwater quality & quantity implications	Low impact, but only minimal increase in water supply. Site has highest yield potential. Former landfill impact assessment needed.	Low impact given this will be a replacement project on an existing site. Flow testing needed to confirm viable yield of increase (i.e. 950 m3/d one well vs.1900 m3/d for two)	Slightly higher potential impact than W1 but provides significantly more supply as site has highest yield potential. Former landfill impact assessment needed.	Likely the highest impact of all four options as groundwater would be coming from an as-yet untapped source (unknown yield potential). Additional studies required to confirm.
Natural Environment Overall Rating				
Social / Cultural Environment Impacts				
Land Use & Archaeological Considerations (Including First Nations)	Minimal, project is contained to existing, previously disturbed municipal lands. Former landfill impact assessment needed	Minimal as project is contained to existing, previously disturbed municipal lands.	Similar Impacts to Option W1.	Archaeological study will be required for any new well site. Higher land use requirement due to creation of an additional well site at a new location.
Visual landscape/Aesthetic impacts, Traffic impacts & interruption to residents	Low impacts due to maximizing use of existing systems. Low to Moderate potential for service interruptions during upgrades.	Low impacts due to maximizing use of existing systems. Moderate potential for service interruptions during well replacement.	Similar impacts to W1, with less potential for service interruptions (no replacement of existing systems to bring online). Lowest impact option.	Low to Medium impact, uncertainty introduced due to unconfirmed site location.
Required Intermunicipal Agreements & Infrastructure	No Intermunicipal Infrastructure or Agreements Required.	No Intermunicipal Infrastructure or Agreements Required.	No Intermunicipal Infrastructure or Agreements Required.	No Intermunicipal Infrastructure required. Land acquisition or agreement required for new site.
Social / Cultural Environment Overall Rating				
Technical/Operational Considerations				
Difficulty to construct or implement the Option relative to other alternatives & additional supply provided.	Medium. Requires landfill investigation. May require pump and distribution upgrades. Exiting treatment may require some changes. Replacement or refurbishment of electrical components might be required. This option enhances the current capacity from 3,928 m³/d to 4,300 m³/d, resulting in a potential increase in water supply of 400 m³/d.	Medium to High. Option may require full replacement of pumphouse and all equipment and structure. Structural condition assessment of reservoir required. Water quality and quantity testing required. This option increases the current capacity of each well from 1,296 m³/d to 2,246 m³/d, resulting in a combined potential increase in water supply of 1900 m³/d, with an initial increase of 950 m³/d assuming conservatively that only one well may be increased.	Medium, but with higher ROI potential than other options. Requires landfill investigation. New pump and infrastructure required to connect to the existing system. Water Quality & Quantity testing required. Equipment and treatment system upgrades potentially needed. This option could increase the current discharge rate by 4,400 m3/d. Highest potential yield. 50% of this yield increase would more than close the servicing gap between water and wastewater systems and provide water for anticipated near term growth.	High due to uncertainty. Requires new pumphouse, pumps, storage capacity, treatment systems, and potentially extensive distribution infrastructure to connect new wellfield to existing system. Capacity available at the most likely candidate site (1.4 km away from the existing water system) is currently unknown and would require field investigations to confirm. This option is viewed as a "long term" solution for further investigation per the original IMP, to be explored once all other viable options have been exhausted.
Operation & Maintenance Efficiency	Minimal changes to O&M burden vs. existing conditions. Slightly higher costs due to higher pumping for additional supply.	Minimal changes to O&M burden vs. existing conditions. Slightly higher costs due to higher pumping for additional supply.	Slighly higher than W1 due to addition of another well at an existing site, however overall difference is still minimal.	Highest maintenance burden of any option due to addition of a completely new well & treatment system in a new location.
Technical/Operational Considerations Rating				

