Maintaining a Safe and Sustainable Supply to 2038

ASSESSING ALTERNATIVES



AECOM

How We Will Assess Alternatives

Scope of Work

- Each potential alternative will be assessed using a consistent approach and evaluation criteria
- A short-list of alternatives will be ranked and further evaluated. This may include screening by:
 - Primary Criteria (e.g., ability to meet regulations, costs, technical feasibility, environmental or social affects)
 - Secondary Criteria (e.g., manageable impacts like construction truck traffic)
- The suggested evaluation is qualitative not a numerical ranking system and considers the suitability of alternative solutions and strategies based on significant advantages and disadvantages
- Comparisons and trade-offs will be made between alternatives and will form the rationale for the identification of the preferred solution or water strategy



Most preferred

Evaluation Criteria

	Scope of Work
Public Health and Safety	Ability to meet provincial requirements
Natural Environment	 Potential effects to natural environment Potential impacts to water resources Potential impacts to natural heritage features Environmental management planning considerations
Social and Cultural Resources	Land use impacts Short-term construction impacts Potential impacts from operations
Economic and Financial Considerations	Estimated capital costs Estimated operations and maintenance costs Impacts to agricultural operations and other private land owners
Legal / Jurisdictional Considerations	 Location of facility relative to city boundaries Land requirements Ability to address outside control
Technological Considerations	Ability to implement and meet peak demand Constructability, schedule and timing, and maintaining operations during construction Water quality Allowance for future treatment needs Expandability Ability to respond to changes in regulations Ability to utilize existing infrastructure
	AECO/

We'd Like Your Input...

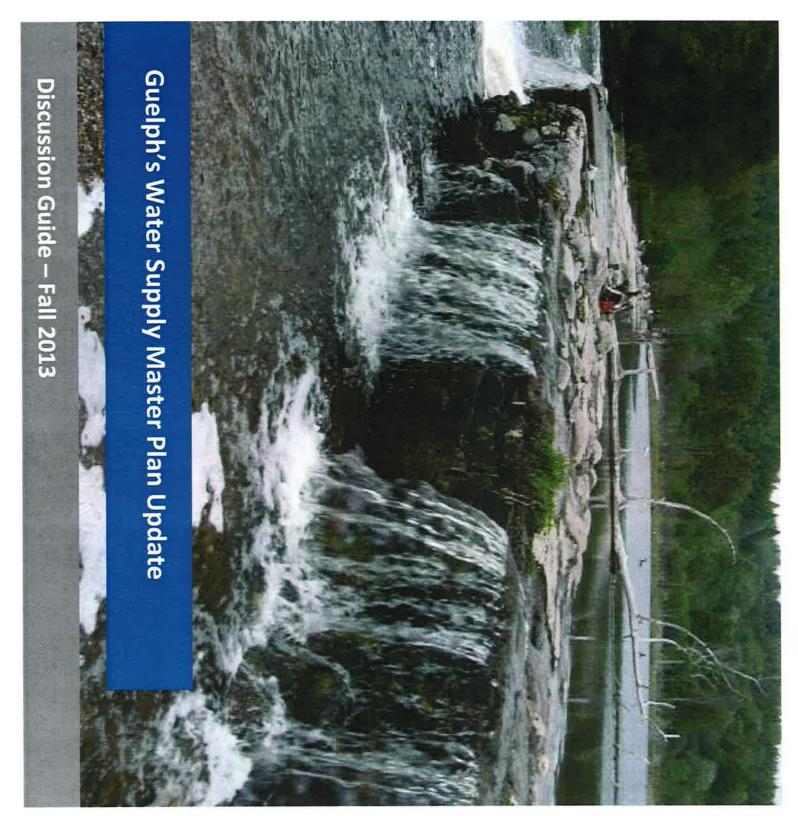
- Are the evaluation criteria suitable for this study? Is there anything you would like to add or change?
- Is the proposed approach adequate? Are you comfortable with us using a qualitative assessment rather than a numerical ranking system?



