WATER SUPPLY ASSESSMENT

LARRY ROBINSON ARENA

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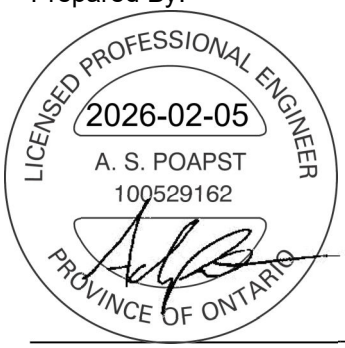
Project# 23211 | December 18th, 2025
Prepared for The City of Ottawa
Revision #1 – Issued for Site Plan Control

This report is respectfully submitted to the City of Ottawa in response to the request for engineering services scope of work for the Hydrogeological Study on the existing water supply servicing the Larry Robinson Arena.

Prepared By:



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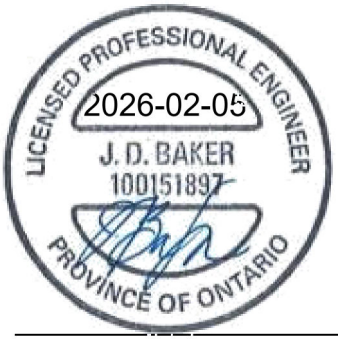

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Date	Revision #	Issued For	Revision Details
2025-11-11	0	Site Plan Control	
2025-12-18	1	Site Plan Control	Revised per City Comments

1 INTRODUCTION

This Hydrogeological Study report has been prepared by EVB Engineering on behalf of the City of Ottawa (the City) in support of the proposed addition to the Larry Robinson Arena, located at 2785 8th Line Road, Metcalfe Ontario.

The follow report provides a summary of the objectives and background for the project, the development of the site characterization, including geology and hydrogeology of the site, followed by the site development concept, with respect to existing private water supply.

1.1 OBJECTIVES

The general objectives of this Water Supply Assessment is to review the existing water supply well's water quality and quantity for compliance with the Ontario Drinking Water Standards and the water supply requirements of the City of Ottawa Guidelines. The basis for the water supply assessment of the Larry Robinson Arena is described in the City of Ottawa's Hydrogeological and Terrain Analysis Guidelines (2021), Section 5.0 Site Plans.

To determine whether the existing well is capable of producing a sufficient quantity and quality of water, the production of the well is assessed through water quality testing and pumping tests as per Section 5.2.2 of the guideline, which states that "wells must be pumped at a rate at least equal or greater than the proposed maximum day water demand" for a period of 8 hours, or 12 hours if the design flow exceeds 10,000 L/d.

As there is no historical water use data available, the maximum design daily sewage flow can be used to determine the required water pumping rates.

The objective of this document are to:

- Present the existing/proposed site plan.
- Provide an understanding of the existing subsurface geological and hydrogeologic conditions in order to support the facility and evaluation of the existing water works.
- Provide a comparison of the historical water demand and proposed water demand at the Larry Robinson Arena.
- Provide a detailed assessment of the existing water supply, constructed details and water quality based on testing of the water supply well.
- Present area/regional water safety/security concerns, as well as present recommendations to bring the existing water supply into compliance with the noted guidelines.

2 SITE CHARACTERIZATION

2.1 SURFICIAL AND BEDROCK GEOLOGY

2.1.1 REGIONAL SURFICIAL GEOLOGY

Figure 2-1 presents a snapshot from The Surficial Geology of Southern Ontario Mapping (Ontario Geological Survey, 2003) for the subject area. The mapping depicts that the representative soil deposits in the subject area is comprised of a mixture of coarse-textured glaciomarine deposits consisting of sand, gravel, minor silt and clay, and bedrock drift complex in Paleozoic terrain. Additionally, organic deposits, ice-contact stratified deposits, till, and fine-textured glaciomarine deposits are present in the area.

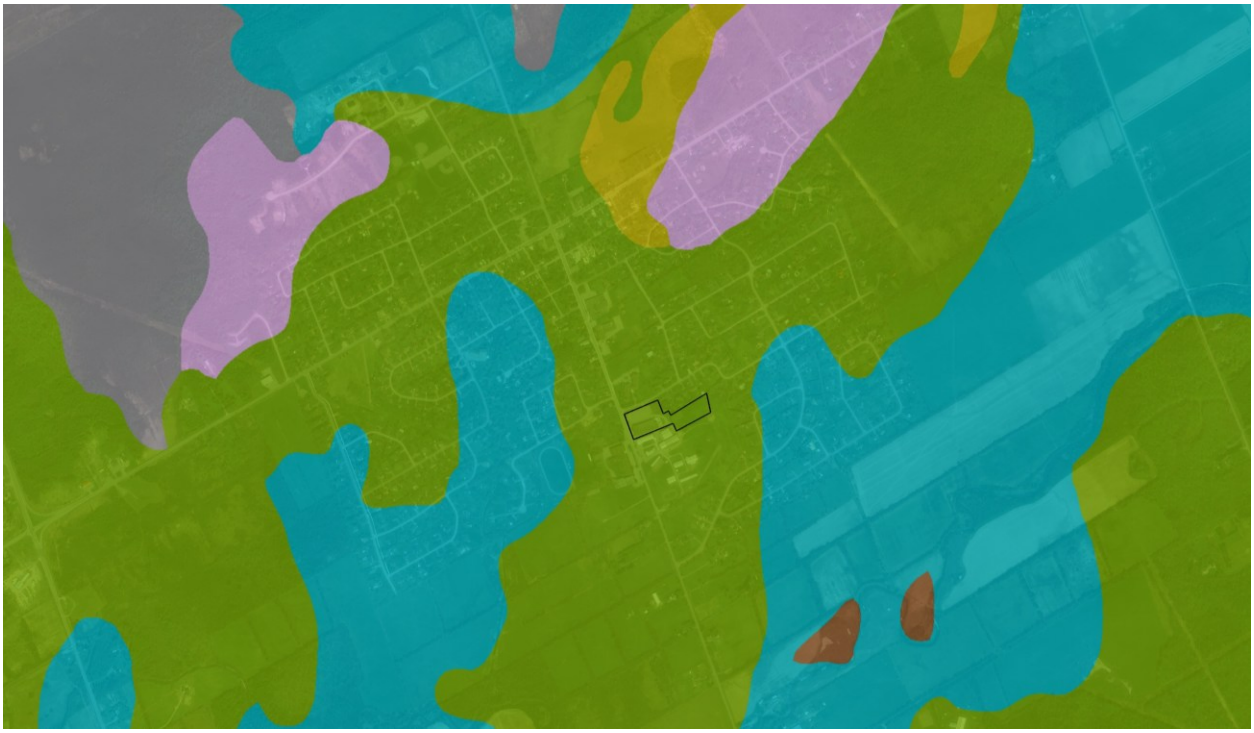


FIGURE 2-1: SURFICIAL GEOLOGY (MRD 128)

Map Colour	Soil Description
Green	Till – stone poor sandy silt to silty sand textured till on Paleozoic Terrain
Light Blue	Fine-textured glaciomarine deposits – silt & clay, minor sand & gravel. Massive to well laminated
Yellow	Coarse-textured glaciomarine deposits – sand, gravel, minor silt and clay. Deltaic deposits
Pink	Bedrock-drift complex in Paleozoic terrain
Brown	Modern alluvial deposits – clay, silt, gravel, may contain organic remains
Grey	Organic deposits – peat, muck, marl

2.1.2 REGIONAL BEDROCK GEOLOGY

Figure 2-2 presents a snapshot from the mapping from the Ministry of Energy, Northern Development and Mines (MRD 126), which indicates that the subject area is predominantly underlain by the bedrock in the Lower Ordovician age. The bedrock is classified in the Beekmantown group and consists of dolostone and sandstone.

FIGURE 2-2: BEDROCK GEOLOGY (MRD 128)

Map Colour	Bedrock Description
Lower Ordovician	
Blue	Oxford Formation – dolostone, minor shale and sandstone – Beekmantown Group

2.1.3 LOCAL GEOLOGY

The local surficial and bedrock geology of the site has been inferred from the local well records accessed through the Ministry of Environment, Conservation and Parks Water Well Information System (WWIS)[1] and the geotechnical borehole program. The MECP's WWIS identified 89 drilled wells located within 500 m of the subject property, the well records have been summarized and tabulated in Table A-1 (Appendix A).

LOCAL SURFICIAL/BEDROCK GEOLOGY

Based on the well record data, the local surficial and bedrock geology may be generally described by the following classifications:

Unit	Description	Depth (m b.g.s.)	Thickness (m)
Overburden	Sand / Clay / Hardpan	0 – 15.5 m b.g.s.	5.0 m +/- 3.4 m
Bedrock	Limestone	0 – 134.4 m b.g.s.	-

The well records indicate that the area is covered by a thin layer of overburden material consisting of a mixture of clay and hardpan with some gravel and sand. This overburden layer ranges in thickness from approximately 0 to 5.0 m, with some wells indicating 10 - 15 m in thickness.

The local bedrock is described as sandstone and limestone throughout the well records with an average depth to bedrock of 5.4 m, with some areas having bedrock outcrops at the ground surface. The wells indicated in the WWIS database were all terminated within the bedrock layer at an average depth of 25 m b.g.s.

