THE TOWN OF ERIN

URBAN CENTRE WATER SERVICING

SCHEDULE B
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

ONLINE PUBLIC INFORMATION CENTRE

January 20, 2020

TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

Welcome

Thank you for your interest in this project. Your input, questions and/or comments on the material presented in this Online PIC are encouraged.

Upon your review of this material, please submit your input, questions and/or comments on or before **February 3, 2020** to communications@erin.ca or rkirtz@tritoneng.on.ca and a member of the Project Team will respond to you directly.

Comments received will be collected under the Ontario Environmental Assessment Act and information will be collected in accordance with the Freedom of Information and Protection of Privacy Act and, with the exception of personal information, may be included in the project documentation and become part of the public record.

Project Team members are available to assist with website navigation and submission of comments by mail/phone/email to:

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Introduction

- The Corporation of the Town of Erin (Town) owns, operates and maintains two groundwater source residential drinking water systems, which are the Erin Municipal Water System and the Hillsburgh Municipal Water System, each being supplied by two communal wells drilled into the bedrock aquifer. However, not all properties are connected to these municipal systems; rather, some are supplied by private well sources.
- In May 2015, the Town initiated a Municipal Class Environmental Assessment (Class EA) to evaluate potential solutions to address water supply and storage requirements for both existing development and future growth scenarios for the two urban centres of Hillsburgh and Erin Village (project), as identified in the Servicing and Settlement Master Plan (SSMP) that was completed by B.M. Ross and Associates in August 2014 for the Town.
- On behalf of the Town, Triton Engineering Services Limited (Triton), is completing this study which is being planned under Schedule B of the Municipal Class EA (October 2000, as amended in 2007, 2011 and 2015) which is an approved process under the Environmental Assessment Act.
    - This Class EA undertaking by the Town of Erin is similar in nature to many other municipal projects where municipalities require improvements to a municipal water supply and distribution system. As a result, the range of environmental effects is known and typically the solutions to such problems respond to mitigating measures. The establishment of a new well or redevelopment of an existing well or increase pumping capacity of an existing well beyond the existing rated yield or the addition of new or expanded water storage facilities are considered Schedule B projects under the Municipal Class EA.

Schedule ‘B’ Class EA

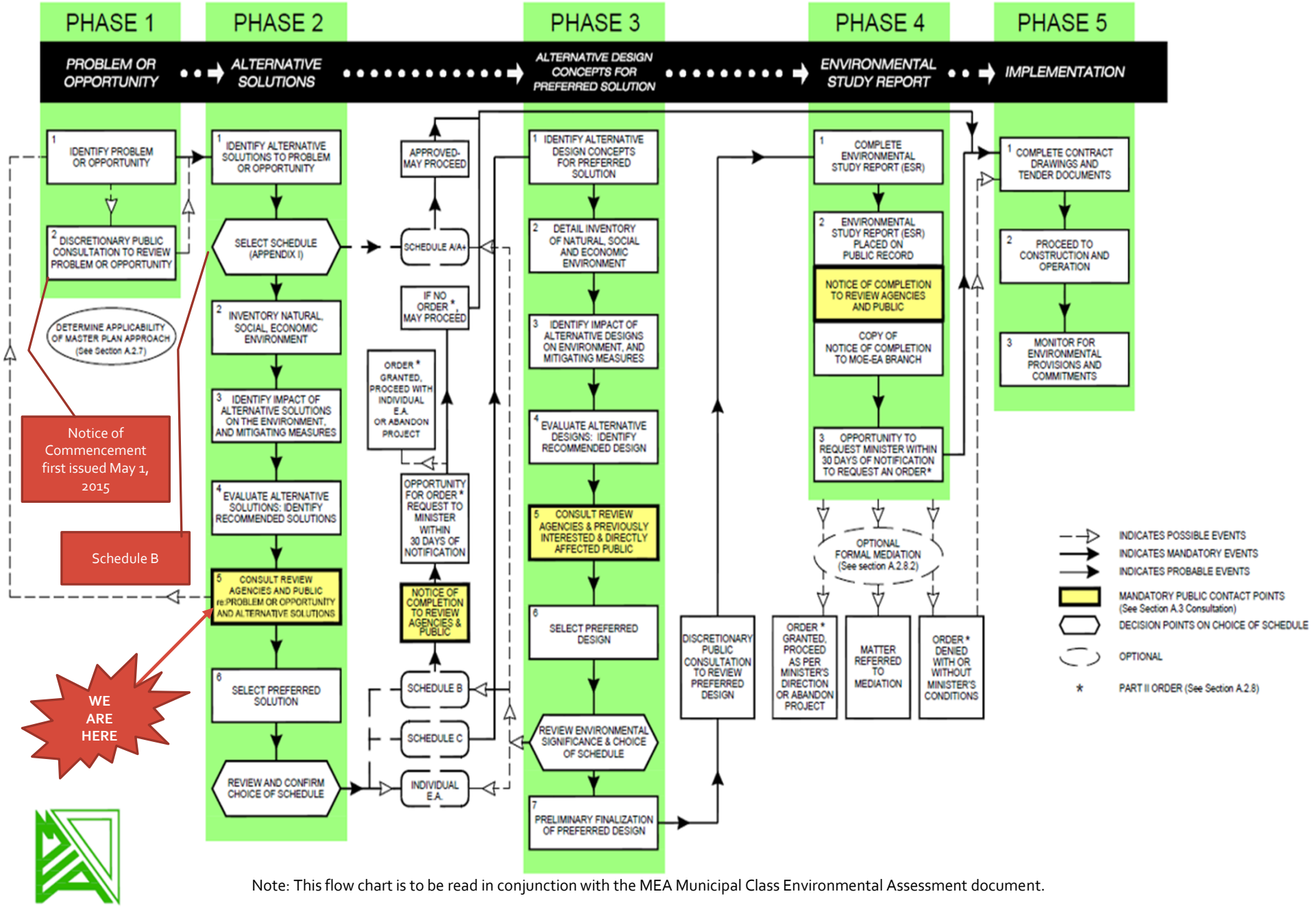
Schedule ‘B’ projects have the potential for some adverse environmental effects. The Municipality is required to undertake a screening process involving mandatory contact with directly affected public and relevant review agencies to ensure that they are aware of the project and that their concerns are addressed. A project file must be prepared and filed for review by the public and review agencies.

The Schedule ‘B’ Class EA process includes:

- Consultation with affected parties, stakeholders and agencies throughout the project
- Identification of a reasonable range of alternatives to address the identified project objective(s)
- Evaluation of alternatives based on potential environmental effects in the context of the economic, social, cultural, natural and technical environments
- Identification of the preferred alternative and reasonable measures to mitigate any adverse impacts that may result from the implementation of the project.

The following slide presents a flow chart relative to a Schedule ‘B’ Class EA which follows Phases 1,2 and 5.

MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS



Note: This flow chart is to be read in conjunction with the MEA Municipal Class Environmental Assessment document.

