Appendix A

Phase 1 Report

TOWNSHIP OF NORTH DUNDAS

NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

PHASE 1 REPORT

SEPTEMBER 15, 2020

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1.0 INTRODUCTION

1.1 Background

The Township of North Dundas' Drinking Water Supply System (DWSS) supplies treated water to residents of the Village of Winchester and the Village of Chesterville, in addition to industrial, commercial and institutional users (notably Lactalis® Canada in Winchester). Villages of Winchester and Chesterville are located approximately 50 km south of downtown Ottawa with populations of 2,394 and 1,677 (based on the 2016 Census), respectively. With their proximity to Ottawa, the populations of both Villages are projected to increase due to future developments. Refer to Figure 1 for a Location Plan of the Township of North Dundas.

Currently, the DWSS is comprised of eight active groundwater wells, five pump houses with chlorine disinfection, two storage reservoirs, two elevated storage tanks and approximately 41.5 km of distribution system piping. The DWSS is owned by the Township of North Dundas (the Township) and is currently operated by Ontario Clean Water Agency (OCWA).

In August 16, 2019, the Township retained J.L. Richards & Associates Limited (JLR) in association with Golder Associates Ltd. (Golder) to undertake a Schedule 'C' Municipal Class Environmental Assessment (Class EA) for the Township DWSS to address long-term potable water supply needs and evaluate servicing solutions for the 20-year planning horizon. This Report fulfills the requirements of Phase 1 of the process. The project is currently proceeding as a Schedule 'C' undertaking; however, the project schedule will be reviewed at the completion of Phase 2 to determine whether the project should be modified to a Schedule 'B' Class EA.

The objectives of this Phase 1 Report are to:

- Provide an overview of the Class EA process;
- Identify conditions and constraints associated with the existing communal potable water system;
- Define a problem and/or opportunity statement for the project;
- Identify future system requirements for the 20-year planning period and include provision for build-out conditions (i.e., design basis); and
- Notify agencies, the public, and other stakeholders of this project.

1.2 Class Environmental Assessment Process

The *Ontario Environmental Assessment Act* (EA Act), enacted in 1976, formally recognizes the Class EA process and outlines requirements for environmental assessment approval. The Municipal Class EA applies to municipal infrastructure projects, including roads, water, and wastewater projects. To ensure that environmental impacts and effects are considered for each project as per the EA Act, proponents are required to generally follow the planning process set out in the Municipal Class EA Guidelines, prepared by the Municipal Engineers Association (MEA) (2015) (www.municipalclassea.ca). The Class EA process includes the following stages:

Phase 1: Problem or opportunity identification.

Phase 2: Identification and evaluation of alternative solutions to determine a preferred solution to the problem or opportunity. This Phase also compiles an environmental 'inventory', identifies impacts, and outlines mitigation measures.

Phase 3: Identification and evaluation of design concepts for the preferred solution. A detailed evaluation of the environmental effects and mitigation measures will be addressed during this project Phase.

Phase 4: Complete and place Environmental Study Report (ESR) on public record. The ESR documents Phases 1 through 3 and summarizes the consultation undertaken throughout the planning process.

Phase 5: Implementation and monitoring.

Class EA graphic.

Since projects may vary in their environmental impact, they are classified in terms of the following schedules:

- Schedule 'A' projects usually have minimal environmental effects and generally include normal or emergency operational and maintenance activities. These projects are pre-approved under the Class EA planning process.

- Schedule 'A+' projects are pre-approved similar to Schedule 'A', however, the public is to be advised prior to project implementation.

- Schedule 'B' projects have potential for some adverse environmental impacts and, therefore, the proponent is required to proceed through a screening process, including consultation with affected parties. Generally, these projects include improvements and minor expansions to existing facilities. Projects within this category are subject to Phases 1, 2 and 5.

- Schedule 'C' projects have potential for greater environmental impacts and are subject to all five Class EA Phases. Generally, these projects include the construction of new facilities and major expansions to existing facilities.

Based on the following excerpt from the MEA Guidelines, this project has been undertaken as a Schedule 'C' Class EA, and thus Phases 1 through 4 of the Class EA process will be completed. Once the Class EA is complete, the Township will be able to proceed with Phase 5.

Excerpt from MEA guidelines for a Schedule 'C' undertaking:

> "1. Construct new water system including a new well and water distribution system".

1.3 Project Team

The following Technical Steering Committee was involved in carrying out this Class EA:

Proponent: Township of North Dundas
636 St. Lawrence Street
PO Box 489
Winchester, ON K0C 2K0
Telephone: 613-774-2105

Project Manager and Operating Authority: Ontario Clean Water Agency
5 Industrial Drive
Chesterville, ON K0C 1H0
Telephone: 613-448-3098

Prime Consulting Engineer: J.L. Richards & Associates Limited
864 Lady Ellen Place
Ottawa, ON K1Z 5M2
Telephone: 613-728-3571

Sub-Consulting Engineer: Golder Associates Ltd.
1931 Robertson Road
Ottawa, ON K2H 5B7
Telephone: 613-592-9600

2.0 PHASE 1 METHODOLOGY

2.1 Project Initiation Meeting

A project initiation meeting was held on September 6, 2019 with the Township to confirm roles and responsibilities and to establish a basis for this Class EA. Refer to Appendix 'A' for Meeting Minutes.

2.2 Compilation of Documentation

Available documentation related to the Township's DWSS was compiled and provided by the Township and OCWA to JLR. The information was used to establish the existing conditions of the system (refer to Appendix 'C' for the list of available documents).

2.3 Review of Existing Studies and Analysis of Data

Available reports and correspondence were reviewed to determine the history and existing conditions of the Study Area. Digital base maps of the collection, pumping and treatment systems were developed using available drawings, which illustrate key infrastructure and planning information.

Historical water meter records and operations data for the Township DWSS between 2015 and 2019 were summarized and analyzed. Historical pumping rates from each groundwater well were reviewed and compared to the applicable Drinking Water Works Permits (DWWP) along with operator consultation to understand potential water system constraints.

2.4 Consultation Planning and Contact with Stakeholder

A Consultation Plan was developed and reviewed with the Township and OCWA, taking into consideration mandatory requirements and objectives of effective consultation with the public and other potential stakeholders, as outlined in the MEA Guidelines (refer to Appendix 'B' for a copy of the Consultation Plan). The Consultation Plan identifies potential stakeholders, defines the level of consultation, establishes appropriate means of contact, and provides a schedule highlighting the general timing of contact. As a minimum, consultation includes project notification to the public and potential stakeholders, and two Public Information Centres.

A Project Initiation Notice was posted on the Township's website (www.northdundas.ca) on September 27, 2019 and project initiation letters were distributed directly to potential stakeholders, with a request to provide comments if applicable. Refer to Appendix 'B' for a copy of the Project Initiation Notice and letter, responses received to date and an updated stakeholder distribution list.

A stakeholder consultation meeting was held with Lactalis® on December 19, 2019 (refer to Appendix 'B' for meeting minutes and follow-up OCWA email) to understand and project long-term water supply requirements as the single largest water user serviced by the water distribution system.

2.5 Problem and Opportunity Identification

A Problem/Opportunity Statement was developed based on the existing conditions, constraints and opportunities identified during Phase 1 and is included in Section 4.0 of this Phase 1 Report.

2.6 Phase 1 Report

This Phase 1 Report is the culmination of the first phase of the Class EA process. The Phase 1 Report will be used as a background document for Phase 2 and can be made available to stakeholders upon request.

3.0 EXISTING CONDITIONS

3.1 Existing Communal Potable Water Infrastructure

The Township of North Dundas DWSS supplies treated water to the two communities of Winchester and Chesterville, including the Lactalis® plant (large volume ICI consumer). This water system is comprised of eight active wells, five pump houses with chlorine disinfection, two storage reservoirs (Chesterville underground reservoir and Winchester at-grade reservoir), two elevated tanks (Chesterville elevated storage tank and Winchester elevated storage tank) and approximately 41.5 km of distribution system piping. The DWSS operates in accordance with

various Permits to Take Water (PTTW) as identified in Table 1, Municipal Drinking Water License No. 180-101, Issue No. 3, dated March 22, 2016 and Drinking Water Works Permit No. 180-201, Issue No. 4, dated July 31, 2018. It is noted that the Township has applied to renew the PTTW for Winchester wells No. 5 and No. 7.

The eight active wells are located at five separate locations within Winchester and Chesterville. Refer to Figure 2 for an overview of the study area and identification of key infrastructure. The age of the wells range between 16 to 61 years; Winchester Well #1 is the oldest well and was drilled in 1958, whereas Chesterville Well #6 is the most recent well that was drilled in 2003.

From available DWWP documentation, the total combined rated capacity of the wells within the DWSS is 102.75 L/s and the DWSS has a firm capacity of 72.5 L/s with the largest well pump out of service. However, based on operational information provided by the Township and OCWA, with the exception of Winchester Wells #7a, #7b and #7c, the wells are currently unable to operate at their rated capacity for a continuous period of time. The operating limits have been established through years of operation and proven yield. In contrast, the initial well capacity ratings were developed shortly after the wells were originally drilled. Therefore, the operational limits for the wells are lower than their rated capacities as summarized in the following table (refer to Appendix E for complete well summary).

Table 1: Well Rated and Operational Capacity Comparison

Location	Rated Capacity (L/s)	Operating Limit (L/s)	Current Rate (L/s)
Winchester Well #1	9.5	5.0 – 6.0	4.5
Winchester Well #5	6.4	3.5 – 5.0	3.85
Winchester Well #6	11.4	5.5 – 9.0	6.5
Winchester Wells #7a, b, and c	22.5	22.5	17.2
Chesterville Well #5	22.7	15.0 – 17.0	16.5
Chesterville Well #6	30.3	20 – 23.0	11 (was 18)
Total	102.8	71.5 – 82.5	59.5

The Township has indicated that in addition to the lower operating capacities, there are other issues that have been experienced in past years with the current system, such as periods of drought which limited well water recharge in the area. The Township has also identified difficulty in producing sufficient water when either the supply from Winchester Wells #7a, #7b and #7c or the Chesterville Well #6 is interrupted and/or out of commission for an extended period of time. Furthermore, the Township has indicated that there has been a history of breaks in the transmission main that supplies water from Winchester Wells #7a, #7b and #7c that are attributed to hydraulic pressure transients that develop upon pump shutdown. OCWA indicated Well #7a is regularly exercised as a back-up well, but not typically run to mitigate potential transient concerns as the motor remains equipped with a direct-on-line (DOL or across-the-line) starter. OCWA advised that only one well operates at a time (i.e., not in parallel as originally designed) and Wells #7b and 7c have been equipped to with VFD to gradually slow down the well pumps upon shutdown to mitigate pressure transients. It is understood that Chesterville Well #6 is prone to fouling overtime. The impact of these constraints on the systems ability to adequately produce and deliver water to consumers are being reviewed as part of this Class EA.

Refer to Table 2 below for a brief summary of some of the key characteristics of the Township's existing potable water system infrastructure.

Table 2: Township Potable Water System Infrastructure

Parameter	Value
Municipal Drinking Water License (180-101)[1]	102.75 L/s (72.5 L/s with largest well pump out of service)
Winchester Well #1	
Permit to Take Water (4175-9C3GPW)	9.5 L/s
Well Pump[2]	Submersible pump rated at 8.7 L/s
Depth / Diameter[2]	57.9 m / N/A
Capacity[1] / Operating Limit[3] / Current Rate[4]	9.5 L/s / 5.0 - 6.0 L/s / 4.5 L/s
Winchester Well #5	
Permit to Take Water (2181-83S8E)[6]	6.4 L/s
Well Pump[2]	Submersible pump rated at 7.6 L/s
Depth / Diameter[2]	28 m / N/A
Capacity[1] / Operating Limit[3] / Current Rate[4]	6.4 L/s / 3.5 – 5.0 L/s / 3.85 L/s
Winchester Well #6	
Permit to Take Water (0088-9C3JG4)	11.4 L/s
Well Pump[2]	Submersible pump rated at 8.3 L/s
Depth / Diameter[2]	15.9 m / N/A
Capacity[1] / Operating Limit[3] / Current Rate[4]	11.4 L/s / 5.5 – 9.0 L/s / 6.5 L/s
Winchester Well #7a, 7b, 7c	
Permit to Take Water (0816-838SXR)[6]	22.5 L/s
Well Pump[2]	Each equipped with a submersible pump rated at 11.4 L/s
Depth[2] / Diameter[5]	24.5 m / 300 mm
Capacity of Two Pumps Combined[1] / Operating Limit[3] / Current Rate[4]	22.5 L/s / 22.5 L/s / 17.2 L/s
Chesterville Well #5	
Permit to Take Water (3380-AC3QF9)	22.7 L/s
Well Pump[2]	Submersible turbine pump rated at 23 L/s

Parameter	Value
Depth / Diameter[2]	12.2 m / 250 mm
Capacity[1] / Operating Limit[3] / Current Rate[4]	22.7 L/s / 15.0 – 17.0 L/s / 16.5 L/s
Chesterville Well #6	
Permit to Take Water (3380-AC3QF9)	30.3 L/s
Well Pump[2]	Submersible turbine pump rated at 30.3 L/s
Depth / Diameter[2]	12.2 m / 305 mm
Capacity[1] / Operating Limit[3] / Current Rate[4]	30.3 L/s / 20 – 23.0 L/s / 11 (was at 18) L/s

(1) Municipal Drinking Water Licence - Schedule C - Table 1: Rated Capacity (March 22, 2016)
(2) Drinking Water Works Permit - Schedule A (July 31, 2018)
(3) Township of North Dundas TOR for Consulting Engineering Services - Table 1: Well Capacity Summary
(4) Township of North Dundas TOR for Consulting Engineering Services - Appendix D: North Dundas Drinking Water Systems - Supply Wells
(5) Winchester Water Supply System Upgrade Class Environmental Assessment Project File Report (August 2009) - Appendix B: Golder Associates and Sauriol Environmental Inc., Environmental Study Report Phase I and II Hydrogeological Components (January 2005) - Figure H-1
(6) Township has applied to renew the PTTW for Winchester Wells No. 5 and No. 7

3.2 Current Water Demands

The Township's historical potable water demands from all eight wells between 2015 and 2019 were obtained from operating data provided by OCWA. Over the past five years, the Township is operating at average and maximum day production rates of 27.9 L/s (2,411 m^3/d) and 54.9 L/s (4,746 m^3/d), respectively as shown in Table 3 below.

Table 3: Township Historic Potable Water Demands (2015 to 2019)

Year	Average Day Demand [1]	Maximum Day Demand [1]	Peaking Factor
2015	25.2 L/s (2,177 m^3/d)	40.5 L/s (3,498 m^3/d)	1.61
2016	25.6 L/s (2,211 m^3/d)	54.9 L/s (4,746 m^3/d)	2.15
2017	27.9 L/s (2,409 m^3/d)	53.2 L/s (4,599 m^3/d)	1.91
2018	30.6 L/s (2,642 m^3/d)	48.8 L/s (4,214 m^3/d)	1.60
2019	30.2 L/s (2,613 m^3/d)	51.7 L/s (4,465 m^3/d)	1.71
Average	**27.9 L/s (2,411 m^3/d)**		
Maximum		**54.9 L/s (4,746 m^3/d)**	

(1) Well production data for each well was provided by the Township/OCWA.

The largest water consumer in the community is the dairy processing plant, Lactalis®. This plant currently utilizes approximately half of the total treated water produced in the Township. In the last few years, the daily average consumption at the plant has changed significantly, rising from 861 m^3/d (2015) to a high of 1,378 m^3/d (2018). The plant's daily average consumption from 2015 to 2019 was approximately 1,121 m^3/d, while maximum day consumption was estimated at 1.5 times the average consumption or 2,067 m^3/d, as shown in Table 4 below.

The Township has been in discussions with Lactalis® regarding their water usage and how the plant's water demand may change in future years. Lactalis® has indicated that their water demand is projected to remain stable for the foreseeable future and that their future daily average water demand will remain consistent with current demand at approximately 1,200 m^3/d +/- 200 m^3/d. For planning purposes of this Class EA water consumption of 1,400 m^3/d and 2,100 m^3/d will be assessed for average and maximum demand, respectively. Also, these values closely match Lactalis'® 2018 historical water consumption. During the Phase 1 review meeting, OCWA advised that Lactalis' recently commissioned sewage treatment system may increase their average water demand by approximately 15 m^3/day. OCWA also reviewed Lactalis' 2020 average water demand from January to June which ranged from 999 m^3/day to 1380 m^3/day, remaining consistent with the Class EA's water demand projections.

Table 4: Lactalis® Water Consumption (2015 to 2019)

Year	Daily Average Consumption (1)	Maximum Day Demand (2)
2015	10.0 L/s (861 m^3/d)	15.0 L/s (1,292 m^3/d)
2016	10.9 L/s (939 m^3/d)	16.3 L/s (1,409 m^3/d)
2017	13.5 L/s (1,170 m^3/d)	20.3 L/s (1,755 m^3/d)
2018	16.0 L/s (1,378 m^3/d)	23.9 L/s (2,067 m^3/d)
2019	14.6 L/s (1,258 m^3/d)	21.8 L/s (1,887 m^3/d)
Average	**13.0 L/s (1,121 m^3/d)**	**19.5 L/s (1,682 m^3/d)**
Maximum	**16.0 L/s (1,378 m^3/d)**	**23.9 L/s (2,067 m^3/d)**
Class EA (3)	**16.2 L/s (1,400 m^3/d)**	**24.3 L/s (2,100 m^3/d)**

(1) Lactalis® water consumption was provided by the Township.
(2) Maximum day demand estimated at 1.5 times average consumption.
(3) Projected Lactalis® water demand based stakeholder consultation and OCWA email correspondence.

Based on data for the past five years, the Township is operating at an approximate average and maximum day production rates of 14.9 L/s (1,289 m^3/d) and 38.6 L/s (3,337 m^3/d), respectively, excluding Lactalis® water usage. This is equivalent to an average daily per capita consumption of 316 L/c/d based on the 2016 population of 4,071 people. This per capita consumption is typical for communities of similar size and comparable to the MECP Design Guidelines for Drinking Water Systems (2008) that identifies typical values between 270 to 450 L/c/d. Refer to Table 5 below which summarizes historical potable water demands for the Township's potable water system, excluding Lactalis® water usage.

Table 5: Township Water Consumption Excluding Lactalis® (2015 to 2019)

Year	Daily Average Consumption (1)	Maximum Day Demand (2)	Peaking Factor
2015	15.2 L/s (1,316 m^3/d)	25.5 L/s (2,206 m^3/d)	1.67
2016	14.7 L/s (1,272 m^3/d)	38.6 L/s (3,337 m^3/d)	2.62
2017	14.3 L/s (1,239 m^3/d)	32.9 L/s (2,844 m^3/d)	2.30

2018	14.6 L/s (1,264 m^3/d)	24.8 L/s (2,147 m^3/d)	1.70
2019	15.7 L/s (1,356 m^3/d)	29.8 L/s (2,578 m^3/d)	1.90
Average (2015-2019)	**14.9 L/s (1,289 m^3/d)**		
Class EA	**14.9 L/s (1,289 m^3/d)**	**38.6 L/s (3,337 m^3/d)**	**2.59**
(1) Daily average consumption illustrates the difference between values shown in Table 3 and Table 4.			

Based on the foregoing table, the Class EA will use 14.9 Ls (1,289 m^3/d) and 38.6 L/s (3,337 m^3/d) for current average and maximum day water demands based on the historical data.

3.3 Water Quality

As outlined in Golder's Technical Memorandum dated March 11, 2020 (refer to Appendix 'E'), the Township's 2018 annual report (OCWA, 2019) indicate good water quality, with occasional raw water detections of non-pathogenic bacteria. Current water treatment was sufficient to reduce these detections below the Ontario Drinking Water Quality Standards. Organic and inorganic parameters also met the standards based on the testing completed by OCWA in accordance with Ontario Regulation 170/03.

3.4 Land Use and Planning

According to the United Counties of Stormont, Dundas and Glengarry Official Plan (2018), the project Study Area consists mainly of commercial, residential, industrial and institutional zoning. The Official Plan projects a population growth of 1,522 people and an increase of 875 housing units to the year 2036 for the Township of North Dundas.

Based on discussions with the Township, and Council consultation and approval on March 3, 2020, the following population growth scenarios are to be considered for this Class EA (refer to Appendix 'D' for a copy of Technical Memorandum No. 1 Population Growth and Development Projection for further details).

Low Growth:

- Winchester: Projected annual growth rate of 1.5% from 2016 to 2019. Projected population growth from 2019 to 2039 based on the future potential development within Winchester provided by the Township (including Phase 1 of the Welling's of Winchester development). This represents a total population growth of 1,236 and additional commercial area of 25.65 ha to 2039.

- Chesterville: Projected at an annual growth rate of 3.5% from 2016 to 2019 and at an annual growth rate of 1.5% from 2019 to 2039. This represents a total growth of 732 people to 2039.

High Growth:

- Winchester: Projected annual growth rate of 1.5% from 2016 to 2019. Projected population growth from 2019 to 2039 based on the future potential development within Winchester

provided by the Township (including Phase 2 to Phase 5 of the Welling's of Winchester development). This represents a total population growth of 1,808 people and additional commercial area of 25.65 ha to 2039.

- Chesterville: Projected at an annual growth rate of 3.5% from 2016 to 2019 and an annual growth rate of 3.5% from 2019 to 2039. This represents a total population growth of 1,350 people to 2039.

3.5 Population and Future Water Demand Projections

Based on census information for Winchester and Chesterville, the serviced population in the Study Area (Villages of Winchester and Chesterville) in 2016 was 4,071 people. This population was used as a baseline to determine the current population for 2019. In order to establish future water demands, population projections and future commercial development areas, per the low and high growth scenarios identified in Section 3.3 - Land Use and Planning, as well as the anticipated future demand for Lactalis®, were used. For the purpose of this study, future water demands are being assessed using design values recommended by MECP design guidelines. Average day demand for future residential population was estimated using a per capita consumption of 350 L/c/d. The existing maximum day peak factor was not applied to future demand because the MECP design guidelines recommend that as serviced populations increase maximum day peak factors decrease. A maximum day peaking factor of 2 was used for residential growth, whereas a maximum day peaking factor of 1.5 was used for the future commercial developments and Lactalis®.

Table 6 provides a summary of the projected service population, average day, and maximum day, for the Study Area for the low and high growth scenarios in 2039. These water demands will be used as the design basis for this Class EA.

Table 6: Existing and Projected Future Water Demands (2016 - 2039)

Parameters	Existing (Class EA)	Projected Growth & Demand from Existing		2039	
		Low Growth	High Growth	Low Growth	High Growth
Service Population	4,355[1]	1,684	2,874	6,039[1]	7,229[1]
Average Day Demand (m^3/d)	1,289[2]	589[3]	1,006[3]	1,878[4]	2,295[4]
Maximum Day Demand (m^3/d)	3,337[2]	1,178[5]	2,012[5]	4,515[4]	5,349[4]
Lactalis® Average Day Demand (m^3/d)	1,400[6]			1,400[6]	1,400[6]
Lactalis® Max Day Demand (m^3/d)	2,100[7]			2,100[7]	2,100[7]
Winchester Future Potential Commercial Development Average Day Demand (m^3/d)				752[8]	752[8]

Winchester Future Potential Commercial Development Max Day Demand (m^3/d)				1,128[8]	1,128[8]
Total Average Day Demand (m^3/d)	**2,689**			**4,030**	**4,447**
Total Maximum Day Demand (m^3/d)	**5,437**			**7,736**	**8,570**

(1) Estimated growth based on Township consultation (refer to growth memo in Appendix 'D') and by applying 350 L/cap/day on future development.
(2) Refer to Table 5.
(3) Projected average day demand calculated at 350 L/cap/day in accordance with MECP Design Guidelines.
(4) Average day demand, max day demand and peak hour demand for 2039 was calculated based on Class EA demand plus projected demand.
(5) Estimated by applying average day peaking factors of 2 and 3 for maximum day and peak hour, respectively (MECP Guidelines 2008).
(6) Based on review of water usage data provided by the Township, December 11, 2019 stakeholder meeting and follow-up OCWA email of 2019 demands (Refer to Appendix 'B')
(7) Estimated by applying an industrial development peaking factors of 1.5 for maximum day (Ottawa Design Guidelines – Water Distribution July 2010).
(8) Estimated by applying 28 m^3/ha day, and a commercial development peaking factor of 1.5 for maximum day (Ottawa Design Guidelines – Water Distribution July 2010).

In summary, the 20 year design basis for the projected maximum day demands are 7,736 m^3/d and 8,570 m^3/d for the low growth and high growth scenarios, respectively. It is noted that the current operational limit of the existing wells is 59.5 L/s (5,140 m^3/d), which includes the largest well out of service (currently Well #7b or c, refer to Table 2).