Next Steps

- Incorporate / consider feedback from tonight's meeting
- Complete current work and develop water supply alternatives
- Conduct preliminary evaluation of alternatives
- On-going Community Engagement
 - Community Liaison Committee Meeting #1 Tuesday September 17
 - Municipality / Agency Workshop #1 Thursday, September 19
 - Community Open House #1 October 10th (tentative)
 - CLC # 2 Mid November
 - Agency/Municipality #2 Mid November







Dave Belanger Water Supply Program Manager

519-822-1260 x 2186 City of Guelph dave.belanger@guelph.ca

Patty Quackenbush

AECOM Senior Project Manager

519-650-8691

patty.quackenbush@aecom.com





The Corporation of the City of Guelph

Why Update the Water Supply Master Plan?

and institutional demands—over the next 25 years. Reviewing our existing water supply system is an we will continue to access a sustainable supply of water—to meet residential, industrial, commercial so that we continue to provide the high level of service Guelph residents have come to expect. opportunity to discuss with Guelph and surrounding communities how best to manage this vital supply The City of Guelph is updating its council-approved Water Supply Master Plan, from 2007, to define how

with the cooperation and participation of the County and the relevant Township. Supply Master Plan, any development of water supply options outside of the City will only be considered water supply will be required to support the City's continued growth. In keeping with the 2007 Water to meet Guelph's predicted demand for water in the future. Guelph is a growing community, and new water. Our updated Master Plan will provide short-term, mid-term and long-term water supply options Today, our existing water supply fulfills the City's commitment to provide a safe and reliable supply of

our water supply will continue to meet the service requirements of the Guelph community and the high quantity, economic factors, environmental concerns and any relevant regulations. Regardless of source, outside of the City, and local surface water sources—we'll consider things like water quality and When investigating existing and new water supply options—like new groundwater sources in and regulatory standards of the Ontario Ministry of the Environment.

What's Included in this Discussion Guide?	
Why update our Water Supply Master Plan (WSMP)?	Page 1
Getting the conversation started	Page 2
Everything you wanted to know about Master Planning	Page 2
Guelph's Current Water Supply	Page 4
Updating our Water Supply Master Plan	Page 9
Community Liaison Committee Agenda	Page 13
Discussion Topics & Questions	Page 14



Getting the Conversation Started

supply for present and future generations. people care about where our water comes from, and that they want to maintain a safe and sustainable Community input is an essential part of our Water Supply Master Plan update process. We know that

from people and organizations in a number of ways to help update the Water Supply Master Plan: That's why we're making it easy for people to get involved. We'll be gathering input and suggestions

community including residents, community groups, local government and business leaders. They team throughout the process. The CLC has members from a wide cross section of the Master Plan update. will meet at least twice to share ideas and perspectives on ways to improve the Water Supply A Community Liaison Committee (CLC) is in place to advise and provide feedback to the project

By-laws and Acts, as well as environmental assessment and approval requirements. perspective to ensure that the Water Supply Master Plan process meets all local and provincial A Municipal / Agency Forum will provide crucial inputs from a government and approval agency

directly to the project team members, and provide feedback. events will give interested individuals and groups an opportunity to review plans, ask questions Two Community Open Houses are planned for the wider community to participate. These

comments, or concerns, please contact either Dave Belanger or Patty Quackenbush by telephone or email. We can also add you to the project email list if you would like to receive project notifications. The Water Supply Master Plan update process is designed with you in mind. If you have any questions,