Project Background

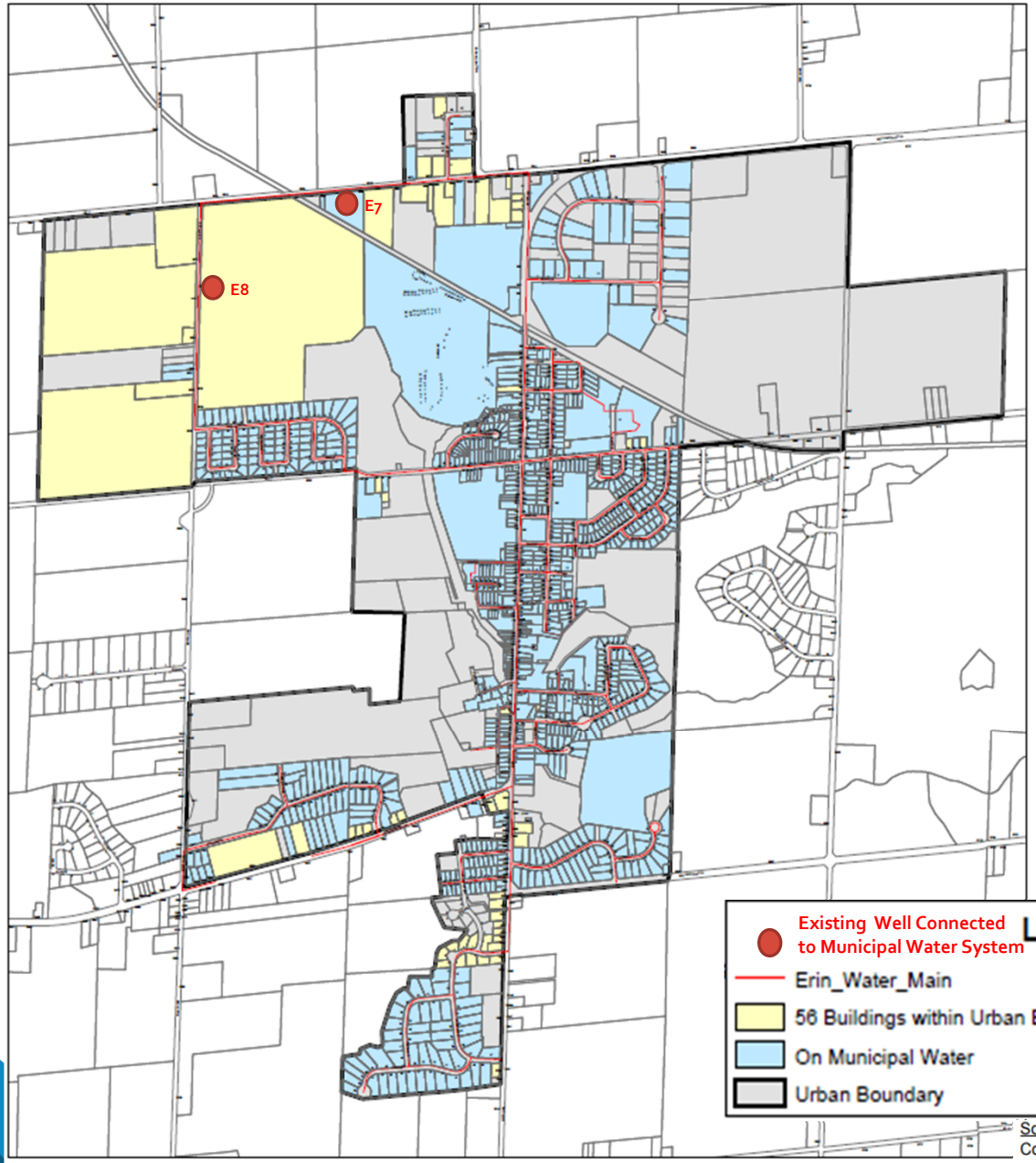
Erin

- The existing (2019) municipal water system in Erin is supplied by two municipal wells, identified as Well No. E7 and E8.
- A third water supply system, known as the Bel-Erin wells, exists in Erin; however, these have been taken out of service due to water quality issues and potential for surface source contamination of these wells given the shallow depth of these wells and the number of septic systems within the wells' capture area.
- The Erin Municipal Water System services an approximate population of 2,650 people occupying 1,019 households (connections).
- The next page shows the location of the existing municipal water supply wells and distribution system consisting of approximately 25 km of watermain. The existing distribution system has the potential to physically service (without consideration of supply) additional properties within the urban boundaries of the village. Also, there exists a number of properties within the village where watermain does not exist but could be extended to service these properties.

Hillsburgh

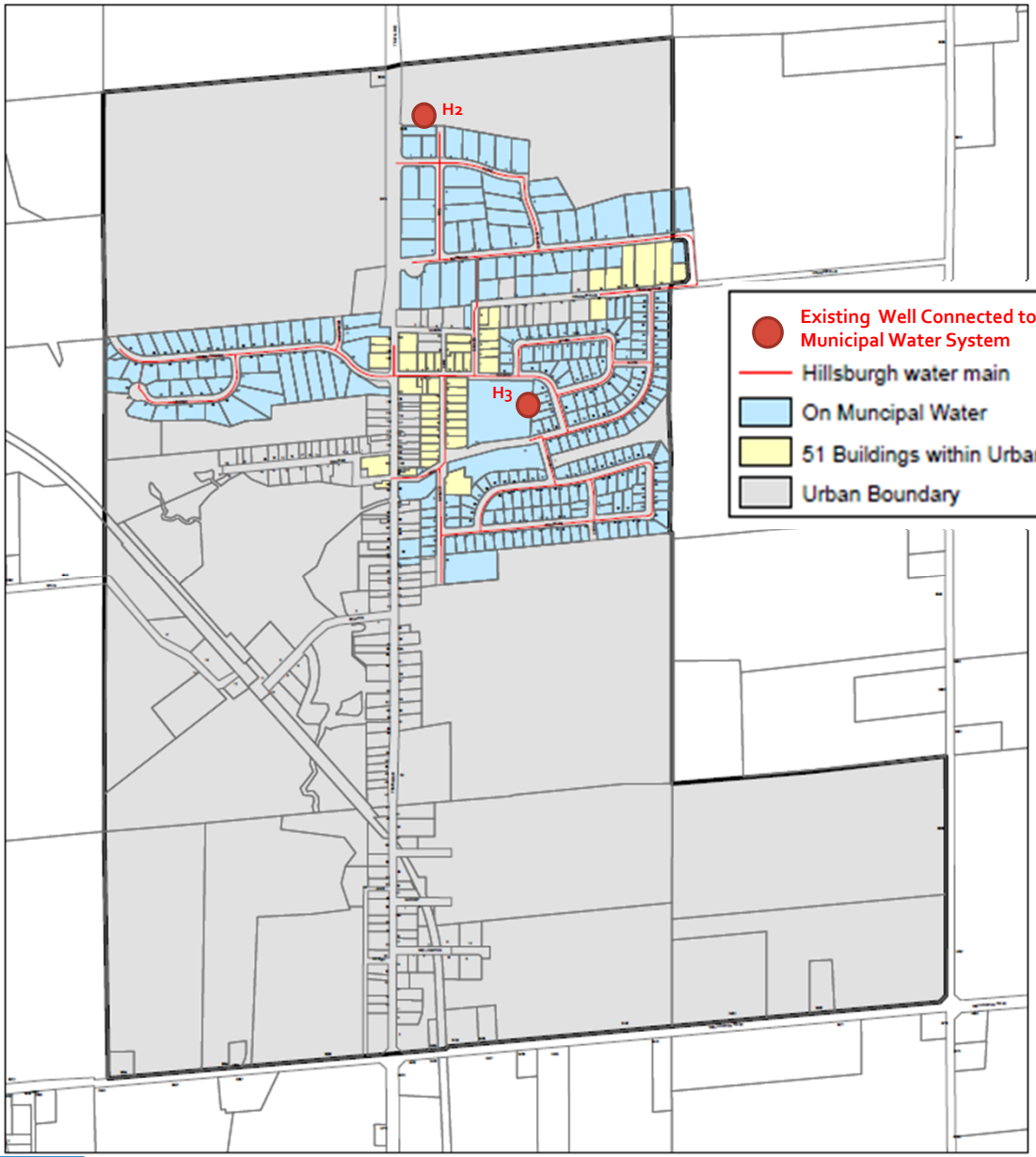
- The existing (2019) municipal water system in Hillsburgh is supplied by two wells, identified as Well No. H2 and H3.
- The Hillsburgh Municipal Water System services a population of 715 people occupying 275 households (connections).
- The next page shows the location of the existing water supply wells and distribution system which consists of approximately 7 km of watermain. As with Erin, there exists a significant number of unserviced properties within the urban boundary and several that are serviced but have not connected.