Any water supply system with elevated water storage must be capable of meeting the maximum day demand of the system, but the current MECP Design Guidelines are not specific on the level of redundancy or firm capacity of a groundwater source system. As a minimum, it is reasonable to expect that a groundwater supply system meet the average day demand with the largest well out of service.

While a more recent and stricter guideline published by the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 2012 Edition, (the Province of Ontario is a member), recommends that: "the total developed groundwater source capacity, unless otherwise specified by the reviewing authority, shall equal or exceed the design maximum day demand with the largest producing well out of service". This Class EA plan to target this stricter recommendation to help address long-term reliability and redundancy. 3.5 Existing and Future Servicing System Constraints

Water supply capacity was reviewed to assess the communal potable water system's ability to accommodate existing and future water demand scenarios. The following general servicing issues are noted:

- Based on the 2039 projected maximum day demand for both low growth and high growth scenarios, there is a future deficit of 2,595 m^3/d and 3,429 m^3/d, respectively, compared to the current operational limit of the existing wells of 59.5 L/s (5,141 m^3/d) with the largest well out of service.

The following constraints have been identified for the Study Area based on existing conditions:

- As previously discussed, with the exception of Well #7a, 7b and 7c, wells are unable to operate at their rated capacity for a continuous period of time.

- Ductile iron transmission main is prone to breaks for Well #7a, 7b and 7c that is attributed to pressure transients during well pump shutdown.

- Winchester Wells #1 and #5 can maintain higher flows than the operational capacity, but not for longer than 10 hours.

  Initial construction for Winchester Well #6 recommended a reduced flow during August and September. However, aquifer is sensitive to use and rainfall/spring melt.
- Steady state was not reached during 30-day pump test for Chesterville Well #5. Stable capacity for Chesterville Wells is considered ~75% listed capacity.

- Chesterville Well #6 is prone to well screen fouling.

- Given the age of the Wells, the reliability of all wells for long-term operation is unknown. Therefore, it would be difficult for the Township's Wells to provide sufficient water when either Well #7a, 7b, and 7c or the Chesterville Well #6 are out of commission for an extended period of time.

- The Township has experienced periods of drought that limited well water recharge in the area. Present climate change projections for Ontario presents the North Dundas area to receive more precipitation during the winter and spring, and less during the summer and fall months. This projection will lead to an increased chance of experiencing extended periods with reduced recharge of the aquifer.

- There is no standby power on site in the event of a power outage for Well #7a, 7b and 7c.

3.6 Other Considerations

3.6.1 Geotechnical and Hydrogeological

A baseline hydrogeological and geotechnical desktop review was undertaken which reviewed the subsurface soil conditions, wells assessments, water quality, wellhead protection areas, existing and historic potential sources of contaminations and impacts to local wells. Refer to Appendix 'E' for the Geotechnical Technical Memorandum (Golder, March 11, 2020).

3.6.2 Cultural and Archaeological Environments

The Official Plan from The United Counties of South Stormont, Dundas and Glengarry (adopted July 2018) does not identify any specific areas of cultural importance within the Study Area. During Phase 2, the screening checklist for evaluating Archaeological Potential and Criteria for Evaluate Build Heritage Recourses and Cultural Heritage Landscapes, developed by the Ministry of Tourism, Culture and Sport will be completed for preferred alternative servicing solutions.

3.6.3 Natural Environment

Natural environment features are legacy components of the community landscape and represent important environmental areas to consider as part of the Class EA. According to studies previously undertaken in this area, the Wisconsinian Glaciation retreated from the area around 15,000 years ago, and the region was covered by the Champlain Sea up to approximately 9,000 years ago. The area is part of the Winchester Clay Plain which is indicated to have higher land capability classes for agriculture than many of the other plains within the South Nation Conservation area (Cataraqui Archaeological Research Foundation, 1997). Due to the high percentage of prime agricultural lands and forest clearing during the late 1800s and early 1900s, the Township of North Dundas does not contain a high percentage of forest cover. According to a report entitled Forest Cover and Trends Analysis (2014) prepared by the South Nation Conservation, the Township has approximately 13.3% forest area remaining (SNC, 2014).

Generally, the lands within the Township and study area are used or agricultural purposes with natural environment areas consisting of Provincially Significant Wetlands, limited woodlots, an Area of Natural and Scientific Interest (Wetland) and Well Head Protection Area (WHPA) associated with the existing communal drinking water system. The natural environmental constraints in the Study Area are illustrated in Figure 3.

4.0 PROBLEM / OPPORTUNITY STATEMENT

The following Problem / Opportunity Statement will be used as the basis for proceeding to Phase 2 of this Class EA:

> *The Township of North Dundas is serviced by a communal potable water supply system that generally consists of eight active groundwater wells, five pump houses with chlorine disinfection, two storage reservoirs, two elevated storage tanks and distribution system. While the system has been operating in accordance with all applicable legislation and is generally achieving all required water quality standards, it is anticipated that the Township will not be able to meet potable water supply requirements as recommended by the Ministry of the Environment, Conservation and Parks within the next 20 years timeframe if projected growth and associated water demand is realized. The Township is therefore in need of a solution that will address water supply constraints and improve the redundancy and reliability in delivering treated water to the community over the next 20 years.*

5.0 PHASE 2 - IDENTIFICATION OF ALTERNATIVE SOLUTIONS

Phase 2 of this Class EA will include the following tasks:

- Confirm sufficient hydraulic capacity required for the treatment facility for 2039;
- Identify and evaluate alternative communal potable water system solutions;
- Identify land use or property requirements, if any;
- Conduct a Public Information Centre to present the findings of Phase 2; and
- Select a preferred solution and confirm project schedule (i.e., Schedule 'C' process).

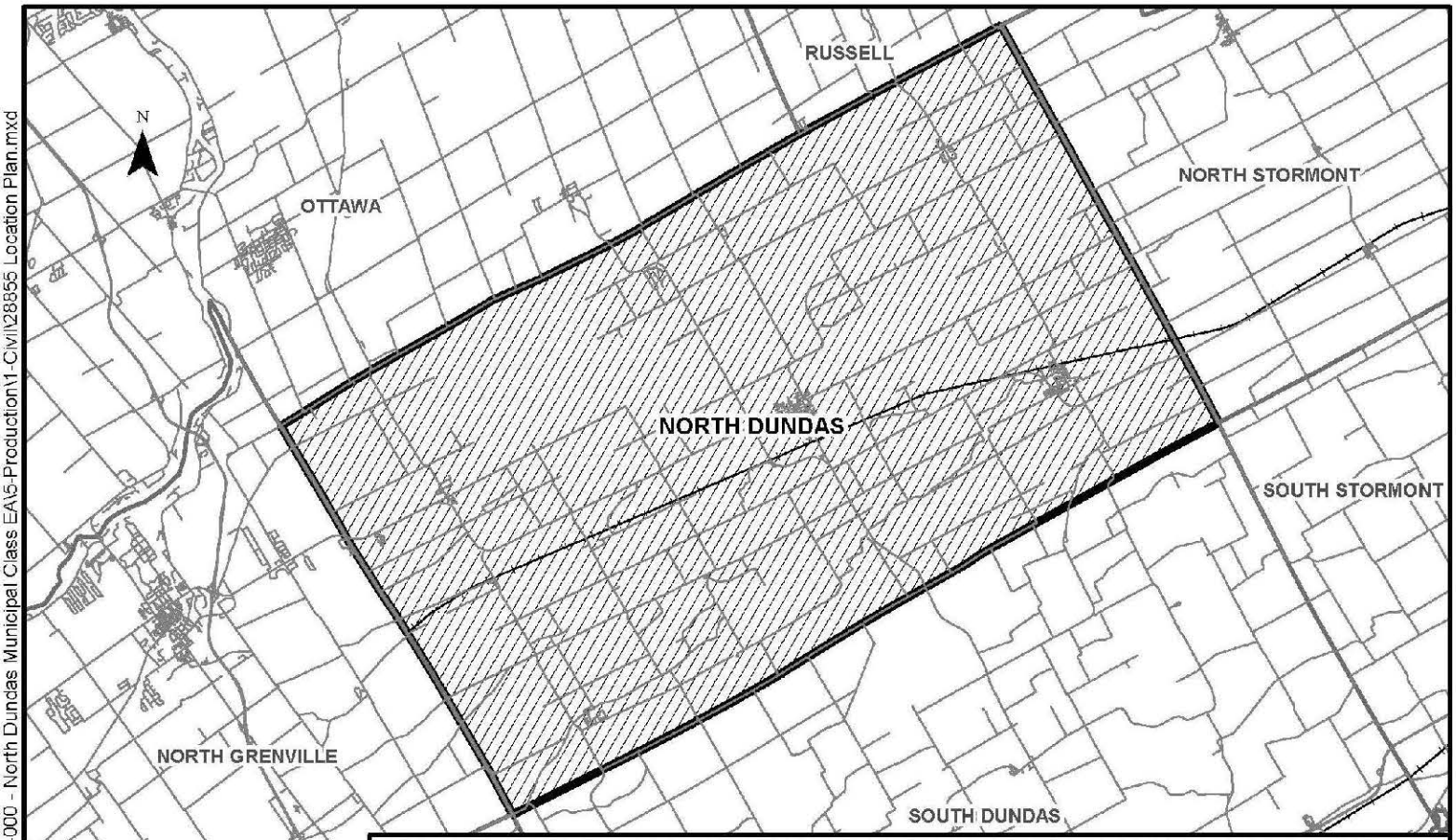
6.0 REFERENCES

MCEA, 2015. Municipal Class Environmental Assessment. Municipal Engineers Associations. October 2000, as amended in 2007, 2011 and 2015.

Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 2012 Edition. Recommended Standards for Water Works

MECP, 2002. Safe Drinking Water Act, 2002. Ministry of the Environment. Ontario Regulation 169/03 Ontario Drinking Water Quality Standards.

MECP, 2008. Design Guidelines for Drinking-Water Systems. Ministry of the Environment. 2008.



PROJECT: TOWNSHIP OF NORTH DUNDAS WATER SUPPLY SYSTEM CAPACITY EXPANSION
MUNICIPAL CLASS EA
NORTH DUNDAS, ONTARIO

DRAWING:

LOCATION PLAN

J.L.Richards
ENGINEERS • ARCHITECTS • PLANNERS
www.jlrichards.ca

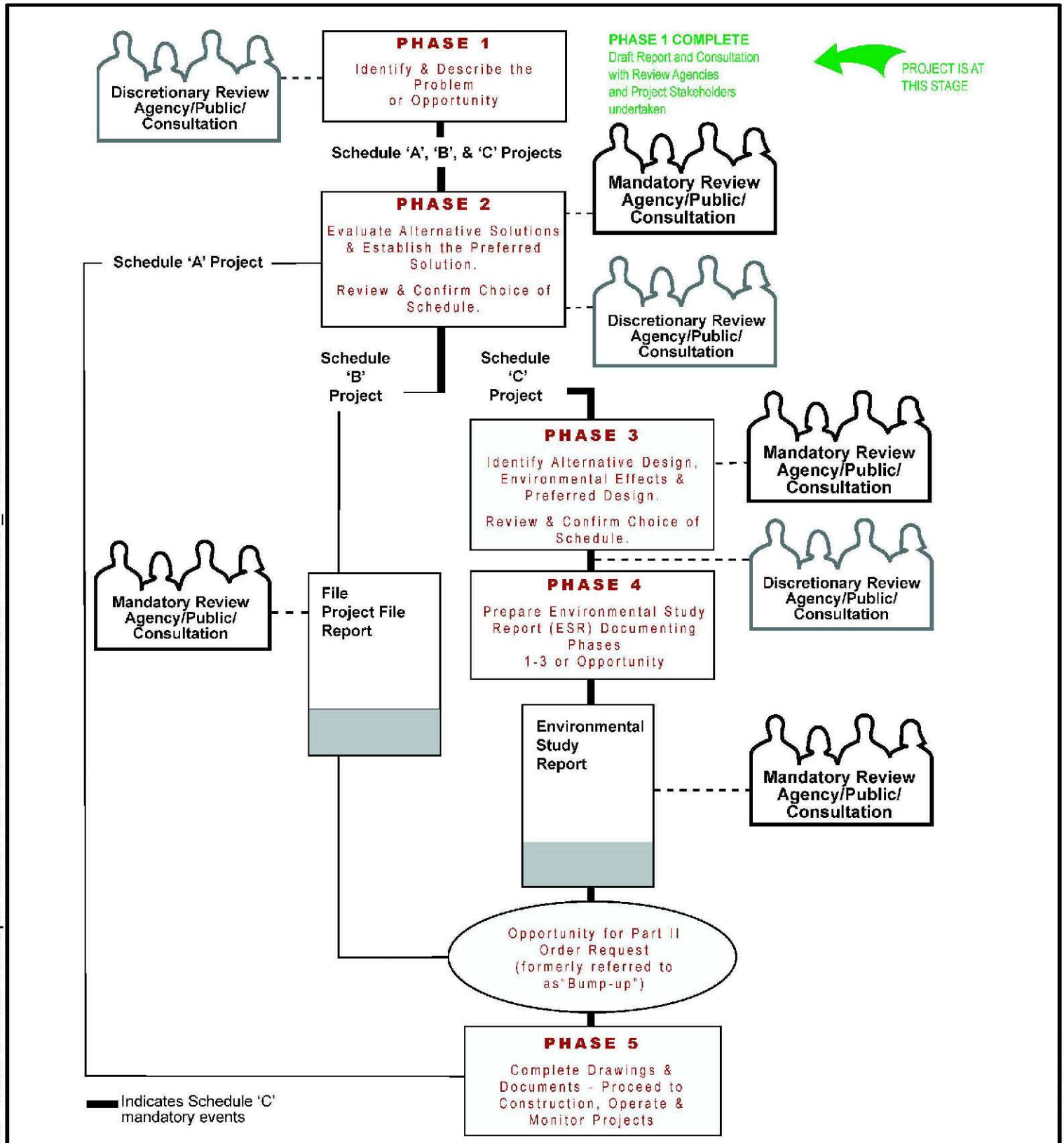
DESIGN:	TB
DRAWN:	TB
CHECKED:	SJ
JLR #:	28855-000

DRAWING #:

FIGURE 1

File Location: P:\28000\28855-000 - North Dundas Municipal Class EA\5-Production\1-Civil\28855 Location Plan.mxd

Plot Date: Wednesday, March 18, 2020 9:35:12 AM



PROJECT: TOWNSHIP OF NORTH DUNDAS WATER SUPPLY SYSTEM CAPACITY EXPANSION
MUNICIPAL CLASS EA
NORTH DUNDAS, ONTARIO

DRAWING:

CLASS EA PROCESS

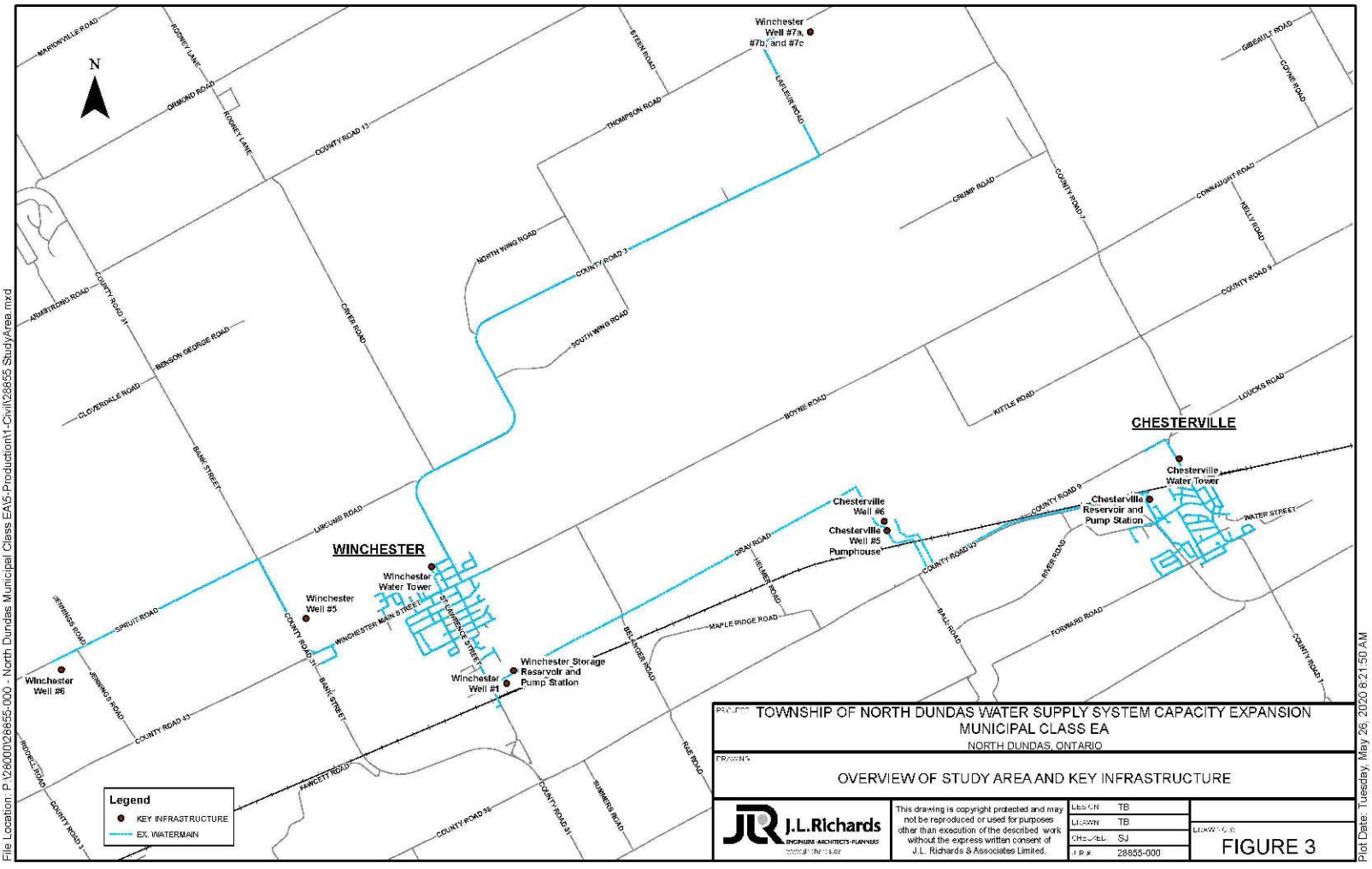
J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
www.jlrichards.ca

DESIGN:	MB
DRAWN:	TB
CHECKED:	MB
JLR #:	28855-000

DRAWING #:
FIGURE 2

File Location: P:\28000\28855-000 - North Dundas Municipal Class EA\5-Production\1-Civil\28855 ClassEA_Process.mxd

Plot Date: Tuesday, May 26, 2020 8:47:01 AM



PROJECT: TOWNSHIP OF NORTH DUNDAS WATER SUPPLY SYSTEM CAPACITY EXPANSION MUNICIPAL CLASS EA
NORTH DUNDAS, ONTARIO

DRAWING: OVERVIEW OF STUDY AREA AND KEY INFRASTRUCTURE

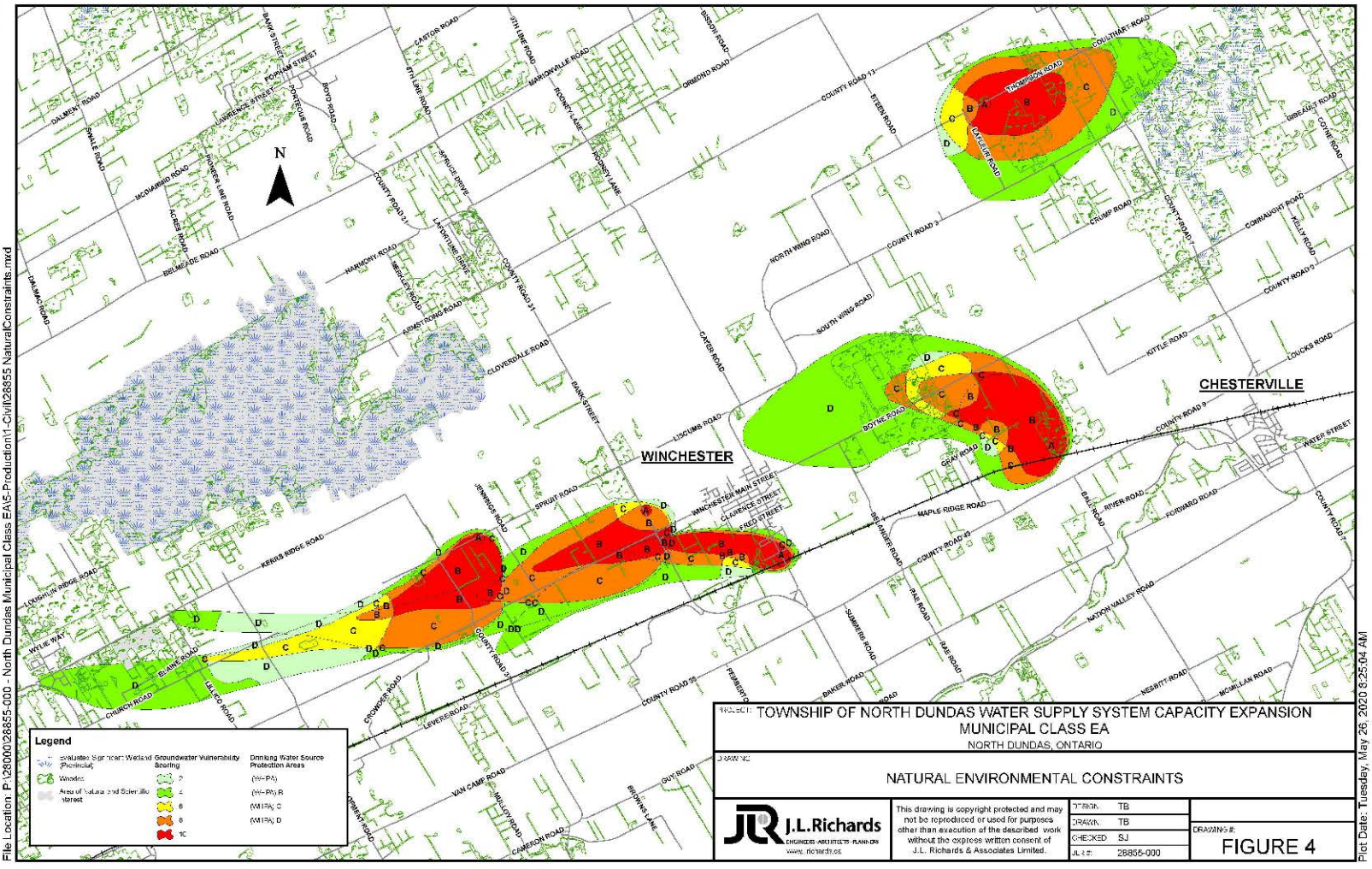
J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

DESIGN	TB
DRAWN	TB
CHECKED	SJ
J.R.#	28855-000

DRAWING: FIGURE 3

File Location: P:\28000\28855-000 - North Dundas Municipal Class EA\5-Production\1-Civil\28855 StudyArea.mxd

Plot Date: Tuesday, May 26, 2020 6:21:50 AM



PROJECT: TOWNSHIP OF NORTH DUNDAS WATER SUPPLY SYSTEM CAPACITY EXPANSION MUNICIPAL CLASS EA
NORTH DUNDAS, ONTARIO

DRAWING: NATURAL ENVIRONMENTAL CONSTRAINTS

J.L.Richards
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www.jlrichards.ca

DESIGN:	TB
DRAWN:	TB
CHECKED:	SJ
JLR #:	28855-000

DRAWING #: FIGURE 4

File Location: P:\28000\28855-000 - North Dundas Municipal Class EA\5-Production\1-Civil\28855 NaturalConstraints.mxd

Plot Date: Tuesday, May 26, 2020 8:25:04 AM

Appendix A

Project Initiation Meeting Minutes

TOWNSHIP OF NORTH DUNDAS
NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

PROJECT INITIATION MEETING NO.1

ATTENDANCE:	Angela Rutley	Township of North Dundas (Township)
	Dan Belleau	Township of North Dundas (Township)
	Mary Lynn Plummer	Township of North Dundas (Township)
	Dave Markell	Ontario Clean water Agency (OCWA)
	Dawn Crump	Ontario Clean water Agency (OCWA)
	Stephane Barbarie	Ontario Clean water Agency (OCWA)
	Brian Henderson	Golder Associates Limited (Golder)
	Paul Smolkin	Golder Associates Limited (Golder)
	Sarah Gore	J.L. Richards & Associates Limited (JLR)
	Mark Buchanan	J.L. Richards & Associates Limited (JLR)
	Sara Jamaliniya	J.L. Richards & Associates Limited (JLR)

The meeting commenced at 2:30 P.M., Friday, September 6, 2019 at the Office of the Township of North Dundas

The following summary of the discussions of this meeting has been prepared to record and direct the project. Please advise the undersigned of any errors or omissions.