Everything you wanted to know about Master Planning

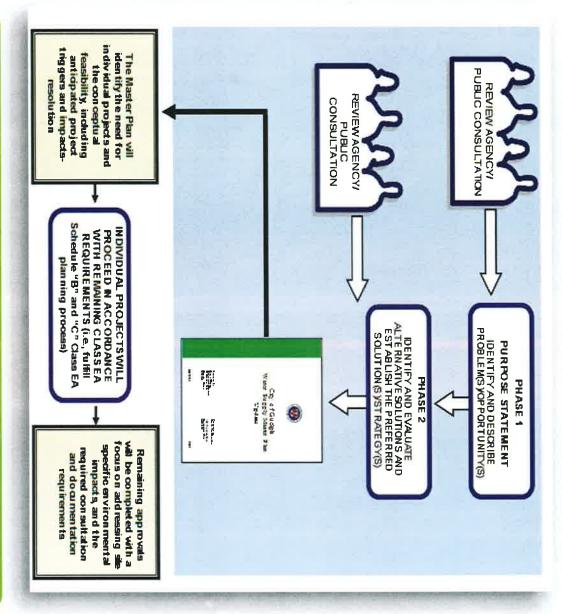
approved by Council—we will have identified constraints and opportunities related to our existing water capacity of our existing system. supply system. We'll also have evaluated and prioritized a number of individual projects to increase the we are finished—after our Water Supply Master Plan Update is reviewed by the Guelph community and Our update follows the requirements of a Municipal Class Environmental Assessment (Class EA.) When

Master Plans differ from project specific studies. They:

- Are broad in scope. They analyse a system in order to develop a framework for the provision of future works and development.
- the larger management system, and may be distributed geographically throughout the study individual projects will also follow the Municipal Class EA process. area. The implementation of specific projects may occur over an extended time frame. Recommend Individual Projects. Specific projects recommended in a Master Plan are part of
- must at least satisfy the requirements of Phases 1 and 2 of the Class EA process. Figure 1 Must Satisfy Requirements of the Class EA. According to the Class EA document, a Master Plan illustrates the Class EA Master Planning Process.



Figure 1 The Master Planning Process



comply with the Environmental Assessment Act: requires a different level of review to complete the requirements of the Class EA, and according to the type of environmental effect(s) anticipated. Each of these classifications The MEA Class EA document classifies projects as either Schedule "A", "B" or "C"

• Schedule 'A' Projects are limited in scale, have minimal adverse effects and include the majority planning process. activities. These projects are approved and may be implemented without following the Class EA of municipal sewage, stormwater management and water operations and maintenance

Schedule 'A' projects typically include normal or emergency operational maintenance activities allowance or an existing utility corridor. Examples of Schedule "A" projects include facilities that are located within a municipal road



pre-approved under the Municipal Class EA. For example, it would be appropriate to notify the The sub-classification, Schedule 'A+', ensures that people are notified of certain projects that are questions or concerns to their municipal council. public of planned construction in their area. This allows people the opportunity to direct

proponent is required to conduct a screening process that involves contact with directly affected concerns are addressed. public and relevant review agencies to ensure that they are aware of the project and that their 'B' Projects have the potential for some adverse environmental effects.

•

and relevant agencies. If there are no outstanding concerns raised by the public and/or review and an Environmental Screening Document be prepared and submitted for review by the public Schedule 'B' projects require that Phases 1 and 2 of the Class EA planning process be followed (commonly referred to as a "bump-up") may be invoked. screening process raises a concern that cannot be resolved, then the Part II Order procedure then the proponent may proceed to project implementation. If,

projects include activities such as siting of water storage facilities or new municipal wells Schedule 'B' projects generally include improvements and expansions to existing facilities where there is the potential for some adverse environmental impacts. Examples of Schedule "B" (including wellhead protection).