Evaluation Criteria	**Option W1** Increase Capacity of Mill St. Well 1	**Option W3** Replace Centre Street Well 2 and 3	**Option W5** Construct Additional Mill St. Well 1A	**Option W6** Development of a New Wellfield(s)
Economic Impacts				
Capital / Construction costs & Potential ROI	Low Capital cost, but lowest estimated ROI (i.e. highest cost per m3/d) at $3,049 per m3/d of additional water supply. The estimated capital Cost for this option is $1,219,500.	Lower estimated ROI of $2,449 per m3/d of additional water supply and relatively high capital cost. The estimated capital Cost for this option is $4,653,750, based on replacing both wells and the pumphouse. Capital cost may decrease by approximately $1,000,000 if only a single well is replaced, but ROI would also be lower ($3,846 per m3/d of additional supply).	Best overall ROI water supply option at $506 per m3/d of additional water supply. The estimated capital Cost for this option is $2,227,500.	Estimated to have similar costs per m3 to W3 for installation of new wells, pumps and treatment, plus the added cost of connecting to the distribution system. GEI's estimate for the nearest potentially viable source would also require 1.41 km of pipe to connect to the existing system.
Long term/operation & maintenance cost burden	Minimal changes to O&M burden vs. existing conditions. Slightly higher costs due to higher pumping for additional supply.	Minimal changes to O&M burden vs. existing conditions. Slightly higher costs due to higher pumping for additional supply.	Slightly higher maintenance burden than W1 due to addition of another well at an existing site, however overall difference is still minimal.	Highest O&M. More costly maintenance due to the addition of an additional physical well site vs. existing.
Payment structure, cost recovery options for Municipality, Phasing Priority / Flexibility.	This option is expected to take 25 months, including the 3-month investigation of waste disposal area, a 2-month approval process for the Drinking Water Works Permit Amendment, a 2-month Permit to Take Water Amendment, a 2-year updates to the Source Water Protection Plan (concurrent with rest of project), and 26 weeks for construction. No agreements are required.	This option is expected to take 24 months, including the 2-month approval process for the Drinking Water Works Permit Amendment, a 2-month Permit to Take Water Amendment, 2 years for updates to the Source Water Protection Plan (concurrent with rest of project), and 52 weeks of construction. No agreements are required.	This option is expected to take 27 months, including the 2-month subsurface investigation, a 2-month approval process for the Drinking Water Works Permit Amendment, a 2-month Permit to Take Water Amendment, 2 years for updates to the Source Water Protection Plan (concurrent with rest of project), and 40 weeks of construction. No agreements are required.	Longest lead time due to the reliance on an unconfirmed water source. Preliminary investigations suggest that the most viable site for the new wellfield is near the Circle Pine Golf Course, requiring approximately 1.41 kilometers of piping to connect to the existing infrastructure. As such, it is considered the lowest priority project. Agreements or land acquisition required to facilitate this option.
Economic Ranking				
Overall Ranking:	**Second Priority After Option W5**	**Third Priority After Option W1**	**Highest Priority Option**	**Lowest Priority**

Preferred Solution: Water Supply

- The preferred solution involves a phased approach: Options W1, W3, and W5 were selected for further exploration to meet Angus's future water capacity needs, with Option W6 considered for future supply once existing sources are fully expanded.
- Further detailed investigations and technical analysis were carried out on all options carried forward from the IMP, and Addendum Evaluations for water supply were focused on prioritization of the identified preferred solution projects.
- Immediate Solution: Based on evaluation criteria, Option W5—Developing a New Well (1A) at the Mill Street Wellfield—was identified as the preferred immediate solution for additional water supply.