ITEM		ACTION
1.0	S. Gore provided a brief overview of the project and introductions were made by all. S. Gore noted that the objective of this project is to determine solution(s) to address the Township's concerns regarding reliability of their communal water system and the anticipated demand increase due to planned residential expansions and growing industrial needs.	INFO
1.1	Project roles and responsibilities are as following: • Dan Belleau, Township Director of Public Works • Angela Rutley, Township CAO • Mary Lynn Plummer, Township Water/Sewer Assistant Manager • Dave Markell, OCWA Project Manager • Dawn Crump, OCWA Operator • Stephane Barbarie, OCWA Operator • Brian Henderson, Golder Project Manager • Paul Smolkin, Golder Principal-In-Charge/Technical Advisor • Sarah Gore, JLR Project Manager • Brian Hein, JLR Principal-In-Charge/Technical Advisor • Mark Buchanan, JLR Assistant PM/Class EA Lead • Sara Jamaliniya, JLR Environmental Engineering Designer	INFO

TOWNSHIP OF NORTH DUNDAS
NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

PROJECT INITIATION MEETING NO.1

ITEM		ACTION

The primary contacts for this project are:

- Dan Belleau, Township
- Dave Markell, OCWA Project Manager
- Brian Henderson, Golder Project Manager
- Sarah Gore, JLR Project Manager
- Mark Buchanan, JLR Class EA Lead/ Assistant PM

1.2 JLR shall provide comments on the Engineering Agreement to the Township. JLR

All project correspondence shall be directed to Dave Markell for distribution to the Technical Steering Committee (TSC). Conversely, all day to day correspondence shall be directed to Mark Buchanan for distribution within the project team.

1.3 M. Buchanan provided an overview of the proposed work plan and schedule. The key points discussed are provided herein: INFO

- An important consideration for this project is to determine if this Class EA needs to be completed as a Schedule 'B' or a Schedule 'C' project. M. Buchanan indicated that the study will begin assuming Schedule 'C' process which will be reviewed at the completion of Phase 1 and 2 if it should be modified to a Schedule 'B'.
- Schedule 'C' projects generally include the construction of new drinking water facilities (i.e. new surface water treatment plant) and major expansions to existing facilities while Schedule 'B' projects includes improvements and minor expansions to existing facilities (i.e. new or increased ground water well capacity).
- As part of Phase 1, in addition to problem and opportunity identification, existing conditions and water capacity constraints are to be clearly defined.
- B. Henderson noted that there is a gap between the information from existing documents (previous studies and permits) and the Township's drinking water supply system's current operational constraints that needs to be studied thoroughly.
- D. Markell indicated that Chesterville Well No.6 has required cleaning several times in the past years. OCWA requested that a long-term solution for cleaning this well be included as part of the problem statement of this Class EA.
- Consultation with the Township's Planning Department is required to establish the 20-year growth projection for Winchester and Chesterville.

TOWNSHIP OF NORTH DUNDAS
NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

PROJECT INITIATION MEETING NO.1

ITEM		ACTION

- Consultation with the MECP district office and local health unit is expected to provide an introduction to the project and assist in identifying any regulatory water supply constraints.
- Consultation with Parmalat (Lactalis) Canada on projected water usage is needed; Township to provide JLR with contacts information from Parmalat (Lactalis) Canada.

Post-Meeting Note: The Township advised JLR that Bruce Shurtleff is the contact for Parmalat (Lactalis).

- As part of Phase 2, various servicing alternatives will be developed/screened, and evaluated to determine the preferred option to address the problem and/or opportunity identified in Phase 1.
- A. Rutley indicated that the Township of North Dundas Council requested that the study consider obtaining surface water from South Dundas (i.e. St. Lawrence River) as a potential servicing alternative during Phase 2.
- As part of Phase 2, additional studies associated with the provisional items will be considered and undertaken, if required.
- If it is determined that the project is to proceed as a Schedule 'C' process, an Environmental Study Report (ESR) will be prepared and filed for thirty day public review; otherwise, the Schedule 'B' Phase 2 report will be filed for thirty day public review.
- Key deliverables for the project are included in the schedule (e.g. Phase 1 Report, Phase 2 Report, draft ESR, and final ESR).
- JLR expects that the project will be completed in 12 months (September-October 2020).

1.4 JLR shall provide a draft Public Consultation Plan to the OCWA/Township for review. JLR

JLR shall prepare and provide the Project Initiation Notice to the OCWA/Township for review and for posting on the Township's website.

A. Rutley indicated that the name of Parmalat has changed to Lactalis.

1.5 Township indicated that the main issue to address is reliability and redundancy of the existing water supply system in North Dundas.

D. Markell noted that OCWA suspects that Winchester Wells No.4 (abandoned) and No.5 are hydraulically connected.

TOWNSHIP OF NORTH DUNDAS
NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

PROJECT INITIATION MEETING NO.1

ITEM		ACTION
	D. Markell indicated that the sodium limit has been exceeded in Winchester Well No.5 in several occasions in the past.	
	It was noted that JLR will arrange/coordinate a site visit to each well to discuss the current situation and operational constraints with operators.	JLR
1.6	A preliminary list of required documentation was presented to all in the meeting.	
	M. Buchanan noted that required documentation list is a work in progress as additional documentation may be needed and it will be updated by JLR/Golder as the project continues.	
	JLR shall provide the FTP site access so that all available documentation can be shared.	
	Post-Meeting Note: JLR provided FTP site access details to the Township/OCWA and Golder. Various documentation has been added by OCWA/Township to the FTP site; attached is an updated list of background documentation requirements.	
	Township shall provide digital release of data Agreement to JLR and Golder to sign before sharing any County GIS data.	Township
1.7	Next Meeting: To be determined.	

Prepared by:

J.L. RICHARDS & ASSOCIATES LIMITED

Sara Jamaliniya

Sara Jamaliniya, M.Eng.

Distribution: All present

TOWNSHIP OF NORTH DUNDAS
NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

LIST OF DOCUMENTATION

No.	Description	Action / Status
GENERAL		
1.1	Certificate of approval, July 2010	Received
1.2	Drinking Water Works Permit, July 2018	Received
1.3	Municipal Drinking Water License, March 2016	Received
1.4	North Dundas Drinking Water System- Supply Wells	Received
1.5	Winchester Water Supply System Upgrade Class Environmental Assessment Project File, Stantec August 2009	Received
1.6	2018 North Dundas Water Operations Budget	Received
1.7	Permits to Take Water for each Well	
1.8	Drinking Water Operation and Maintenance Manuals	
WATER DISTRIBUTION		
2.1	2016-2018 Water Consumption Spreadsheet Data	Received
2.2	As-Constructed Drawings for Water Distribution System (Watermains, Towers, Pumping Stations)	Received
2.3	GIS Data of Watermain Network	
2.4	2014-2018 (5 Years) Hourly Well Production Records, Water Level, Water Quality (Spreadsheet Data)	Received
2.5	2016-2018 MECP Inspection Report (if any)	Received
2.6	2016-2018 Annual Drinking Water Report	Received
2.7	Maintenance Records	Received
GEOTECHNICAL		
3.1	Golder Associates and Sauriol Environmental Inc., Environmental Study Report Phase I and II, Hydrogeological Components, Townships of North Dundas and Russell, Ontario, January 2005	Received
PLANNING		
4.1	Township of North Dundas Official Plan	Received

Appendix B

Public Consultation
Documentation

September 30, 2019

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

J.L. Richards & Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

TOWNSHIP OF NORTH DUNDAS
SCHEDULE 'C' MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION
(DRINKING WATER SUPPLY SYSTEM CLASS EA)

CONSULTATION PLAN

The Municipal Class Environmental Assessment (Class EA) planning process typically includes the development of a consultation plan. The following provides a summary of the consultation plan for the Township of North Dundas, Schedule 'C' Municipal Class Environmental Assessment for the North Dundas Drinking Water Supply System Capacity Expansion. Please note that the project is referenced herein as the Drinking Water Supply System Class EA. The consultation plan takes into consideration the mandatory requirements and objectives of effective consultation with the public and other potential stakeholders, as outlined in the Municipal Engineers Association (MEA) Class Environmental Assessment Document by addressing the following:

- Identification of potential stakeholders
- Level of consultation
- Appropriate means of contact
- General timing of contact

Consultation plans for Class EAs are not required to be formal documents, but rather an approach or methodology that is determined early in the study and may be documented (e.g. minutes, memo, etc.).

Township Council

Council will be informed of progress and points of public contact directly by Township Staff.

Identification of Potential Stakeholders

A list of stakeholders to be contacted for the Drinking Water Supply System Class EA is attached; responses will be documented. The contact list will be periodically updated as the project progresses.

Level of Consultation

The level of consultation depends largely on the problem or opportunity being addressed, the level of complexity, potential environmental issues and impacts, specific community characteristics and needs, available resources, and approaches used on similar studies in the Township.

This Class EA will be initiated as a Schedule 'C' that requires at minimum two (2) Public Information Centres (PICs) while one (1) PIC is required for a Schedule 'B' Class EA. The Class EA Schedule will be reviewed and confirmed after completion of Phase 1 (Problem/Opportunity definition) and Phase 2 (Evaluate Alternative Solutions). The North Dundas Drinking Water Supply System Class EA PICs will be scheduled to present the major findings of Phase 2 (Evaluate Alternative Solutions) and if required Phase 3 (Evaluate Alternative Solutions and Prepare Draft Environmental Study Report) of the Class EA process, allowing public input prior to finalizing the Environmental Study Report. The outline below indicates timing for major work tasks, and consultation.

To facilitate the consultation process and consider feedback from interested Stakeholders, the Project Committee will meet at regular intervals, where the Project Committee includes representative(s) from the

Township of North Dundas, Ontario Clean Water Agency (OCWA), the Consultant and other Stakeholders, if and when required.

Appropriate Means of Contact

The following means of contact have been confirmed for the Drinking Water Supply System Class EA planning process:

PURPOSE	MEANS OF CONTACT
Notification	▪ Notices in newspapers ▪ Notices mailed to persons directly affected (as required) ▪ Notices mailed to review agencies and interested parties directly ▪ Notices posted on Township's web page
Information Collection/Exchange	▪ Public Information Centre(s) (two required for a Schedule 'C' and one for Schedule 'B' projects). Other forms of information collection and exchange will include: ▪ Site visits/meetings ▪ Comment sheets ▪ Telephone calls ▪ Written communication ▪ E-mail addresses which are used to communicate feedback

General Timing

The general timing of key consultation points are summarized below:

DATE	MILESTONE
September 2019	Project start-up
September 2019 – November 2019	Phase 1: Identify and Describe the Problem or Opportunity
October 2019	Notify Potential Stakeholders and confirm level of interest/involvement
December 2019 to April 2020	Phase 2: Evaluate Alternative Solutions
April 2020	Notify Stakeholders of Schedule 'C' Phase 2 Report and Conduct Public Consultation (PIC No.1)
April 2020	Finalize Schedule 'C' Phase 2 Report
May 2020 to August 2020	Phase 3: Alternative Design Concepts of Preferred Solution
August 2020	Notify Stakeholders of Draft Environmental Study Report and Conduct Public Consultation (PIC No. 2)
September 2020	Finalized Environmental Study Report and Issue Notice of Completion
October 2020	Public Review Period for the Study File

Summary

In summary, consultation with project stakeholders is mandatory in the Class EA planning process. The consultation plan was developed to define stakeholders, levels of consultation, means of communication, approximate project scheduling and implemented as such.

LIST OF POTENTIAL STAKEHOLDERS
Township of North Dundas - Drinking Water Supply System Capacity Expansion Class EA

J.L.Richards
ENGINEERS • ARCHITECTS • PLANNERS

MEA REVIEW AGENCIES	NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION CLASS	NOTES
REVIEW AGENCIES TO BE CONTACTED IN ALL CASES		
MINISTRY OF THE ENVIRONMENT AND CLIMATE CHANGE - DISTRICT OFFICE (CORNWALL)	✓	To be notified in every situation
MINISTRY OF THE ENVIRONMENT AND CLIMATE CHANGE - REGIONAL OFFICE ENVIRONMENTAL ASSESSMENT COORDINATOR (KINGST	✓	To be notified in every situation
OTHER DIRECTLY AFFECTED MUNICIPALITIES	**See OTHER below**	
TO BE CONTACTED AS APPROPRIATE		
MINISTRY OF INDIGENOUS RELATIONS AND RECONCILIATION	✓	To be contacted for direction on consultation with First Nations
MINISTRY OF ATTORNEY GENERAL	x	Not to be contacted in this case
Ministry of Community Safety and Correctional Services		Contact to see if they have an interest in the EA.
MINISTRY OF AGRICULTURE, FOOD AND RURAL AFFAIRS (LAND USE PLANNING)	✓	Only required if designated for prime agricultural (soil class 1,2 or 3) in Official Plan (note, surrounding area - agricultural use)
MINISTRY OF COMMUNITY AND SOCIAL SERVICES	x	Only required in situations involving a social service facility
MINISTRY OF TOURISM, CULTURE AND SPORT	✓	To be notified for this project
MINISTRY OF ECONOMIC DEVELOPMENT, EMPLOYMENT AND INFRASTRUCTURE	x	To be contacted in situations involving significant job creation potential or supply chain benefits to the region or province
MINISTRY OF HEALTH AND LONG-TERM CARE	✓	To be contacted in situations involving groundwater or potential impacts on public health
MINISTRY OF MUNICIPAL AFFAIRS & HOUSING	✓	To be contacted in situations involving a municipal proponent, relate to municipal servicing or have federal involvement
MINISTRY OF NATURAL RESOURCES AND FORESTRY - DISTRICT OFFICE (KEMPTVILLE)	✓	To be contacted in situations involving permanent and intermittent watercourses and water bodies and navigable water bodies
MINISTRY OF NATURAL RESOURCES AND FORESTRY - SOUTHERN REGIONAL OFFICE	✓	To be contacted in situations involving permanent and intermittent watercourses and water bodies and navigable water bodies
MINISTRY OF NORTHERN DEVELOPMENT AND MINES	✓	To be notified for this project - agency will review if there are impacts on mining resources
MINISTRY OF INFRASTRUCTURE (INFRASTRUCTURE ONTARIO)	x	Not to be contacted in this case
MINISTRY OF TRANSPORTATION	x	To be contacted in situations involving Provincial Highway / Road /Facility; Not to be contacted in this case
HEALTH CANADA	x	CEAA to determine if HC is to be contacted
ELECTRICAL UTILITIES	See OTHER below	
LOCAL CONSERVATION AUTHORITY - SOUTH NATION CONSERVATION AUTHORITY	✓	To be contacted in situations involving permanent and intermittent watercourses and water bodies and navigable water bodies
NIAGARA ESCARPMENT COMMISSION	x	Not Applicable
ONTARIO PROVINCIAL POLICE	See OTHER below	
WATERFRONT REGENERATION TRUST	x	Not Applicable
ONTARIO GROWTH SECRETARIAT	x	Not Applicable
FEDERAL DEPARTMENTS AND AGENCIES		
FISHERIES AND OCEANS CANADA - COMMUNICATION BRANCH	✓	To be contacted in situations involving fish and fish habitat, and water
TRANSPORT CANADA - NAVIGABLE WATERS PROTECTION PROGRAM - CANADIAN COAST GUARD	✓	To be reviewed at the end of Phase 2 if St. Lawrence is preferred
TRANSPORT CANADA - ENVIRONMENTAL MANAGEMENT PROGRAMS - ONTARIO REGION	✓	To be reviewed at the end of Phase 2 if St. Lawrence is preferred
CANADIAN TRANSPORT AGENCY	x	Not required - not likely to effect transportation service facilities related to Canadian Transport Facilities
CANADIAN HERITAGE - PARKS CANADA	x	Not required - not likely to effect historical, paleontological and architectural resources
ENVIRONMENT CANADA - ONTARIO REGION	x	To be contacted in situations where CEAA requirements may be applicable
CANADIAN ENVIRONMENTAL ASSESSMENT AGENCY	x	To be contacted in situations involving permanent and intermittent watercourses and water bodies and navigable water bodies
CANADIAN ENVIRONMENTAL PROTECTION AGENCY	x	Not to be contacted in this case
INDIAN AND NORTHERN AFFAIRS CANADA	x	Not to be contacted in this case - Ministry of Aboriginal Affairs and Local First Nation Groups contacted directly
INDUSTRY CANADA	x	Not to be contacted in this case
OTHER		
COUNTIES, DISTRICTS, MUNICIPALITIES AND PLANNING BOARDS		
United Counties of Stormont, Dundas and Glengarry	✓	To be notified for this project
Surrounding Municipalities (South Dundas)	✓	To be notified for this project
Township of North Dundas Staff	✓	To be notified for this project
Township of North Dundas Mayor, Deputy Mayor and Councillors	x	Township staff to notify as required
EMERGENCY SERVICES (FIRE, POLICE, AMBULANCE)		
North Dundas Fire Department	x	Not to be contacted in this case
O.P.P. Detachment (Winchester)	x	Not to be contacted in this case
Paramedic Services (Winchester)	x	Not to be contacted in this case
SCHOOL BOARDS	x	Not to be contacted in this case
GO Transit and Metrolinx	x	Not to be contacted in this case
CN AND CP RAIL	x	Not to be contacted in this case
ONTARIO POWER GENERATION	x	Not to be contacted in this case
PROPERTY OWNERS ADJACENT TO PROJECT SITE AND DIRECTLY AFFECTED PUBLIC/LANDOWNERS	✓	To be notified in every situation (150 m RADIUS)
Ministry of Education	x	Not to be contacted in this case

Ministry of Advanced Education, Skills & Training	×	Not to be contacted in this case
UTILITIES (NATURAL GAS, CABLE, TELEPHONE)	×	Not to be contacted in this case
Hydro One	×	Not to be contacted in this case
Union Gas	×	Not to be contacted in this case
Bell Canada	×	Not to be contacted in this case
EASTERN ONTARIO HEALTH UNIT	✓	To be notified for this project
FIRST NATIONS		
Algonquins of Ontario - Consultation Office	✓	To be notified for this project
Huron-Wendat Nation Council	✓	Notify only if highly likely that archaeological resources will be discovered, or once they have been found
LOCAL INTEREST GROUPS		
Parmalat (Lactalis)	✓	To be notified for this project

LIST OF POTENTIAL STAKEHOLDERS (Contact Information)								
Township of North Dundas - Drinking Water Supply System Capacity Expansion Class EA								
Letter #	Salutation	First Name	Last Name	Title	Agency	Address Line 1	Address Line 2	Email Address
1	Ms.	Tracey	Dawson-Kinnunen	Manager	Strategic Support Unit - Ministry of Energy, Northern Development and Mines	Willet Green Miller Ctr. 2nd Flr. 933 Ramsey Lake Rd	Sudbury, ON P3E 6B5	tracey.dawsonkinnunen@ontario.ca
2	Ms.	Jennifer	Paetz	Initiatives Coordinator	Strategic Support Unit - Ministry of Energy, Northern Development and Mines	Willet Green Miller Ctr. 2nd Flr. 933 Ramsey Lake Rd	Sudbury, ON P3E 6B5	jennifer.paetz@ontario.ca
3	Ms	Angela	Coleman	General Manager/Secretary Treasurer	South Nation Conservation Authority	38 Victoria Street, P.O. Box 29	Finch, ON K0C 1K0	
4	Ms.	Ruth	Lindenburger	Regional Planning Coordinator	Ministry of Natural Resources and Forestry - Southern Regional Office	4th Floor South Tower, 300 Water Street, Box 7000	Peterborough, ON K9J 3C7	ruth.lindenburger@ontario.ca
5	Mr.	Michael	Elms	Manager, Community Planning and Development	Eastern Municipal Services Office - Ministry of Municipal Affairs & Housing - Planners, Community E & D	8 Estate Lane, Rockwood House	Kingston, ON K7M 9A8	michael.elms@ontario.ca
6	Mr.	Shawn	Parry	Manager	Planning Innovation Section, Provincial Planning Policy Branch - Ministry of Municipal Affairs and Housing	777 Bay Street, 13th Floor	Toronto, ON M5G 2E5	shawn.parry@ontario.ca
7				Fisheries Protection Program	Fisheries and Oceans Canada	867 Lakeshore Road	Burlington, ON L7S 1A1	
8	Ms.	Karla	Barboza	Team Lead (A), Heritage	Heritage Planning Unit, Programs and Services Branch - Ministry of Tourism, Culture and Sport	401 Bay Street, Suite 1700	Toronto, ON M7A 0A7	karla.barboza@ontario.ca
9	Ms.	Kimberly	Livingstone	Heritage Planner(A)	Heritage Program Unit, Programs and Services Branch - Ministry of Tourism, Culture and Sport	402 Bay Street, Suite 1700	Toronto, ON M7A 0A8	kimberly.livingstone@ontario.ca
10					Ministry of Indigenous Affairs	160 Bloor St E, 9th Floor	Toronto, ON M7A 2E6	
11	Ms.	Mary	Dillon	District Planner	Ministry of Natural Resources and Forestry - Kemptville District Office	Unit 1 - 10 Campus Drive, PO Box 2002	Kemptville, ON K0G 1J0	mary.dillon@ontario.ca
12	Ms.	Vicki	Mitchell	Environmental Assessment Coordinator	Ministry of the Environment, Conservation and Parks – Kingston Regional Office	1259 Gardiners Rd., PO Box 22032	Kingston ON K7M 8S5	
13	Mr.	John	O'Neil	Rural Planner	Ministry of Agriculture and Food & Rural Affairs	1st Fl.-59 Ministry Road, Box 2004, ORC Building	Kemptville, ON K0G 1J0	john.oneil@ontario.ca
14	Mr.	James	Peets	Inspector/Provincial Officer	Ministry of the Environment, Conservation and Parks - Cornwall District Office	113 Amelia Street	Cornwall, ON K6H 3P1	james.peets@ontario.ca
15	Mr.	Andrea	Pastor	Cabinet Liaison and Strategic Policy Branch Coordinator	Strategic Policy and Analytics Branch, Strategic, Network and Agency Policy Division - Ministry of Energy, Northern Development and Mi	77 Grenville St. 6th Flr	Toronto, ON M7A 1B3	andrea.pastor@ontario.ca
16	Dr.	Paul	Roumeliotis	Medical Officer of Health & Chief Executive Officer	Eastern Ontario Health Unit	1000 Pitt Street	Cornwall, ON K6J 5T1	
17	Ms.	Angela	Rutley	Chief Administrative Officer	Township of North Dundas	636 St. Lawrence Street, PO Box 489	Winchester, ON K0C 2K0	
18	Mr.	Bruce	Shurtleff	Director of Operations - Winchester Dairy Food Group	Parmalat Canada Inc	490 Gordon Street	Winchester, ON K0C 2K0	bruce_shurtleff@parmalat.ca
19	Mr.	Konrad	Sioui	Grand Chief	Huron-Wendat Nation Council	255 Place Chef-Michel-Laveau	Wendake QC G0A 4V0	
20	Ms	Janet	Stavinga	Executive Director	Algonquins of Ontario – Consultation Office	31 Riverside Drive, Suite 101	Pembroke, ON K8A 8R6	
21	Mr.	Jim	Mahoney	Water Supervisor	Ministry of the Environment-Kingston District Office	PO Box 22032	Kingston ON K7M 8S5	
22	Mr.	Robert	Dobos	Manager, Environmental Assessment Section	Environment Canada-Ontario Region	867 Lakeshore Blvd	Burlington, ON L7R 4A6	
23					Canadian Environment Assessment Agency	Place Bell, 160 Elgin Street, 22nd Floor	Ottawa, ON K1A 0H3	
24					Aboriginal Affairs and Northern Development Canada	25 St. Clair Avenue East, 8th Floor	Toronto, ON M4T 1M2	
25					Transport Canada			EnviroOnt@tc.gc.ca
26	Mr.	Dave	Lannin	Deputy Fire Chief	Chesterville Fire Department	c/o Fire Services - Station #4, PO Box 489, 636 St. Lawrence St	Winchester, ON K0C 2K0	
27	Mr.	Sandy	Johnston	Deputy Fire Chief	Winchester Fire Department	c/o Fire Services - Station #3, PO Box 489, 636 St. Lawrence St	Winchester, ON K0C 2K0	
28	Ms.	Shannon	Geraghty	CAO	Municipality of South Dundas	34 Ottawa street, PO Box 740	Morrisburg, ON K0C 1X0	
29	Mr.	Ray	Hunter	Deputy Fire Chief	South Dundas Fire Department	1 Dundas Street, PO Box 38	Iroquois, ON K0E 1K0	
30	Mr.	Robert	Greene	Director	Ministry of Community Safety and Correctional Services	George Drew Building, 25 Grosvenor Street, 19th Flr.	Toronto ON M7A 1Y6	robert.greene@ontario.ca

Notice of Study Commencement

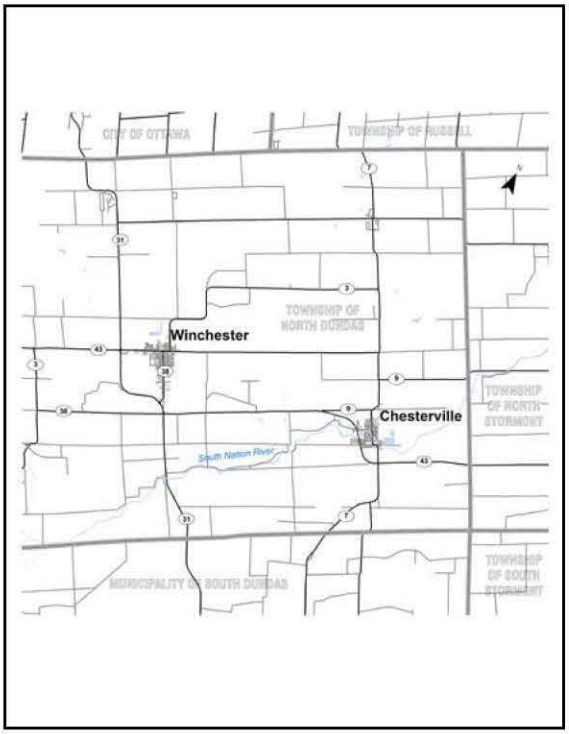
Township of North Dundas
North Dundas Drinking Water Supply System
Capacity Expansion
Municipal Class Environmental Assessment

The Township of North Dundas (Township) has initiated a Class Environmental Assessment (Class EA) to determine the most suitable expansion and/or upgrades to the North Dundas Drinking Water Supply System over the next 20 years.