Schedule 'C' Projects have the potential for significant environmental effects and must proceed Class EA document. under the full planning and documentation procedures (Phases 1 to 4) specified in the MEA

II Order procedure may be invoked. submitted for review by the public. If concerns are raised that cannot be resolved, then the Part Schedule 'C' projects require that an Environmental Study Report (ESR) be prepared and

treatment plants, and major expansions to existing facilities Schedule 'C' projects typically include the siting and construction of new facilities, such as water

Guelph's Current Water Supply System

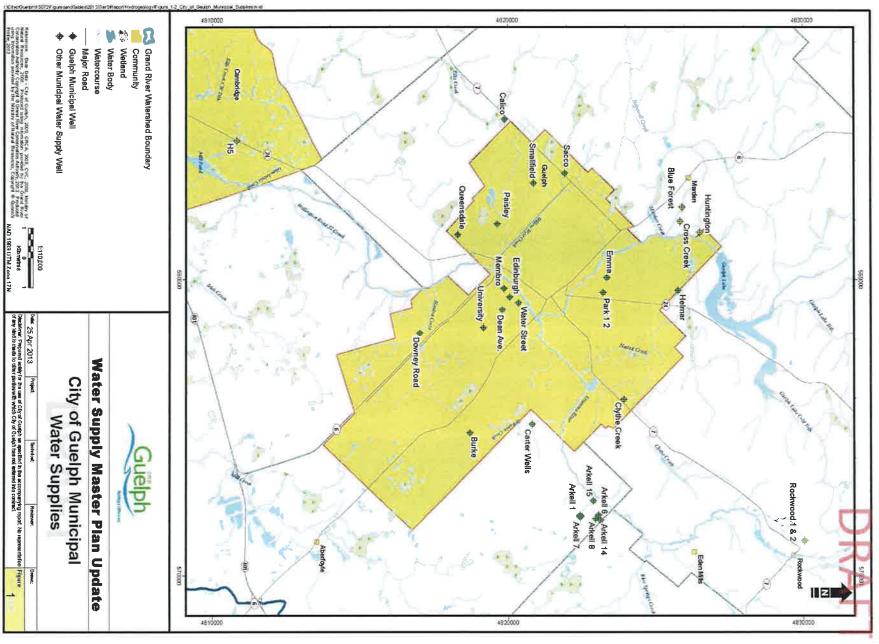
industrial, commercial and institutional (IC & I) water demands. Other municipal water uses including system and its capacity. fire fighting, street washing, and watermain flushing. The following describes the City's water supply The City of Guelph relies exclusively on groundwater to meet the municipality's residential and

collector system. The locations of the various wells and the collector are shown on Figure 2 - Existing includes production wells installed in the Guelph-Gasport bedrock aquifer and the Arkell Spring Grounds Water Supply System. The City has used groundwater as its primary source of water since 1879. Guelph's water supply system



Guelph

Figure 2. City of Guelph Municipal Water Supplies



groundwater system that collects spring water in the Arkell Spring Grounds. status of the individual production wells. quality concerns. Table 1 Municipal Production Wells – Operational Status summarizes the operational were operated on a near continuous basis while the other four wells were offline, due primarily to water There are currently 25 production wells in the municipal supply system. In 2013, 21 municipal wells In addition to the municipal wells, there is a shallow

groundwater where it is captured by the collector system. The augmentation of flows is operated within pumping water from the Eramosa River to a pit and trenches and recharging this water to the (i.e., summer demand.) low river flow conditions resulting in less water to the system at times when the water is most needed strict constraints and is closely monitored for water quality. This system is occasionally shut down under The City also has the infrastructure to augment flow in the collector system during summer months by