Village of Erin



Sources:
County of Wellington Planning and Development Department 2011.

Village of Hillsburgh



Sources:
County of Wellington Planning and Development Department 2011.

Problem/Opportunity Statement

Consistent with the SSMP, the following project problem/opportunity statement was identified as part of Phase 1 of the Class EA process for the project:

"Partial water servicing, in Hillsburgh and Erin Village, limits the operational and cost efficiency of the systems and inhibits redevelopment and future development. The capacity of the existing system will need to be augmented to address current limitations and the needs of future development."

It is on the basis of the above "Problem Statement" that the purpose of this Class EA is to examine feasible alternatives to provide additional supply capacity and redundancy for the Town's municipal drinking water systems.

- Further, to evaluate water system operating configuration and storage requirements for both the existing community and the future Growth Scenario as presented in the Growth Management Strategy (GMS), (Oct 2019). Following a review of these alternatives, a preferred strategy to upgrade the water systems will be established.
    - As part of Phase 2 of the Class EA process, data was collected from previous studies, including the background studies and findings of the SSMP (Aug 2014) and Urban Centre Wastewater Servicing Class EA (April 2018) (WWEA), as well as a number of additional studies, to document the existing conditions of the economic, social, cultural, natural, and technical environments.

Summary of Existing Economic Environment

Existing Development Pattern

- The existing predominant housing type is single detached homes with a small number of semi-detached units and duplexes, apartment buildings and a trailer park. Erin Village is the largest urban settlement within the Town, followed by Hillsburgh. For both urban centres, development is off of the Main Street. Recent residential development in both urban centres has occurred on large lots with large estate-type residences.
- Existing commercial development is located along the Main Street of both urban centres.
- Industrial development is located primarily to the north of the Cataract Trail in Erin Village. Both urban centres have vacant lots large enough for new industrial development or expansions.
- Five aggregate operations are located within the Town, outside of the urban areas, which represent a significant component of the local economy.
- Rural lands are predominantly used for agricultural purposes and represent a large portion of the remaining lands within the Town.

Growth Projections

- The intent of the GMS was to provide a long-term plan for the location, timing, phasing, servicing and financing of growth of the Town's population and employment base in the urban centres of Hillsburgh and Erin through to year 2041. The GMS was undertaken with consideration of this Class EA, the Development Charges Background Study and WWEA.
- An assimilative capacity study (i.e. estimated maximum serviceable population) was completed as part of the WWEA which determined that the West Credit River can accommodate the effluent resulting from a future total equivalent population of 18,873. The preferred Growth Scenario presented in the Final GMS Report (Oct 2019) is within this servicing limitation which was used to determine the future drinking water requirements.

Summary of Existing Social Environment

Existing Communities

- The Town includes the two urban centres, which are the Village of Erin and the Village of Hillsburgh, where the majority of residents within the Town live. The Town is also comprised of six hamlets, which are the hamlets of Ballinafad, Brisbane, Cedar Valley, Crewson's Corners, Orton and Ospringe. These hamlets and the remainder of the Town, which is characterized by agricultural land and natural heritage areas are categorized by Greenlands and Rural systems (Town of Erin Official Plan).

Town of Erin Official Plan

- With respect to the provision of municipal water services, the Official Plan for the Town indicates that "It is the intention of the Town, over time and where practical to provide municipal water service from the Town's central systems to all lands within the designated Urban Centres." Residential growth will occur primarily within and by expansion of existing settlement areas of Erin and Hillsburgh, and will be in accordance with the Town's urban design standards. In order to satisfy the County's overall growth targets, "The Town will contribute to the achievement of these targets, subject to servicing constraints." Extension of water services and the provision of sanitary sewage services to new development within Erin and Hillsburgh is required if continued growth is to occur and in order to meet the requirements of the Provincial Policy Statement.

Summary of Existing Cultural Environment

Archaeological Features

- A Stage 1 Archaeological Assessment was conducted in December 2017 and 2019 at prospective new well sites.
- Stage 2 Archaeological Assessment was conducted in May 2018 except for one prospective well site located in Erin, due to weather constraints. No archaeological materials were encountered and it was concluded that further assessment was not required prior to any development within the areas assessed. A Stage 2 Assessment is required and will be completed at the remaining site (Erin 3) when weather conditions permit.

Cultural Heritage Features

- A Cultural Heritage Evaluation Report was completed for structures and landscapes with the potential to be impacted by the construction of proposed potential future well sites.
- The evaluation determined that no direct impacts to heritage attributes of identified built heritage resources and cultural heritage landscapes will occur as a result of construction of well sites; although, a potential impact of a proposed well site is that they are not sympathetic with the historic fabric and appearance of the built heritage resources and cultural heritage landscapes.
- The heritage attributes of the identified cultural heritage landscapes and built heritage resources are mainly defined by intrinsic values (e.g., architecture and associated values), which will continue to exist with or without the installation of proposed well site infrastructure. Mitigation measures to conserve the identified cultural heritage value or interest to limit identified potential impacts of the proposed well sites, such as installing natural or built buffers) are considered in the evaluation of alternatives.

Summary of Existing Natural Environment

Natural Heritage Inventory

- A Natural Heritage – Existing Conditions Report was completed to document the natural heritage inventory of the proposed lands identified as being a potential source location for new water supply wells.
- No nationally or provincially rare, threatened or endangered vegetation species were observed. Minor impacts, if any, may occur as a result of development of a well at any of the proposed sites.
- Breeding birds, reptiles and amphibians, and mammals Species at Risk were not observed during the investigation of the study area. Potential impacts are rated as minor, if any, and measures for monitoring and mitigation during well construction are recommended.
- Significant Wildlife Habitat in the form of Waterfowl Stopover and Staging Areas may be present in the area. Drilling activities in these areas should be completed outside of the spring staging window (mid-March to May) to avoid impacts to wildlife and habitat.
- Habitat suitable for Species at Risk, Bobolink and Eastern Meadowlink, may occur in the study area. Grassland bird surveys are required to be completed if drilling activities are planned to occur between May 1 and July 31 within open graminoid communities (i.e., agricultural [hay, wheat] and meadow or pasture) to avoid harm to the species and/or their habitat.