How Will This Affect Me?

The study will assess current and future requirements of the North Dundas Drinking Water Supply System to address the reliability and redundancy of the communal water system and the anticipated demand increase due to planned residential expansions and growing industrial needs in Winchester and Chesterville.

Public and agency consultation is a key element of the process. Based on your input, alternative strategies will be evaluated to identify optimal community, environmental and economic opportunities.



How Do I Get More Information?

Two (2) Public Information Centre(s) (PIC) will be conducted and notice of these sessions will be provided at least two (2) weeks in advance. In the meantime, the study team is reviewing background data and determining alternative solutions. You are also invited to contact a member of the study team at anytime with questions or to provide input into the study.

Updates will be provided throughout the study on the Township website, and if you have any questions regarding the study, please visit the website at www.northdundas.com or contact one of the people listed below.

TO FIND OUT MORE VISIT
www.northdundas.com

Mark Buchanan, P.Eng.
Senior Civil Engineer
J.L. Richards & Associates Limited
864 Lady Ellen Place
Ottawa, ON K1Z 5M2
mbuchanan@jlrichards.ca
Phone: 613-728-3571

Dave Markell
Ontario Clean Water Agency
5 Industrial Drive
Chesterville, ON K0C 1H0
DMarkell@ocwa.com
Phone: 613-448-3098

This study is being initiated according to the requirements of a Schedule 'C' project under the Municipal Class Environmental Assessment process (October 2000, as amended in 2015). This Notice issued September 27, 2019.

TOWNSHIP OF
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TOWNSHIP OF NORTH DUNDAS
NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

MEETING NO. 2 – LACTALIS STAKEHOLDER MEETING

ATTENDANCE:	Bruce Shurtleff	Parmalat Canada (Lactalis)
	William Bruining	Parmalat Canada (Lactalis)
	Dan Belleau	Township of North Dundas (Township)
	Mary Lynn Plummer	Township of North Dundas (Township)
	Dave Markell	Ontario Clean water Agency (OCWA)
	Mark Buchanan	J.L. Richards & Associates Limited (JLR)
	Sara Jamaliniya	J.L. Richards & Associates Limited (JLR)

The meeting commenced at 10:00 A.M., Wednesday, December 11, 2019 at the Lactalis Site

The following summary of the discussions of this meeting has been prepared to record and direct the project. Please advise the undersigned of any errors or omissions.

ITEM		ACTION
2.1	Introductions were made by all.	INFO
2.2	M. Buchanan noted that the objective of the meeting is to better understand Lactalis' 20 year water demand projections to be considered as part of the North Dundas drinking water supply Class Environmental Assessment (Class EA).	INFO
2.3	M. Buchanan indicated that the Township is undertaking a Municipal Class EA to address concerns regarding reliability of their communal water system and the anticipated demand increase due to planned residential expansions and growing industrial needs.	INFO
2.4	M. Buchanan provided a brief overview of the Municipal Class EA process. The key points discussed are provided herein: • In the Province of Ontario, municipalities are required to complete a Municipal Class EA to identify the preferred servicing solution for municipal infrastructure projects such as roads, water, wastewater and transit. • Depending on the environmental impact, the process requires consultation with the public, stakeholders and regulatory agencies to identify the preferred servicing solution. • Since projects undertaken by municipalities can vary in their environmental impact, such projects are classified in terms of schedules: o Schedule A: Least environmental impact, which generally includes normal or emergency operational and maintenance activities. o Schedule B: Moderate environmental impact, which generally includes improvements and minor expansions to existing facilities (i.e., new or increased ground water well capacity).	INFO

TOWNSHIP OF NORTH DUNDAS
NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

MEETING NO. 2 – LACTALIS STAKEHOLDER MEETING

ITEM		ACTION
	○ Schedule C: Highest environmental impact, which generally includes the construction of new drinking water facilities (i.e., new surface water treatment plant) and major expansions to existing facilities.	
2.5	The attached Lactalis and Township water consumption rates from 2015 to 2018 Tables were reviewed by all at the meeting. B. Shurtleff indicated that Lactalis' water demand is project and process capacity dependent. Water consumption was notably increased in 2018 due to a project that required more cleaning and cooling starting from mid-2017. W. Bruining indicated that any future process modifications would be 1 for 1, with no change in water consumption. B. Shurtleff indicated that Lactalis' process requires removal of the chlorine and hardness levels present in the potable water. M. Buchanan indicated that the chlorine residual is maintained in the communal potable water system to satisfy secondary disinfection criteria in accordance with regulatory requirements and hardness is typical of a groundwater source. B. Shurtleff advised a surface water source water could be desirable to Lactalis to address the hardness constraints in their process. B. Shurtleff advised that Lactalis has a technical objective to consume 1,000 m^3/day. B. Shurtleff confirmed that no major expansions have been identified in the longer term to significantly change the water volume. Specifically, he anticipates water consumption to remain consistent over the next 5 years to remain at 2019 level (1,000 ± 200 m3/day). M. Buchanan indicated that the Lactalis water consumption will be considered to remain at 2019 level for the next 20 years for planning purposes of this Class EA.	INFO

Prepared by:

J.L. RICHARDS & ASSOCIATES LIMITED

Sara Jamaliniya

Sara Jamaliniya, M.Eng.

Distribution: All present

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NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

AGENDA FOR MEETING NO. 2

The meeting is to be held at 10:00 A.M., Wednesday, December 11, 2019 at the Lactalis Site.

1.0 Introductions and Opening Remarks

2.0 Objectives of Meeting

3.0 Township of North Dundas Water Supply Class EA

4.0 Brief review of the Municipal Class EA Process

5.0 Question: Lactalis 20 year Water Demand Projections

- Less than current water consumption (by how much)
- Consistent with current demand
- Increased water consumption (by how much)

Table 1: Lactalis Water Consumption from 2015 to 2019

Year	Monthly Average Consumption (m^3/month)	Max Monthly Consumption (m^3/month)	Daily Average Consumption (m^3/day)	Max Daily Average Consumption (m^3/day)
2019(1)	38,080	43,860	1,253.7	1,462.0
2018	42,021	51,009	1,381.5	1,645.5
2017	35,701	41,767	1,172.8	1,351.8
2016	28,642	33,959	939.3	1,078.0
2015	26,274	30,984	863.2	999.5

(1) 2019 data for Lactalis is up to the end of August 2019

Table 2: Township of North Dundas Water Consumption from 2015 to 2018

Year	Monthly Average Consumption (m^3/month)	Max Monthly Consumption (m^3/month)	Daily Average Consumption (m^3/day)	Max Daily Average Consumption (m^3/day)	% Monthly Consumption of Lactalis
2019					
2018	82,051	92,318	2,703.4	2,978.0	51%
2017	73,982	82,190	2,430.4	2,676.5	48%
2016	68,280	76,202	2,244.0	2,458.1	42%
2015	65,571	71,450	2,156.8	2,305.8	40%

From:	Dave Markell
To:	Sara Jamaliniya
Cc:	Mark Buchanan; dbelleau@northdundas.com; MPlummer@northdundas.com; Dawn Crump
Subject:	FW: 28855 Township of North dundas Drinking Water Supply system Capacity Expansion Class EA - Meeting Minutes
Date:	Monday, January 6, 2020 1:00:06 PM
Attachments:	JLRLogo_25d314df-5936-49f2-bb07-59bbaa1ccc3c.png image001.png

Hi Sara,
As a follow up, I stopped by the township office today to collect the Lactalis meter readings for the last few months of 2019 (below). My concern is that your meeting minutes (below in italics) downplay the actual usage.
1,200 ± 200 m3/day would more closely represent 2019 consumption.

dave

B. Shurtleff confirmed that no major expansions have been identified in the longer term to significantly change the water volume. Specifically, he anticipates water consumption to remain consistent over the next 5 years to remain at 2019 level (1,000 ± 200 m3/day).

jan	1084
feb	1204
mar	1228
apr	1210
may	1323
jun	1462
jul	1280
aug	1239
sep	1325
oct	1278
nov	1137
dec	1322
AVG	**1258**

From: Dave Markell
Sent: December-16-19 7:43 AM
To: Sara Jamaliniya
Cc: Mark Buchanan
Subject: RE: 28855 Township of North dundas Drinking Water Supply system Capacity Expansion Class EA - Meeting Minutes

Hi Sara,
From my notes
Bruce was not prepared to forecast beyond 5 years
Lactalis' goal is 1,000m3/day although he recommended using 2019 flows (1200m3/day) for planning.

dave

From: Sara Jamaliniya [sjamaliniya@jlrichards.ca]
Sent: Friday, December 13, 2019 3:58 PM
To: Bruce Shurtleff
Cc: dbelleau@northdundas.com; Dave Markell; Mark Buchanan; MPlummer@northdundas.com; william_bruining@parmalat.ca
Subject: RE: 28855 Township of North dundas Drinking Water Supply system Capacity Expansion Class EA - Meeting Minutes

Hi Bruce,

To clarify, we will change this item to:

"B. Shurtleff confirmed that Lactalis has no plans to increase water consumption beyond 2019 rates for the next 20 years. No major expansions have been identified in the longer term to significantly change the water volume. Specifically, he anticipates water consumption to remain consistent over the next 5 years to remain at 2019 level (1,000 ± 200 m3/day)."

I will send the revised minutes after your confirmation.

Thank you,

Sara Jamaliniya, M.Eng.
Environmental Engineering Designer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Tel: 613-728-3571 Fax: 613-728-6012

From: Bruce Shurtleff <bruce_shurtleff@parmalat.ca>
Sent: Friday, December 13, 2019 3:47 PM
To: Sara Jamaliniya <sjamaliniya@jlrichards.ca>
Cc: dbelleau@northdundas.com; Dave Markell <DMarkell@ocwa.com>; Mark Buchanan <mbuchanan@jlrichards.ca>; MPlummer@northdundas.com; william_bruining@parmalat.ca
Subject: RE: 28855 Township of North dundas Drinking Water Supply system Capacity Expansion Class EA - Meeting Minutes

As per the timeline - we said 5 years. No major expansions have been identified in the longer term to significantly change the water volume.

From: Sara Jamaliniya <sjamaliniya@jlrichards.ca>
To: Bruce Shurtleff <bruce_shurtleff@parmalat.ca>
Cc: "dbelleau@northdundas.com" <dbelleau@northdundas.com>, Dave Markell <DMarkell@ocwa.com>,

Mark Buchanan <mbuchanan@jlrichards.ca>, "MPlummer@northdundas.com" <MPlummer@northdundas.com>, "william_bruining@parmalat.ca" <william_bruining@parmalat.ca>
Date: 13/12/2019 03:39 PM
Subject: RE: 28855 Township of North dundas Drinking Water Supply system Capacity Expansion Class EA - Meeting Minutes

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Hi Bruce,

Thanks for your input. We are revising the last item in the meeting minutes with the following:

"B. Shurtleff confirmed that Lactalis has no plans to increase water consumption beyond 2019 rates for the next 20 years. Specifically, he anticipates water consumption to remain consistent over the next 5 years to remain at 2019 level (1,000 ± 200 m3/day)."

Please let me know if you agree with it and I will send the revised meeting minutes to everyone.

Thank you,

Sara Jamaliniya, M.Eng.
Environmental Engineering Designer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Tel: 613-728-3571 Fax: 613-728-6012

From: Bruce Shurtleff <bruce_shurtleff@parmalat.ca>
Sent: Friday, December 13, 2019 3:13 PM
To: Sara Jamaliniya <sjamaliniya@jlrichards.ca>
Cc: dbelleau@northdundas.com; Dave Markell <DMarkell@ocwa.com>; Mark Buchanan <mbuchanan@jlrichards.ca>; MPlummer@northdundas.com; william_bruining@parmalat.ca
Subject: Re: 28855 Township of North dundas Drinking Water Supply system Capacity Expansion Class EA - Meeting Minutes

Hi,

Sara....our technical goal is 1000m3/day. We stated that for purpose of planning to utilize REAL consumption...water to remain at 2019 levels - which is closer to 1100 to 1200 m3.

Please adjust your report.

Bruce

From: Sara Jamaliniya <sjamaliniya@jlrichards.ca>
To: "bruce_shurtleff@parmalat.ca" <bruce_shurtleff@parmalat.ca>, "william_bruining@parmalat.ca" <william_bruining@parmalat.ca>, Dave Markell <DMarkell@ocwa.com>, "dbelleau@northdundas.com"

<dbelleau@northdundas.com>, "MPlummer@northdundas.com" <MPlummer@northdundas.com>
Cc: Mark Buchanan <mbuchanan@jlrichards.ca>
Date: 13/12/2019 02:36 PM
Subject: 28855 Township of North dundas Drinking Water Supply system Capacity Expansion Class EA - Meeting Minutes

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Good afternoon,

Attached is the Meeting Minutes for the Lactalis stakeholder meeting that was held on December 11, 2019 at the Lactalis Site for the above noted project. Should you have any questions, please do not hesitate to contact us.

Thank you,

Sara Jamaliniya, M.Eng.
Environmental Engineering Designer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Tel: 613-728-3571 Fax: 613-728-6012
[attachment "28855 Meeting No.2 - Dec 11, 2019.pdf" deleted by Bruce Shurtleff/Winchester/Parmalat]

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NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

MEETING NO. 3 – DEVELOPMENT PROJECTIONS MEETING

ATTENDANCE:	Angela Rutley	Township of North Dundas (Township)
	Dan Belleau	Township of North Dundas (Township)
	Mary Lynn Plummer	Township of North Dundas (Township)
	Calvin Pol	Township of North Dundas (Township)
	Dave Markell	Ontario Clean Water Agency (OCWA)
	Dawn Crump	Ontario Clean Water Agency (OCWA)
	Stephane Barbarie	Ontario Clean Water Agency (OCWA)
	Mark Buchanan	J.L. Richards & Associates Limited (JLR)
	Jordan Morrissette	J.L. Richards & Associates Limited (JLR)

The meeting commenced at 8:30 A.M., Wednesday, February 12, 2020 at the Township Office.

The following summary of the discussions of this meeting has been prepared to record and direct the project. Please advise the undersigned of any errors or omissions.

ITEM		ACTION
3.1	Introductions were completed. M. Buchanan noted that the objective of the meeting is to review the development projections and technical memorandum that will be used as the basis for determining the 20-year water demand projections (low-growth and high-growth scenarios) to be considered as part of the North Dundas Drinking Water Supply Class Environmental Assessment (Class EA). The Township explained that they will be presenting the development projections to Council in order to obtain buy-in prior to proceeding with the development projections as part of the Class EA. M. Buchanan noted that JLR is currently holding on progress of the Phase 1 Report until confirmation is received.	INFO
3.2	It was noted that from a cursory review of the projected water demand associated with the draft growth projections for Winchester and Chesterville, it appears that there would be water supply deficits of approximately 17 L/s and 29 L/s for the low and high growth scenarios, respectively. These deficits are based on the existing operating limits of the wells with one of the largest wells out of service. It is our understanding that well reliability is a concern that shall be considered as part of this Class EA (i.e., well production and history of watermain breaks between Winchester and Wells 7a, 7b, and 7c). Guidance on firm capacity requirements from groundwater supplies is not outlined in the current Ministry of the Environment, Conservation and Parks (MECP) Water Design Guidelines (2008); however, the Province of Ontario is a member of the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers. A Report from this Board's Water Supply Committee entitled Recommended Standards for Water Works, (2007 Edition) indicated that the ground water source capacity should be equal or greater than the maximum day demand with the largest	

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NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

MEETING NO. 3 – DEVELOPMENT PROJECTIONS MEETING

ITEM		ACTION
	producing well out of service. Projected water demand and well firm capacity will be reviewed for the low and high growth scenario as part of Phase 1.	
3.3	JLR noted that 2.5 persons per unit was used to estimate the projected population increase based on the potential development areas in Winchester identified previously by the Township. It was noted that an annual growth rate of 1.5% and 3.5% was used for the low and high growth scenarios in Chesterville, respectively.	INFO
	Table 1: Winchester Future Potential Development was reviewed by the Township. It was requested that Phase 1 of the Wellings of Winchester Development be included within the low growth scenario. Additional projected units were identified for Area 22 and Area 24A. Phasing was also reviewed at the meeting as part of a separate project.	
3.4	The Township noted that the Urban Settlement Area boundary on Figure M1-1 should be updated to reflect the area identified on Schedule A1a Winchester of the Counties of SD&G Official Plan.	
3.5	JLR is currently developing a model of the existing water network. In order to run simulations under different scenarios, information about the pumping capacity of the wells and the operating set points of the reservoirs is needed. As a start, OCWA will provide JLR with well pump curves to be added within the model. OCWA was also requested to flag if the wells operate with any known deviations from the pump curves. Elevations of the set points for the reservoirs that will be provided by OCWA will be referenced to grade.	OCWA
	OCWA noted that they will also send the operating strategy for the wells and reservoir.	OCWA
3.6	JLR is to update the Technical Memorandum with new projected units and new growth scenarios by February 17, 2020.	JLR
	Post-Meeting Note: Refer to the attached updated technical memorandum for projected units and growth scenarios.	

Prepared by:

J.L. RICHARDS & ASSOCIATES LIMITED

Jordan Morrissette

Jordan Morrissette, M.Eng., P.Eng.

Attach.
Distribution: All present

MEMORANDUM

J.L. Richards
& Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

TO:	Calvin Pol, BES, MCIP, RPP Director of Planning, Building and By-Law Enforcement Township of North Dundas	DATE:	February 14, 2020
		JOB NO.:	28855-000
FROM:	Jordan Morrissette, M.Eng., P.Eng.	CC:	Angela Rutley, Township of North Dundas Dan Belleau, Township of North Dundas Dave Markell, Ontario Clean Water Agency Sarah Gore, P.Eng., J.L. Richards & Associates Limited Mark Buchanan, P.Eng., J.L. Richards & Associates Limited
RE:	**North Dundas Drinking Water Supply System Capacity Expansion Class EA Technical Memorandum No. 1 Population Growth and Development Projections (Rev. 1) DRAFT**		

INTRODUCTION

The purpose of this Memorandum is to assist in establishing proposed 20 year population projections for the Village of Winchester and the Village of Chesterville within the Township of North Dundas (Township) by determining their potential development opportunities for growth. The 20 year population projections will serve as the basis for establishing the drinking water supply system requirements for the North Dundas Drinking Water Supply System Capacity Expansion Class Environmental Assessment (Class EA).

EXISTING POPULATION AND GROWTH SCENARIOS (WINCHESTER AND CHESTERVILLE)

A review of available 2016 Census information indicates that the population in 2016 within Winchester and Chesterville was approximately 2,394 and 1,677 persons, respectively. It is noted that based on 2011 Census information, the population was 2,460 people in Winchester and 1,448 people in Chesterville, representing an annual percentage growth rate of approximately -0.5% and 3.1%, respectively over the five (5) year period. Due to the development anticipated within both villages over the next 20+ years, the following growth scenarios are proposed to be used for the Class EA:

Low Growth Scenario

- Winchester: Projected annual growth rate of 1.5% from 2016 to 2019. Projected population growth from 2019 to 2039 based on the future potential development within Winchester provided by the Township (refer to Table 1) not including Phase 2 to Phase 5 of the proposed Wellings of Winchester development (Area 11);
- Chesterville: Projected at an annual growth rate of 3.5% from 2016 to 2019 and at an annual growth rate of 1.5% from 2019 to 2039.

High Growth Scenario

- Winchester: Projected annual growth rate of 1.5% from 2016 to 2019. Projected population growth from 2019 to 2039 based on the future potential development within Winchester provided by the Township (refer to Table 1) including Phase 2 to Phase 5 of the proposed Wellings of Winchester development (Area 11);

- Chesterville: Projected at an annual growth rate of 3.5% from 2016 to 2019 and at an annual growth rate of 3.5% from 2019 to 2039.

POPULATION PROJECTIONS FOR WINCHESTER

In order to determine the potential population increase in Winchester for the Low Growth and High Growth Scenarios, an updated list of potential development areas and their associated types of land-use was obtained from the Township. Table 1 provides a description of the future potential developments in Winchester and the total projected units and/or commercial area estimated. The areas identified in Table 1 are illustrated in Figure M1-1.

TABLE 1: WINCHESTER FUTURE POTENTIAL DEVELOPMENT[1]

Area	Description	Total Projected Units or Residents	Commercial Area
A	Existing – Not Connected	28	-
1	Pioneer Gas Restaurant / Car Wash	Constructed	-
2A	Commercial #31 Strip	-	1.13 ha
2B	Commercial #31 Strip	-	1.22 ha
3	Commercial #43 / #31 corner	-	0.97 ha
4	Industrial/Commercial John Deere	-	6.17 ha
5	Commercial – Main Street South side	-	0.45 ha
6	Commercial – Main Street North side	-	(0.33 L/s)
7	Motel	14	-
8	Restaurant – Country Kitchen	7	-
9A	Commercial/Residential	-	5.07 ha
9B	Commercial/Residential	-	Buildout[2]
10	Commercial	Mini storage	0.88 ha
11A	Wellings of Winchester + Commercial (Phase 1)	68 (refer to Table 2)	2.28 ha
11B	Wellings of Winchester (Phase 2 to Phase 5)	432 (refer to Table 3)	
12	Commercial	-	0.8 ha
13	Residential Infill/Apartment in-houses	15	-
14	Winfields Subdivision	9	-
15	Residential – Winfields Phase 2	-	Buildout[2]
16	Commercial	-	0.75 ha
17	Residential (connected)	connected	-
18	New Dundas Manor[3]	-	-
19	Old Dundas Manor Building and Property	-	1.19 ha
20	Guy Racine Subdivision - Phase 3	8	-
21A	Seniors Complex	54 residents	-
21B	Development	36	-
22A	Winchester Meadows Subdivision	22	-
22B	Winchester Meadows Subdivision	22	-
23	Vacant Residential	-	Buildout[2]
24A	Woods Development	78	-
24B	High Density Apartments	21	-
25A	Woods Development	19	-
25B	Singles & Semis & Townhomes	36	-

Area	Description	Total Projected Units or Residents	Commercial Area
26	Residential – Barnhart	-	Buildout[2]
27	Residential - M. Lafortune Investments	-	Buildout[2]
28A	Residential	2	-
28B	Wintonia Drive / James Street	10	-
29A	Residential	15	-
29B	Esper Lane	51	-
30	Commercial	-	4.34 ha
31	Commercial	-	0.40 ha
LOW GROWTH SCENARIO[4]		**393 units + 68 units Wellings + 54 residents**	**25.65 ha + 0.33 L/s**
HIGH GROWTH SCENARIO[5]		**393 units + 500 units Wellings + 54 residents**	**25.65 ha + 0.33 L/s**

1. List of potential development areas and their associated types of land-use were provided by the Township.
2. Additional development areas are available; these development areas are projected beyond a 20-year period.
3. The flow from the new Dundas Manor is anticipated to remain the same as the flow from existing Dundas Manor.
4. Low Growth Scenario includes Phase 1 of the Wellings of Winchester Development only.
5. High Growth Scenario includes Phase 1 to Phase 5 of the Wellings of Winchester Development.

Although, the Township's Official Plan (based on 2016 Census information) indicates a household occupancy of 2.45 persons per unit within the United Counties of Stormont, Dundas and Glengarry, the Township has reported that based on more recent information available, the household occupancy to be used for the Class EA is 2.5 persons per unit. The Township has also identified that the Wellings of Winchester development will have a different household occupancy since the proposed development is intended to be for seniors. Table 2 and Table 3 below presents Phase 1 potential population increase for Wellings of Winchester development (Area 11) as well as the total potential population increase for Phase 2 to Phase 5.