[1] https://www.ontario.ca/environment-and-energy/map-well-records, accessed September 24, 2024

Geotechnical Investigation (EVB)

On March 24th and 25th, 2025, EVB was on-site to install a series of monitoring wells around the site using a track mounted drill rig supplied by Downing Well Drilling. Soil samples were inspected using a 50mmØ split spoon (SS) sampler. Split spoon samples indicated the underlying soil consisted of a silty clay material. Bedrock was encountered 1.63 to 1.81 m b.g.s.

Five overburden monitoring wells were installed at a depth of 1.6 to 1.8 m b.g.s. and 3 shallow bedrock monitoring wells were installed at a depth of 4.5 to 4.9 m b.g.s. The monitoring wells were equipped with 0.9 to 1.5 m long screens. Waterra tubing and foot valves were installed in the monitoring wells to collect groundwater samples around the site.

Previous Studies in the Village of Metcalfe

1. Hydrogeological Investigation – Village of Metcalfe Communal Water Supply, prepared by Water and Earth Science Associates Ltd. (1991)

   In 1991, Water and Earth Sciences Associates (WESA) completed a hydrogeological study in the Village of Metcalfe to determine the suitability of the underlying aquifers in Metcalfe for the development of a communal water supply. The study identified three water-bearing formations underlying the Metcalfe area that were suitable to support a communal water supply; the shallow Oxford Formation aquifer, the March Formation aquifer, and the Nepean Formation aquifer. The study examined each of these aquifers through a testing program that included well drilling, hydraulic testing, and groundwater sampling, in accordance with Section 5 of the RMOC Guidelines for the Design of Communal Water Systems. Test wells were constructed into bedrock using air rotary drilling and developed by stop-start compressed air surging.

   Following the completion of the well testing program, it was determined that the Nepean Formation aquifer was the most suitable aquifer for development of a communal water supply in the Metcalfe area. Theoretical Groundwater Yields were determined to be 127 L/s for maximum day flow, 92 L/s for the 10-year design flow and 89.9 L/s for the 20-year design flow. The Nepean Formation aquifer responded to pumping in a manner consistent with the response of a confined aquifer. The actual thickness of the aquifer was undetermined but is greater than 10m. Groundwater sampling indicated that all geochemical and bacteriological parameters related to health in the groundwater met the Maximum Acceptable Concentrations outlined in the Ontario Drinking Water Objectives.

   The report recommends that a new 30.5cm (12”) diameter drilled well, cased with a 0.25m diameter steel wall casing, and pressure grouted beyond the last significant water-bearing fracture in the March Formation (approximately 54m below ground surface) to ensure the well is supplying the better-quality groundwater from the Nepean Formation.

2. Groundwater Assessment and Review of Alternative Servicing Solutions – Village of Metcalfe, prepared by Golder Associates Ltd. (2003).

   In 2003, a hydrogeological study was completed by Golder Associates to assess the groundwater in the Metcalfe area and review alternative water and wastewater solutions for the Village of Metcalfe.

   In the study, Golder identified three bedrock formations underlying the Metcalfe area based on previous studies, including the 1991 WESA report.

   - The first bedrock formation is the Oxford Formation, described as dolostone with shaley interbeds, located below the overburden to an elevation of 50m above sea level (ASL).
   - The Oxford formation is underlain by the March Formation, found from 50 to 23m ASL, and described as interbedded sandstone and dolostone.
   - Finally, the Nepean Formation underlies the March formation, found at an elevation of ~23 mASL, and is described as sandstone.

   Four major options were assessed as solutions:

- Option 1A: Private Individual Corrections (existing wells + treatment)
- Option 1B: Private Individual Corrections (drill new wells, no treatment)
- Option 2: Private Communal Services (2 to 5 units/new well, no treatment)
- Option 3A: Public Communal Services (2 wells + disinfection + standard distribution system)
- Option 3B: Public Communal Services (2 wells + disinfection + trickle feed distribution system)
- Option 4A: Extension of City of Ottawa Central Services (standard distribution system)
- Option 4B: Extension of City of Ottawa Central Services (trickle feed distribution system)

Following a review of the alternatives listed above, Golder concluded that the preferred solution for an alternative water supply would be Option 1B - Private individual corrections with new drilled wells to the deeper aquifer, as well as Option 2 – Private Communal Services with 2 units/well.

Both of the preferred options include installing a new drilled well into the deeper Nepean Formation aquifer where the water supply is less susceptible to surface contamination. Option 2 was included as it allows neighbouring properties to share the cost of installing a new well; however, it was noted this would also require increased coordination between the landowners (i.e., plumbing requirements, legal easements, maintenance, etc.).

The report discusses implementation of the preferred solutions and highlights the need for a clear understanding of the technical issues associated with obtaining a water supply from the deeper bedrock aquifer and an appreciation of the need to prevent cross-contamination of the aquifer.

The report also indicates that if a homeowner has a satisfactory water supply from an existing well or has already invested in an appropriate treatment unit, there would be no urgent reason to replace their well with a new deeper well. The recommended well construction for Option 1B and 2 in the Golder report includes drilling a new well to a depth of approximately 90m below ground surface and installing and grouting the steel casing to a depth of 30m below ground surface, in order to isolate the lower water-bearing zones.

2.2 TOPOGRAPHY

A topographic survey was completed by EVB staff on March 25th, 2024. The site elevation varies between 88.50 and 87.00 m above sea level. The contours provided from the survey indicate that surface water would drain to the southwest.

2.3 GROUNDWATER

MECP Well Records

During installation, the depth to water and static water levels in the local wells were recorded in the MECP's well record forms. Of the 71 well records, 57 wells appear to be constructed in the shallow Oxford Formation, 9 wells appear to be within the March Formation and 6 wells appear to be within the Nepean Formation. The depth at which water was found in each unit is as follows:

Formation	Depth to Water (m b.g.s.)		
	Average	Maximum	Minimum
Oxford	16.3	35.0	5.2
March	43.3	59.4	36.6
Nepean	83.9	121.3	69.5

The hydrostatic surface reported in these wells were determined at the time of installation of the well through direct measurement and are as follows:

Formation	Static Water Level (m b.g.s.)		
	Average	Maximum	Minimum
Oxford	3.5	22.6	0.61
March	5.9	9.3	2.4
Nepean	12.2	21.3	4.8

Overburden Monitoring Wells

Five overburden and three bedrock monitoring wells were installed by EVB, with Downing Well Drilling, varying in depth from approximately 1.6 m to 4.9 m below ground surface (b.g.s.) in order to monitor the shallow groundwater levels in the overburden across the site. The overburden was observed to be a stiff and compacted brown silty clay above the bedrock.

On April 29th, 2025, the static water levels in each monitoring well to determine the direction of groundwater flow in the overburden and shallow bedrock. During the site visit, the overburden wells were dry, indicating there is no shallow groundwater in overburden unit. The water level in the shallow bedrock wells ranged between 84.93m ASL and 85.47 mASL and appears to be flowing to the South. A potentiometric contour for the shallow bedrock has been provided on Figure 1 (attached). Based on the potentiometric contour, the groundwater in the shallow bedrock has a horizontal gradient of approximately 0.005 m/m in the southwesterly direction.

Existing Bedrock Water Bearing Zones

The previous hydrogeological study completed by Water and Earth Science Associates Ltd. in 1991 and Golder Associates Ltd. in 2003 provides a summary of the water bearing zones in each bedrock formation found within the Metcalfe Area. All three bedrock formations appear to produce sufficient quantities to support private residences; however, the quality of water appears to improve with the deeper well construction. The three bedrock formations are found at the following depths.

- Oxford Formation: 0 – +/- 35m b.g.s.
- March Formation: +/- 35 to +/- 65 m b.g.s.
- Nepean Formation: +/- 65m+ b.g.s

The upper bedrock aquifer in the Oxford formation is unconfined and more susceptible to surface contamination. The 2003 study indicated that wells constructed in both the shallow and deep bedrock presented signs of impacts caused by sewage system effluent; however, the deeper wells showing signs of contamination consisted of an open hole throughout the bedrock. Samples that were collected from deep wells that had casing extended to a depth of at least 21m b.g.s. did not show signs of impacts from septic system effluent. Extending the well casing deeper into the bedrock isolates the deeper aquifer found within the Nepean Formation from the upper water bearing zones.

2.4 CONCEPTUAL HYDROGEOLOGIC SITE MODEL

The site hydrogeologic model may be described as a thin silty clay deposit overlying multiple stratified bedrock aquifers with isolation between the various units. The potentiometric surface of the upper (Oxford formation) bedrock aquifer is located within the upper sand units, approximately 4.4 m below ground surface. As indicated in the MECP well records, the main source of groundwater for the area is in the Oxford Formation bedrock aquifer. The area surrounding the site is characterized by the following hydrostratigraphy:

- Overburden:
  - **Silty Clay**, 5.0 +/- 3.4 m thickness, this material is described as a brown or grey clay and hardpan material.
  - This surficial layer is aerially extensive to a 500 m radius from the development, as identified from various descriptions in the MECP well records and the geology mapping for the region. The upper 2 m of this material will be subject to a freeze/thaw cycle and is underlain by a bedrock.
- Bedrock:
  - **Limestone/Sandstone/Dolostone/Shale**, top of bedrock surface ranges from a minimum of 0 m to a maximum value of 15.5 m and an average bedrock surface located 5.4 m b.g.s. The supply aquifer for the area is found in the various bedrock formations.
  - Previous studies for the Metcalfe Area identify three water-bearing zones within the bedrock.
    - **Oxford Formation**, 0 – 35m b.g.s., comprised of dolostone with shaley interbeds.
    - **March Formation**, +/- 35 to 65 m b.g.s., interbedded sandstone and dolostone.