Summary of Existing Natural Environment

General Hydrogeological/Groundwater Environment

- The municipal water systems and majority of private wells obtain water from groundwater wells drilled into the Silurian limestone/dolostone bedrock aquifer system formerly referenced as the Guelph and Amabel Formations (now termed the Guelph and Gasport Formations).
- Vulnerability to contamination of the bedrock aquifer that supplies the municipal wells in Erin Village and Hillsburgh is generally medium to low (Golder and Associates, 2006). The overburden thickness ranges from approximately 10 m in the vicinity of the wells to over 40 m in other areas of the well capture zones. There are, however, areas of high vulnerability in the vicinity of Erin Well E8, Hillsburgh Well H3, and non-operational Bel-Erin wells. The area of high vulnerability around Well H3 is found in the two-year capture zone around the well; however, water quality data for the well does not indicate any surface source of contamination (CTC Assessment Report, 2015).
- The Town is largely characterized as having a high level of recharge that results in a significant groundwater contribution to baseflow in the West Credit River and tributaries of the Eramosa River and Blue Springs Creek in the Grand River watershed and maintains a minimum depth of water in various streams and moderates stream temperature (CVC, 2011). Details are provided in the Erin SSMP Phase 1 - Environmental Component - Existing Conditions Report by Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc. (2011).
- Groundwater usage within the Town includes municipal drinking water, private water wells, commercial water taking for purposes of water bottling, golf course irrigation, aquaculture agriculture and industrial (i.e. aggregates washing). Most of the non-residential water takers require a Permit to Take Water (PTTW) from MECP due to the volume of water taken per day.

Summary of Existing Natural Environment

Source Water Protection

- The Town of Erin is located within the Credit Valley, Toronto and Region and Central Lake Ontario (CTC) Source Protection Region, specifically within the Credit Valley Source Water Protection Area. The CTC Source Protection Plan (effective December 31, 2015) for the Credit Valley Source Water Protection Area outlines source protection policies related to existing and future threats to drinking water sources for the Town of Erin and is a requirement of the Ontario *Clean Water Act*.
- The Ontario *Clean Water Act* (2006) was put in place "to protect existing and future sources of municipal drinking water" for the province of Ontario. This is done through Source Protection Plans that identify threats to municipal drinking water sources and set out policies to help reduce the risks from those threats.
- The Credit Valley Source Protection Assessment Report (approved July 22, 2015) identifies the location and nature of threats (including potential threats) to the Erin and Hillsburgh water systems groundwater sources and provides a delineation of vulnerable areas and an overview of water quality and quantity.
- Vulnerable areas include Wellhead Protection Areas (WHPA), Intake Protection Zones (IPZ), Highly Vulnerable Aquifers (HVA), and Significant Groundwater Recharge Areas (SGRA).

Summary of Existing Natural Environment

Source Water Protection (continued)

- Any new municipal well is required to have wellhead protection areas established and approved prior to water being distributed to residents. This is a requirement of the *Clean Water Act* and *Safe Drinking Water Act*.
- A preliminary assessment of source protection implementation requirements was completed based on mapping published in the CTC Assessment Report (2015) and policies in the CTC Source Protection Plan.
- Based on the preliminary assessment of source protection requirements, existing properties within wellhead protection areas may be subject to a number of requirements including septic inspections, manure application prohibitions, risk management plans for a number of agricultural activities and for chemical (DNAPL) handling / storage and education requirements. There will also be prohibitions applicable to new lots created within the WHPA-A (100 metres radius) that are serviced by septic systems. New lots serviced by sanitary sewers would be allowed within the WHPA-A.
- Further study will be required following the completion of this Class EA to delineate vulnerable areas and amend the CTC Source Protection Plan.

Summary of Existing Technical Environment

Erin Village Water System Summary

- Raw water from operational Wells E7 and E8 is directed to a pumphouse housing water storage, treatment facility, and monitoring equipment.
- Disinfection of the raw water is by gaseous chlorine.
- Both wells are drilled into the fractured limestone bedrock and have a total rated capacity of 4,128 m^3/d.
- Each well operates under a Permit to Take Water (PTTW).
- Well E7 has a daily production limit of 2,160 m^3
- Well E8 has a daily production limit of 1,968 m^3
- The Erin Municipal Water System serves an estimated connected population of approximately 2,650 people in the former Village of Erin, with approximately 1,019 residential connections
- Pressure in the majority of the water system is maintained by the existing water tower; however, pressure tanks are required to maintain adequate pressure for the 65 residences in the Erin Heights subdivision. The Town currently has 2,200m^3 of water storage (i.e. reservoirs and water tower) available.

Summary of Existing Technical Environment

Hillsburgh Water System Summary

- Raw water from operational Wells H2 and H3, is directed to a pumphouse (each well has its own pumphouse with an inground reservoir) that provides housing for water storage, treatment facility, and monitoring equipment, in accordance with the Safe Drinking Water Act 2002.
- Between the two inground reservoirs (Well No. H2 and H3), approximately 790 m^3 of water storage is provided.
- Disinfection of the raw water is by sodium hypochlorite solution. Ferric chloride solution is also used to treat raw from Well No. H2 for the presence of naturally-occurring lead.
- Both wells are drilled into the fractured limestone bedrock and have a total rated capacity of 1,637 m^3/d.
- Each well operates under a Permit to Take Water (PTTW).
- Well H2 has a daily production limit of 655 m^3
- Well H3 has a daily production limit of 982 m^3
- The Hillsburgh Municipal Water System serves an estimated connected population of approximately 715 people in the former Village of Hillsburgh, with approximately 275 residential connections.
- The system is separated into two pressure zones where Well No. H2 supplies water to the Upper Zone and Well No. H3 supplies water to the Lower zone. The Hillsburgh Booster Pumping Station allows for the transfer of water between the Upper and Lower zones to meet demand in each zone and is able to maintain pressure in the upper zone of the distribution system during peak and minimum demand periods.

Summary of Existing Technical Environment

System Capacity

- The system capacity represents the cumulative sum of all the well capacities, which is based on the limiting condition (i.e. production limit) of the rated capacity of the PTTW, Drinking Water Works Permit (DWWP) or pumping equipment. Treated water storage requirement is determined in accordance with MECP guidelines which considers fire, equalization and emergency components of storage.
- The "firm" capacity of a water system is defined as the supply capacity of the system with the largest pump or source out of service. Water supply reserve capacity calculations typically use the "firm" capacity of the water system to ensure that there is sufficient redundancy in the system for water supply and treatment in the event of a well or equipment failure.
- For the Erin water system, the largest source is Well E7 with a capacity of 2,150 m^3/d. This results in a system firm capacity of 1,968 m^3/day. For the Hillsburgh water system, the largest source is Well H2 with a capacity of 982 m^3/d. This results in a system firm capacity of 655 m^3/day.