TABLE 2: POTENTIAL POPULATION INCREASE (PHASE 1) - WELLINGS OF WINCHESTER

Unit	Number of Residential Units	Household Occupancy (Persons per unit)	Potential Population Increase
1 - bedroom	42	1.17	49
2 - bedroom	26	1.62	42
TOTAL	**68**		**91**

TABLE 3: POTENTIAL POPULATION INCREASE (PHASE 2 TO PHASE 5) - WELLINGS OF WINCHESTER

Unit	Number of Residential Units	Household Occupancy (Persons per unit)	Potential Population Increase
1 - bedroom	286	1.17	335
2 - bedroom	146	1.62	237
TOTAL	**432**		**572**

Using the number of total projected units and residents (Table 1) and the different household occupancy for Phase 1 of the Wellings of Winchester development (Table 2), the total potential population increase for the Low Growth Scenario is summarized in Table 4 below.

TABLE 4: POTENTIAL POPULATION INCREASE IN WINCHESTER (LOW GROWTH SCENARIO)

Number of Residential Units	Household Occupancy (Persons per unit)	Number of People (based on units)	Number of Additional Residents (Seniors Complex)	Potential Population Increase
393	2.5	983	54	1,037
68	See Table 2	91	-	91
461	-	1,074	54	1,128

1. The above equivalent population is based on the Low Growth Scenario which does not include Phase 2 to Phase 5 of Area 11 – Wellings of Winchester Development.

Using the above information, the 2039 population projections for the Low Growth and High Growth Scenarios in Winchester were determined and presented in Table 5.

TABLE 5: POPULATION PROJECTIONS IN WINCHESTER (2016 – 2039)

	Low Growth Scenario		High Growth Scenario	
Year	**Projected Population Increase (Persons)**	**Population Projected (Low Growth Scenario)**	**Projected Population Increase (Persons)**	**Population Projected (High Growth Scenario)**
2016	-	2,394[1]	-	2,394[1]
2019	108[2]	2,502	108[2]	2,502
2039	1,128[3]	3,630	1,128[4] + 572[5]	4,202

1. Population based on the 2016 Census Information for Winchester.
2. 2019 population increase is based on an assumed annual growth rate of 1.5%.
3. Based on the potential population increase for Low Growth Scenario identified in Table 4.
4. Based on the potential population increase for Low Growth Scenario (including Phase 1 of the Wellings of Winchester development) identified in Table 4.
5. Based on the potential population increase for Phase 2 to Phase 5 of the Wellings of Winchester development identified in Table 3.

POPULATION PROJECTIONS FOR CHESTERVILLE

As determined in consultation with the Township, Table 6 illustrates the projected population for the Low Growth and High Growth Scenarios for Chesterville to 2039 based on annual growth rates of 1.5% and 3.5% respectively.

TABLE 6: POPULATION PROJECTIONS IN CHESTERVILLE (2016 – 2039)

	Low Growth Scenario		High Growth Scenario	
Year	**Annual Projected Growth Rate (%)**	**Population Projected (Low Growth Scenario)**	**Annual Projected Growth Rate (%)**	**Population Projected (High Growth Scenario)**
2016	-	1,677[1]	-	1,677[1]
2019	3.5[2]	1,853	3.5[2]	1,853
2039	1.5[2]	2,409	3.5[2]	3,027

1. Population based on the 2016 Census Information for Chesterville.
2. 2019 population increase is based on an assumed annual growth rate of 3.5%.
3. Low annual growth rate (1.5%) and high annual growth rate (3.5%) developed in consultation with the Township.

TOTAL PROJECTED POPULATION FOR CLASS EA

As summarized in Table 7, the total projected population for Winchester and Chesterville based on the Low Growth and High Growth Scenarios are 6,039 and 7,229 people, respectively. These population projections will be used to determine water supply requirements for the drinking water system as part of the Class EA.

TABLE 7: TOTAL POPULATION PROJECTIONS IN WINCHESTER AND CHESTERVILLE (2039)

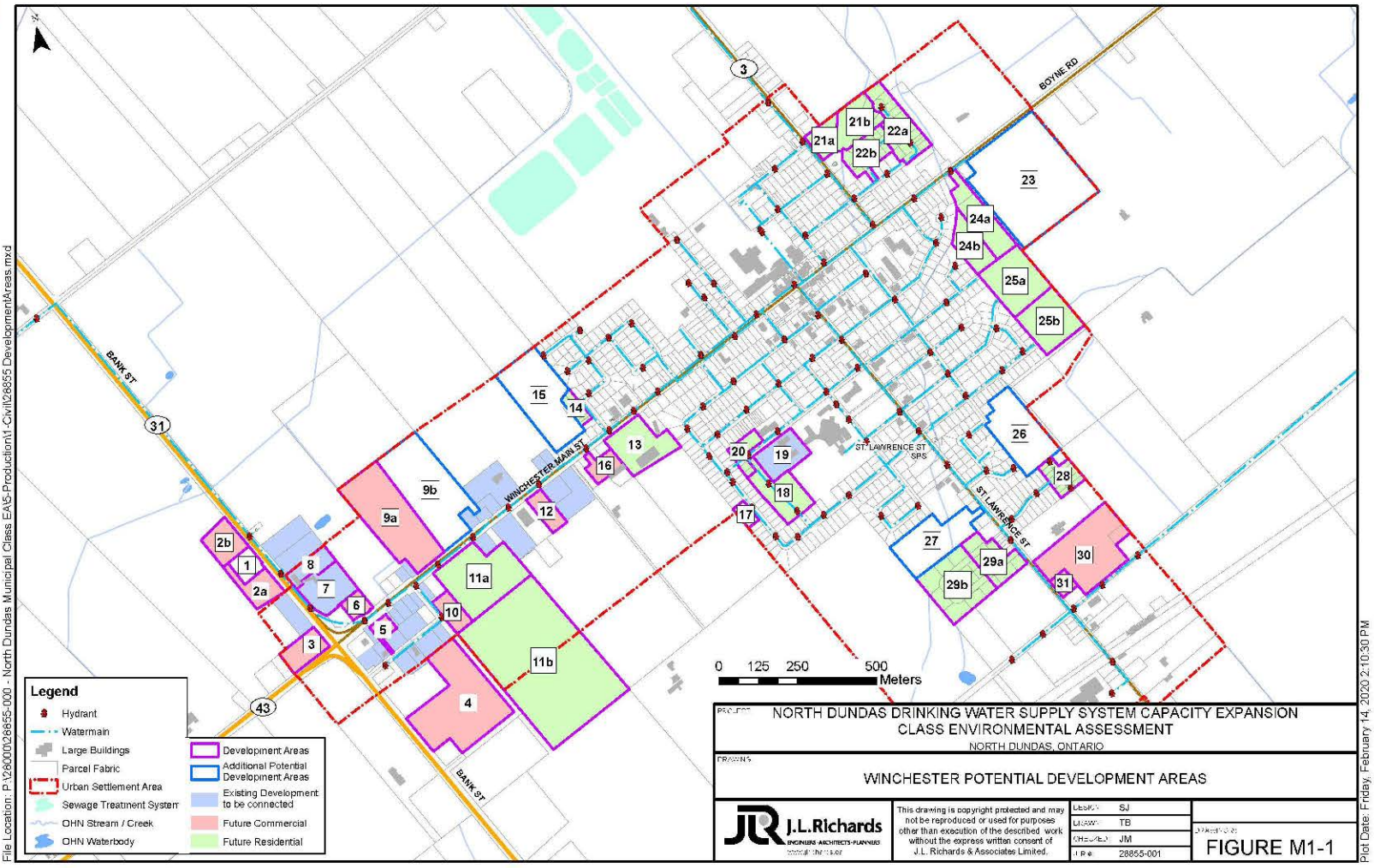
Village	2019 Total Population	Total Projected Population (Low Growth Scenario)	Total Projected Population (High Growth Scenario)
Winchester	2,502	3,630	4,202
Chesterville	1,853	2,409	3,027
TOTAL	**4,355**	**6,039**	**7,229**

Prepared by
J.L. RICHARDS & ASSOCIATES LIMITED

Sara Jamaliniya, M.Eng.

Reviewed by
J.L. RICHARDS & ASSOCIATES LIMITED

Jordan Morrissette, M.Eng., P.Eng.



NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT
NORTH DUNDAS, ONTARIO

WINCHESTER POTENTIAL DEVELOPMENT AREAS

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

DESIGN: SJ
DRAWN: TB
CHECKED: JM
J.R.# 28855-001

FIGURE M1-1

File Location: P:\28000\28855-000 - North Dundas Municipal Class EA\5-Production\1-Civil\28855 DevelopmentAreas.mxd

Plot Date: Friday, February 14, 2020 2:10:30 PM

Township of North Dundas
North Dundas Drinking Water Supply System Capacity Expansion

AGENCY / STAKEHOLDER RESPONSE FORM

DATE: Feb. 10, 2020

Name (please print): Rami Basha CPHI(C), MPH

Agency: Eastern Ontario Health Unit

1) Is your agency interested in being involved in this project? (Circle One) (YES) NO

2) If you are interested in being involved in this project, please identify a contact person:

Name and Title: Rami Basha CPHI(C), MPH Program Manager Safe Water

Address: 1000 Pitt Street

Cornwall, ON Postal Code: K6J 5T1

Telephone: (613) 933-1375 Fax: (613) 933-7930

E-mail: rbasha@eohu.ca

3) If you presently have any comments or questions about this project please outline them below or attach on a separate sheet of paper.

4) Do you have any information regarding the Study Area that will assist us in our planning process? If so, please outline below or attach on a separate sheet of paper.

N/A

Please submit to:

Mark Buchanan, P.Eng., Senior Civil Engineer
J.L. Richards & Associates Limited
864 Lady Ellen Place
Ottawa, ON K1Z 5M2
Telephone: 613-728-3571
Facsimile: 613-728-6012
E-mail: mbuchanan@jlrichards.ca

Note: If you wish to respond via email, please write directly on the form and scan a copy before emailing it to the address above. Comments and information regarding this Study are being collected to assist the Ministry in meeting the requirements of the EA Act. This material will be maintained on file for use during the Study and may be included in project documentation. With the exception of personal information, all comments will become part of the public record.

Ministry of Heritage, Sport, Tourism and Culture Industries

Programs and Services Branch
401 Bay Street, Suite 1700
Toronto, ON M7A 0A7
Tel: 416.314.7643

Ministère des Industries du Patrimoine, du Sport, du Tourisme et de la Culture

Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto, ON M7A 0A7
Tél: 416.314.7643

Ontario

February 3rd, 2020 EMAIL ONLY

Mark Buchanan, P. Eng.
Senior Civil Engineer
J.L. Richards & Associates Ltd.
864 Lady Ellen Place
Ottawa, ON K1Z 5M2
Mbuchanan@jlrichards.ca

MHSTCI File	:	**0011637**
Proponent	:	**Township of North Dundas**
Subject	:	**Notice of Commencement – Municipal Class EA**
Project	:	**North Dundas Drinking Water Supply System Capacity Expansion**
Location	:	**North Dundas**

Dear Mark Buchanan:

Thank you for providing the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) with the Notice of Commencement for the above-referenced project. MHSTCI's interest in this Environmental Assessment (EA) project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- Archaeological resources, including land and marine;
- Built heritage resources, including bridges and monuments; and,
- Cultural heritage landscapes.

Under the EA process, the proponent is required to determine a project's potential impact on cultural heritage resources.

Project Summary
The Township of North Dundas is initiating a planning process to assess expanding the capacity of the existing drinking water supply system. The Township is seeking to secure additional source(s) of potable drinking water to increase the reliability of the drinking water system and address anticipated demand increase due to the planned residential expansions and growing industrial needs. The project is being initiated within the requirements for a Schedule 'C' project under the Municipal EA process.

Identifying Cultural Heritage Resources
While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to these communities. Municipal Heritage Committees, historical societies and other local heritage organizations may also have knowledge that contributes to the identification of cultural heritage resources.

Archaeological Resources
This EA project may impact archaeological resources and should be screened using the MHSTCI *Criteria for Evaluating Archaeological Potential* to determine if an archaeological assessment is needed. MHSTCI archaeological sites data are available at *archaeology@ontario.ca*. If the EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licenced under the *OHA*, who is responsible for submitting the report directly to MHSTCI for review.

Built Heritage and Cultural Heritage Landscapes
The MHSTCI *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* should be completed to help determine whether this EA project may impact cultural heritage resources. If potential or known heritage resources exist, MHSTCI recommends that a Heritage Impact Assessment (HIA), prepared by a qualified consultant, should be completed to assess potential project impacts. Our Ministry's *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. Please send the HIA to MHSTCI and make it available to local organizations or individuals who have expressed interest in review.

Environmental Assessment Reporting
All technical cultural heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MHSTCI whether any technical cultural heritage studies will be completed for this EA project, and provide them to MHSTCI before issuing a Notice of Completion or commencing any work on the site. If screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

Thank you for consulting MHSTCI on this project and please continue to do so throughout the EA process. If you have any questions or require clarification, do not hesitate to contact me.

Sincerely,

Joseph Harvey
On behalf of

Kimberly Livingstone
Heritage Planner
Kimberly.Livingstone@ontario.ca

Copied to: Dave Markell, Ontario Clean Water Agency

Ministry of the Environment, Conservation and Parks
Eastern Region
1259 Gardiners Road, Unit 3
Kingston ON K7P 3J6
Phone: 613.549.4000
or 1.800.267.0974

Ministère de l'Environnement, de la Protection de la nature et des Parcs
Région de l'Est
1259, rue Gardiners, unité 3
Kingston (Ontario) K7P 3J6
Tél: 613 549-4000
ou 1 800 267-0974

Ontario

By email only

November 14, 2019

Township of North Dundas

Attention: Jo-Anne McCaslin, Deputy CAO / Clerk
jmccaslin@northdundas.com

Dear Ms. McCaslin:

Re: Township of North Dundas Drinking Water Supply

Thank you for the October 16, 2019 letter notifying us of the initiation of this project, and the Notice of Commencement dated September 27, 2019. The project involves identifying and assessing potential sources of water to address the Township's needs for the next 20 years. The project is being planned as a schedule C project in accordance with the *Municipal Class Environmental Assessment* (Class EA).

Here are MECP preliminary comments on the project. Please consider these comments as you proceed through the Class EA process. The comments are grouped under these headings:

- Class EA process,
- MECP technical review issues,
- Aboriginal consultation.

Class Environmental Assessment Process

Notification

As the Regional EA Coordinator for this project, Jon Orpana will be responsible for circulating project notices and information to MECP reviewers and coordinating the MECP response during the Class EA process. Mr. Orpana is a mandatory contact for all notices issued for the project. In addition, please provide copies of other relevant information such as information updates, technical studies related to MECP's mandate, interim reports and technical memoranda, and two copies of the final report when it is available.

Preferred methods of correspondence are email for notices, one hard copy of technical reports and final reports (i.e. Environmental Study Report), and one copy of the report on a thumb drive. It is helpful to provide scanned copies of the notices as they appear in newspapers, and confirm the dates of publication.

Please contact:

Jon Orpana, Environmental Assessment Coordinator
Ministry of the Environment, Conservation and Parks
1259 Gardiners Road
P.O. Box 22032
Kingston, Ontario
K7M 8S5
email: jon.orpana@ontario.ca

Please ensure that the Notice of Completion states that Part II Order requests should be addressed in writing to:

> Minister Jeff Yurek
> Ministry of Environment, Conservation and Parks
> 777 Bay Street, 5th Floor
> Toronto ON M7A 2J3
> minister.mecp@ontario.ca

and

> Director, Environmental Assessment and Permissions Branch
> Ministry of Environment and Climate Change
> 135 St. Clair Ave. W, 1st Floor
> Toronto ON, M4V 1P5
> enviropermissions@ontario.ca

The notice should also state that a Part II Order Request Form must be used to request a Part II Order. The Part II Order Request Form is available online on the Forms Repository Website (http://www.forms.ssb.gov.on.ca) by searching "Part II Order" or "012-2206E" (the form number).

Consultation with Review Agencies

In addition to public consultation, consultation with review agencies is an important component of the Class EA process. Please ensure that you contact review agencies directly to determine their interest in the project at the Notice of Commencement stage.

The MECP Regional office is a mandatory contact for all notices (please refer to contact information above). In addition, other ministries and agencies that may have an interest in the project are listed in section A.3.6 and Appendices 3 and 7. The provincial ministries that are most often involved in Class EA project review include the Ministry of Municipal Affairs (for example, expansion of settlement boundaries, consistency with Growth Plan), Ministry of Natural Resources and Forestry (for example, significant wetlands), and Ministry of Tourism, Culture and Sport (for example, cultural heritage or archaeological resources).

The final report should include information on correspondence with review agencies, issues raised by reviewers, and how these issues will be addressed. This could include technical studies or other information, and commitments to obtain specific approvals or permits.

MECP Technical Review

This Ministry's interest in water projects includes:

- MECP inspections of existing facilities,
- raw water quality of the drinking water source,
- source protection of drinking water supplies,
- impacts to / interference with area wells during operation of new communal water supply,
- impacts to groundwater and surface water due to construction (i.e. dewatering of trenches during installation of watermains, control of erosion and sedimentation, construction and/or dredging at water crossings, spill control),
- proposed water service area compared to sewage service area,
- potential for encountering waste disposal sites, contaminated soil, contaminated sediment or groundwater,
- management of excess materials, waste, contaminated soil and groundwater.

These environmental issues, and appropriate mitigation measures, should be addressed during the Class EA process.

We recommend that you contact this office as soon as possible during the environmental assessment process if you become aware of:

- contaminated sites in the study area or influence area of the project,
- a source water protection vulnerable area in the vicinity of the project, or
- issues that are contentious to the general public, aboriginal communities or review agencies.

Water Resources

For a new or expanded groundwater supply, this office is interested in reviewing the hydrogeological assessment as part of the Class EA process rather than at the Permit To Take Water stage. The hydrogeological assessment provides important information to the proponent, MECP reviewers, and other interested parties on potential environmental impacts, and it is necessary to evaluate this information as part of the Class EA process.

Source Protection

Proponents undertaking a Municipal Class EA project must identify early in the process whether a project is occurring within a source water protection vulnerable area, or changes vulnerable areas or creates new vulnerable areas. This must be clearly documented in a Master Plan, Project File report or Environmental Study Report. Specifically, the report should discuss whether or not the project changes or creates new vulnerable areas, and provide applicable details about the area. This section should then be used to inform and should be reflected in other sections of the report, such as the identification of net positive or negative effects of alternatives, mitigation measures, evaluation of alternatives etc.

In cases that result in delineation of new vulnerable areas (WHPA/IPZ) or amendment of existing vulnerable areas, completion of other technical work to assess source water vulnerability scores within the new or expanded vulnerable areas may be necessary, and may result in the development or extension of source protection policies to areas where they previously did not apply. If creating or changing a vulnerable area, proponents should document whether any existing uses or activities may potentially be affected by the implementation of source protection policies.

The proponent should contact and consult with the appropriate Conservation Authority/Source Protection Authority (CA/SPA) to discuss these issues early in the process.

Ontario Regulation 205/18 applies to source protection areas and ensures that municipal residential drinking water sources are protected *before* drinking water can be provided to the public. Where owners of municipal residential drinking water systems are applying for a drinking water works permit for a change that results in new or expanded vulnerable areas, the regulation requires:

- identification of vulnerable areas and vulnerability scoring,
- written confirmation from the Source Protection Authority (SPA) that
    - the SPA is satisfied that the vulnerability area mapping and scoring is complete,
    - identifies amendments necessary to the source protection plan (SPP),
    - indicates when the source protection authority will be able to propose amendments to the SPP, and
    - identifies if any of the amendments have already been made,
- a condition in the drinking water works permit or license that prevents the supply of drinking water to users of the new or expanding system until any necessary amendments to the SPP have been approved.

In summary, we recommend that early in the Class EA process the proponent contact the local SPA to discuss source protection implications. We recommend that during the Class EA process, delineation of new or expanded vulnerable areas and vulnerability scoring be completed, and businesses and landowners be consulted about source protection implications resulting from the new or expanded water supply.

Planning for Sewage and Water Servicing

As discussed in section 1.6.6 of the 2014 Provincial Policy Statement (PPS) under the Planning Act, municipal sewage and water services are the preferred form of servicing for settlement areas. Where municipal services are not provided, municipalities may allow the use of private communal sewage and water services. Partial services shall only be permitted to address failed individual on-site services in an existing development, or to allow infilling and minor rounding out of existing development on partial services, provided that site conditions are suitable for the long-term provision of such services with no negative impacts.

The Environmental Study Report should include a discussion of these servicing options, and a rationale for proceeding with one of the less preferred types of servicing, and the environmental implications of the servicing. For example, in cases where private communal water and septic systems are proposed, the report should discuss why municipal servicing is not feasible, why full services are not feasible, and whether any impacts to the environment (for example, impacts to the effectiveness of individual septic systems) could result.

As discussed in PPS section 1.1.3.8, settlement areas can only be identified or expanded during a comprehensive review of the Official Plan. We recommend that the local Ministry of Municipal Affairs Municipal Services Office be circulated on notices and reports and consulted on issues related to new or expanded settlement areas.

Contaminated Sites and Waste Management

The proponent should consider the potential that the project may be constructed in an area of contamination. If an area of contamination is present, the EA should determine the appropriate management of contaminated soil, sediment and groundwater as well as consider health and safety measures.

Waste, including contaminated soil, must be managed in accordance with MECP standards. The *Environmental Protection Act* (EPA) and Regulation 347 require waste to be classified and disposed of appropriately. When determining the waste category, the proponent must ensure compliance with Schedule 4 of Regulation 347.

<u>Consultation with First Nation and Métis Communities</u>

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before you can proceed with this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the process.

Your proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to your proposed project**, the MECP is delegating the procedural aspects of rights-based consultation to you through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information you have provided to date and the Crown`s preliminary assessment you are required to consult with the following Aboriginal communities who have been identified as potentially affected by your proposed project:

- Algonquins of Ontario (AOO)
- Mohawk Council of Akwesasne
- Ottawa Region Métis Council – please cc Métis Nation of Ontario (MNO) on any correspondence going to the council

Steps that you may need to take in relation to Aboriginal consultation for your proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process" which can be found at the following link:

https://www.ontario.ca/document/consultation-ontarios-environmental-assessment-process

Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments

You must contact the Director of Environmental Assessment and Permissions Branch under the following circumstances subsequent to initial discussions with the communities identified by MECP:

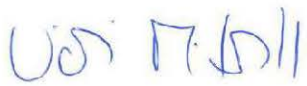
- Aboriginal or treaty rights impacts are identified to you by the communities
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right
- Consultation has reached an impasse
- A Part II Order request or elevation request is expected

The Director can be notified by email, mail or fax using the information provided below:

Email:	enviropermissions@ontario.ca Subject: Potential Duty to Consult
Fax:	416-314-8452
Address:	Environmental Assessment and Permissions Branch 135 St. Clair Avenue West, 1st Floor Toronto, ON, M4V 1P5

The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play should additional steps and activities be required.

Yours Truly,



Vicki Mitchell
Environmental Assessment Coordinator
Eastern Region

ec: Mark Buchanan, P.Eng., J.L. Richards & Associates Limited, mbuchanan@jlrichards.ca

Dave Markell, Ontario Clean Water Agency, DMarkell@ocwa.com

Jim Mahoney, MECP

Source Protection Programs Branch, MECP

Jon Orpana, MECP

From:	Mark Buchanan
To:	Mitchell, Vicki (MECP)
Cc:	EA Notices to ERegion (MECP); jmccaslin@northdundas.com; dmarkell@ocwa.com; MPlummer@northdundas.com; dbelleau@northdundas.com; Sara Jamaliniya
Subject:	RE: North Dundas drinking water supply, notice of initiation
Date:	Tuesday, November 5, 2019 11:55:00 AM
Attachments:	28855-000.1 Notice of Commencement.pdf MECP Initiation Letter_Oct 16_2019.pdf 28855 North Dundas Water Supply streamlined_ea_project_information_form_2.xlsx

Hello Vicki,

Thank you for the clarification. We will ensure our first mandatory stakeholder letter, that shall be issued prior to Public Information Centre No. 1 is prepared in accordance with the approved Municipal Class Environmental Assessment, (MEA 2015). The initial project letter exceeds with minimum consultation requirements. Also, the attached public notice has been published on the Township's website and contains a project map and contact from the Township.

In accordance with the current submission process, we have attached the initial project letter, public notice, Project Information Form (Excel spreadsheet) and copied the eanotification.eregion@ontario.ca address. All future project notices shall be directed to this email address and copy you.

We look forward to consulting with the MECP on the this project.

Should you require anything further, please do not hesitate to contact us.