- **Nepean Formation**, +/- 65m b.g.s., sandstone.

The average depth to the water bearing zone in the MECP wells is 24.7 m b.g.s. and appears to primarily be within the shallow Oxford Formation. The boreholes completed by EVB described the overburden as a compact silty clay material before reaching bedrock.

The general hydrogeologic conditions of the site are described as an unconfined bedrock aquifer overlain by a thin surficial clay layer. The main water bearing features in the Oxford Formation bedrock were located approximately 24.7 m b.g.s. within bedding planes and other vertically fractured features in the rock. The potentiometric surface in the bedrock aquifer is generally located at a depth of 4.4 m b.g.s.

The March and Nepean formation aquifers are considered confined aquifers and are found below the Oxford Formation. The average depth to water in the March and Nepean formation are approximately 43.3 and 83.9 m b.g.s, respectively.

3 WATER SUPPLY ASSESSMENT

3.1 WELL DESCRIPTION

The Larry Robinson Arena has been in operation for more than 30 years and has utilized a drilled well for its water supply since opening.

The original well for the arena was installed inside the building in the mechanical room, which is no longer in use and has since been replaced by a newer drilled well, located in the parking lot at the southwest corner of the building. There are no records available on the MECP database for the drilled wells at the Larry Robinson Arena; however, based on drawings provided by the city, this well appears to have been installed after August 2000 (refer to Drawing G7639-1 by John D. Paterson & Assoc. Ltd, 2000).

On July 3, 2025, EVB staff were on-site to complete a preliminary inspection on the drilled well and collect a background sample of the raw water servicing the Larry Robinson Arena. The well is located 3.0m from the building exterior at the southwest corner, within the parking lot. The well casing extends 0.46m above the ground surface and bollards are placed around the well to provide protection from vehicular traffic (Figure 3-1).

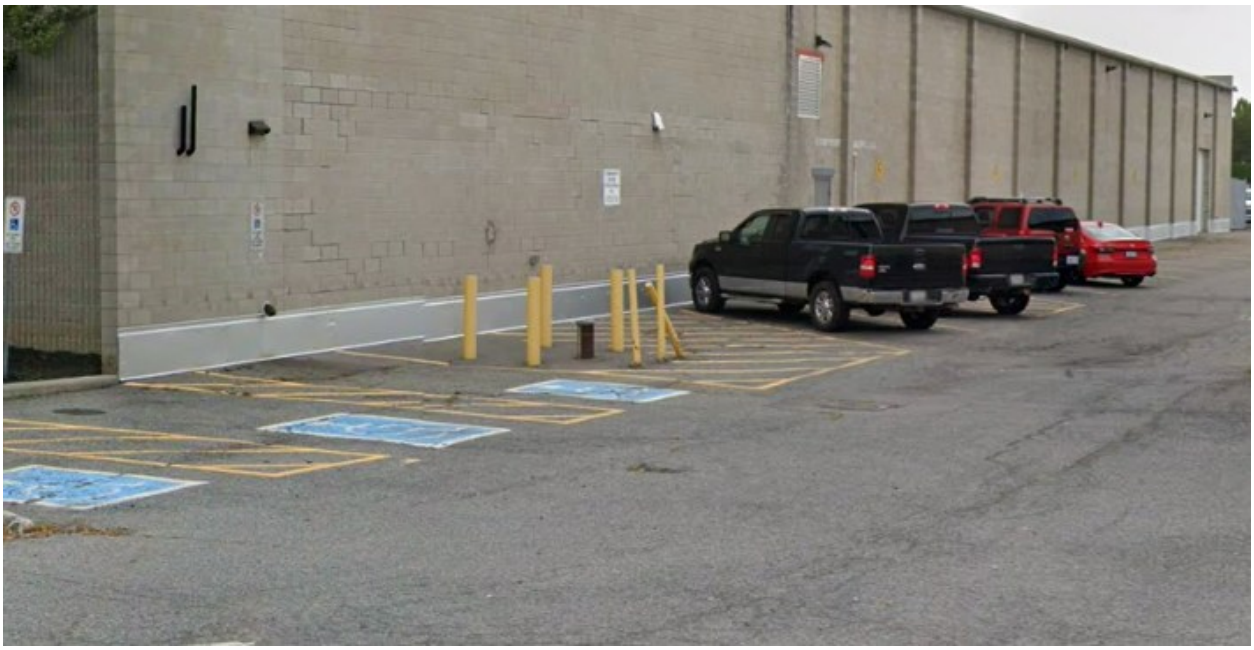


FIGURE 3-1: ON-SITE WELL LOCATION

On August 6th, 2025, EVB returned to the site to complete a camera inspection on the existing well in order to confirm the well's construction. The well pump was removed by Priority Pump Services, and the well was inspected using a Lavel SC-350 Well camera. The water level at the time of the inspection was approximately 7.2m below ground surface and below the top of the bedrock surface, see Figure 3-2, below.

The inspection determined that the existing well is a 150mmØ drilled well, installed to a depth of 32 m b.g.s. with a 150mmØ steel casing extending to 6.25m b.g.s. At the time of the inspection, the integrity of the steel casing appeared to be good and there were no obvious signs of failure observed. Ontario Regulation (O. Reg.) 903 states that a well's casing must extend to a height of 0.40m above and extend at least 6.0m below the original ground surface. As such, the current well construction meets the minimum requirements of O. Reg. 903.

The well records in the area indicate bedrock is found approximately 0.9 to 1.5 m b.g.s., as such the existing well is assumed to be drilled and cased into the bedrock.

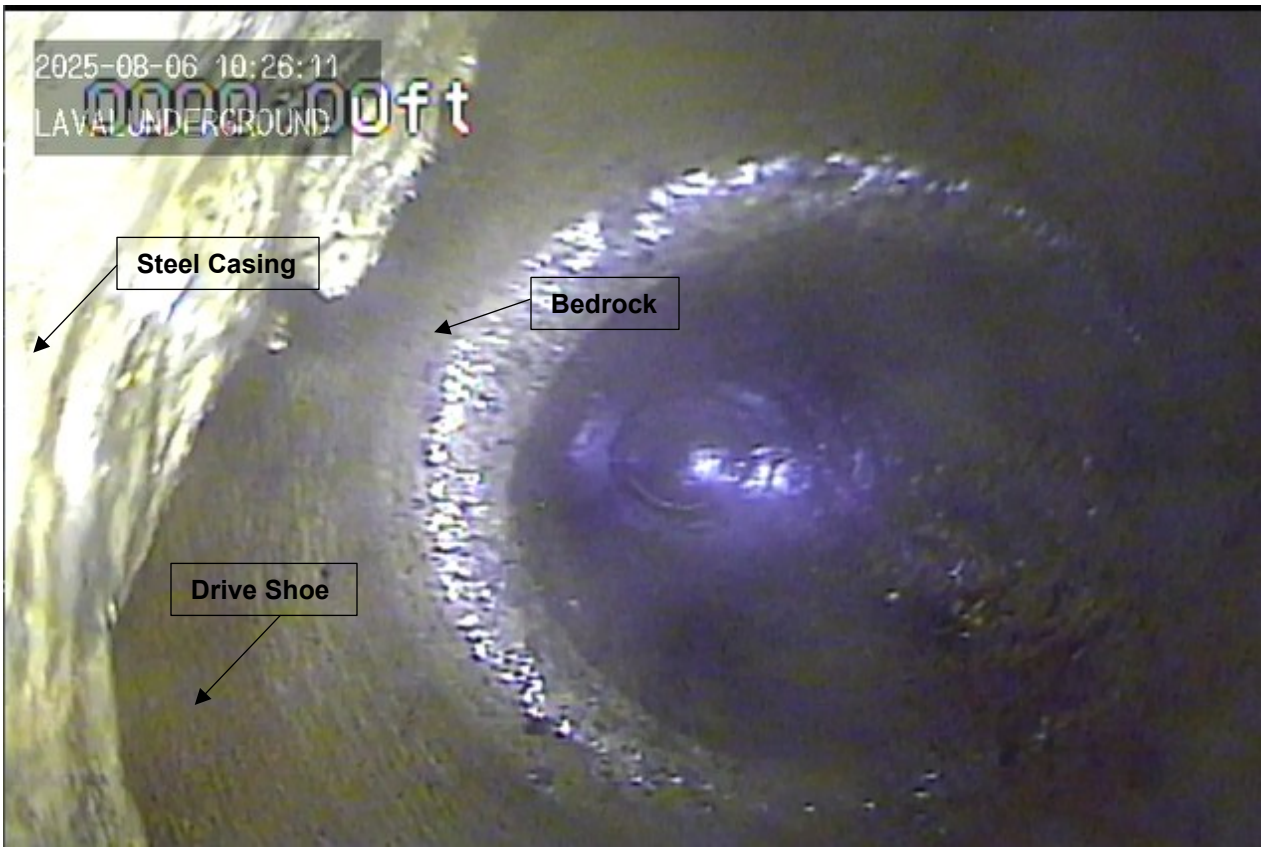


FIGURE 3-2: BOTTOM OF WELL CASING AT ON-SITE WELL

The Arena uses a Reverse Osmosis system to treat the groundwater and a 600gal (2,275L) storage tank to store treated water for use within the facility. During the site visit, the arena staff indicated they have not experienced any issues with the quantity of water produced by the on-site well.