Summary of Municipal Water Supply Systems

Municipal Water System	Erin		Hillsburgh	
Well	E7	E8	H3	H2
PTTW Capacity (m^3/d)	2,160	1,968	655	982
DWWP Capacity (m^3/d)	2,592	2,361	654	982
Production Limit (m^3/d)	2,160	1,968	655	982
Existing Pumping Equipment (m^3/d)	2,592	2,356	656	1,011
System Capacity (m^3/d)	4,128		1,637	
Firm Capacity (m^3/d)	1,968		655	
System Storage (m^3)	2,200		790	

Summary of Existing Technical Environment

Existing Water Demands

The total annual pumping volume of raw water from the wells between 2016 and 2019, along with the total annual rainfall is summarized below. Additionally summarized below are the monthly average day flow and monthly maximum day demand for the last three years as reported in the annual Well Supply Summary Reports for each municipal water system.

Erin Raw Water Data

Year	2016	2017	2018	2019
Total Volume (m^3)	281,334	281,900	275,761	244,107
Change (m^3)	-10,044	566	-6,139	-31,654
Rainfall (mm)	756	972	773	968

Erin Water Demands

Year	2017		2018		2019		
	Avg Day Flow (m^3/day)	Max Day Flow (m^3/day)	Avg Day Flow (m^3/day)	Max Day Flow (m^3/day)	Avg Day Flow (m^3/day)	Max Day Flow (m^3/day)	3 year Average (m3/day)
12 Month Average	742	1,041	755	1,114	674	967	724
12 Month Maximum	812	1,351	1,018	1,561	880	1,508	1,473

Hillsburgh Raw Water Data

Year	2016	2017	2018	2019
Total Volume (m^3)	59,529	66,152	77,277	78,938
Change (m^3)	1,896	6,623	11,126	1,661
Rainfall (mm)	756	972	773	968

Hillsburgh Water Demands

Year	2017		2018		2019		
Month	Avg Day Flow (m^3/day)	Max Day Flow (m^3/day)	Avg Day Flow (m^3/day)	Max Day Flow (m^3/day)	Avg Day Flow (m^3/day)	Max Day Flow (m^3/day)	3 year Average (m3/day)
12 Month Average	181	400	212	393	218	407	204
12 Month Maximum	234	733	275	531	274	639	634

Summary of Existing Technical Environment

Projected Water Demands

Project Water Demands, based on Projected Future Serviced Households in accordance with the Final Growth Management Strategy (October 2019) are summarized below. The Reserve Capacities noted are what will be available if no new wells are brought onto the system.

Erin Forecasted Water Demands Corresponding to Revised Growth Forecast

Year	Erin Village Independent			
	System Firm Capacity (m^3/day)	Total Serviced House Holds	Max. Day Demand (m^3/d)	Reserve Capacity (m^3/d)
2020	1,968	1,019	1,473	495
2031	1,968	1,700	2,465	-489
2036	1,968	2,000	2,900	-923
2041	1,968	2,500	3,625	-1,646

Hillsburgh Forecasted Water Demands Corresponding to Revised Growth Forecast

Year	Hillsburgh Village Independent			
	System Firm Capacity (m^3/day)	Total Serviced House Holds	Max. Day Demand (m^3/d)	Reserve Capacity (m^3/d)
2020	655	275	634	21
2031	655	700	1,617	-960
2036	655	900	2,079	-1,421
2041	655	1,100	2,541	-1,883

Erin & Hillsburgh Forecasted Water Demands Corresponding to Revised Growth Forecast if Connected

Year	Erin & Hillsburgh Systems Connected			
	System Firm Capacity (m^3/day)	Total Serviced House Holds	Max. Day Demand (m^3/d)	Reserve Capacity (m^3/d)
2020	3,605	1,294	2,107	1,498
2031	3,605	2,400	4,072	-467
2036	3,605	2,900	4,967	-1,362
2041	3,605	3,600	6,151	-2,546

Summary of Existing Technical Environment

Projected System Storage Requirements

In accordance with the Ministry of Environment, Conservation and Parks (MECP), storage facilities for municipal water distribution systems must be designed to allow for maintenance of adequate flows and pressures in the distribution system during the peak hour water demand and to meet critical demands during fire and emergency events and is determined using the following equation:

Total Treated Water Storage Requirement (m^3) = A + B + C

Where: A (m^3) = fire storage

B (m^3) = equalization storage (25% of Maximum Day Demand)

C (m^3) = emergency storage (25% of (A + B))

The distribution system storage requirements for the current population and future planning horizons based on the current per capita maximum day demand is summarized in the following table. This table includes storage requirements under a configuration where the two water systems are connected since this is an alternative that is being considered.

Summary of System Storage Requirements

Village	Planning Period	Population	Duration (hours)	Fire Flow (L/s)	A (m3)	B (m3)	C (m3)	Total (m3)
Erin	2020	3,100	2	110	792	435	307	1,534
	2031	4,500	2	130	936	616	388	1,940
	2036	5,600	3	140	1,512	725	559	2,796
	2041	7,100	3	160	1,728	906	659	3,293
Hillsburgh	2020	1,500	2	90	648	289	234	1,171
	2031	2,000	2	90	648	404	263	1,315
	2036	2,500	2	100	720	520	310	1,550
	2041	3,200	2	110	792	635	357	1,784
Combined	2020	5,100	3	130	1,404	724	532	2,660
	2031	6,500	3	150	1,620	1,021	660	3,301
	2036	8,100	3	170	1,836	1,245	770	3,851
	2041	10,300	3	190	2,052	1,542	898	4,492

Summary of Alternatives

Alternative 1: Do Nothing

- Does not address the lack of water supply reserve capacity, which is required to service existing unconnected residents and permit continued growth in the urban centres
- Typically only implemented when the costs of all alternatives including financial and environmental considerations outweigh the possible benefits of other alternatives.

Alternative 2: Increase Water Taking From Existing Municipal Wells

- Was considered a feasible alternative at the outset of the Class EA; however, due to the increased population of the future growth scenario of the GMS, it has been determined that increasing water taking from the existing municipal well systems will not address the needs of the future growth scenario.

Alternative 3: Reinstate Bel-Erin Wells

- Involves reinstatement of these wells following appropriate approvals and implementation of a water treatment system.
- Bel-Erin wells are classified as Groundwater Under Direct Influence (GUDI) of surface water.
- Anticipated treatment costs would be prohibitive as compared to the development of a new water supply that is not GUDI. Also, the contamination risks to water quality of a GUDI well are greater.

Alternative 4: Addition of New Wells for Each Existing Municipal System

- Addition of new municipal wells to increase firm capacity to satisfy the estimated maximum day demand of the future growth scenario of the Final Growth Management Strategy.
- In general, the minimum viable groundwater well capacity for a municipal well supply is in the range of 1,380 m^3/day; however, capacities in excess of 1,963 m^3/day are typical. It is expected that multiple wells will be required to achieve the desired long-term firm capacity, requiring a multi-year well exploration/development program.
- New wells would need to meet water quality requirements to justify the expense of bringing the well on-line.