Regards,

From: Mitchell, Vicki (MECP) <Vicki.Mitchell@ontario.ca>
Sent: Thursday, October 31, 2019 2:27 PM
To: Mark Buchanan <mbuchanan@jlrichards.ca>
Cc: EA Notices to ERegion (MECP) <eanotification.eregion@ontario.ca>; jmccaslin@northdundas.com; dmarkell@ocwa.com
Subject: North Dundas drinking water supply, notice of initiation

Hello Mark,

I received a hard copy of a notice of initiation for the Township of North Dundas drinking water system expansion.

I am contacting you because the information is incomplete and has not been submitted in accordance with the MECP approved process. The notice does not contain the information required in a notice of commencement, including a map of the project location, and the contact at the Township of North Dundas.

MECP has a new process for submission of notices of commencement for Class EA projects to our ministry (since May 2018). We request that you follow the new process and submit an electronic copy of the notice (pdf) and the Project Information Form (Excel spreadsheet) to the appropriate Regional email account.

For projects in Eastern Region, please send the requested information to eanotification.eregion@ontario.ca

I have attached a copy of the Project Information Form and instructions. Information on the new process can be found at https://www.ontario.ca/page/class-environmental-assessments-approved-class-ea-information.

Please submit copies of all notices via email only. MECP prefers not to receive paper copies of notices.

Thank you for your attention to this matter,

Vicki Mitchell
Regional EA Coordinator
MECP Eastern Region
1259 Gardiners Road, Kingston ON
(613) 549-4000 ext. 2614

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

J.L. Richards & Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

October 16, 2019
Our File: 28855-000.1

VIA EMAIL

Ms. Angela Coleman
General Manager/Secretary-Treasurer
South Nation Conservation Authority
38 Victoria Street, P.O. Box 29
Finch, ON K0C 1K0

Dear Ms. Coleman:

Re: Township of North Dundas
Schedule 'C' Municipal Class Environmental Assessment
North Dundas Drinking Water Supply System Capacity Expansion
Notice of Project Initiation

This letter is to inform you that the Township of North Dundas (the Township) is initiating a planning process to assess expanding the capacity of the existing drinking water supply system. The Township is seeking to secure additional source(s) of potable drinking water to increase the reliability of the drinking water system and address anticipated demand increase due to planned residential expansions and growing industrial needs.

The project is being initiated within the requirements for a Schedule 'C' project under the Terms of the Municipal Class Environmental Assessment (Class EA) process, which is approved under the *Environmental Assessment Act* (The project Schedule will be confirmed during the EA process).

BACKGROUND

The Township of North Dundas Drinking Water System supplies treated water to the Village of Winchester and the Village of Chesterville, in addition to key industrial, commercial and institutional users (notably Lactalis Group in Winchester and Winchester District Memorial Hospital). With its proximity to Ottawa, the population growth rate is projected to increase due to future developments.

Currently, the potable water system is comprised of eight active groundwater wells, five pump houses with chlorine disinfection, two storage reservoirs, two elevated storage tanks and approximately 40 km of distribution system. Exploring new water sources has been a long-standing focus for the Township and with the anticipated increase in water demand, this Class EA will focus on identifying and assessing potential sources of water to address the Township's needs for the next 20 years.

October 16, 2019
Our File: 28855-000.1

DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION CLASS ENVIRONMENTAL ASSESSMENT

The Township has retained the services of J.L. Richards & Associates Limited (JLR) in association with Golder Associates Ltd. to initiate Phases 1 to 4 of a Schedule 'C' Class EA.

The Class EA process will consider the following:

- Sufficient water supply capacity for both residential and industrial use
- Enhanced water supply system reliability and redundancy
- Appropriate treated water storage and efficient distribution\

PROJECT CONTACT INFORMATION

We are interested in hearing any comments or concerns that you may have about this project, and will be maintaining a record of comments and including them in the study documentation that will be made available for public review. Parties interested in providing input or that wish to obtain additional information at this time, are asked to submit comments in writing to:

Mark Buchanan, P.Eng.
Senior Civil Engineer
J.L. Richards & Associates Limited
864 Lady Ellen Place
Ottawa, ON K1Z 5M2
Telephone: 613-728-3571
Facsimile: 613-728-6012
E-mail: mbuchanan@jlrichards.ca

Please find attached a form to assist you in advising us of your interest in this project.

If you do not believe your involvement is necessary at this time, or if there is another member of your staff whom we should be in contact with, please advise us accordingly. Your written response in either case would be appreciated.

Yours very truly,

J.L. RICHARDS & ASSOCIATES LIMITED

Mark Buchanan, P.Eng.

SJ/MB/jd
Attach.

cc: Mr. Dave Markell, Ontario Clean Water Agency

Township of North Dundas
North Dundas Drinking Water Supply System Capacity Expansion

AGENCY / STAKEHOLDER RESPONSE FORM

DATE: 2019/10/22

Name (please print): Michael Melaney

Agency: South Nation Conservation Authority

1) Is your agency interested in being involved in this project? (Circle One) (YES) NO

2) If you are interested in being involved in this project, please identify a contact person:

Name and Title: Michael Melaney, Hydrogeologist

Address: 38 Victoria Street, Embrun, ON

Postal Code: K0C 1X0

Telephone: (613) 984-2948 Fax: (____) ____

E-mail: mmelaney@nation.on.ca

3) If you presently have any comments or questions about this project please outline them below or attach on a separate sheet of paper.

4) Do you have any information regarding the Study Area that will assist us in our planning process? If so, please outline below or attach on a separate sheet of paper.

Source protection information.

Please submit to:

Mark Buchanan, P.Eng., Senior Civil Engineer
J.L. Richards & Associates Limited
864 Lady Ellen Place
Ottawa, ON K1Z 5M2
Telephone: 613-728-3571
Facsimile: 613-728-6012
E-mail: mbuchanan@jlrichards.ca

Note: If you wish to respond via email, please write directly on the form and scan a copy before emailing it to the address above. Comments and information regarding this Study are being collected to assist the Ministry in meeting the requirements of the EA Act. This material will be maintained on file for use during the Study and may be included in project documentation. With the exception of personal information, all comments will become part of the public record.

Township of North Dundas
North Dundas Drinking Water Supply System Capacity Expansion

AGENCY / STAKEHOLDER RESPONSE FORM

DATE: Oct. 22, 2019

Name (please print): Mary Dillon

Agency: Ministry of Natural Resources and Forestry

1) Is your agency interested in being involved in this project? (Circle One) (YES) NO

2) If you are interested in being involved in this project, please identify a contact person:

Name and Title: Mary Dillon, District Planner

Address: 10-1 Campus Dr. Kemptville, ON

Postal Code: K0G 1J0

Telephone: (613) 258-8470 Fax: (613) 258-3920

E-mail: mary.dillone ontario.ca

3) If you presently have any comments or questions about this project please outline them below or attach on a separate sheet of paper.

4) Do you have any information regarding the Study Area that will assist us in our planning process? If so, please outline below or attach on a separate sheet of paper.

See email attachment

Please submit to:

Mark Buchanan, P.Eng., Senior Civil Engineer
J.L. Richards & Associates Limited
864 Lady Ellen Place
Ottawa, ON K1Z 5M2
Telephone: 613-728-3571
Facsimile: 613-728-6012
E-mail: mbuchanan@jlrichards.ca

Note: If you wish to respond via email, please write directly on the form and scan a copy before emailing it to the address above. Comments and information regarding this Study are being collected to assist the Ministry in meeting the requirements of the EA Act. This material will be maintained on file for use during the Study and may be included in project documentation. With the exception of personal information, all comments will become part of the public record.

Sara Jamaliniya

From: Mark Buchanan
Sent: Wednesday, October 23, 2019 10:58 AM
To: Sara Jamaliniya
Subject: FW: North Dundas Drinking Water Supply System Expansion Class EA
Attachments: KVD_In_Water_Work_Timing_Guidelines_2018-02-27.pdf; NHGuide_MNRF_2019-04-01.pdf; RE: North Dundas Drinking Water Supply System Expansion Class EA

Hey Sara,

Please file in our stakeholder response folder and update our contact list.

Thanks,

Mark Buchanan, P.Eng.
Associate
Senior Civil Engineer

J.L. Richards & Associates Limited
700 - 1565 Carling Avenue, Ottawa, ON K1Z 8R1
Tel: 613-728-3571 Fax: 613-728-6012

J.L. Richards & Associates Limited
ENGINEERS • ARCHITECTS • PLANNERS

BEST MANAGED COMPANIES

From: Dillon, Mary (MNRF) <Mary.Dillon@ontario.ca>
Sent: Wednesday, October 23, 2019 9:26 AM
To: Mark Buchanan <mbuchanan@jlrichards.ca>
Subject: North Dundas Drinking Water Supply System Expansion Class EA

Dear Mr. Buchanan,

Thank you for the Notice of Project Initiation in accordance with the Municipal Class EA for the North Dundas Drinking Water Supply Expansion which was received by mail on October 21, 2019.

You may already be aware of the process, but I have attached a guide to help you access natural heritage data from convenient online sources and in-water timing guidelines should the proposed project activities require fisheries considerations. It is the proponent's responsibility to complete a preliminary screening for each project, obtain available information from multiple sources, conduct any necessary field studies, and to consider any potential environmental impacts that may result from an activity. If there are any questions or concerns regarding the Ministry's interests following completion of the preliminary screening, we would be happy to provide technical information and advice. Please note that Species at Risk data is no longer provided by the MNRF. All Endangered Species Act or Species at Risk enquiries should be directed to the Ministry of Environment, Climate Change and Parks at SAROntario@ontario.ca.

Here is some additional information to help you determine whether other legislation is applicable.

Petroleum Wells & Oil, Gas and Salt Resource Act

There may be petroleum wells within the proposed project area. Please consult the Ontario Oil, Gas and Salt Resources Library website (www.ogsrlibrary.com) for the best known data on any wells recorded by MNRF. Please reference the 'Definitions and Terminology Guide' listed in the publications on the Library website in order to better understand the well information available. Any oil and gas wells in your project area are regulated by the Oil, Gas and Salt Resource Act, and the supporting regulations and operating standards. If any unanticipated wells are encountered during development of the project, or if the proponent has questions regarding petroleum operations, the proponent should contact the Petroleum Operations Section at 519-873-4634.

Public Lands Act & Lakes and Rivers Improvement Act

Some Municipal projects may be subject to the provisions of the *Public Lands Act* or *Lakes and Rivers Improvement Act*. Please review the information on MNRF's web pages provided below regarding when an approval is required or not. Please note that many of the authorizations issued under the *Lakes and Rivers Improvement Act* are administered by the local Conservation Authority.

- For more information about the *Public Lands Act*: https://www.ontario.ca/page/crown-land-work-permits
- For more information about the *Lakes and Rivers Improvement Act*: https://www.ontario.ca/document/lakes-and-rivers-improvement-act-administrative-guide

We wish to remain engaged in this project and review the project report that is produced. Please contact me if you have any questions or concerns regarding MNRF interests.

Sincerely,

Mary Dillon
District Planner – Kemptville District
Ministry of Natural Resources and Forestry
613-258-8470

Appendix C

List of Compiled Background Documentation

TOWNSHIP OF NORTH DUNDAS
NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

LIST OF DOCUMENTATION

No.	Description
GENERAL	
1.1	Certificate of approval, July 2010
1.2	Drinking Water Works Permit, July 2018
1.3	Municipal Drinking Water License, March 2016
1.4	North Dundas Drinking Water System- Supply Wells
1.5	Winchester Water Supply System Upgrade Class Environmental Assessment Project File, Stantec August 2009
1.6	2018 North Dundas Water Operations Budget
1.7	Permits to Take Water for each Well
1.8	Drinking Water Operation and Maintenance Manuals
WATER DISTRIBUTION	
2.1	2016-2018 Water Consumption Spreadsheet Data
2.2	As-Constructed Drawings for Water Distribution System (Watermains, Towers, Pumping Stations)
2.3	GIS Data of Watermain Network
2.4	2014-2018 (5 Years) Hourly Well Production Records, Water Level, Water Quality (Spreadsheet Data)
2.5	2016-2018 MECP Inspection Report (if any)
2.6	2016-2018 Annual Drinking Water Report
2.7	Maintenance Records
GEOTECHNICAL	
3.1	Golder Associates and Sauriol Environmental Inc., Environmental Study Report Phase I and II, Hydrogeological Components, Townships of North Dundas and Russell, Ontario, January 2005
PLANNING	
4.1	Township of North Dundas Official Plan
4.2	Population Growth Information

Appendix D

North Dundas Drinking Water Supply System Capacity Expansion Class EA – Technical Memorandum No. 1

MEMORANDUM

J.L. Richards
& Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

TO:	Calvin Pol, BES, MCIP, RPP Director of Planning, Building and By-Law Enforcement Township of North Dundas	DATE:	February 14, 2020
		JOB NO.:	28855-000
FROM:	Jordan Morrissette, M.Eng., P.Eng.	CC:	Angela Rutley, Township of North Dundas Dan Belleau, Township of North Dundas Dave Markell, Ontario Clean Water Agency Sarah Gore, P.Eng., J.L. Richards & Associates Limited Mark Buchanan, P.Eng., J.L. Richards & Associates Limited
RE:	**North Dundas Drinking Water Supply System Capacity Expansion Class EA Technical Memorandum No. 1 Population Growth and Development Projections (Rev. 1) DRAFT**		

INTRODUCTION

The purpose of this Memorandum is to assist in establishing proposed 20 year population projections for the Village of Winchester and the Village of Chesterville within the Township of North Dundas (Township) by determining their potential development opportunities for growth. The 20 year population projections will serve as the basis for establishing the drinking water supply system requirements for the North Dundas Drinking Water Supply System Capacity Expansion Class Environmental Assessment (Class EA).

EXISTING POPULATION AND GROWTH SCENARIOS (WINCHESTER AND CHESTERVILLE)

A review of available 2016 Census information indicates that the population in 2016 within Winchester and Chesterville was approximately 2,394 and 1,677 persons, respectively. It is noted that based on 2011 Census information, the population was 2,460 people in Winchester and 1,448 people in Chesterville, representing an annual percentage growth rate of approximately -0.5% and 3.1%, respectively over the five (5) year period. Due to the development anticipated within both villages over the next 20+ years, the following growth scenarios are proposed to be used for the Class EA:

Low Growth Scenario

- Winchester: Projected annual growth rate of 1.5% from 2016 to 2019. Projected population growth from 2019 to 2039 based on the future potential development within Winchester provided by the Township (refer to Table 1) not including Phase 2 to Phase 5 of the proposed Wellings of Winchester development (Area 11);
- Chesterville: Projected at an annual growth rate of 3.5% from 2016 to 2019 and at an annual growth rate of 1.5% from 2019 to 2039.

High Growth Scenario

- Winchester: Projected annual growth rate of 1.5% from 2016 to 2019. Projected population growth from 2019 to 2039 based on the future potential development within Winchester provided by the Township (refer to Table 1) including Phase 2 to Phase 5 of the proposed Wellings of Winchester development (Area 11);

- Chesterville: Projected at an annual growth rate of 3.5% from 2016 to 2019 and at an annual growth rate of 3.5% from 2019 to 2039.

POPULATION PROJECTIONS FOR WINCHESTER

In order to determine the potential population increase in Winchester for the Low Growth and High Growth Scenarios, an updated list of potential development areas and their associated types of land-use was obtained from the Township. Table 1 provides a description of the future potential developments in Winchester and the total projected units and/or commercial area estimated. The areas identified in Table 1 are illustrated in Figure M1-1.

TABLE 1: WINCHESTER FUTURE POTENTIAL DEVELOPMENT[1]

Area	Description	Total Projected Units or Residents	Commercial Area
A	Existing – Not Connected	28	-
1	Pioneer Gas Restaurant / Car Wash	Constructed	-
2A	Commercial #31 Strip	-	1.13 ha
2B	Commercial #31 Strip	-	1.22 ha
3	Commercial #43 / #31 corner	-	0.97 ha
4	Industrial/Commercial John Deere	-	6.17 ha
5	Commercial – Main Street South side	-	0.45 ha
6	Commercial – Main Street North side	-	(0.33 L/s)
7	Motel	14	-
8	Restaurant – Country Kitchen	7	-
9A	Commercial/Residential	-	5.07 ha
9B	Commercial/Residential	-	Buildout[2]
10	Commercial	Mini storage	0.88 ha
11A	Wellings of Winchester + Commercial (Phase 1)	68 (refer to Table 2)	2.28 ha
11B	Wellings of Winchester (Phase 2 to Phase 5)	432 (refer to Table 3)	
12	Commercial	-	0.8 ha
13	Residential Infill/Apartment in-houses	15	-
14	Winfields Subdivision	9	-
15	Residential – Winfields Phase 2	-	Buildout[2]
16	Commercial	-	0.75 ha
17	Residential (connected)	connected	-
18	New Dundas Manor[3]	-	-
19	Old Dundas Manor Building and Property	-	1.19 ha
20	Guy Racine Subdivision - Phase 3	8	-
21A	Seniors Complex	54 residents	-
21B	Development	36	-
22A	Winchester Meadows Subdivision	22	-
22B	Winchester Meadows Subdivision	22	-
23	Vacant Residential	-	Buildout[2]
24A	Woods Development	78	-
24B	High Density Apartments	21	-
25A	Woods Development	19	-
25B	Singles & Semis & Townhomes	36	-

Area	Description	Total Projected Units or Residents	Commercial Area
26	Residential – Barnhart	-	Buildout[2]
27	Residential - M. Lafortune Investments	-	Buildout[2]
28A	Residential	2	-
28B	Wintonia Drive / James Street	10	-
29A	Residential	15	-
29B	Esper Lane	51	-
30	Commercial	-	4.34 ha
31	Commercial	-	0.40 ha
LOW GROWTH SCENARIO[4]		**393 units + 68 units Wellings + 54 residents**	**25.65 ha + 0.33 L/s**
HIGH GROWTH SCENARIO[5]		**393 units + 500 units Wellings + 54 residents**	**25.65 ha + 0.33 L/s**

1. List of potential development areas and their associated types of land-use were provided by the Township.
2. Additional development areas are available; these development areas are projected beyond a 20-year period.
3. The flow from the new Dundas Manor is anticipated to remain the same as the flow from existing Dundas Manor.
4. Low Growth Scenario includes Phase 1 of the Wellings of Winchester Development only.
5. High Growth Scenario includes Phase 1 to Phase 5 of the Wellings of Winchester Development.

Although, the Township's Official Plan (based on 2016 Census information) indicates a household occupancy of 2.45 persons per unit within the United Counties of Stormont, Dundas and Glengarry, the Township has reported that based on more recent information available, the household occupancy to be used for the Class EA is 2.5 persons per unit. The Township has also identified that the Wellings of Winchester development will have a different household occupancy since the proposed development is intended to be for seniors. Table 2 and Table 3 below presents Phase 1 potential population increase for Wellings of Winchester development (Area 11) as well as the total potential population increase for Phase 2 to Phase 5.

TABLE 2: POTENTIAL POPULATION INCREASE (PHASE 1) - WELLINGS OF WINCHESTER

Unit	Number of Residential Units	Household Occupancy (Persons per unit)	Potential Population Increase
1 - bedroom	42	1.17	49
2 - bedroom	26	1.62	42
TOTAL	**68**		**91**

TABLE 3: POTENTIAL POPULATION INCREASE (PHASE 2 TO PHASE 5) - WELLINGS OF WINCHESTER

Unit	Number of Residential Units	Household Occupancy (Persons per unit)	Potential Population Increase
1 - bedroom	286	1.17	335
2 - bedroom	146	1.62	237
TOTAL	**432**		**572**

Using the number of total projected units and residents (Table 1) and the different household occupancy for Phase 1 of the Wellings of Winchester development (Table 2), the total potential population increase for the Low Growth Scenario is summarized in Table 4 below.

TABLE 4: POTENTIAL POPULATION INCREASE IN WINCHESTER (LOW GROWTH SCENARIO)

Number of Residential Units	Household Occupancy (Persons per unit)	Number of People (based on units)	Number of Additional Residents (Seniors Complex)	Potential Population Increase
393	2.5	983	54	1,037
68	See Table 2	91	-	91
461	-	1,074	54	1,128

1. The above equivalent population is based on the Low Growth Scenario which does not include Phase 2 to Phase 5 of Area 11 – Wellings of Winchester Development.

Using the above information, the 2039 population projections for the Low Growth and High Growth Scenarios in Winchester were determined and presented in Table 5.

TABLE 5: POPULATION PROJECTIONS IN WINCHESTER (2016 – 2039)

	Low Growth Scenario		High Growth Scenario	
Year	**Projected Population Increase (Persons)**	**Population Projected (Low Growth Scenario)**	**Projected Population Increase (Persons)**	**Population Projected (High Growth Scenario)**
2016	-	2,394[1]	-	2,394[1]
2019	108[2]	2,502	108[2]	2,502
2039	1,128[3]	3,630	1,128[4] + 572[5]	4,202

1. Population based on the 2016 Census Information for Winchester.
2. 2019 population increase is based on an assumed annual growth rate of 1.5%.
3. Based on the potential population increase for Low Growth Scenario identified in Table 4.
4. Based on the potential population increase for Low Growth Scenario (including Phase 1 of the Wellings of Winchester development) identified in Table 4.
5. Based on the potential population increase for Phase 2 to Phase 5 of the Wellings of Winchester development identified in Table 3.

POPULATION PROJECTIONS FOR CHESTERVILLE

As determined in consultation with the Township, Table 6 illustrates the projected population for the Low Growth and High Growth Scenarios for Chesterville to 2039 based on annual growth rates of 1.5% and 3.5% respectively.

TABLE 6: POPULATION PROJECTIONS IN CHESTERVILLE (2016 – 2039)

	Low Growth Scenario		High Growth Scenario	
Year	**Annual Projected Growth Rate (%)**	**Population Projected (Low Growth Scenario)**	**Annual Projected Growth Rate (%)**	**Population Projected (High Growth Scenario)**
2016	-	1,677[1]	-	1,677[1]
2019	3.5[2]	1,853	3.5[2]	1,853
2039	1.5[2]	2,409	3.5[2]	3,027

1. Population based on the 2016 Census Information for Chesterville.
2. 2019 population increase is based on an assumed annual growth rate of 3.5%.
3. Low annual growth rate (1.5%) and high annual growth rate (3.5%) developed in consultation with the Township.

TOTAL PROJECTED POPULATION FOR CLASS EA

As summarized in Table 7, the total projected population for Winchester and Chesterville based on the Low Growth and High Growth Scenarios are 6,039 and 7,229 people, respectively. These population projections will be used to determine water supply requirements for the drinking water system as part of the Class EA.

TABLE 7: TOTAL POPULATION PROJECTIONS IN WINCHESTER AND CHESTERVILLE (2039)

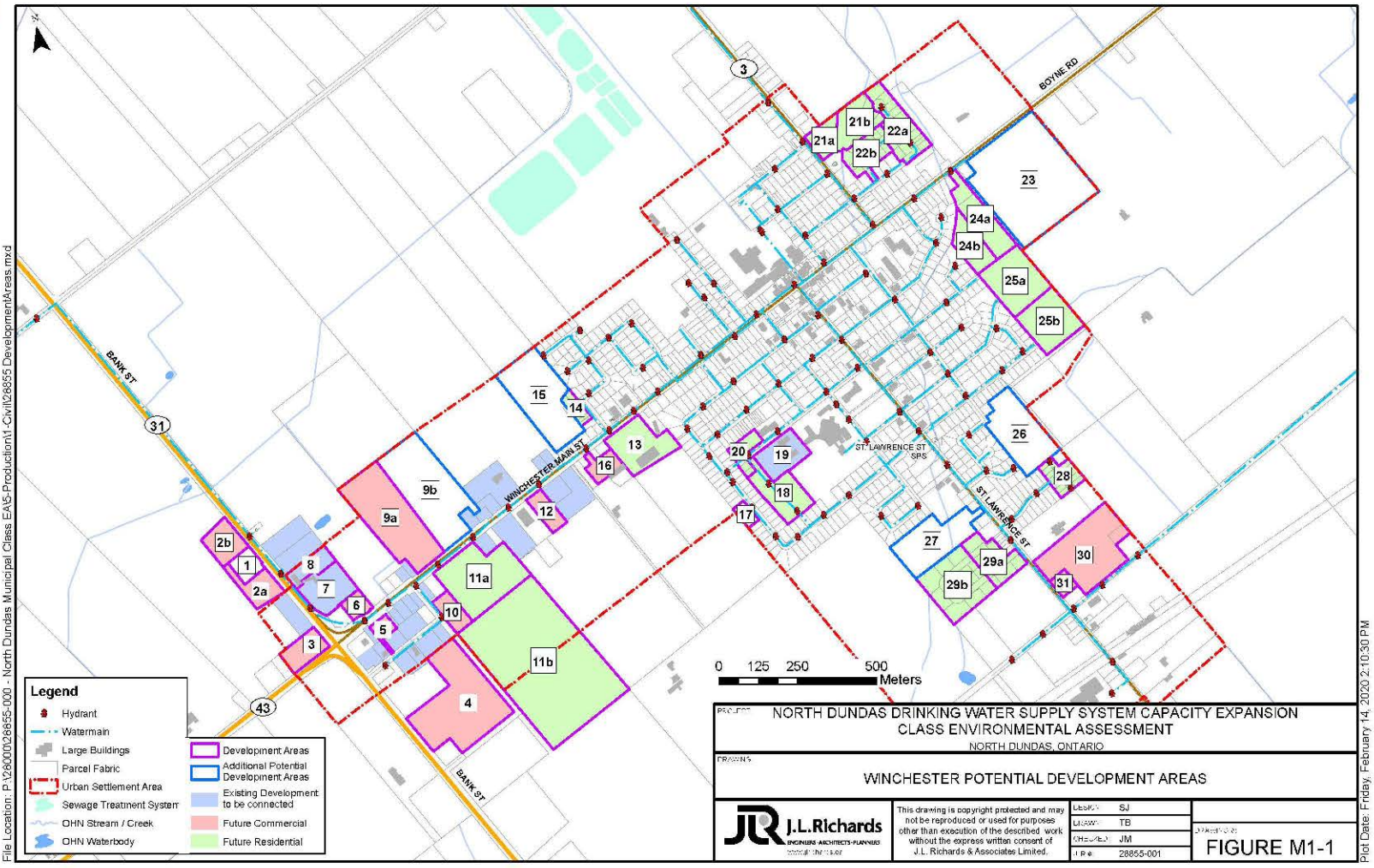
Village	2019 Total Population	Total Projected Population (Low Growth Scenario)	Total Projected Population (High Growth Scenario)
Winchester	2,502	3,630	4,202
Chesterville	1,853	2,409	3,027
TOTAL	**4,355**	**6,039**	**7,229**

Prepared by
J.L. RICHARDS & ASSOCIATES LIMITED

Sara Jamaliniya, M.Eng.