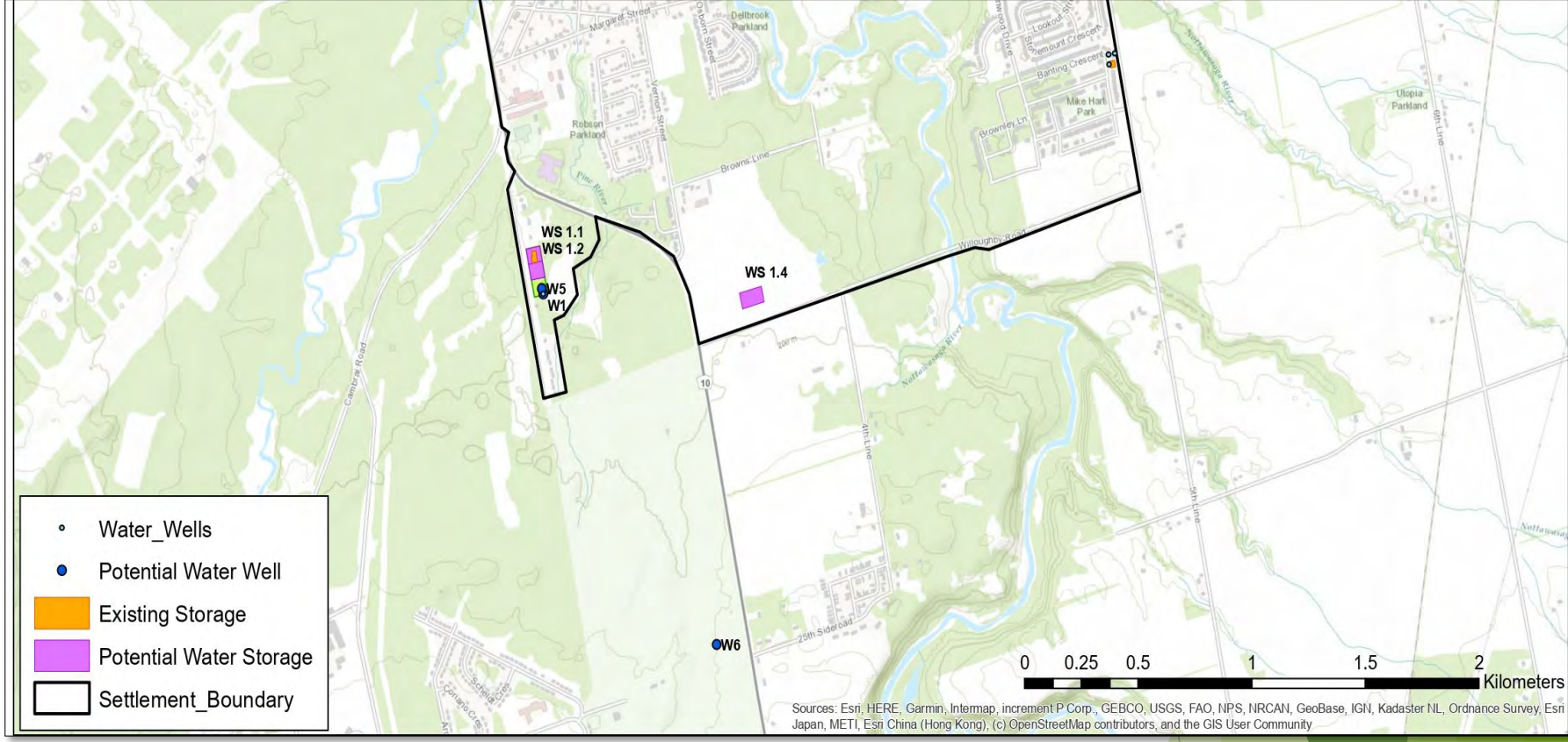
Long List of Servicing Strategies
Water Storage & Fire Flow

Servicing Strategy Alternative	Description
Option WS-1 - Storage at a Single Location	• Construct a storage system (elevated, in-ground or at grade) at a single site, preferably at (or adjacent to) an existing reservoir location. • Option carried forward into multiple specific site evaluations (see next slide)
IMP Option WS-3 - Storage at Two (2) Locations	• Construct two (2) storage systems (elevated, in-ground or at grade) located at two (2) sites, preferably at (or adjacent to) existing municipal well locations in the Brownley (1), Center (1), Mill (1) areas of Angus. • Option eliminated from further evaluation due to high capital costs, O&M and insufficient space at two of the available sites (Brownley and Centre)
IMP Option WS-4 - Storage at Three (3) Locations	• Construct three (3) storage systems (elevated, in-ground, or at grade) located at three (3) sites, preferably at (or adjacent to) existing municipal well locations in the Brownly, Center (1) and Mill (1) areas of Angus. • Option eliminated from further evaluation due to high capital costs, O&M and insufficient space at two of the available sites (Brownley and Centre)