Summary of Alternatives

Alternative 5: Interconnect Erin and Hillsburgh Water Systems

- On the basis of firm capacity, interconnection (i.e. trunk watermain) of the water systems would minimize the capacity upgrades needed to meet the demands of the existing community and future growth scenario by reducing the redundancy requirement from two wells to just one.
- Was considered a feasible alternative at the outset of the Class EA; however, it has been determined that interconnection of the existing municipal water systems without the addition of new well supply(ies) will not address the capacity needs of the future growth scenario.

Alternative 6: Interconnect Existing Erin and Hillsburgh Water Systems and Addition of New Well Supply

- Similar to Alternative 5 on the basis of firm capacity, the capacity upgrades needed to meet the demands of the existing and future growth scenario would be minimized by reducing redundancy; however, this alternative also includes the addition of new well supply(ies) to satisfy the demand of the future population growth scenario presented in the Final Growth Management Strategy.
- Interconnection of the systems provides greater access to potential future wells and would facilitate easy connection of such a well into either or both systems.
- Based on the total build-out growth scenario presented in the GMS, if the systems were to be interconnected, it is anticipated that only the two additional proposed wells would be required to satisfy these future demands assuming that each of these wells has a capacity of at least 1,300m^3/day.
- The new wells would need to meet water quality requirements to justify the expense of bringing the well(s) on-line.

Shortlist Evaluation of Alternatives

The shortlist evaluation of the alternatives is based on the ability of the alternative solution to address the issues identified in the Problem/Opportunity Statement and is summarized in the following table:

Alternatives 4 and 6 fully address the Problem Statement and are therefore carried forward for further evaluation with respect to investigation of source locations for new well supplies and potential impacts on the environment.

Summary of Water Supply Alternatives Evaluation Versus Problem Statement

	Problem Statement Components			
Alternative Solutions	Increase Supply Capacity to Meet Requirements of Existing Community	Increase Redundancy in Both Communities	Increase Supply Capacity to Meet Future Supply and Storage Requirements	Problem Statement Addressed?
Alternative 1: Do Nothing	No	No	No	No
Alternative 2: Increase Water Taking from Existing Municipal Wells	Yes	Yes	No	No
Alternative 3: Reinstate Bel-Erin Wells	Yes	Yes	No	No
Alternative 4: Addition of New Wells at Each Existing Municipal System	Yes	Yes	Yes	**Yes**
Alternative 5: Interconnect Existing Erin and Hillsburgh Water Systems	Yes	Yes	No	No
Alternative 6: Interconnect Existing Erin and Hillsburgh Water Systems and Addition of New Well Supply	Yes	Yes	Yes	**Yes**

Investigation of New Water Sources

Criteria for Potential Source Locations:

- Wells should be located outside of the existing Well Head Protection Areas (WHPAs) to minimize the potential for mutual interference.
- Locations should be selected where a reasonable level of natural protection from surface sources of contamination can be provided.
- In general, wells should be located away from known or potential sources of contamination and/or poor groundwater quality.
- Areas where the existing well yield information shows limited promise for higher yielding wells (<500 m^3/day) should be given a low priority.
- Where possible, wells should be located in relatively close proximity to the existing distribution system.
- It is assumed that each new well will be capable of producing at least 1,000 m^3/day.

A review of the existing higher producing wells in the areas of both Erin and Hillsburgh was completed to determine common patterns and provide drilling target focus. Based on the area's hydrogeology, the main drilling target is identified as the deeper bedrock zone, corresponding to the base of the Amabel Formation (now called the Gasport Formation).

There is no "preferred" area of the community (i.e., Hillsburgh and/or Erin) where the deeper zone is known to have higher production capacity. However, historical trichloroethylene (TCE) contamination and Source Protection issues related to the existing industrial area at the north end of Erin Village would preclude that immediate area from the drilling program. Former (now closed) landfill areas occur in or near both Hillsburgh and Erin villages, which are potential sources of contamination. An extensive river and tributary system flows through both communities and reservoir/ponds are present in both villages. In addition, geologic conditions, including areas of extensive sand and gravel at surface, may lead some areas to be more susceptible to influence from shallow groundwater or surface water features. Through consideration of the above noted items and the review of existing high producing wells, the potential drilling site areas were identified, as shown on the next slides, with the intent to serve the existing population to the future build-out.

Test Well Drilling and Assessment

The construction and development of Exploratory Test Wells provides a preliminary assessment of the potential capacity of the chosen investigation sites through the drilling process and some short-term testing. The Exploratory Test Well drilling does not include any long-term pumping or significant removal of water from the well.

Based on the results of the Exploratory Test Well drilling, two well sites, Erin 3 (E9) and Hillsburgh 2 (H4), were chosen to advance forward to the construction of a larger, potential municipal well, and a long-term pump test to confirm capacity, assess water quality and assess impacts to the surrounding groundwater system and private water supplies.

A summary of the Test Well drilling activities completed are summarized on the following slides.

Test Well Drilling and Assessment

Erin 1 (Mountainview)

- First priority of the testing program due to location, Town ownership of the site and the potential aquifer capacity.
- Overall capacity of the Test Well is limited (estimated as 259 m^3/day), and does not meet identified water supply needs.

Erin 2 (Solmar/Former Mattamy Homes Lands, Wellington Road 124)

- Existing Test Well (constructed by others) identified as a second priority of the testing program based on location, reported historical capacity (985 m^3/day) and potential to reduce drilling costs.
- Tests completed on the existing well showed significant decline in capacity. For the second Test Well drilled, results showed marginal well capacity with respect to the identified water supply needs. This location may be considered for future supply.

Erin 3 (Tavares Lands, Wellington Road 23)