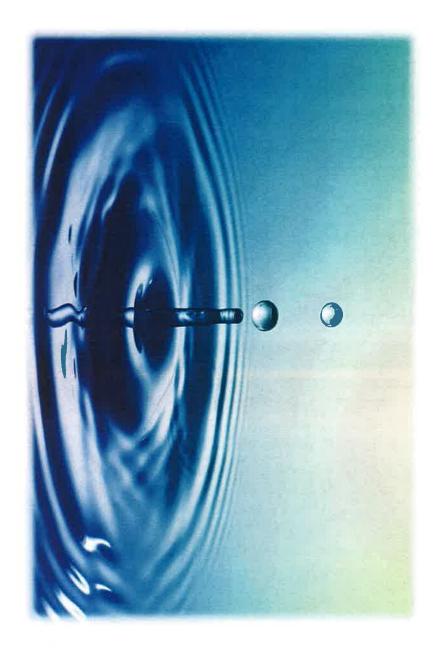




Table 1 - Mun	icipal Production W	Table 1 - Municipal Production Wells - Operational Status
Pumping Well	Service Dates	Status in 1998
Northeast Quadrant		
Emma Street Well PW1/31(COG)	1931 to present	continuous operation
Park Wells PW1/37(COG) & PW1/47(COG)	1937 to present	continuous operation
Clythe Creek Well PW2/76(COG)	1984 to present	off line for treatment upgrade
Helmar Well PW6/66(COG)	1975 to present	continuous operation
Northwest Quadrant		
Sacco Well PW8/52(COG)	1953 to 1991	removed from service, low level volatile organic compound contamination
Paisley Road Well PW4/59(COG)	1962 to present	continuous operation
Smallfield Well PW3/66(COG)	1970 to 1993	removed from service, low level volatile organic compound contamination
Queensdale Well PW1/70(COG)	1973 to present	continuous operation
Calico Well PW4/76(COG)	1979 to present	continuous operation
Southwest Quadrant		
Membro Well PW1/53(COG)	1997 to present	continuous operation
Edinburgh Road Well PW2/53(COG)	1955 to 1996	removed from service, low level volatile organic compound contamination
Dean Avenue Well PW3/58(COG)	1972 to present	continuous operation
Water Street Well PW16/53(COG)	1956 to present	continuous operation
Downey Road Well PW5/67(COG)	1980 to present	continuous operation
Univ. of Guelph PW1/73(COG)	1970 to present	continuous operation
Southeast Quadrant		
Carter Wells PW2/62(COG) & PW1/89(COG)	1963 to present	continuous operation
Arkell 6 PW6/63(COG)	1967 to present	continuous operation
Arkell 7 PW7/63(COG)	1964 to present	continuous operation
Arkell 8 PW8/63(COG)	1989 to present	continuous operation
Arkell 1 PW1/66(COG)	1967 to present	continuous operation
Arkell 14	2012 to present	new well in Operational Testing Program
Arkell 15	2012 to present	new well in Operational Testing Program
Burkes Well PW2/66(COG)	1975 to present	continuous operation



We've made improvements since our 2007 WSMP

wells have increased the City water supply capacity by about 8,000 m³/day. For more information visit wells and operation of the Arkell Bedrock Wellfield is now in an Operational Testing Program. These new http://guelph.ca/plans-and-strategies/water-supply-master-plan/arkell-spring-grounds/ projects recommended in the Master Plan. The Arkell Spring Grounds has added two new production Since the completion of the Water Supply Master Plan in 2007, the City has initiated a number of the

supply-master-plan/southwest-quadrant/) to provide more water from the bedrock wellfield in the quantity and quality issues associated with the Dolime Quarry. southwest part of the City. This project, however, is currently on hold pending resolution of water The City also initiated the Southwest Quadrant Class EA (http://guelph.ca/plans-and-strategies/water-

for wells that are currently offline with the intent to return these wells to service. Water supply investigations have also been conducted in the south end of the City to identify new sources. Investigations of water supply capacity and treatment requirements have also been completed

included water budget assessments, conducted in association with the Grand River Conservation more information visit http://www.sourcewater.ca/index/document.cfm?Sec=7&Sub1=6&Sub2=5 supply and to prevent loss of water supply capacity in the future. These Source Protection programs Authority, to determine the amount of water that may be available for municipal water supply. For (http://guelph.ca/plans-and-strategies/drinking-water-source-protection/) to protect its existing water In addition to these Master Plan projects, the City is actively implementing source protection programs