Reviewed by
J.L. RICHARDS & ASSOCIATES LIMITED

Jordan Morrissette, M.Eng., P.Eng.



NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT
NORTH DUNDAS, ONTARIO

WINCHESTER POTENTIAL DEVELOPMENT AREAS

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

DESIGN: SJ
DRAWN: TB
CHECKED: JM
J.R.# 28855-001

FIGURE M1-1

File Location: P:\28000\28855-000 - North Dundas Municipal Class EA\5-Production\1-Civil\28855 DevelopmentAreas.mxd

Plot Date: Friday, February 14, 2020 2:10:30 PM

Appendix E

Geotechnical Technical Memorandum (Golder, March 11, 2020)

GOLDER

TECHNICAL MEMORANDUM

DATE March 11, 2020 **Project No.** 19125451-1

TO Mark Buchanan, P.Eng.
J.L. Richards & Associates Limited

FROM Brian Henderson, P.Eng.
Paul Smolkin, P.Eng.

EMAIL brian_henderson@golder.com
paul_smolkin@golder.com

BASELINE HYDROGEOLOGICAL CONDITIONS
TOWNSHIP OF NORTH DUNDAS MUNICIPAL CLASS EA
FOR THE NORTH DUNDAS DRINKING WATER SUPPLY SYSTEM CAPACITY EXPANSION

1.0 BACKGROUND

This memorandum has been prepared to provide information to support the North Dundas Township Class Environmental Assessment (EA). The EA is being undertaken to provide a solution to address water supply capacity for both residential and industrial use for the future 20-year projection period and provide water supply system reliability over the 20-year future projection period for the Village of Winchester (Winchester) and the Village of Chesterville (Chesterville) in the Township of North Dundas.

The North Dundas Drinking Water System (System) supplies treated water to Winchester and Chesterville. These communities are located approximately 50 kilometres south of the City of Ottawa, within the Township of North Dundas. The System derives its water supply from three communal wells completed in bedrock (Winchester Wells No. 1, 5 and 6), and two well fields completed in overburden sediments, comprised of three communal wells (Winchester Wells No. 7a, 7b, and 7c) and two communal wells (Chesterville Wells No. 5 and 6). The locations of the wells are illustrated on the Site Plan (Figure 1). Each of the bedrock wells and the well fields are equipped with its own disinfection system and pumping facility located in a pump house that either contains the well head (Winchester Wells No. 1, 5, 6 and Chesterville Well No. 5) or is located near the well heads (Chesterville Well No. 6 and Winchester Wells No. 7a, 7b and 7c). The disinfecting system injects sodium hypochlorite solution into the water. The pumping facilities use either a submersible or a turbine pump to deliver water to the distribution system. The Ontario Clean Water Agency (OCWA) is the operating authority of the System.

2.0 REGIONAL SETTING

This section describes the physical setting for the study area on a regional scale.

2.1 Surficial Geology

The topography of the study area is generally flat lying to undulating and ground surface elevations range from approximately 70 to 80 metres above sea level (asl). The study area is located in the physiographic region of the Winchester Clay Plain (Chapman and Putnam, 1984). The stratigraphic sequence is derived from recently deposited materials of glacial, glacio-fluvial and marine origins (Figure 2). Spatially the most dominant units consist of glacial tills and marine clays, with a thickness ranging between a few metres to 20 metres. The glacial

tills in the area tend to be stony and sandy and are generally characterized as silty sands. The basal glacial till is known to contain stringers of sorted sediment that can transmit water at relatively high rates.

There are the occurrences of glacio-fluvial deposits within the area. These long and narrow ice-contact stratified drifts are north-south trending features comprised of well-sorted coarse sands and gravels that deposited in melt-water channels within glaciers that covered the area long ago. The most prominent features within the area are the Morewood Esker (part of the Vars-Winchester Esker Complex and the Maple Ridge Esker.

The Morewood Esker is an extensive north-south linear feature that is some 7.5 kilometres long by approximately 250 metres wide at the surface (average subsurface width of the esker is ~800 metres). The esker material consists of a highly conductive 100 to 200 metre wide esker core of well sorted sand and gravel, cobbly gravels and sandy gravels. The core is flanked by finer soils, grading from sands to silts and clays. The esker is entrenched into the glacial till and its base is generally at or near the underlying bedrock surface; it is frequently overlain by marine clays at the margins. The surficial signature of the esker core is delineated in places by a small topographical ridge reworked by nearshore processes (former beach). Elsewhere the presence of the esker core is only inferred and may be discontinuous in places.

The Maple Ridge Esker is comprised of an assortment of sand, gravel, clay, ice-contact stratified drift, and till. The esker is located approximately 3 kilometres west of Chesterville. Its surface expression is approximately 3 kilometres in length and between 0.2 and 1.5 kilometres wide. The core of the esker consists of coarse sand and gravel with gravel content increasing towards the north. In the southern portion of the esker, glacial till exists between the bedrock and overlying sands and gravels.

2.2 Bedrock Geology

The study area is underlain by flat lying sedimentary bedrock of the Middle to Lower Ordovician Period (Figure 3). The sequence of sedimentary rocks underlying the majority of the study area (from youngest/shallowest to oldest/deepest) have been interpreted to consist of the Bobcaygeon Formation (limestone), Gull River Formation (interbedded silty dolostone and limestone), Rockcliffe Formation (interbedded sandstone, shaley limestone and shale) and Oxford Formation (dolostone; Williams, 1991).

2.3 Hydrogeology

The following sub-sections outline the general characteristics of both the bedrock and overburden aquifers in the study area.

2.3.1 Bedrock Aquifers

Groundwater flow in the bedrock aquifers is controlled by and occurs along and through fractures and bedding plane features (secondary porosity). It has been hypothesized that the contact zone between the upper weathered bedrock surface and the overburden materials (basal till) have an enhanced permeability and thus have a higher hydraulic conductivity than the lower, more massive bedrock.

The Gull River Formation, the most predominant bedrock in the study area, is regionally known to have low transmissivities and potable quality at a regional scale. Yields are usually adequate for private individual well supplies but are not adequate for municipal communal water supply.

The lower formations in the stratigraphic sequence (i.e., Oxford Formation and the underlying Nepean Formation) are regionally known to produce higher well yields. The bedrock municipal wells of Winchester are completed in these deeper bedrock aquifers.

The bedrock aquifers in the study area are largely overlain by several metres of low permeability clays and silts that act as an aquitard by storing water and transmitting it slowly to the aquifer. Thus, the bedrock aquifers in the study area are considered mostly to be confined/semi-confined.

A review of the water level information within the Ministry of Environment Conservation and Parks (MECP) Water Well Information System (WWIS) indicates that, on a regional scale, flow in the bedrock is from south-west to north-east. On a more local scale, groundwater flow in the bedrock is generally towards the rivers that exist within the study area (East Castor River and South Nation River).

Recharge to the bedrock aquifers likely occurs where the bedrock outcrops, where the overburden is thin, or in areas where relatively permeable sediments are in contact with the bedrock. The main recharge areas are expected to be in areas of topographic highs. Some recharge occurs from storage in the overlying aquitard. Recharge through the aquitard may occur in areas of local topographic lows where depression-focused recharge may occur.

2.3.2 Overburden Aquifers

As discussed in Section 2.1, the overburden in the study area is mainly comprised of marine clay and glacial till. The hydraulic conductivity of the clay is very low, and water is transmitted very slowly through the matrix of the clay. The clay is considered an aquitard and not suitable for the development of a high yield water supply. Even though the glacial till has a higher hydraulic conductivity than the marine clays, it is perhaps only capable of providing adequate well yields for a high yield water supply in very localized areas. These high producing areas would have to be identified by chance. The lower portion of the till (basal till) is known to contain coarse-grained sediments, which can have high hydraulic conductivities and at selected locations high producing areas for communal systems have be identified. These high producing areas would again have to be identified by chance. This unit could be targeted by wells penetrating other formations (i.e., glaciofluvial or bedrock) to potentially increase well yields.

The coarse grained glaciofluvial deposits within the Morewood Esker (~8 kilometres northeast of Winchester), and the Maple Ridge Esker (~4.5 kilometres east of Winchester), and potentially the Loughlin Ridge (~11 kilometres west of Winchester) form excellent local aquifers. Wells constructed within these deposits typically have high yields of potable water. The Morewood Esker, the Maple Ridge Esker and the Loughlin Ridge are principally unconfined, but confined conditions persist where the marine clays overlay the coarse-grained materials on the margins of the deposits, or where the deposits are entirely buried (if present). The aquifers are recharged by infiltrating precipitation (diffuse) and by the surface ponds created by gravel extraction operations (local) below the water table. The majority of recharge will occur where the coarse granular central core and sandy flanks of the eskers are exposed at the surface. The permeable material that comprises the core of the eskers is underlain by less permeable till and/or bedrock. Previous hydrogeological evaluations completed for the wellfield in the Morewood Esker (Golder, 2003; Golder and Sauriol, 2005) and the Maple Ridge Esker (Golder, 2003a), indicate that it is likely that the two eskers have some inflow from an adjacent source such as an underlying bedrock aquifer, although this has not been conclusively determined. To our knowledge, the water supply potential in the Loughlin Ridge has not been investigated.

3.0 NORTH DUNDAS DRINKING WATER SYSTEM WELLS

3.1 Winchester Well No. 1

Winchester Well No. 1 is a limestone bedrock well that was drilled in 1958 to a depth of 94.5 metres below ground surface; however, due to issues with high chloride concentrations coming from the lower water bearing zone, a packer was installed at a depth of 57.9 metres to seal off the lower water bearing zone. According to the water well record, there are two water bearing zones located 24.3 metres and 47.5 metres below ground surface.

The permitted pumping rate for the well is 821 cubic metres per day (m^3/day; 9.5 Litres per second (L/s)); however, the operational capacity is between 432 and 516 m^3/day (5 and 6 L/s). The lower operational capacity of the well was determined during a dry period in 1992-1993 where the well was operated for 24 hours per day at 6 L/s and the water level in the well was drawn down to close to the level of the pump. On average in 2018, the pump was operated for approximately 11 hours per day at a rate of 5 L/s resulting in a volume of water taken of approximately 196 m^3/day. The average water level while pumping during this period was approximately 38 metes below ground surface.

Information provided by the Ontario Clean Water Agency (OCWA), the operator of the well, indicated that maintenance and inspections were completed for the well/pump in 2003 and 2009, including cleaning and redevelopment of the well in 2009. The well redevelopment in 2009 was performed with an acid solution designed to clear bacteria and debris from a fracture located at approximately 44 metres below ground surface. The performance improved following the redevelopment. No records were provided for additional cleaning and redevelopment performed since 2009.

A Groundwater Under the Direct Influence of Surface Water (GUDI) study was completed for the well in 2002 (Golder, 2002). The well was determined not to be GUDI based on the criteria defined in the *Terms of Reference for Hydrogeological Study to Examine Groundwater Sources Potentially Under Direct Influence of Surface Water* (MOE, 2001).

3.2 Winchester Well No. 5

Winchester Well No. 5 is a limestone bedrock well that was drilled in 1972 to a depth of 28 metres below ground surface. According to the water well record, there are three water bearing zones located at depths of between 14 to 15.8 metres, 19.5 to 22.9 metres and 24.4 to 28 metres below ground surface.

The permitted pumping rate for the well is 556 m^3/day (6.4 L/s); however, the operational capacity is approximately between 302 and 432 m^3/day (3.5 and 5 L/s). The lower operational capacity of the well was determined during a dry period in 1992-1993 where the well was operated for 24 hours per day at 3.5 L/s and the water level in the well was drawn down to close to the level of the pump. On average in 2018, the pump was operated for approximately 15 hours per day at a rate of 4 L/s resulting in a volume of water taken of approximately 209 m^3/day (averages do not include periods where pump was offline for maintenance). The average water level while pumping during this period was approximately 10 metres below ground surface.

Information provided by OCWA indicated that maintenance and inspections were completed for the well/pump in 2008, 2015, 2017 and 2018. The well was offline from January through late May in 2018 for maintenance.

A GUDI study was completed for the well in 2002 (Golder, 2002). The well was determined to be potentially GUDI based on the criteria defined in MOE, 2001. In a follow-up study (Golder, 2002b), results from particle counting concluded that the aquifer is providing effective in-situ filtration for Winchester Well No. 5.

3.3 Winchester Well No. 6

Winchester Well No. 6 is a limestone bedrock well that was drilled in 1982 to a depth of 15.9 metres below ground surface. According to the water well record, there is one water bearing zone located between 12.2 to 15.2 metres below ground surface.

The permitted pumping rate for the well is 982 m^3/day (11.4 L/s); however, the operational capacity is approximately between 475 and 778 m^3/day (5.5 and 9 L/s). The lower operational capacity of the well was determined during a dry period in 1992-1993 where the well was operated for 24 hours per day and eventually had to have the rate reduced to below 5.5 L/s. The well has shown to be very sensitive to precipitation, causing the water levels to be much lower during the drier summer months, which is the reason for the large range in operational capacity. On average in 2018, the pump was operated for approximately 15 hours per day at a rate of 5.9 L/s resulting in a volume of water taken of approximately 318 m^3/day. The average water level while pumping during this period was approximately 6 metres below ground surface.

Information provided by OCWA indicated that maintenance and inspections were completed for the well/pump in 2003, 2015 and 2017. The well was cleaned in 2011 using high pressure air.

A GUDI study was completed for the well in 2002 (Golder 2002). The well was determined to be potentially GUDI based on the criteria defined in MOE, 2001. In a follow-up study (Golder 2002b), results from particle counting concluded that the aquifer is providing effective in-situ filtration for Winchester Well No. 6.

3.4 Winchester Well Field No. 7

In 1989 and 1990, Golder undertook a series of studies in an effort to identify potential additional municipal groundwater supplies for Winchester. As part of a hydrogeological review, two areas were identified as having potential for development; one area in bedrock, and the other in overburden (Golder, 1989). After completing hydrogeological testing on the two locations (Golder, 1990), it was found that the groundwater from a well constructed in the bedrock area was not of sufficient quantity or quality for a municipal supply. An existing well constructed in the overburden area could not produce the required quantity, but the quality was suitable for a municipal supply. Further investigations in the overburden area, based on the results of hydrogeological testing, led to the development of Winchester Well Field No. 7.

Winchester Well Field No. 7 is comprised of three overburden wells (7a, 7b and 7c) drilled between 1994 and 1996. Winchester Wells No. 7a, 7b and 7c are completed in the Morewood Esker with screen lengths of 6 metres, 4.6 metres and 4.6 metres, respectively. The well schematics indicate that the bottom of the screens are located at approximately 11.8 metres below ground surface for Winchester Well No. 7a and 11 metres below ground surface for Winchester Wells No. 7b and 7c.

Currently only Winchester Wells No. 7b and 7c are operated and Winchester Well No. 7a serves as a standby well because it is less efficient than Winchester Wells No. 7b and 7c. Previously Winchester Well No. 7c was operated as the standby well due to elevated concentrations of manganese, but it was brought back online in 2011 to replace the less efficient Winchester Well No. 7a. Winchester Well Field No. 7 was designed to have two of the three pumps running at one time, but currently only one of Winchester Wells No. 7b or 7c is being operated at one time on a weekly rotation.

Golder performed a 30-day pumping test at Winchester Well No. 7a in 1995 (Golder, 1995) at a pumping rate of 2,127 m^3/day (24.6 L/s), which estimated the transmissivity of the overburden aquifer to be 1,100 m^2/day with a

storage coefficient between 0.02 to 0.32. Drawdowns in excess of 1 metre were limited to a zone of about 130 metres from the test well. The point of zero drawdown was estimated to be located 3,500 metres from the test well. The study concluded that the safe yield of the aquifer would range from 2,252 to 2,380 m^3/day (26.1 to 27.5 L/s).

After Winchester Wells No. 7b and Well 7c were added, the well field was operated at a daily taking of approximately 1,944 m^3/day (22.5 L/s). In 2003, a hydrogeological study concluded that the capacity of Winchester Well Field No. 7 could be increased to 2,169 m^3/day (25.1 L/s) without affecting the Morewood Esker over a twenty-year period (Golder 2003).

The current permitted pumping rate for the well field is 1,950 m^3/day (22.5 L/s) and it is operating at the current permitted pumping rate. On average in 2018, the pump was operated for approximately 16 hours per day at a rate of 17 L/s resulting in a volume of approximately 970 m^3/day. In 2018, the average water level at Winchester Well No. 7b during periods of pumping was approximately 6 metres below ground surface.

Information provided by OCWA indicated that maintenance and inspections at the well field include the redevelopment of Winchester Well No. 7a in 2007 and pump replacements at Winchester Wells No. 7b and 7c in 2013 and 2010, respectively.

A GUDI study was completed for the wells in 2002 (Golder, 2002). Winchester Wells No. 7b and 7c were determined not to be GUDI, whereas Winchester Well No. 7a was determined to be potentially GUDI based on the criteria defined in MOE, 2001. In a follow-up study (Golder, 2002b), results from particle counting concluded that the aquifer is providing effective in-situ filtration for Winchester Well No. 7a.

3.5 Chesterville Well No. 5

Chesterville Well No. 5 is an overburden well drilled in 1989 to a depth of 12.19 metres below ground surface. The well is completed in the Maple Ridge Esker with a screen interval from 9.14 to 12.19 metres below ground surface.

Based on a 72-hour pumping test performed by Morrison Beatty in 1989, transmissivity of the overburden aquifer in the area of the well was estimated to be between 1,000 and 2,000 m^2/day. The storativity of the aquifer sediments was estimated to be 0.005. The report concluded that the well could produce up to 22.7 L/s, and that the water quality was good.

In 2005, a 30-day pumping test was completed at Chesterville Wells No. 5 and 6 to gain a better understanding of the long-term yield of the aquifer (Golder, 2005). During the test, Chesterville Wells No. 5 and 6 were simultaneously pumped at rates of 17 to 20 L/s and 29.3 L/s, respectively, for the initial 25 days, and then at rates of 16.5 and 22.7 L/s, respectively, until the end of the test. Based on the results of the test, it was concluded that the long-term aquifer yield is at least 3,456 m^3/day (40 L/s). A yield of 4,320 m^3/day (50 L/s) may be sustainable for several weeks. The program also indicated that Chesterville Well No. 5 is relatively inefficient, and efforts to rehabilitate the well should be undertaken.

The permitted pumping rate for the well is 1,960 m^3/day (22.7 L/s), and the operational capacity is between 1,296 and 1,469 m^3/day (15 and 17 L/s). On average in 2018, the pump was operated for approximately 7 hours per day at a rate of 16.4 L/s resulting in a volume of approximately 412 m^3/day. In 2018, The average water level during periods of pumping was approximately 5.5 metres below ground surface.

Information provided by OCWA indicated that the well inspection and maintenance plan requires well inspections to be completed semi-annually, camera inspections and pumping tests to be completed every 5 years and pump inspections to be completed every 10 years. A camera inspection of Chesterville Well No. 5 was completed in 2005 that showed the screen was badly plugged. The recommendation from the contractor was that the well required cleaning and rehabilitation. Another camera inspection was completed in 2019 that showed the casing was in poor condition and the screen required cleaning.

A GUDI study was completed for the well in 2002 (Golder, 2002a). Chesterville Well No. 5 was determined to be potentially GUDI based on the criteria defined in MOE, 2001. In a follow-up study (Golder, 2002c), results from particle counting concluded that the aquifer is providing effective in-situ filtration for Chesterville Well No. 5.

3.6 Chesterville Well No. 6

Chesterville Well No. 6 is an overburden well drilled in 2003 to a depth of 9.75 metres below ground surface. The well is completed in the Maple Ridge Esker with a screen interval from 5.2 to 8.3 metres below ground surface. The well was deepened in 2005 by approximately 2 metres.

The permitted pumping rate for the well is 2,615 m^3/day (30.3 L/s), and the operational capacity is between 1,728 and 1,987 m^3/day (20 and 23 L/s). The pumping rate in 2018 was variable, but generally was either 18 L/s or 11 L/s. On average in 2018, the pump was operated for approximately 11 hours per day at a rate of 15.5 L/s resulting in a volume of approximately 624 m^3/day. In 2018, the average water level during periods of pumping was approximately 5.5 metres below ground surface.

In 2003, Golder conducted a 72-hour pumping test at a pumping rate of 30.3 L/s (Golder, 2003a). The transmissivity of the overburden aquifer was estimated to be 1,300 m^2/day and the specific yield was 0.045. The final measured drawdown at the pumping well was 2.13 metres and the calculated well efficiency was 97%. During the testing, only minor interference from pumping at Chesterville Well No. 5 was observed in Chesterville Well No. 6. The long-term capacity of Chesterville Well No. 6 was conservatively evaluated at 2,290 m^3/day (26.5 L/s).

In 2005, a 30-day pumping test was completed at Chesterville Wells No. 5 and 6 to gain a better understanding of the long-term yield of the aquifer (Golder, 2005). During the test, Chesterville Wells No. 5 and 6 were simultaneously pumped at rates of 17 to 20 L/s and 29.3 L/s, respectively, for the initial 25 days, and then at rates of 16.5 and 22.7 L/s, respectively, until the end of the test. Based on the results of the test, it was concluded that the yield of Chesterville Well No. 6 was at least 2,592 m^3/day (30 L/s), and the long-term aquifer yield is at least 3,456 m^3/day (40 L/s). A yield of 4,320 m^3/day (50 L/s) may be sustainable for several weeks.

Information provided by OCWA indicated that the well inspection and maintenance plan requires well inspections to be completed semi-annually, camera inspections and pumping tests to be completed every 5 years and pump inspections to be completed every 10 years. Chesterville Well No. 6 consistently has issues with fouling and the screen and gravel pack becoming plugged with hydrogen sulfide bacteria. As a result of this, the well is often operated at a reduced capacity. The well screen was cleaned in 2015, which reportedly improved the well performance from 6 L/s per metre of drawdown to 13.6 L/s per metre of drawdown. Further rehabilitation was performed on the well in 2018 that improved the specific capacity to 20.7 L/s per metre of drawdown, which is close to the original performance level of the well.

A GUDI study was completed for the well in 2005 (Golder, 2005a). Chesterville Well No. 6 was determined to be potentially GUDI based on the criteria defined in MOE, 2001; however, results from particle counting concluded that the aquifer is providing effective in-situ filtration for Chesterville Well No. 6.

3.7 Well Summary

A summary of the pumping rates for the wells included in the System are provided in the following table:

Table 1: North Dundas Drinking Water Wells System Water Taking Summary

Well Name	Tested Rate (L/s)	Maximum Permitted Pumping Rate (L/s)	Existing Operational Pumping Rate in Dry/Wet Conditions (L/s)	Average Pumping Rate of Taking in 2018 (L/s)
Winchester Well No. 1	N/A	9.5	5 / 6	5
Winchester Well No. 5	N/A	6.4	3.5 / 5	4
Winchester Well No. 6	N/A	11.4	5.5 / 9	5.9
Winchester Wells No. 7a-c	26.1 - 27.5	22.5	22.5 / 22.5	17.0
Chesterville Well No. 5	40	22.7	15 / 17	16.4
Chesterville Well No. 6		30.3	20 / 23	15.5
Total	**N/A**	**102.8**	**71.5 / 82.5**	**63.7**

Results from aquifer testing are not available for Winchester Wells No. 1, 5 and 6; therefore, the capacity of the aquifer is not known at these well locations. The wells are operated below the maximum permitted rate (existing operational pumping rate) due to past experience in operating the wells.