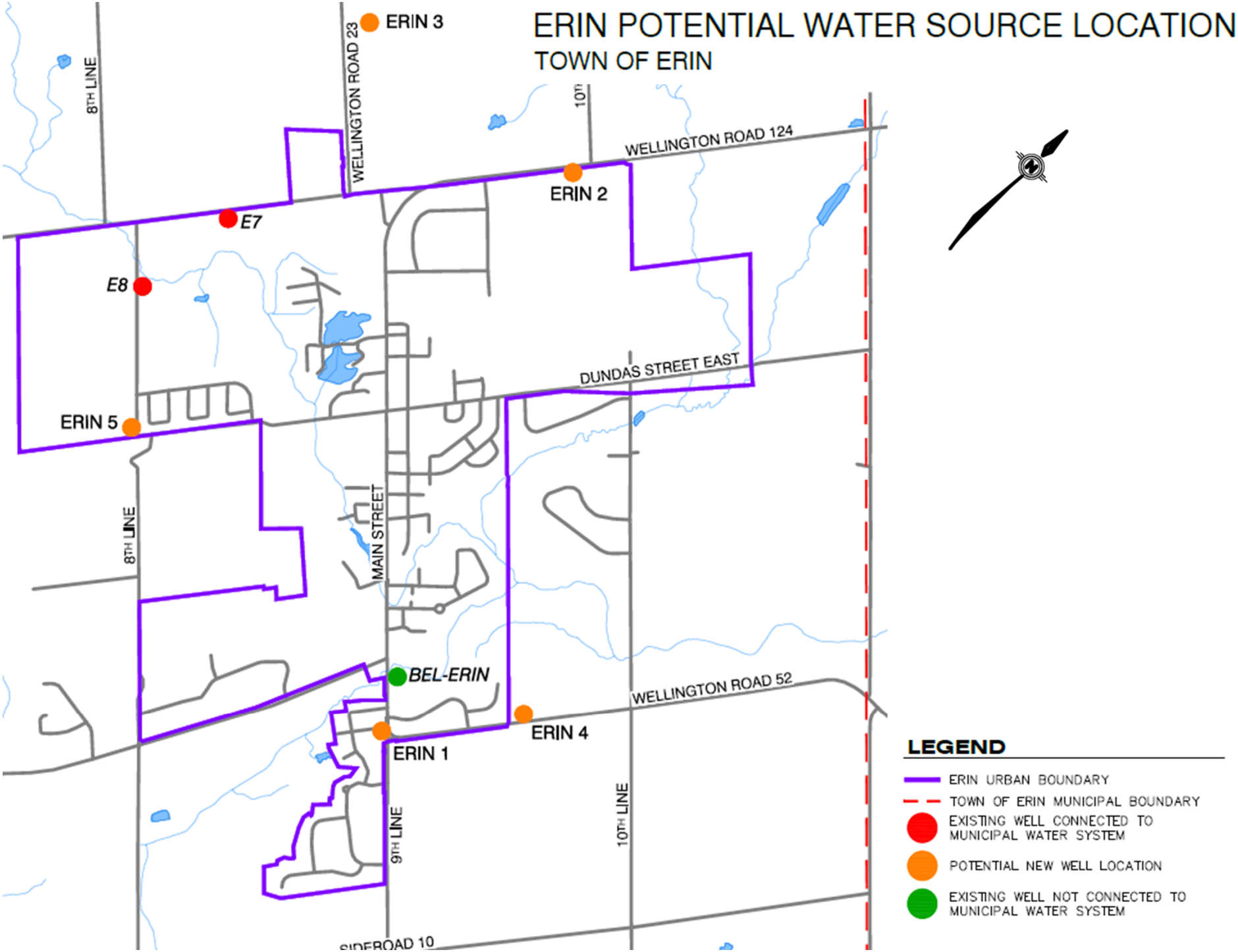
- Third priority due to location and identified local aquifer capacity.
- Two significant deep production zones were encountered, with a potential estimated capacity of 2,722 m^3/day.
- Overall good water quality results; with parameters at concentrations below drinking water guidelines.
- Site recommended to proceed to the municipal well construction and testing stage.

Erin 4 (Wellington Road 52) and Erin 5 (8th Line/Dundas Street)

- Based on successful results obtained at Erin 3, no additional test drilling was completed. Future water supply investigations, as required, can be completed to assess potential water supply capacity of these sites.

ERIN POTENTIAL WATER SOURCE LOCATIONS

TOWN OF ERIN



Test Well Drilling and Assessment

Hillsburgh Firehall

- First priority of the testing program due to Town ownership of the site/well and reported historical capacity.
- Testing indicated reduced well capacity, unacceptable sediment production and local water table response when pumped at higher rates. Upper bedrock identified as primary production zone, lower (target) zone does not supply water as expected. Well does not meet identified water supply needs.

Hillsburgh 1 (Nestlé)

- Nestlé Waters Canada, as part of an initiative to expand their monitoring network, and to assist the Town with this Class EA, drilled and tested a deep well on their property.
- The projected well capacity (413 m^3/day at 10 m drawdown), is considered marginal with respect to the identified water supply needs. The Test Well has been converted to a Monitoring Well.

Hillsburgh 2 (Tavares Lands, Currie Drive)

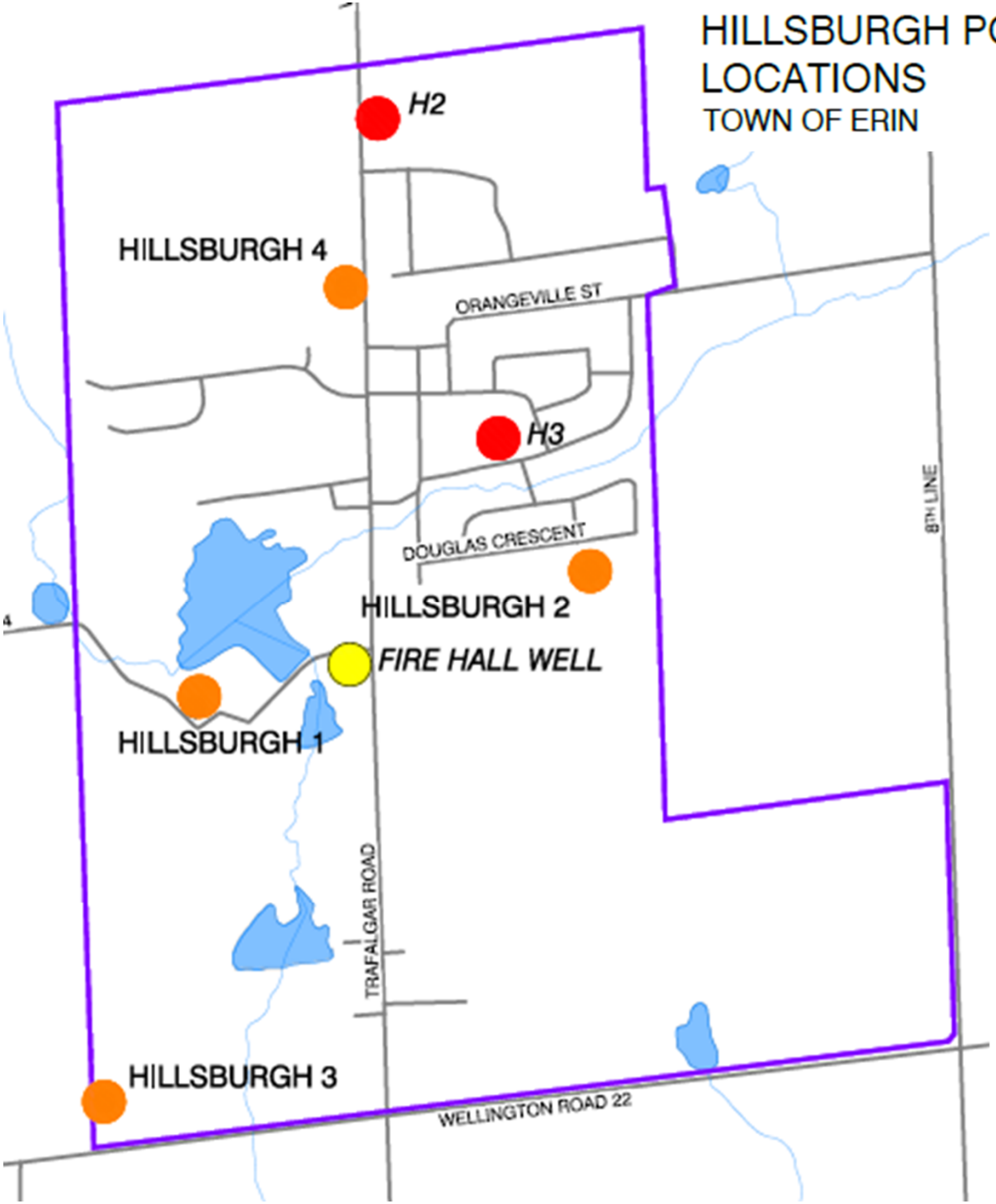
- Third priority of the testing program due to location and potential aquifer capacity.
- Two productive zones encountered, one very high capacity zone in the shallow bedrock, and one high capacity zone in the deep bedrock. Lower zone capacity estimated to be 1,512 m^3/day and identified as the preferred target for municipal well construction.
- Overall good water quality results; with parameters at concentrations below drinking water guidelines.
- Site recommended to proceed to the municipal well construction and testing stage.