Water Conservation and Demand Management

conservation initiatives, we have reduced our community's average daily water production by twelve per capita than comparable Canadian cities! Since 2006, because of our many successful water Update as they were during the 2007 Water Supply Master Plan. We are committed to using less water water wisely. Conservation and demand management will be as important during this Master Plan initiatives, go to http://guelph.ca/ourstoconserve per cent, with Guelph residents using 20 per cent less water per person per day than the average person In Guelph we depend mostly on groundwater for our water supply so we know it makes sense to use our in Ontario. For more information regarding Guelph's current water conservation opportunities and

The 2009 Guelph Water Conservation and Efficiency Strategy Update identifies the preferred program, Water Supply Master Plan, Community Energy Plan and City Council's Strategic Plan. This report can be policy and resource requirements to achieve and sustain the water use reduction targets of the City's found at: http://guelph.ca/plans-and-strategies/water-conservation-and-efficiency-strategy/



Updating our Water Supply Master Plan

adequate and sustainable supply of water to meet current and future needs of all our customers, over Class EA process. the next 25 years. It will be our strategic plan for implementing – in a phased manner – specific projects Our updated Water Supply Master Plan will provide a community endorsed framework for ensuring an to increase our current water supply capacity, and will provide the basis for individual studies under the

Our Proposed Purpose Statement

element of the project. It also assists in setting the scope of the project. is the principle starting point of a Class EA study and becomes the central theme and integrating that identifies the problems, deficiencies and opportunities to be investigated. The Purpose Statement to document their reasons. This leads to the development of the Purpose Statement: a clear statement Phase 1 of the Class EA planning process requires proponents to consider why a change is required and

The Purpose Statement in the previous WSMP has been updated to reflect this update

supply of water to meet the current and future needs of all residents, industrial, commercial and strategies for ensuring adequate water supply. The goal is to develop a reliable and sustainable The City of Guelph is committed to manage population growth as it continues to develop institutional customers.

increase the capacity of the City's existing water supply. Recent analysis confirms that the existing water supply capacity will not meet future demands. It sustainability is not compromised. adequate amount of water in a safe and cost-effective manner and ensure that environmental therefore, prudent to update the previous Master Plan (2007) by reviewing strategies to These strategies must deliver an

Master Plan, including water conservation/efficiency measures and additional sources of water This 2013 update will build on the recommendations made during the 2007 Water Supply

Proposed Alternatives (Preliminary)

considered in the 2007 WSMP. We'll consider the following: To identify the optimal water supply system to go forward with, we'll start by updating the alternatives

- <u>.-</u> Water Conservation & Demand Management: Reducing or reusing water can have the same management will be as important during this Master Plan update as it was during the 2007 made available for the growth needs of the community. Water conservation and demand Water Supply Master Plan. effect as increasing water supply – each litre of water saved by an existing customer can be
- 'n Groundwater Sources - In & Outside of the City: We'll update information related to existing water supply areas, including: supplies and new supply sources recommended in the 2007 study, as well as investigate new
- a. Increasing water takings from established sources



- Ö poorer water quality Re-establishing sources (includes treatment) that are currently not used because of
- c. Water takings from new sources
- ώ Local Surface Water Sources: New local surface water sources —with or without Aquifer and Guelph Lake. Storage & Recovery (ASR)—will be considered, including possibly the Speed River, Eramosa River
- 4 this alternative would have significant impact on the City's growth potential and would be Do Nothing: Assumes no improvements to the current water supply system. It is expected that contrary to the City's Official Plan.