Winchester Wells No. 7a, 7b and 7c are operated at the maximum permitted rate (when pumping); however, the maximum permitted rate is below the results obtained from aquifer testing. Chesterville Wells No. 5 and 6 are both operated below the maximum permitted rate; however, during wet conditions, the wells (combined) are operated at the maximum tested rate for the aquifer.

The average 2018 pumping rates are below both the permitted and operational pumping rates at Winchester Wells No. 7 a-c and Chesterville Well No. 6.

In all cases, the wells are only pumped as required by demand in the system and as such do not operate 24 hours per day.

3.8 Water Quality

The 2018 Annual Report (OCWA, 2019) for the System indicated that the water quality is good, with occasional detections of non-pathogenic bacteria in raw water supply. Water treatment was sufficient to reduce these detections to below the Ontario Drinking Water Quality Standards ("ODWQS"; MOE, 2003). Based on the testing completed by OCWA under Ontario Regulation 170/03, inorganic and organic parameters met the standards.

4.0 WELLHEAD PROTECTION AREAS

As part of the source protection planning exercise undertaken by the Raisin Region Conservation Authority ("RRCA") and South Nation Conservation ("SNC") an Assessment Report for the South Nation Source Protection Area was completed. As part of the Assessment Report, a Wellhead Protection Area (WHPA) Study and a vulnerability assessment was completed for each of the Winchester and Chesterville wells.

The following four wellhead protection zones were defined for each well:

- Zone A – 100 metre radius pathogen security/prohibition zone
- Zone B – 2-year horizontal Time of Travel (ToT) pathogen management zone
- Zone C – 5-year ToT DNAPL/contaminant protection zone
- Zone D – 25-year ToT secondary protection zone

These zones are used to assist in identifying the various levels of potential risks faced by municipal supply wells from pathogens and chemical contaminants. Figure 4 shows the capture zones that make up the WHPAs for each of the wells in the System.

A vulnerability assessment was also completed on the wells to establish a vulnerability score based on the time required for water to reach the well from the surface. Generally, areas where water takes a relatively shorter time to reach the well are considered more vulnerable.

The following activities were identified as threats to the combined groundwater supply wells (i.e., within the WHPAs developed for the individual wells (SNC and RRCA, 2016).

- the application of agricultural source material to land
- the application of non-agricultural source material to land
- the application of pesticide to land
- the establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage (i.e., septic systems)
- the handling and storage of a dense non-aqueous phase liquid
- the handling and storage of an organic solvent
- the handling and storage of commercial fertilizer
- the handling and storage of fuel
- the handling and storage of pesticide
- the storage of agricultural source material
- the use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard.
- agricultural source material generation

5.0 ISSUES AND CONSTRAINTS

The overall objective of the North Dundas Township Class EA is to provide a solution to address water supply capacity for both residential and industrial use for the future 20-year projection period and provide water supply system reliability over the 20-year future projection period. Should the solution require additional groundwater wells, the following issues and constraints should be considered.

5.1 Wellhead Protection Areas

If an increase to the water taking from existing wells or if an additional groundwater source is identified as the preferred alternative to increase water capacity in the System, amending or updating the existing vulnerable areas (WHPA) will be required. The Source Protection Plan (SNC and RRCA, 2016a) will also require updating to reflect any changes.

5.2 Existing and Historic Potential Sources of Contamination

An active landfill (Boyne Road Landfill) exists within the existing WHPA-D of the Chesterville wellfield. Expansion of this wellfield (if chosen as a preferred alternative) will continue to include the landfill within the WHPA. Currently, the Source Protection Plan (SNC and RRCA, 2016a) for the Chesterville wellfield indicates that the provincial policies concerning waste only apply to WHPAs A and B and portions of WHPA-C for which the vulnerability score is 8 or higher. Waste sites are not prohibited within WHPA-D. Changes to the overall WHPA for the well field (if required) may alter the shapes of the individual WHPAs or the vulnerability scores within the WHPA.

A second source of potential contamination for the Chesterville wellfield is the pits created by sand and gravel extraction located to the west and southwest of the wellfield. Previous aquifer testing has demonstrated that the closest pit is hydraulically connected to the municipal wells, and supplied water, although indirectly, to the wells during the test (Golder, 2005). It is assumed, based on the interpreted radius of influence of the municipal wells, that other pits in the area are also hydraulically connected to the water supply. While the extraction of sand and gravel does not in itself pose a significant threat to the wells, the extraction machinery requires fuel, and presence of fuel storage and/or dispensing outlets could raise concerns about impact from potential spills or leaks.

Although no impacts to water quality have been observed to date, existing sewage systems, graveyards and farming operations may also pose potential threats to any future expansion of the System.

5.3 Impacts to Local Wells

A site-specific hydrogeological assessment of the preferred site would likely be required to confirm the available groundwater quantity and quality for a municipal well, and to demonstrate the potential effects of the proposed development, if any, on existing individual wells in the area.

5.4 Geotechnical Considerations

Lowering of the groundwater levels in a sand and gravel esker from a groundwater supply well may result in a lowering of pore pressures in the silty clay layer or deposit above and on the flanks of the esker. This lowering of pore pressures will result in an increase in effective stress and consolidation of the clay. This consolidation will result in settlement of the ground surface in the area affected by groundwater drawdown. Although consolidation and settlement of the sand, sand and gravel esker and glacial till layers would also be expected due to changes in groundwater levels, the magnitudes of these settlements would be expected to be very small compared to the settlements in the clay layer.

If a groundwater source is chosen as a preferred alternative for an increased water supply, consideration should be given to the potential of settlement due to groundwater lowering.

6.0 LIMITATIONS AND USE OF MEMORANDUM

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7.0 CLOSURE

We trust this memorandum meets your current requirements. Should you have any questions regarding this memorandum, please contact the undersigned.

Golder Associates Ltd.

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https://goldersassociates.sharepoint.com/sites/111069/project files/6 deliverables/phase 1/final/19125451-1-tm-rev0_existing_conditions_11mar2020.docx

Attachments: Figure 1: Site Plan
Figure 2: Surficial Geology
Figure 3: Bedrock Geology
Figure 4: Wellhead Protection Areas

8.0 REFERENCES

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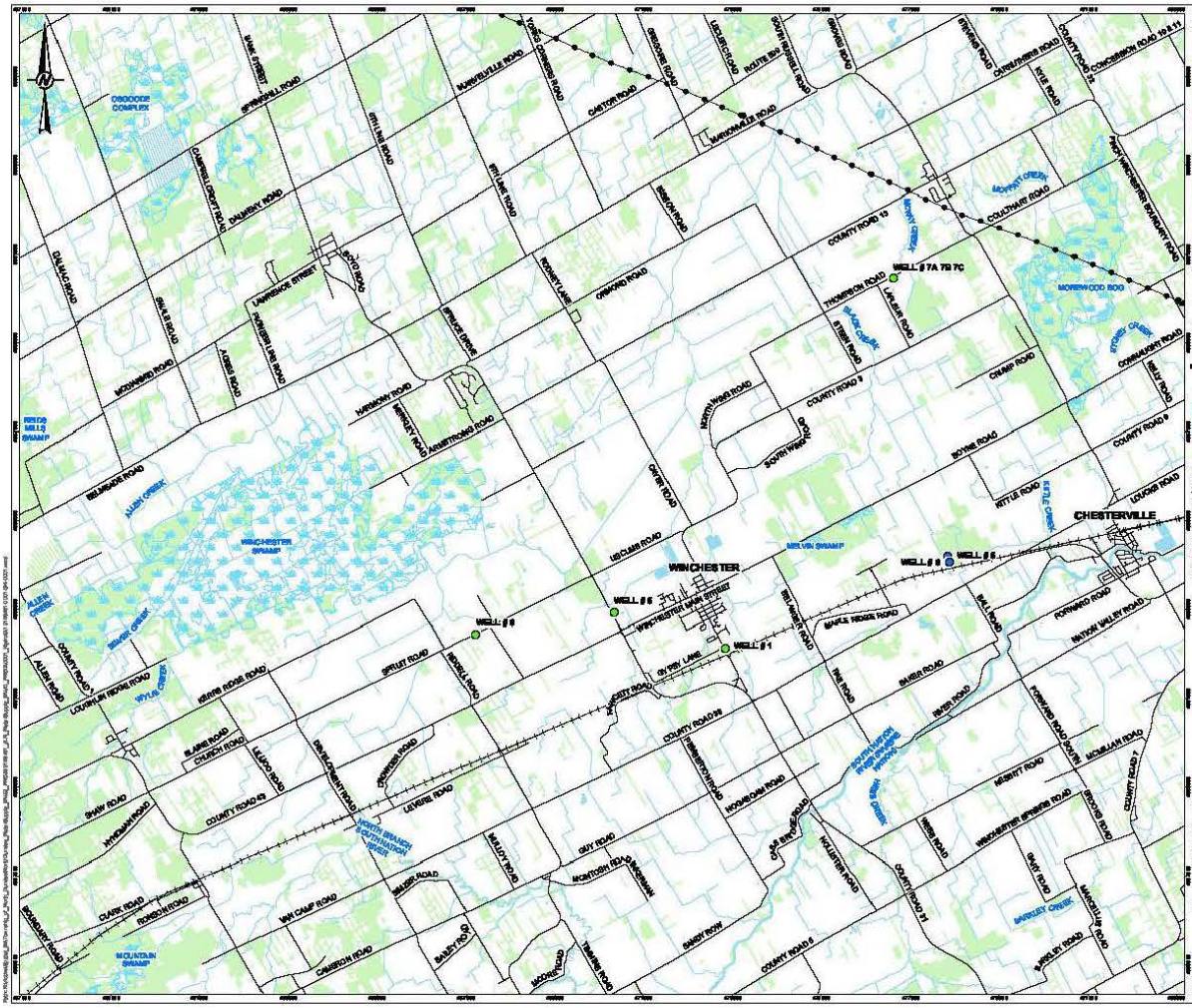

KEY MAP

SCALE 1:1,750,000

LEGEND

- CHESTERVILLE WELL LOCATION
- WINCHESTER WELL LOCATION
- ROADWAY
- RAILWAY
- UTILITY LINE
- WATERCOURSE
- WATERBODY
- WETLAND
- WOODED AREA

NOTES

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCES

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEEN'S PRINTER 2018
2. WELLHEAD PROTECTION AREAS (SOURCE) FROM SOUTH NATION CONSERVATION GEOPORTAL WEBSITE
3. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
4. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 1,000 2,000 4,000

1:50,000 METRES

CLIENT

J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT

TOWNSHIP OF NORTH DUNDAS WATER SUPPLY MUNICIPAL CLASS EA

TITLE

SITE PLAN

CONSULTANT

GOLDER

YYYY-MM-DD	2019-03-11
DESIGNED	—
PREPARED	BR
REVIEWED	RH
APPROVED	PAS

PROJECT NO.	CONTROL	REV.	FIGURE
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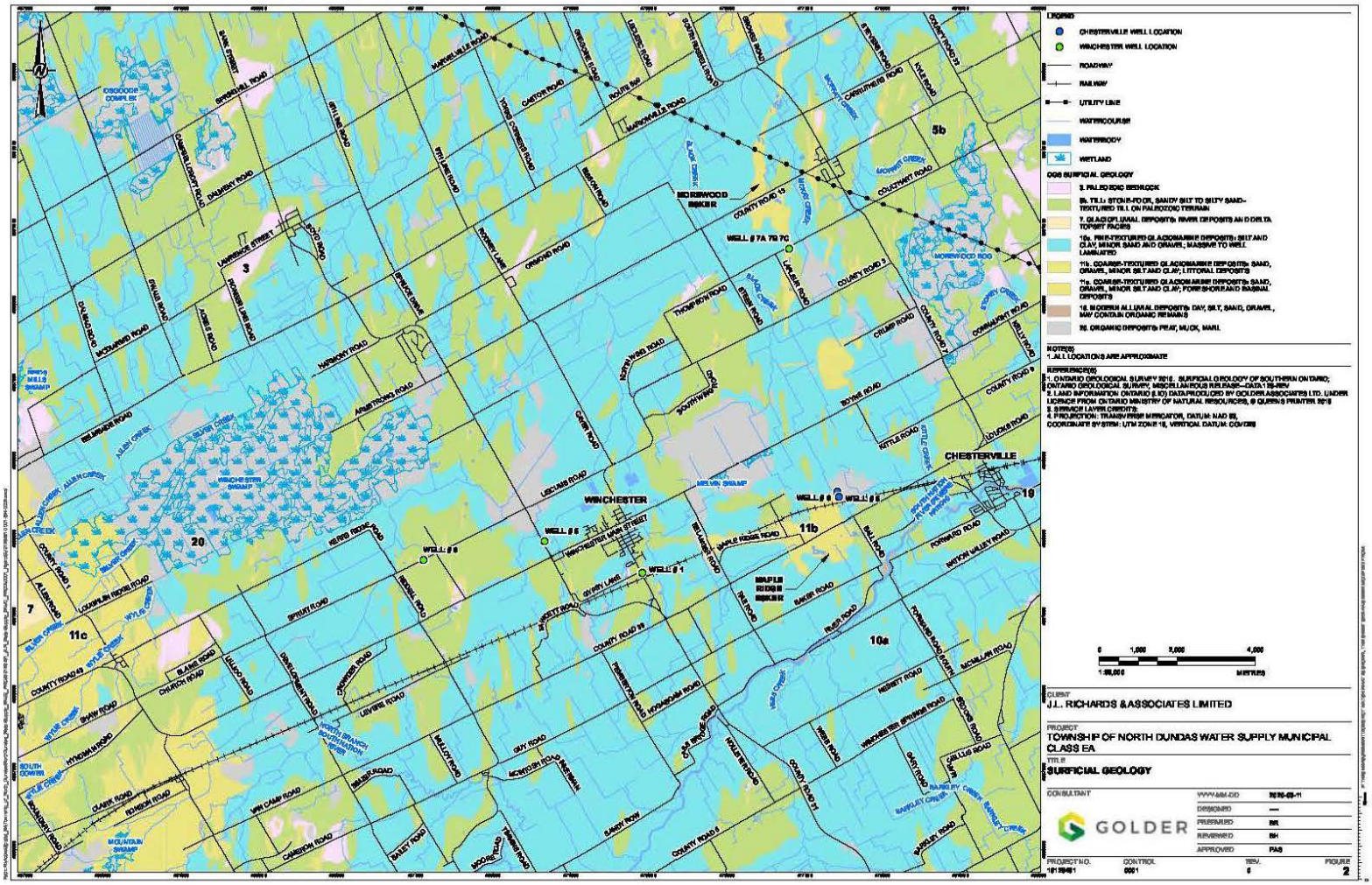

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
TOWNSHIP OF NORTH DUNDAS WATER SUPPLY MUNICIPAL CLASS EA

TITLE
SURFICIAL GEOLOGY

CONSULTANT
GOLDER

YYYY-MM-DD	2019-03-11
DESIGNED	—
PREPARED	BR
REVIEWED	BH
APPROVED	PAS

PROJECT NO.	CONTROL	REV.	FIGURE
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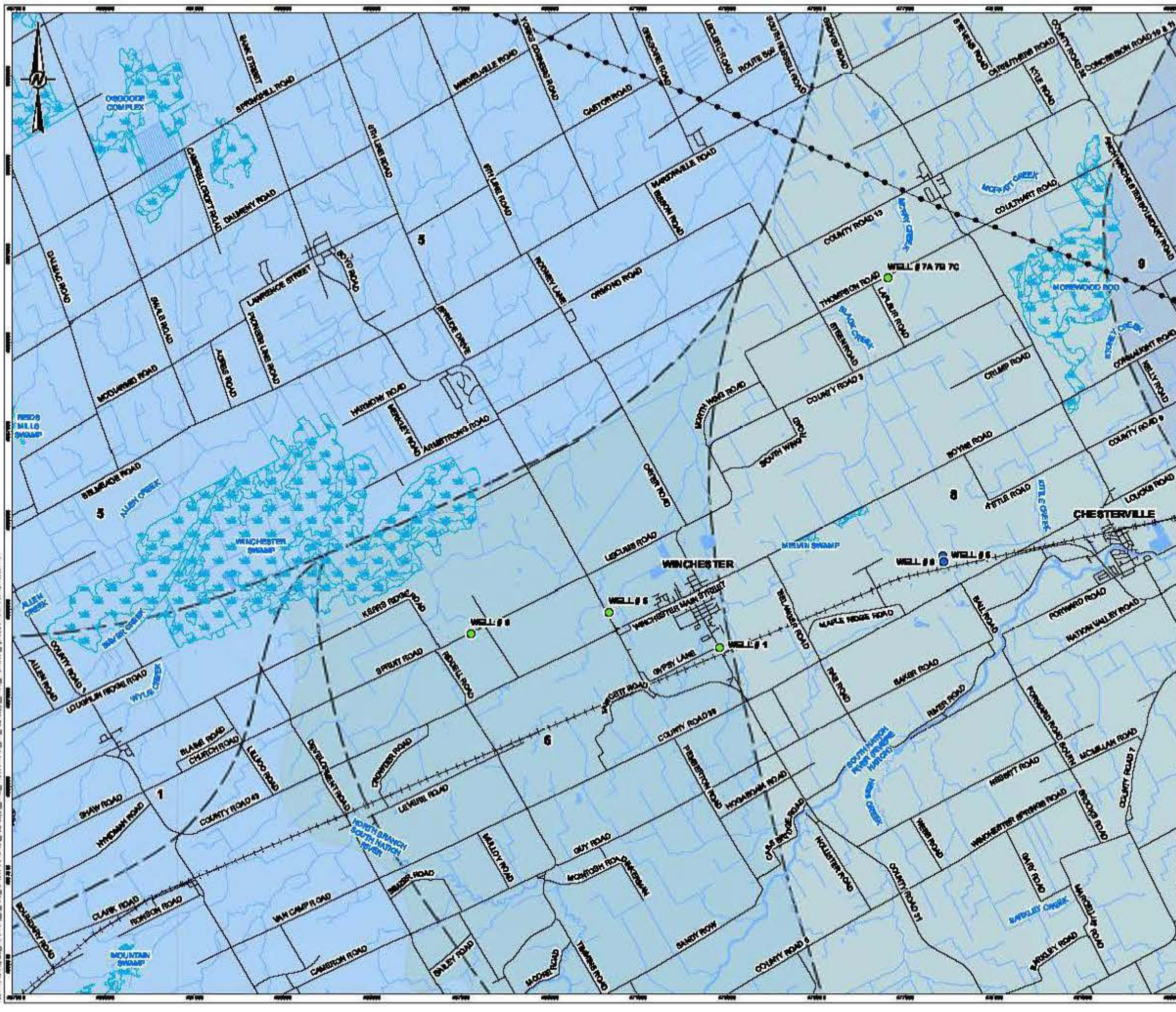

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. ARMSTRONG, D.K. AND DODGE, J.E.P. 2007. PALEOZOIC GEOLOGY OF SOUTHERN ONTARIO; ONTARIO GEOLOGICAL SURVEY, MISCELLANEOUS RELEASE—DATA 219
2. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2019
3. SERVICE LAYER CREDITS:
4. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 1,000 2,000 4,000
1:50,000 METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
TOWNSHIP OF NORTH DUNDAS WATER SUPPLY MUNICIPAL CLASS EA

TITLE
BEDROCK GEOLOGY

CONSULTANT
GOLDER

YYYY-MM-DD	2020-03-11
DESIGNED	—
PREPARED	BR
REVIEWED	BH
APPROVED	PAS

PROJECT NO.	CONTROL	REV.	FIGURE
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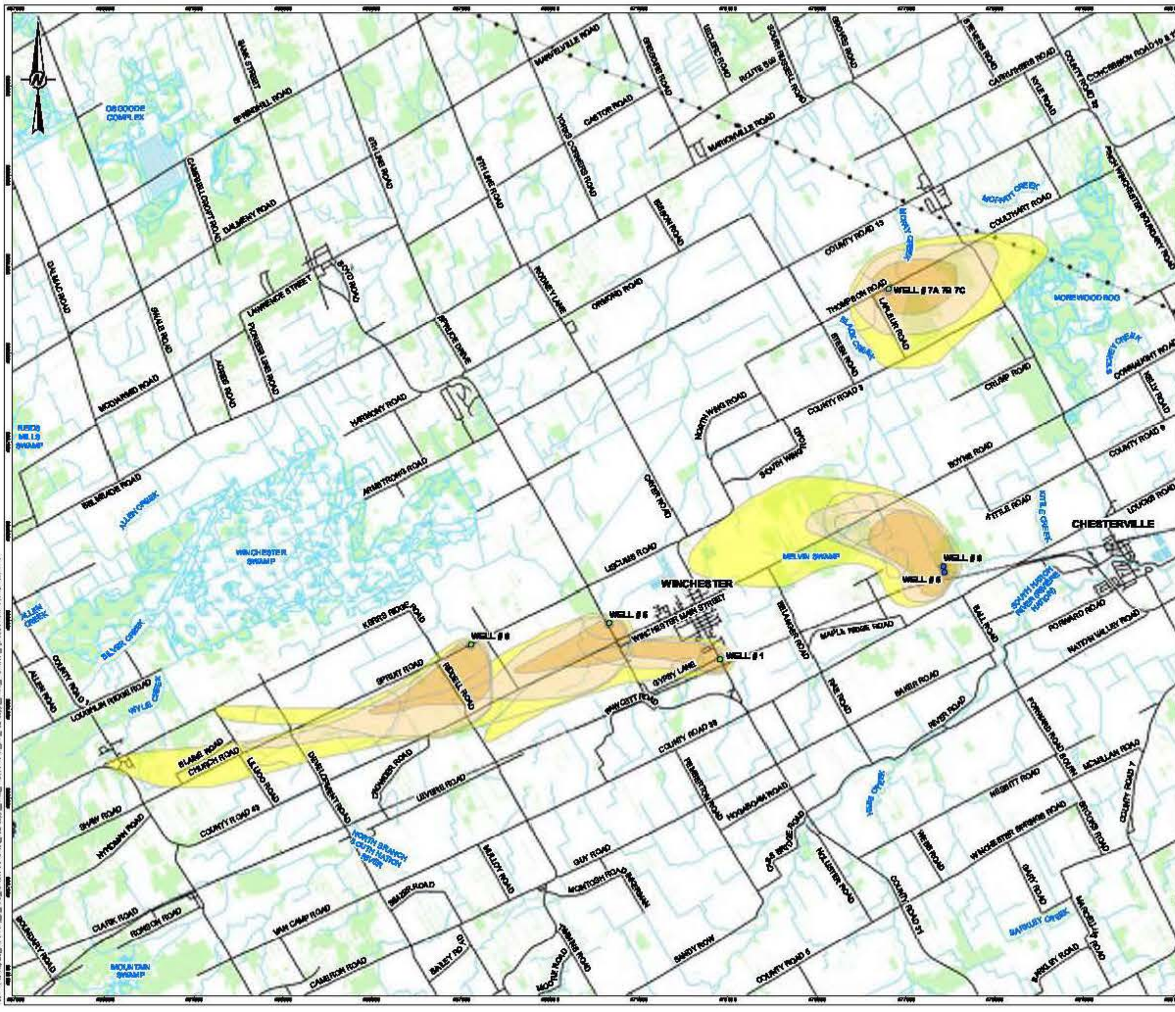

LEGEND

- CHESTERVILLE WELL LOCATION
- WINCHESTER WELL LOCATION

DRINKING WATER SOURCE PROTECTION AREAS

- WELLHEAD PROTECTION AREA (WHPA) A
- WELLHEAD PROTECTION AREA (WHPA) B
- WELLHEAD PROTECTION AREA (WHPA) C
- WELLHEAD PROTECTION AREA (WHPA) D
- ROADWAY
- RAILWAY
- UTILITY LINE
- WATERCOURSE
- WATERBODY
- WETLAND
- WOODED AREA

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2019
2. WELLHEAD PROTECTION AREAS DIGITIZED FROM SOUTH NATION CONSERVATION GEOPORTAL WEBSITE.
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0 1,000 2,000 4,000
METRES

CLIENT
J.L. RICHARDS & ASSOCIATES LIMITED

PROJECT
TOWNSHIP OF NORTH DUNDAS WATER SUPPLY MUNICIPAL CLASS EA

TITLE
WELLHEAD PROTECTION AREAS

CONSULTANT
GOLDER

YYYY-MM-DD	2020-03-11
DESIGNED	---
PREPARED	BR
REVIEWED	BH
APPROVED	PAS

PROJECT NO.	CONTROL	REV.	FIGURE
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