Hillsburgh 3 (Thomasfield Homes, Wellington Road 22) and Hillsburgh 4 (North of Upper Canada Drive)

- Based on successful results obtained at Hillsburgh 2, no additional test drilling was completed as part of the current well testing program. Future water supply investigations, as required, can be completed to assess potential water supply capacity of these sites.

HILLSBURGH POTENTIAL WATER SOURCE LOCATIONS

TOWN OF ERIN



LEGEND

- HILLSBURGH URBAN BOUNDARY
- EXISTING WELL CONNECTED TO MUNICIPAL WATER SYSTEM
- POTENTIAL NEW WELL LOCATION
- EXISTING WELL NOT CONNECTED TO MUNICIPAL WATER SYSTEM

Production Well Development

Regulatory Requirements

- In order for a well to be used for municipal purposes, a long-term Permit To Take Water (PTTW) is required. To obtain a long-term PTTW, information obtained from a pumping test, completed over an extended period (e.g. one-week) is required. This includes a hydrogeologic study to examine well capacities and potential impact.
- To complete the pumping test, a pumping/monitoring plan is developed and a temporary (short-term) PTTW is obtained from the Ministry of the Environment, Conservation and Parks (MECP).
- Input is obtained from MECP and Credit Valley Conservation (CVC) to develop a pumping/monitoring plan that will adequately assess potential impacts to other water users (e.g. private wells) in the area, in addition to natural environment features (wetlands, ponds, creeks), including known cold water fish habitat, spring areas and/or trout spawning areas.
- A 1 km study area around each Test Well was chosen as a basis for assessment; however, monitoring and assessment also extends beyond 1 km.

Production Well Development Status

- Municipal well (E9) construction at the Erin 3 site was completed in early November 2019. Pump testing was conducted from December 12 to 18, 2019. The total (pre to post test) monitoring period began in early November 2019 and is ongoing. Final results are expected by the end of January 2020.
- Municipal well (H4) construction at the Hillsburgh 2 site was completed in late November 2019. Pump testing was conducted from January 9 to 18, 2020. The total (pre to post test) monitoring period began in early December 2019 and is ongoing. Final results are expected by the end of January 2020.

Preliminary Preferred Alternatives

The results of the testing, monitoring and assessment of Erin 3 and Hillsburgh 2 will be used to evaluate the shortlisted alternatives, which are:

Alternative 4: Addition of New Wells for Each Existing Municipal System and

Alternative 6: Interconnect Existing Erin and Hillsburgh Water Systems and Addition of New Well Supply

The evaluation will consider the future supply demands of the Preferred Growth Allocation Scenario, in accordance with the Final Town of Erin Growth Management Strategy Report to identify the recommended/preferred alternative.

Identification of the preferred alternative is ultimately selected as the alternative that is most prepared to meet the water demand requirements of the existing residents, both connected and unconnected, and future growth scenario; since both alternatives are able to address these requirements and the potential impacts on the environment are similar between both alternatives, as summarized on the next slide.

Evaluation of Potential Impacts

Environment Category	Alternative 4 - Addition of New Wells for Each Existing Municipal System	Alternative 6 - Interconnect Existing Erin and Hillsburgh Water Systems and Addition of New Well Supply
Cultural	The heritage attributes of identified cultural heritage landscapes and built heritage resources will continue to existing with or without the installation of proposed well site infrastructure. Mitigation measures to conserve cultural heritage value or interest will limit potential impacts. Completion of Stage 2 archeological assessment at Erin 3 site pending.	
Social	Will permit the extension of water services to new developments, which is a requirement for continued growth to meet the requirements of the Provincial Policy Statement.	
Natural	Potential impacts to vegetation, wildlife and their habitat are rated as minor. Mitigation measures will be used to avoid any adverse impacts to vegetation, wildlife and habitat. Based on a preliminary assessment, 16 existing properties within a 100 m radius of the new wells may be subject to a number of requirements including septic inspections, manure application prohibitions, risk management plans for agricultural activities and for chemical handling/storage and education requirements. Conditions/restrictions (i.e. no private servicing) will be applicable to new developments created within 100 m of the new well. Further study will be required following the completion of this Class EA to delineate vulnerable areas and amend the CTC Source Protection Plan.	
Technical	This alternative would require an additional new well and increased storage due to reduced redundancy. The Town will be more resilient to extreme weather including drought and extreme cold as firm capacity of the municipal water system will be increased through additional well supply, storage and redundancy, should one of the well sites fail during a storm event (climate change related).	Provides greater access to potential future wells since the area between Erin/Hillsburgh is hydrologically suitable for a new well. This connection would facilitate the easy connection of such a well into either system; however, development potential along the preferred trunk watermain route (i.e. Trail) is limited. The Town will be more resilient to extreme weather including drought and extreme cold as firm capacity of the municipal water system will be increased through additional well supply, storage and redundancy, should one of the well sites fail during a storm event (climate change related).
Economic	This alternative would require additional infrastructure (i.e. additional well and storage) due to reduced redundancy which would increase both capital and operational costs. Supports the intent of the GMS regarding Growth Projections.	A sewage forcemain is proposed along the same route as would be for the interconnecting trunk watermain, so cost of construction for this interconnection will be significantly reduced. Supports the intent of the GMS regarding Growth Projections.

Implementation Strategy and Supporting Infrastructure Considerations

Details regarding infrastructure and implementation requirements will be addressed during the design phase of the project (i.e., following identification of the preferred alternative and completion of the Class EA) and will include the following:

- System Storage Configuration and Location
- System Distribution
- Capital Cost
- Future Wells Exploration Strategy
- Future Interconnection of Systems

Next Steps

1. Receive input/questions/comments from this Online PIC on or before February 3, 2020. Consider and incorporate this information into the planning and assessment of this project.

2. Compile and finalize the results of the testing, monitoring and assessment of Erin 3 (E9) and Hillsburgh 2 (H4) wells to identify a preferred alternative.

3. Notify all stakeholders of Class EA Notice of Completion and filing of Project File Report for public review for a period of at least 30 calendar days.

4. Subject to comments received as a result of the Notice of Completion, proceed to the next phase of the project, which includes design and construction of the preferred alternative.

Thank You

Thank you for your interest and participation in this project. Your input, questions and/or comments on the material presented in this Online PIC are encouraged.

Please submit your input, questions and/or comments on or before **February 3, 2020** to communications@erin.ca or rkirtz@tritoneng.on.ca and a member of the Project Team will respond to you directly. Comments received will be collected under the Ontario Environmental Assessment Act and information will be collected in accordance with the Freedom of Information and Protection of Privacy Act and, with the exception of personal information, may be included in the project documentation and become part of the public record.

Project Team members are available to assist with website navigation and submission of comments by mail/phone/email to:

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