Long List of Storage at Single Location Options

Servicing Strategy Alternative	Description
Option WS-1.1 - Additional in-ground Storage at the Mill Street Site	• Construct new 4,200 m³ in-ground reservoir at the Mill Street property, including site works • Upgrade approximately 2,508 m of watermain to achieve 100 L/s fireflow in all areas
Option WS-1.2 - Additional Elevated Storage at the Mill Street Site	• Construct a 4,200 m³ elevated storage tank at Mill Street, including site works • Upgrade approximately 2,157 m of watermain to achieve >100 L/s fireflow in all areas
Option WS-1.3 - Additional Elevated Storage at the Brownley Site	• Construct a new 4,200 m³ elevated storage tank at the Brownley Street property • Upgrade approximately 2,056 m of watermain to achieve >100 L/s fireflow in all areas • Eliminated after site review due to insufficient space at the Brownley site for additional storage
Option WS-1.4 - New Storage at a Greenfield Site (South Angus)	• Construct a 4,200 m³ elevated storage tank at new site (TBD) in southern Angus, including site works • Upgrade Approximately 1,879 m of watermain to achieve >100 L/s fireflow in all areas • Acquire land for new storage site and/or execute agreements for land use
Option WS-1.5 - New Storage at a Greenfield Site (Northeast Angus)	• Similar to WS-1.4 but with greater limitations and land acquisition requirements • Eliminated from further evaluation due to inferiority vs. similar option
Option WS-1.6 - Additional Elevated Storage at the Centre Street	• Construct a 4,200 m³ elevated storage tank at Centre Street, • Upgrade Approximately 2,547 m of watermain to achieve >100 L/s fireflow in all areas • Eliminated after site review due to insufficient space at the Centre St. site for additional storage

Water Storage Short List Options



Additional Storage Required	4,199 m^3		
Options	Additional Storage (m3)	Timeline to Approval	Capital Cost
Option WS-1.1 - Additional in-ground Storage at the Mill Street Site	4,200	2.5 years (31 months)	$ 10,485,125
Option WS-1.2 - Additional Elevated Storage at the Mill Street Site	4,200	2.25 years (26 months)	$ 11,876,750
Option WS-1.4 - New Storage at a Greenfield Site (South Angus)	4,200	2.25 years + Unknown Land Acquisition Time	$ 11,876,750 + Land & TBD Costs