3.2 HISTORICAL WATER USE

Under current operations at the Larry Robinson Arena, there is no daily log of water meter readings to track the daily consumption. However, between August 26, 2024 and December 2, 2024, operations logged the meter readings for the front of the building (i.e., lobby, dressing rooms and banquet hall).

Date	Meter (m^3)	# of Days	Water Use (L)	Daily Use (L/d)
26-Aug-24	22,078.2	-	-	-
03-Sep-24	22,080.8	8	2,600	325
09-Sep-24	22,081.8	6	1,000	167
16-Sep-24	22,083.4	7	1,600	229
23-Sep-24	22,085.2	7	1,800	257
01-Oct-24	22,087.7	8	2,500	313
07-Oct-24	22,104.8	6	17,100	2,850
15-Oct-24	22,107.5	8	2,700	338
21-Oct-24	22,119.7	6	12,200	2,033
28-Oct-24	22,133.4	7	13,700	1,957
02-Dec-24	22,193.5	35	60,100	1,717

Based on the meter reading provided, the maximum daily water use for the front of the arena is 2,850 L/d. However, this data is a very small sample size and does not account for water use for ice resurfacing operations. As such, it is not sufficient to support a reduction in the maximum daily water demand.

It is recommended that the City install a permanent water meter at the facility to properly monitor the actual water consumption at the arena.

3.3 DESIGN WATER DEMAND

Due to the lack of water meter data, the maximum daily water use at the Larry Robinson Arena has been calculated based on the design daily sewage flow for the facility plus the maximum daily water usage for Zamboni operations.

Sewage systems are sized based on the requirements of Part 8 of the Ontario Building Code (OBC). Section 8.2.1.3.(3) of the Ontario Building Code states "Where a building contains more than one establishment, the total daily design sanitary sewage shall be the sum of the total design sanitary sewage flow for each establishment".

The proposed facility contains a bleacher and lobby area for fans, a meeting room, and a community hall with a kitchen. Based on Table 8.2.1.3.B, the design sewage flow for the proposed facility is calculated to be:

Stadiums, Race Tracks, Ball Parks

Bleachers/Rink Slab	= 576 seats x 20 L/seat/d	= 11,520 L/d
Lobby	= 40 seats x 20 L/seat/d	= 800 L/d
Total Seating Capacity Design Flow		= 12,320 L/d **AND,**

Assembly Hall (no food service)

Meeting Room	= 50 persons x 8 L/d per bay	= 400 L/d **AND,**

Assembly Hall (food service provided (kitchen))

Community Hall	= 200 persons x 36 L/seat/d	= 7,200 L/d

Total Estimated Design Sewage Flow

Design Flow	= 12,320 L/d + 400 L/d + 7,200 L/d	= **19,920 L/d**

At a minimum, the maximum day water demand for the arena should be equal to the maximum daily sewage demand calculated above. However, the water supply well also provides water needed for daily operations at the arena, such as ice resurfacing, which would not be captured in the sewage flow calculations. Through discussions with rink staff, the following details have been provided for water usage with respect to ice resurfacing (flooding).

- The Zamboni uses 570 – 760 L of water per flood.
- The ice is resurfaced a maximum of 15 times per day (i.e., when there is a full day of ice rentals)

Therefore, the maximum water usage due to ice resurfacing is calculated to be:

Water Use = 760 L/flood x 15 floods/d
= 11,400 L/d

Based on the daily sewage demand and the water use for ice resurfacing, the maximum daily water demand at the Larry Robinson Arena is estimated to be 31,320 L/d.

3.4 WATER USE COMPARISON

The original septic system for the arena was designed by Oliver Mangione McCalla & Associates Ltd. in October 1987, and was designed to treat a peak daily sewage flow of 19,000 L/d. The proposed upgrades to the sewage works is designed for 19,920 L/d, representing only a 5% increase.

The proposed addition to the Larry Robinson Arena consists of a new 7,600 ft^2 addition along the north side of the building. The purpose of the addition is to replace the existing dressing rooms with newer, larger rooms for teams, while the existing dressing rooms will be converted in washrooms and additional lobby space. The operations at the arena, with respect to ice resurfacing, will remain the same. The proposed renovations will not be adding an additional ice surface, as such the maximum number of resurfacing events

that would take place in a day remains at 15. As such, it is not expected that the proposed additions will increase the daily water use at the arena.

3.5 EXISTING WATER QUALITY

In order to determine the quality of water produced by the existing drilled well, a raw groundwater sample was collected upstream of the treatment system in the Arena. The sample was collected from a tap on the existing pressure tank, after being flushed for 30 minutes, in order to remove any stagnant water inside the lines and/or tank.

Raw water samples are collected in accordance with the MECP's *Practices for the Collection and Handling of Drinking Water Samples* (2009). To ensure sample quality, EVB staff utilize disposable, powder-free, nitrile gloves that are changed between each sample. The sample bottles are carefully handled to ensure the inside of the bottle and cap are not contaminated by the surrounding environment. If contact is made, the sample bottle or cap is thoroughly rinsed with sample water, or the bottle is discarded. The sample bottle is labelled on the bottle's label, cap, and bag with the monitoring well, date and time of sample, which is confirmed using the site map and labels on the monitoring wells.

All samples are collected in laboratory prepared sample bottles, with appropriate preservative, in a manner in which the outside environment does not come into contact with the interior of the sample bottle or cap. Once a sample is collected, the cap is promptly replaced, and the sample bottle is placed back in the cooler for shipping to Caduceon Environmental Laboratories. The methods used to complete the required analysis as well as the QA/QC checks are detailed on the Caduceon analytical reports. Caduceon complies with the requirements of ISO/IEC Guide 17205.

The results from the sample taken are summarized in Table 3-1 and Table 3-2 and have been compared to the Ontario Drinking Water Standards, Objectives and Guidelines (ODWS/OG) and the Guideline D-5-5 Reasonably Treatable Concentrations.

TABLE 3-1: WELL SAMPLE RESULTS (JULY 3, 2025)

Parameter	Unit	TW1	ODWS/OG
Hardness (as $CaCO_3$)	mg/L	720	80-100
Alkalinity (as $CaCO_3$)	mg/L	326	30-500
Conductivity	us/cm	2,780	
pH @ 25°C		8.02	6.5-8.5
Colour		< 2	5
Turbidity	NTU	1.6	5
Fluoride	mg/L	< 0.1	1.5
Chloride	mg/L	705	250
Sulphate	mg/L	123	500
Calcium	mg/L	181	
Magnesium	mg/L	65	
Sodium	mg/L	286	200, 20
Potassium	mg/L	12.8	
Iron	mg/L	0.241	0.30
Manganese	mg/L	0.071	0.05
Ammonia (N)-Total (NH_3 + NH_4)	mg/L	0.17	
Total Kjedahl Nitrogen	mg/L	0.4	
Organic Nitrogen	mg/L	0.20	0.15
Nitrate	mg/L	< 0.05	10.0
Nitrite	mg/L	< 0.05	1.0
Phenol	mg/L	< 0.001	
Dissolved Organic Carbon	mg/L	2.3	5.0 (AO)
Total Dissolved Solids	mg/L	1,570	500
Copper	mg/L	0.012	1.0 (AO)
Silica	mg/L	10	
Zinc	mg/L	0.013	5.0 (AO)
E.Coli	cfu/100mL	0	0

Parameter	Unit	TW1	ODWS/OG
Total Coliforms	cfu/100mL	0	0

TABLE 3-2: GUIDELINE D-5-5 REASONABLY TREATABLE CONCENTRATIONS

Parameter	Unit	TW1	Guideline D-5-5 Reasonably Treatable Concentrations	
Date			Limit	Comments on Treatment
Hardness	mg/L	720	500	Water Softener
Colour	TCU	< 2	7	Carbon Filter Treatment Systems
DOC	mg/L	2.3	10	
Chloride	mg/L	705	250	Not considered reasonably treatable beyond limit
Sulphate	mg/L	123	500	
Sodium	mg/L	286	200	
Iron	mg/L	0.241	5	Water softeners or manganese greensand filters
Manganese	mg/L	0.071	1	
TDS	mg/L	1,570	500	Requires written rationale that corrosion, encrustation, or taste problems will not occur
Turbidity	NTU	1.6	5	

3.6 DISCUSSION ON WATER QUALITY & TREATMENT ALTERNATIVES

The sample results depict elevated concentrations for hardness, sulphate, sodium, and total dissolved solids.

1. Hardness
   - The sampling results depict an elevated hardness concentration of 720 mg/L, indicating the water is considered hard by drinking water standards (80 – 100 mg/L).
   - Typically, water with hardness above 80 – 100 mg/L as $CaCO_3$ is softened for domestic use by a conventional sodium ion exchange. However, this can introduce elevated sodium concentrations into drinking water, which may contribute a significant percentage to the daily sodium intake for a consumer on a sodium restricted diet. A separate, unsoftened tap can be installed when ion exchange water softeners are installed to be used for drinking and culinary purposes.
2. Sodium
   - Some of the sample results also indicated levels of sodium are above the ODWS/OG limit of 200 mg/L, with a concentration of 286 mg/L.
   - Sodium concentrations greater than 20 mg/L may be of interest to people on a sodium restricted diet. The MECP requires the local Medical Officer of Health to be notified where sodium levels are above 20 mg/L in order for that information to be relayed to local physicians.
3. Chloride
   - The recorded chloride concentration in the sample was 705 mg/L, which is well above the ODWS/OG aesthetic objective and the Guideline D-5-5 Reasonably Treatable Limit of 250 mg/L. Elevated concentrations of chloride can produce a salty taste detectable by the consumer.
4. Total Dissolved Solids
   - Total dissolved solids (TDS) are typically comprised of cations (calcium, magnesium, sodium, and potassium) and anions (carbonate, bicarbonate, chloride, sulphate) that are dissolved in water.
   - Based on the results of a taste testing study completed by Bruvold and Ongerth in 1969, the potability of the groundwater would be rated as unacceptable due to the TDS concentrations (>1,101 mg/L).