Evaluating our Options – Evaluation Criteria

options. This same process is intended to be used again during this update The Water Supply Master Plan (2007) provided a process to evaluate the proposed water supply

each of the following environmental components¹: A detailed evaluation of each water supply alternative will be completed to assess the impact, if any, to

- Public Health & Safety. Addresses public's health and safety.
- the environment (i.e., air, land, water, plants and animal life) including natural heritage Natural Environment. Addresses the protection of significant natural and physical elements of environmentally-sensitive policy areas.
- heritage components in addition to municipal development objectives. community character, social cohesion, community features and historical/archaeological and Social / Cultural. Evaluates potential effects on residents, neighbourhoods, businesses,
- Economic / Financial. Addresses the potential effect on water supply system costs
- alternative (and also has regard to political boundaries). Legal / Jurisdictional. Considers regulatory and land requirements for each water supply
- Technical. Considers technical suitability and other engineering aspects of the water supply



10

¹ The Environmental Assessment Act (Section 1. (c) (i) to (vi)) defines the "environment" as: "air, land, water, plant and animal between any two or more of them, in or of Ontario." This definition of the environment is used and is reflected in the structure, machine or other device or thing made by humans; any solid, liquid, gas, odour, heat, sound, vibration or radiation life including humans; the social and cultural conditions that influence the life of humans or a community; any building environmental components used in the Phase 2 evaluation. resulting directly or indirectly from human activities; or; any part of combination of the foregoing and the interrelationships

In keeping with our 2007 Water Supply Master Plan, we are proposing to use the following evaluation criteria to assess the feasibility of the identified water supply alternatives.

Public Health & Safety Natural Environmental Considerations Economic / Financial Considerations Legal / Jurisdictional	Potential effects to the natural environment including siting/routing considerations and/or constraints Potential impacts to water resources e.g. stream crossings, stream base flow, aquifer groundwater levels Potential impacts to natural heritage features, including provincially significant wetlands (PSWs), environmentally significant areas (ESAs), Areas of Natural and Scientific Interest (ANSIs), and sensitive species habitat (i.e., vulnerable/threatened/endangered or locally/regionally rare) Environmental management planning considerations Short-term construction related impacts including dust, traffic, access, and noise. Potential siting/routing considerations including cultural/heritage (e.g., archaeological) and/or tourist recreational resources Potential impacts from operations including impacts to ground and surface water users. Estimated operations and maintenance costs Estimated operations and other land use. Location inside vs. outside City boundaries and associated jurisdictional issues Land Requirements Ability to address outside control (independence and reliability) of City with respect to participation in decision making, rate structures and risk related to location/position on proposed water supply scheme (e.g. end of pipe) Consideration towards Political Boundaries Ability to implement alternative Maintaining operation during construction Minimizing disruptions/ downtime Constructability Schedule and Timing
Natural Environmental Considerations Considerations Considerations Considerations Considerations Considerations Considerations	
conomic / Financial Considerations	
.egal / Jurisdictional	
Technical Considerations	 Ability to implement alternative Maintaining operation during construction Minimizing disruptions/ downtime Constructability Schedule and Timing Water Quality – Requirement for treatment Allowance for future treatment needs Expandability Ability to respond to change in regulatory treatment requirements/standards



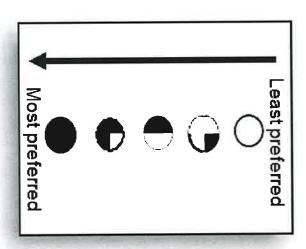
Evaluating our Options – Methodology

disruption) and secondary (e.g., mitigable impacts such as water crossings and construction truck traffic wellhead protection, excessive costs, technical feasibility, and unacceptable environmental or socia primary (e.g., aquifer and surface water supply sustainability, inability to meet regulations including carried forward for more detailed evaluation. This task may include a screening step that involves components and criteria. Based on subjective evaluations, short list alternatives will be ranked and A detailed assessment of each Phase 2 alternative solution will be completed based on evaluation