Evaluation Criteria	Servicing Strategy WS-1.1 Additional in ground reservoirs at the Mill St. Site	Servicing Strategy WS-1.2 New Elevated Storage at the Mill Street Site	Servicing Strategy WS-1.4 New Elevated Storage at New Site (South Angus)
Natural Environment Impacts			
Impacts of the option to vegetation, wildlife & the Natural Environment	Low due to use of existing site.	Low due to use of existing site.	High due to uncertainty of using a new, undisturbed site.
Surface/groundwater quality implications	Minimal, aside from construction dewatering for WM replacements..	Slightly less than WS1.1, due to less WM replacement requirements	Potentially less WM replacement requirements than WS-1.2 but higher uncertainty with new Greenfield site.
Natural Environment Overall Rating			
Social / Cultural Environment Impacts			
Land Use & Archaeological Considerations (Including First Nations)	Minimal – All work in previously disturbed municipal lands & ROW's	Minimal – All work in previously disturbed municipal lands & ROW's	Higher potential for issues due to use of TBD Greenfield Site.
Visual landscape/Aesthetic impacts, Traffic impacts & interruption to residents	Minimal visual or traffic impacts, Mill St. location is somewhat remote, and no above ground storage. Potential construction interruptions due to WM replacement and potential need to take existing storage offline.	Slightly more visual impact with above ground reservoir. Less impact to residents due to use of a separate storage system vs. augmenting existing, and less WM replacement requirements than WS-1.1.	Potential for interruption to residents due to WM replacement requirement. Some uncertainty on visual / traffic impacts, subject to ultimate site selection, but likely similar to WS-1.2.
Required Intermunicipal Agreements & Infrastructure	No Intermunicipal Infrastructure or Agreements Required	No Intermunicipal Infrastructure or Agreements Required	No Intermunicipal Infrastructure, but Agreements may be Required for acquisition of a new storage site.
Social / Cultural Environment Overall Rating			
Technical/Operational Considerations			
Difficulty to construct or implement the Option relative to other alternatives	Medium. Approximately 2,508 l.m. of WM upgrades req'd for adequate fire flows & pressure in addition to in-ground storage.	Medium. Approximately 2,508 l.m. of WM upgrades req'd for adequate fire flows & pressure in addition to elevated storage.	Similar to Option WS1.2 but with added field investigations, and associated uncertainties. Total WM installation requirement is likely similar to or slightly higher than Option WS1.2 when accounting for internal site servicing.
Operation & Maintenance Efficiency	Inspections and cleaning every few years to check for cracks and/or remove iron/manganese deposits. More burden on pumping systems under this option vs. an elevated tank which provides static pressure.	Overcoating of exterior and re-touching of interior at year 10 & full recoating in at year 25. Due to the elevated tank, this option will have less maintenance overall than WS1.1 which relies more heavily on existing pumps for system flow & pressure.	Maintenance will be similar to WS1.2.
Technical/Operational Considerations Rating			
Economic Impacts			
Capital/construction costs	The estimated Capital Cost is $ 10,485,125.	The estimated Capital Cost is $ 11,876,750.	Min. cost of $12 Million plus land acquisition, studies and connection to existing system (approx. 100-200m of pipe)
Long term/operation & maintenance cost burden	Minimal maintenance requirements other than inspections and cleaning every few. More burden on pumping vs. an elevated tank. Higher associated energy cost.	Overcoating of exterior and re-touching of interior at year 10 & full recoating in at year 25. Less maintenance overall than WS1.1.	Maintenance will be similar to WS1.2.
Payment structure, cost recovery options for Municipality, Phasing Priority & Flexibility.	Good flexibility given the project is on existing municipal lands - Estimated time to completion: 31 months, with 3 months.	Good flexibility given the project is on existing municipal lands - Estimated time to completion: 26 months.	Least flexible and longest lead time to a shovel ready solution as agreements would need to be made with private owners in the required pressure zone - timing to achieve this is unknown.
Economic Ranking			
Overall Ranking:	**Less Preferred Option**	**Most Preferred Option**	**Less Preferred Option**

Preliminary Preferred Alternative: Water Storage

Construct New, Elevated Storage Tank at Mill Street Site: Option WS-1.2

The recommended overall preferred servicing strategy for water storage in Angus includes the following components:

- Increase available storage by 4,200 m^3
- Supports the 25-year growth projection, providing scalable storage capacity that can be adjusted as demand increases.

Preferred Servicing Option Projected Capital Costs (Near- Term Implementation)

- Increase Angus' water supply by adding a new well at Mill Street (W5), providing an estimated capacity of 4,400 m^3/d (supporting approximately 1,590 residential units)
- Construct an elevated storage system at Mill Street (WS-1.2) with a capacity of 4,200 m^3 to support a 25-year buildout, initially filled to 50% for maintenance until further capacity is needed.
- Option W5's new well at Mill Street will support around 1,590 homes, matching (and exceeding) current wastewater capacity to accommodate near-term growth.
- Other supply options are not suggested now and may have higher costs later when further wastewater upgrades are required.

Project Description	Option of Probable Capital Cost
Option W5 - Construct Additional Mill Street Well 1A (incl. hydrogeological & environmental testing/studies)	$ 2,227,500
Option WS 1.2 - Construct New, Elevated Storage Tank at Mill Street Site (Cost does not include WM Upgrades in existing areas)	$11,876,750

Next Steps

- Incorporate PIC and Agency comments into the Final Design Concept Selection;
- Finalize the water supply and storage Addendum Summary Report and Publish Notice of Study Completion; and,
- Place the Class EA Addendum Report on file with the MECP and Township for public review and comment for a period of 30 days.
- If no Part II Order Requests are received during the ESR 30-day review period, the Class EA Addendum would be concluded and the project would proceed to the next stage of approvals following the 30-day review period.
- Initiate hydrogeological investigation and environmental testing for the final Water Supply Solution
- Initiate detailed design for the final water supply & storage solutions

THANK YOU FOR ATTENDING

Please direct any comments via email to the project representatives within 10 business days of this PIC

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