Reverse Osmosis treatment systems can be used to reduce the chloride, sodium and TDS concentrations from a raw groundwater supply. The Larry Robinson Arena has a Reverse Osmosis System, (Canature Can 4040-6) installed to treat the raw groundwater (see Appendix C). The treatment system is rated for 45.4 m^3/d, however discussions with the arena staff have suggested they typically get about 19 – 25 m^3/d

of production through the system. Reverse Osmosis systems are also used to remove chloride and sodium from groundwater.

The treatment system as a nominal salt rejection rate of greater than 98%.The effluent readings show 55 ppm of TDS in the treated water, indicating the system is capable of removing 96.5% of TDS in the raw water.

4 CONCLUSIONS & RECOMMENDATIONS

Based on existing drawings for the Arena, it is anticipated that the existing well was installed around 2000; however, there are no records on the MECP database for the existing well at the Larry Robinson Arena From the field inspections, it was determined that the existing well is a 150mmØ drilled well, installed within the upper bedrock (Oxford Formation) aquifer to a depth of approximately 32 m b.g.s. The steel casing is extended to a depth of 6.25m b.g.s. and is inferred from the video inspection to be installed into the bedrock. The well is located within the existing parking lot at the southwest corner of the building and is protected by bollards.

The proposed addition to the Larry Robinson Arena is not expected to increase the water demand at the facility. Through discussions with the Facility operators, the existing well has never provided any issues with providing a sufficient water supply to the Facility. A water meter, capable of reading and logging water use, should be installed at the facility per City of Ottawa requirements (i.e., Neptune T10 (16mm x 19mm) c/w synthetic bottom cap and remote reading, having a range of 0.03 to 1.26 L/s @ 100% accuracy ±1.5%).

A raw groundwater sample was collected from the existing water supply, which depicted elevated concentrations for hardness, sulphate, sodium, and total dissolved solids. Following preliminary discussions with the City of Ottawa's hydrogeological reviewer, the water quality of the existing well is considered highly mineralized and does not meet the requirements set out in the Provincial and the City of Ottawa's Guidelines. As such, it is recommended that a new water supply well be installed to service the Larry Robinson Arena.

4.1 RECOMMENDED WELL CONSTRUCTION

Based on the recommendations from previous studies in the Metcalfe area, new drilled wells in the Metcalfe Area should be installed into the March/Nepean formation, as this water bearing zone has been determined to provide adequate quantity and quality for drinking water, as well as be isolated from surface contaminants (i.e., sodium, chlorides, nitrates, etc.).

The 2003 Village of Metcalfe Study states that "If a homeowner has a satisfactory water supply from an existing well or has already invested in an appropriate treatment unit, there is no urgent reason to replace these with a new deeper well". The City has already installed a robust Reverse Osmosis treatment system at the Larry Robinson Arena that is capable of reducing more 95% of the Total Dissolved Solids in the raw water source. As such, based on the statement from the 2003 study, the level of urgency to replace the existing drilled well is low.

However, should the City move forward with replacing the water supply, the new well should be installed as per the recommendations in the 2003 Village of Metcalfe Study. Following these recommendations, the well casing for a new well should be extended to a depth of approximately 30m b.g.s., to completely isolate the Oxford Formation aquifer, as this water bearing zone is known to be susceptible to surface contamination. Figure 2 provides a cross section showing the approximate depth for the new drilled well.

It is recommended to install the new drilled well at the front of the arena, inside the garden area just north of the front door. This location is ideal, as it would be located just outside of the mechanical room where the existing pressure tank and interior plumbing is located. It would also take the well out of the parking lot area and be in a location with limited foot traffic. Figure 1, attached, provides a site plan showing the proposed location for the new drilled well.

The new well accessing the deep bedrock aquifer should be constructed as per the following recommendations and the requirements of O. Reg. 903, the MECP's Water Supply Wells - Requirements and Best Practices. The recommended well construction is as follows:

a. All new wells should be constructed upgradient of new/existing septic systems.
b. Wells to be constructed using air rotary or percussion drilling techniques (i.e., cable tool) to access the upper bedrock aquifer.

c. Drill a 200mmØ hole into the bedrock to the March formation, located at a depth of approximately ± 30 m + 2m seating into the formation.
d. The hole is cased in 150mmØ steel pipe with drive shoe. The casing will be installed through the bedrock to a depth of approximately 32m in order to isolate the upper bedrock aquifer (Oxford Formation) from the water supply.
e. The casing will be grouted using either pressure grouting or displacement grouting techniques. The **neat** grout must be a mixture of 50 kg of cement to 20L of clean water (as per O. Reg. 903). Hydrated Lyme up to 10% v/v may be added to allow the grout to be pumped more easily and accelerate setup times.
f. Grout must be placed in one continuous operation and set a minimum 72 hours before drilling continues.
g. Drilling continues open hole using a 150mmØ bit to a depth of **± 82 m below ground surface** into the Nepean Formation, it is anticipated that the targeted water bearing zone will be located approximately 15m into the Nepean formation.
h. The well is completed at a height of 600mm above the ground surface and disinfected as per O. Reg. 903. Pump lines are installed through a watertight pitless adapter below the frost line.

Following the installation of the new drilled well, a 12-hour pumping test should be completed, as per the City of Ottawa's Hydrogeological and Terrain Analysis Guidelines. The proposed pumping rate will be based on the anticipated maximum day water demand for the Facility and is as follows:

Pumping Rate = 31,320 L/d ÷ 12 hours/d = 2,610 L/hr (43.5 L/min)

The raw water quality should be sampled at the 6- and 12-hour mark of the test and monitoring of static water levels should be done by manual measurements, as well as using a Solinst Levelogger. Recovery will also be monitored for 24 hours following completion of the pumping test.

The neighbouring property is run by the Metcalfe Agricultural Society and has two drilled wells situated on the property. EVB has been given permission by the president of the agricultural society to install level loggers in these wells to complete the hydrogeological testing of the new well, and to observe impacts on the neighbouring well(s) during the pumping test at the Larry Robinson Arena.

Once the hydrogeological study is completed and new well has been commissioned, the existing drilled well should be decommissioned as per the requirements of O. Reg. 903.

5 REFERENCES

Water and Earth Science Associates Ltd. 1991. Hydrogeological Investigation – Village of Metcalfe Communal Water Supply

Fetter, C.W. 1994. Applied Hydrogeology. Prentice-Hall, Inc. Upper Saddle River, New Jersey 07458.

The Ontario Geological Survey. 2003, Surficial Geology of Southern Ontario

The Ministry of Environment, Conservation, and Parks. 1994. Hydrogeological Technical Information Requirements for Land Development Applications.

The Ministry of Environment, Conservation, and Parks. 2003. Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines. Revised 2006.

Golder Associates Ltd. 2003. Groundwater Assessment and Review of Alternative Servicing Solutions – Village of Metcalfe, City of Ottawa.

Chapman, L.J. and Putnam, D.F. 2007 The Physiography of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 228.

The Ministry of Environment, Parks, and Conservation. 2008. Design Guidelines for Sewage Works.

The Ministry of Northern Development and Mines. 2009. Bedrock Geology of Ontario, MRD 126 - Revision 1. scale 1:250,000.