It is suggested that our evaluation not be based on a numerical ranking system; ensuring statistical identify significant advantages and disadvantages with respect to the various evaluation criteria. or qualitative evaluation will be used to consider the suitability of alternative solutions/strategies and to validity is often difficult in a multi-faceted exercise like a Class EA. Instead, a consensus based descriptive

in the text of the Class EA Master Plan report and will form the rationale for the identification of the will be ranked in order of preference (based on advantages/disadvantages) under the discussion with preferred solution or servicing strategy. Trade-offs involve forfeiting an advantage or accepting a In this respect, comparisons and trade-offs will be made between alternatives. These will be described respect to each aspect of the environment. disadvantage to address a higher priority consideration. For information purposes only, the alternatives

For the evaluation summary, the following rating symbols will be used:





AGENDA

Municipality / Agency Meeting #1 September 19, 2013 from 1:00 to 5:00 pm Guelph City Hall, 1 Carden Street Meeting Room C

Meeting #1 Discussion Topics and Questions Agency / Municipality

short-term, mid-term and long-term water supply options to meet predicted demand. since it is a finite but renewable resource. Keeping our Water Supply Master Plan up to date gives Guelph Guelph depends on groundwater for its water supply, so we know it makes sense to use our water wisely

will focus primarily on planning aspects of the Water Supply Master Plan update, such as the: to-date on our progress. Today, we want to gather your perspectives on many topics. Today's meeting we're making it easy for people from Guelph, the County and the Townships to be involved and kept up-We want people to join the conversation! We understand that good planning involves the community so

- Current level of water supply service provided, and any overall concerns or issues
- Proposed Purpose Statement for the WSMP
- Preliminary water supply alternatives we are considering
- Evaluation Criteria and Methodology we will use



Providing your Feedback

feedback. Feel free to make note of your thoughts. A team member will gather your feedback at the end of the meeting. All feedback will be used to prepare recommendations to improve the Water Supply Master Plan update project, and will be included in the Consultation Summary Report for the project. documenting much of the Committee's conversation, it would valuable to also receive your individual The following sheets include the questions we will be discussing today. Although we will be

<u>a</u>
P
3
P
73
쁘
റ്റ
ē
5
=
2
2
•

2.	1
Do you believe the City should consider water use goals for new growth (e.g., industries that require less water or conservation-oriented new residential developments?)	Do you feel the City's current water conservation goals are adequate? Are there additional goals that you feel should be considered?



	4	, , , , , , , , , , , , , , , , , , ,
Are there new approaches that we should consider to improve our water supply system?	Are there existing activities / programs that you would like to see continued or prioritized?	How much water (i.e., percent of existing supply capacity) do you believe should be considered as 'back-up' to ensure security of supply?



7.		6.
Are the Objectives and Purpose Statement adequate for this WSMP update? Are there additional objectives that you feel should be considered?	Objectives and Scope of Work	Are there pressing issues or concerns related to water supply that we should consider while updating the Water Supply Master Plan?





11.	10.
Do you have a preferred approach for expanding our water supply capacity? If so, what and why?	Are there other water supply alternatives that should be considered by the project team?



Water Conservations & Demand Management

13.	Peg	12.
Recognizing that new water supply sources will himpact of some extent, what level of potential enrelated to municipal water supply is acceptable?	Developing Groundwater Sources	Should there be bylaw changes to restrict or prouse in the City; to protect water supply sources?
Recognizing that new water supply sources will have an environmental impact of some extent, what level of potential environmental impact related to municipal water supply is acceptable?		Should there be bylaw changes to restrict or prohibit new groundwater use in the City; to protect water supply sources?



15.	14.
Do you believe it is appropriate for the project team to consider obtaining water from sources that required treatment to remove contaminants (i.e., natural or industrial)? (Assumes that all regulatory standards are met after treatment)	Should water supply sources inside the City be prioritized over those outside City boundaries?



Evaluation Criteria & Methodology

17.	16.
Is the proposed approach adequate? Are you comfortable with us using a qualitative assessment rather than a numerical ranking?	Are the evaluation criteria suitable for this study? Is there anything you would like to add or change?