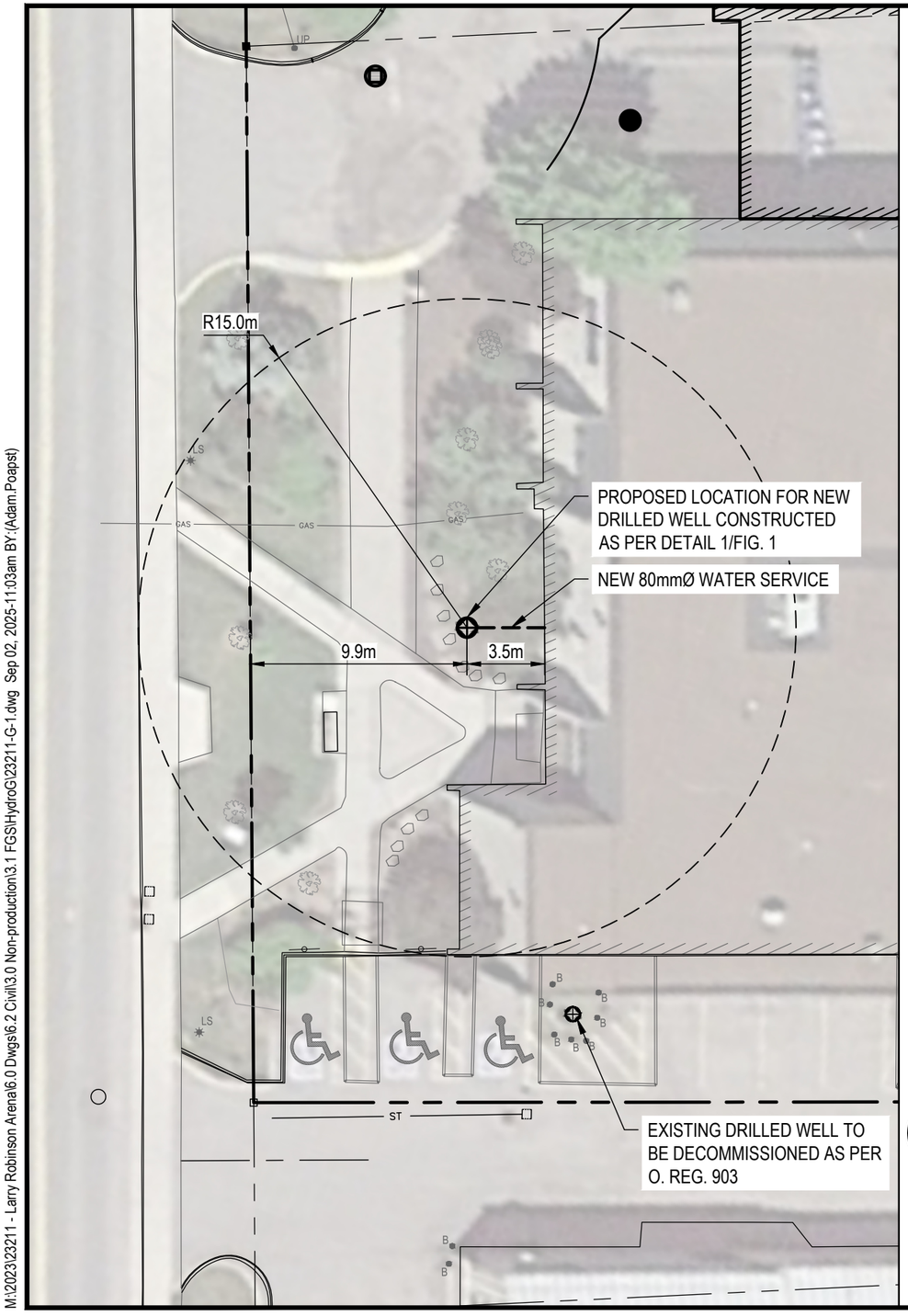
The Ministry of Environment, Parks, and Conservation. 2009. Practices for the Collection and Handling of Drinking Water Samples.

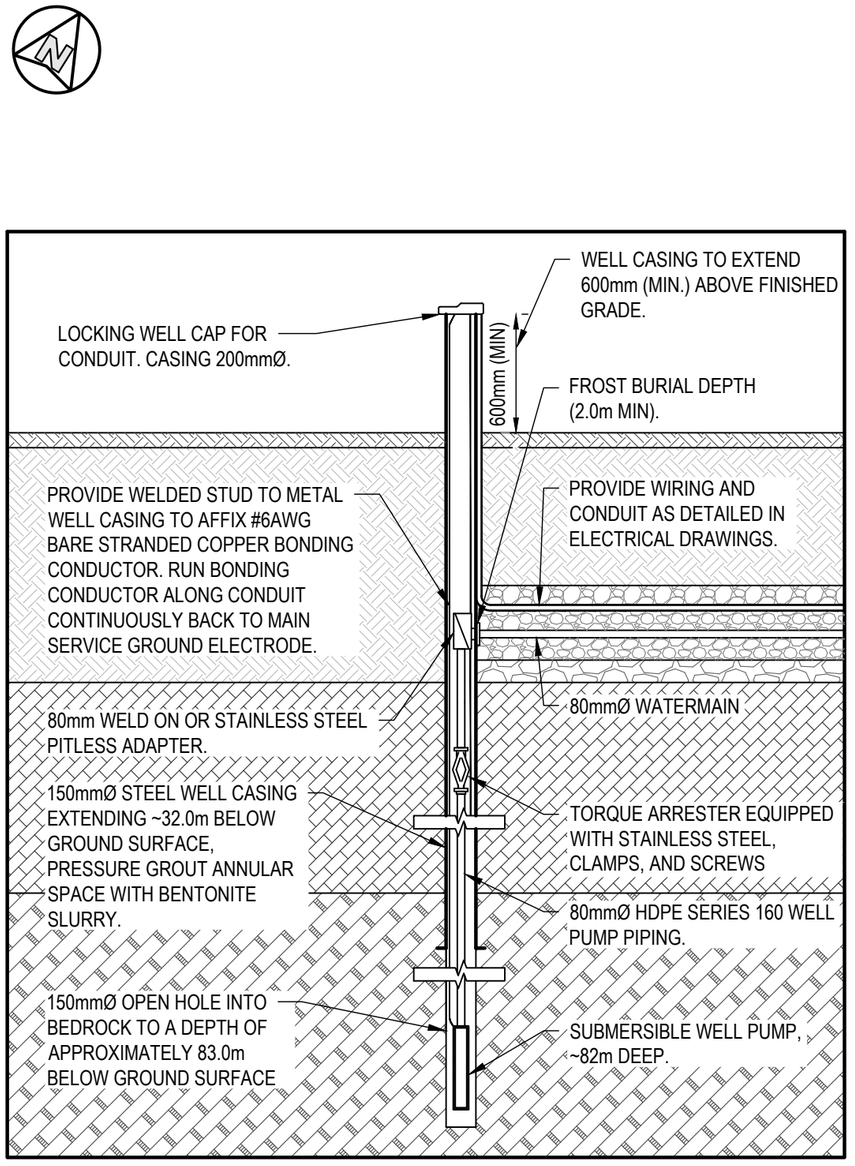
The Ministry of Environment, Conservation, and Parks. 2015. Water Supply Wells – Requirements and Best Management Practices.

City of Ottawa. 2021. Hydrogeological and Terrain Analysis Guidelines.

Ontario Building Code (O.B.C.) Part VIII, 2024.

Figures





1
FIG. 1

POTABLE WATER WELL DETAIL

SCALE: N.T.S.

LEGEND

- EXISTING WALKWAY
- EXISTING PROPERTY LINE
- EXISTING ASPHALT
- GAS — EXISTING GAS LINE
- NEW WATER SERVICE
- EXISTING TREES/SHRUBS
- NEW DRILLED WELL
- EXISTING DRILLED WELL
- B — EXISTING BOLLARD
- EXISTING BUILDING
- NEW BUILDING

EVB ENGINEERING
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CORNWALL, ONTARIO CANADA, K6J 1H6
TEL: 613-935-3775 | FAX: 613-935-6450
WEBSITE: EVBengineering.com

CLIENT:

CITY OF OTTAWA

PROJECT:

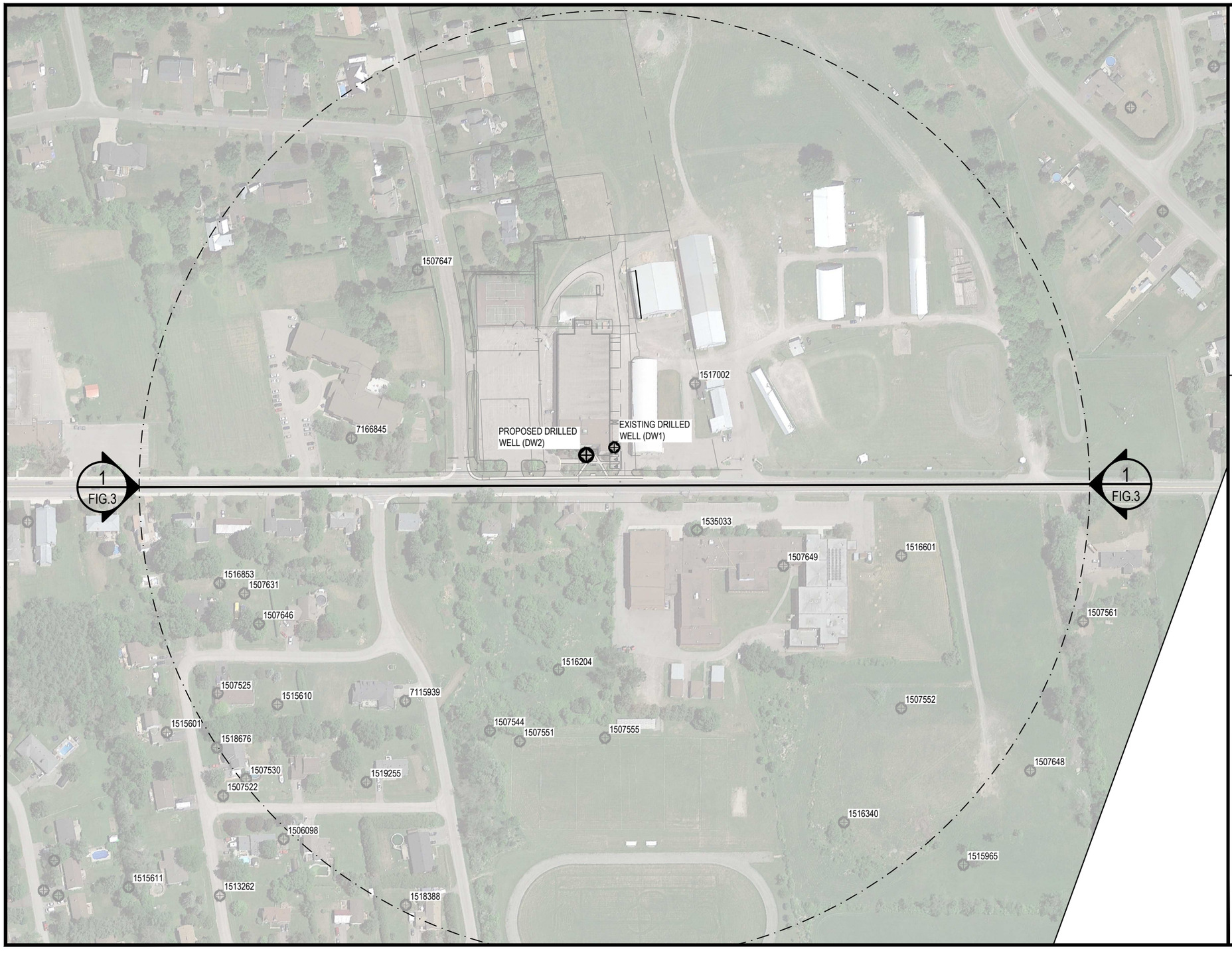
LARRY ROBINSON ARENA
NEW ADDITION

TITLE:

PROPOSED NEW WELL LOCATION

SCALE: 1:250	JOB NO: 23211
DESIGNED BY:	DATE: 25/03/25
DRAWN BY: AP	DRAWING NO. FIG. 1
CHECKED BY: JB	

M:\2023\23211 - Larry Robinson Arena\6.0 Dwgs\6.2 Civil\3.0 Non-production\3.1 FGS\HydroG\23211-G-1.dwg Sep 02, 2025-11:03am BY:(Adam.Poapst)



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LEGEND

- EXISTING WALKWAY
- EXISTING PROPERTY LINE
- EXISTING ASPHALT
- GAS — EXISTING GAS LINE
- NEW WATER SERVICE
- EXISTING TREES/SHRUBS
- NEW DRILLED WELL
- EXISTING DRILLED WELL
- EXISTING BOLLARD
- EXISTING BUILDING
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CLIENT:

CITY OF OTTAWA

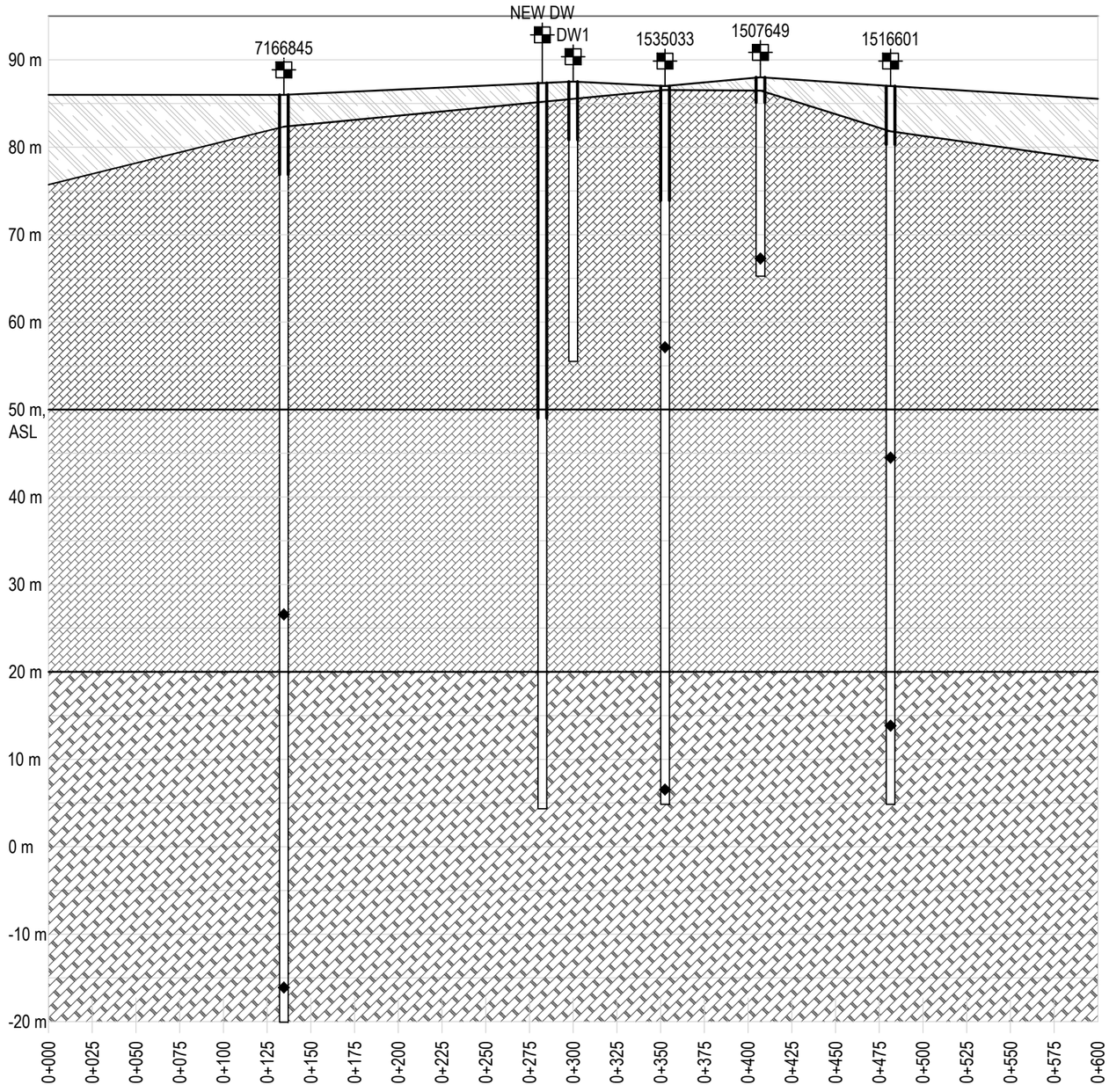
PROJECT:

LARRY ROBINSON ARENA
NEW ADDITION

TITLE:

EXISTING WELL LOCATIONS

SCALE: 1:2500	JOB NO: 23211
DESIGNED BY:	DATE: 25/03/25
DRAWN BY: AP	DRAWING NO. FIG. 2
CHECKED BY: JB	



NOTES:

1. THE INTERPRETED SOIL STRATIGRAPHY REPRESENTS SIMPLIFIED SUBSURFACE CONDITIONS. THE SOIL STRATA HAS BEEN DEFINED AT THE APPROXIMATE WELL LOCATIONS ONLY. THE CONDITIONS BETWEEN WELL LOCATIONS HAVE BE INTERPRETED, BASED ON THE MECP WELL RECORDS, AND COULD DIFFER FROM THE ILLUSTRATED CONDITIONS.

LEGEND

- SILTY CLAY
- BEDROCK (OXFORD FM.)
- BEDROCK (NEPEAN FM.)
- BEDROCK (MARCH FM.)
- EXISTING DRILLED WELL
- 71152515 — EXISTING MECP WELL
- 71152515 — MECP WELL RECORD LABEL
- DEPTH TO WATER (MECP RECORD)

EVB ENGINEERING
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CLIENT:

CITY OF OTTAWA

PROJECT:

LARRY ROBINSON ARENA
NEW ADDITION

TITLE:

GEOLOGICAL CROSS SECTION

SCALE: N.T.S.	JOB NO: 23211
DESIGNED BY:	DATE: 25/03/25
DRAWN BY: AP	DRAWING NO. FIG. 3
CHECKED BY: JB	

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APPENDIX A

MECP Well Records

Table A-1: MECP Well Record Database for the Area identified in Drawing G1.0

Well Information		Location			Date Constructed	Borehole Log			Well Depth (m)	Depth to Water (m)	Static Water Level (m)	Casing Length	Stratigraphy						Accessed Aquifer	
ID	Type	Northing	Easting	Address		Start Depth (m)	End Depth (m)	Description					Overburden Thickness (m)	Description	Contact Zone (m)	Description	Depth to Bedrock (m)	Description	Depth to Water from Bedrock (m)	Unit
1507522	Drilled	5008715	462885		17-Jan-52	0.30	5.79	Boulder Clay	10.67	10.67	2.13	6.40	5.49	Boulder Clay	-	-	5.79	Limestone	4.88	Bedrock
						5.79	10.67	Hard Limestone												
1507525	Drilled	5008740	462945		15-Jan-55	0.30	2.13	Black Loam	16.46	16.46	3.35	2.74	1.83	Black Loam	-	-	2.13	Limestone	14.33	Bedrock
						2.13	16.46	Limestone												
1507530	Drilled	5008705	462900		19-Jul-58	0.00	5.49	Clay Loam	17.07	16.15	2.44	6.40	5.49	Clay Loam	-	-	5.49	Limestone	10.67	Bedrock
						5.49	17.07	Grey Limestone												
1507542	Drilled	5008640	462765	106 Second Ave, Ottawa	10-Sep-63	0.00	3.05	Clay	18.59	18.29	3.66	6.10	3.05	Clay	-	-	3.05	Limestone	15.24	Bedrock
						3.05	18.59	Blue Limestone												
1507544	Drilled	5008645	462725	824 Rainsford Street, Osgoode	23-Dec-63	0.00	7.32	Clay	15.24	14.63	3.05		7.32	Clay	-	-	7.32	Limestone	7.32	Bedrock
						7.32	15.24	Blue Limestone												
1507551	Drilled	5008550	462980		28-May-58	0.00	4.88	Clay Loam	14.63	13.41	1.83	5.49	4.88	Clay	-	-	4.88	Limestone	8.53	Bedrock
						4.88	14.63	Grey Limestone												
1507552	Drilled	5008330	463080	1171 Kingston Ave, Ottawa	05-Jun-63	0.00	1.22	Gravely Loam	15.54	12.19	6.71	5.49	1.22	Gravely Loam	-	-	1.22	Limestone	10.97	Bedrock
						1.22	15.54	Blue Limestone												
1507553	Drilled	5008010	462980		26-May-64	0.00	2.13	Loam, Boulders	21.34	13.72	3.05	5.49	2.13	Loam, Boulders	-	-	2.13	Limestone	11.58	Bedrock
						2.13	21.34	Limestone												
1507554	Drilled	5008570	462980		02-Jul-96	0.00	6.10	Limestone	16.76	15.24	3.05	0.91	0.00	-	-	-	6.10	Limestone	9.14	Bedrock
						6.10	16.76	Black Hard Rock												
1507555	Drilled	5008500	463000		20-Jun-67	0.00	4.57	Loam, Boulders	5.18	5.18	0.61	5.18	4.57	Loam, Boulders	0.61	Gravel	-	-		
						4.57	5.18	Gravel												
1507631	Drilled	5008745	463010		30-May-61	0.00	2.13	Sandy Clay with Boulders	39.01	10.67	1.52	6.10	2.13	Sandy Clay with Boulders	-	-	2.13	Limestone	8.53	Bedrock
						2.13	24.38	Grey/Blue Limestone												
						24.38	39.01	Blue/Black Limestone												
1507646	Drilled	5008730	462995		20-Feb-67	0.00	1.83	Gravel, Boulders	48.77	24.38	1.52	6.32	1.83	Gravel, Boulders	-	-	1.83	Limestone	22.56	Bedrock
						1.83	48.77	Grey Limestone												
1507647	Drilled	5008630	463180		15-Mar-49	0.00	2.44	Till, Boulders	25.30	25.30	0.91	2.44	2.44	Till, Boulders	-	-	2.44	Limestone	22.86	Bedrock
						2.44	25.30	Hard Limestone												
1507648	Drilled	5008240	463070		17-Aug-53	0.00	1.52	Topsoil / Till	22.74	20.73	2.44	2.90	1.52	Topsoil / Till	-	-	1.52	Sandstone	19.20	Sandstone
						1.52	22.74	Sandstone												
1507649	Drilled	5008430	463140		10-Aug-60	0.00	1.22	Clay	73.15	-	-	3.66	1.22	Clay	-	-	1.22	Limestone		Bedrock
						1.22	73.15	Grey Limestone												
1507651	Drilled	5008240	463170		18-May-60	0.00	3.96	Hardpan	10.67	9.14	0.91	3.96	3.96	Hardpan	-	-	3.96	Limestone	5.18	Bedrock
						3.96	10.67	Grey Limestone												
1507652	Drilled	5008100	463400		15-Dec-60	0.00	10.36	Brown Sand / Boulders	28.96	27.43	10.67	9.45	10.36	Brown Sand / Boulders	-	-	10.36	Limestone	17.07	Bedrock
						10.36	28.96	Grey Limestone												
1510173	Drilled	5008782	462720.9	Clyde Ave, Ottawa	30-Aug-69	0.00	6.10	Brown Clay	12.19	9.14	2.13		6.10	Brown Clay	0.3	Brown Gravel	6.40	Limestone	2.74	Bedrock
						6.10	6.40	Brown Gravel												
						6.40	12.19	Grey Limestone												
1510439	Drilled	5008962	462890.9	4040 Statun E, Ottawa	20-Nov-69	0.00	3.66	Brown Clay / Boulders	15.24	15.24	2.44	6.71	5.79	Brown Clay / Hardpan	-	-	5.79	Limestone	9.45	Bedrock
						3.66	5.79	Grey Hardpan / Stones												
						5.79	15.24	Grey Limestone												
1511127	Drilled	5008590	462710	1356 Meadowlands Dr, Ottawa	29-Apr-71	0.00	6.10	Brown Clay	15.24	11.89	0.91		6.10	Brown Clay	1.22	Black Gravel	7.32	Limestone	4.57	Bedrock
						6.10	7.32	Black Gravel												
						7.32	15.24	Grey Limestone												
1511173	Drilled	5008852	462810.9	Levis Street, Vanier	27-May-71	0.00	2.74	Grey Clay	23.16	22.56	1.83	13.41	13.11	Clay/Hardpan	-	-	13.72	Limestone	8.84	Bedrock
						2.74	13.11	Hardpan												
						13.72	23.16	Grey Limestone												
1511273	Drilled	5008892	462840.9		10-Jul-71	0.00	2.95	Brown Sand Clay	29.87	14.94	1.83	13.41	12.34	Sandy Clay / Till	-	-	12.34	Limestone	2.59	Bedrock
						2.95	8.53	Grey Till												
						8.53	12.34	Red Till												
						12.34	29.87	Grey Limestone												
1511672	Drilled	5008922	462830.9	Bruce Street, Metcalfe	27-Aug-71	0.00	5.18	Blue Clay	12.80	12.80	2.44		5.18	Blue Clay	-	-	5.18	Limestone	7.62	Bedrock
						5.18	12.80	Grey Limestone												
1511823	Drilled	5008802	462810.9		19-May-72	0.00	8.84	Grey Clay / Stones	17.07	17.07	1.22	9.45	8.84	Grey Clay / Stones	-	-	8.84	Limestone	8.23	Bedrock
						8.84	17.07	Grey Limestone												
1511824	Drilled	5008792	462790.9		23-May-72	0.00	7.01	Grey Clay / Stones	15.24	15.24	1.22	7.92	7.01	Grey Clay / Stones	-	-	7.01	Limestone	8.23	Bedrock
						7.01	15.24	Grey Limestone												
1512291	Drilled	5008802	462790.9		07-Sep-72	0.00	5.79	Grey Clay	16.46	16.46	1.52	9.14	8.23	Clay / Hardpan	-	-	8.23	Limestone	8.23	Bedrock
						5.79	8.23	Grey Hardpan / Stones												
						8.23	16.46	Grey Limestone												
1512499	Drilled	5008843	462796.9		05-Apr-73	0.00	1.22	Brown Soft Clay	13.72	13.11	2.44	8.84	3.66	Clay	4.27	Gravel	7.92	Limestone	5.18	Bedrock
						1.22	3.66	Brown Clay, Sand, Boulders												
						3.66	7.92	Grey Gravel												
						7.92	13.72	Black Limestone												
1513253	Drilled	5008681	462789	111 Stanwood Road, Ottawa	08-May-73	0.00	0.61	Brown Sand / Clay	22.25	21.34	6.10		15.54	Clay / Hardpan	-	-	15.54	Limestone	5.79	Bedrock
						0.61	15.54	Brown Hardpan / Gravel / Boulders												
						15.54	22.25	Grey Limestone												
1513262	Drilled	5008696	462825		30-Apr-73	0.00	1.83	Grey Topsoil	16.76	15.24	1.52		12.19	Hardpan	-	-	12.19	Shale Rock	3.05	Bedrock
						1.83	12.19	Grey Hardpan												
						12.19	16.76	Black Shale Rock												

Table A-1: MECP Well Record Database for the Area identified in Drawing G1.0

Well Information		Location			Date Constructed	Borehole Log			Well Depth (m)	Depth to Water (m)	Static Water Level (m)	Casing Length	Stratigraphy						Accessed Aquifer	
ID	Type	Northing	Easting	Address		Start Depth (m)	End Depth (m)	Description					Overburden Thickness (m)	Description	Contact Zone (m)	Description	Depth to Bedrock (m)	Description	Depth to Water from Bedrock (m)	Unit
1515534	Drilled	5008672	462770.9		29-Jan-76	0.00	3.66	Brown Hardpan	13.72	12.19	3.66		3.66	Hardpan	-	-	3.66	Sandstone	8.53	Bedrock
						3.66	10.97	Shale Rock												
						10.97	13.72	Sandstone												
1515601	Drilled	5008762	462910.9		23-Aug-76	0.00	2.13	Grey Clay	15.24	14.63	2.44		2.13	Clay	-	-	2.13	Sandstone	12.50	Bedrock
						2.13	6.10	Black Shale Rock												
						6.10	15.24	Grey Sandstone												
1515610	Drilled	5008702	462950.9		17-Aug-76	0.00	1.83	Brown Clay	15.24	14.02	0.91		1.83	Clay	-	-	1.83	Limestone	12.19	Bedrock
						1.83	7.62	Black Shale Rock												
						7.62	15.24	Grey Limestone												
1515611	Drilled	5008752	462810.9		19-Aug-76	0.00	3.96	Blue Clay	15.24	14.63	1.52		3.96	Clay	-	-	3.96	Sandstone	10.67	Bedrock
						3.96	7.62	Black Shale Rock												
						7.62	15.24	Grey Sandstone												
1515965	Drilled	5008260	463000	Box 450, RR #5, Ottawa	01-Jun-77	0.00	6.10	Grey Clay	13.41	12.19	1.83		6.10	Clay	3.66	Clay / Gravel	9.75	Limestone	2.44	Bedrock
						6.10	9.75	Grey Clay / Gravel												
						9.75	13.41	Grey Limestone												
1516098	Drilled	5008602	463070.9		03-Jun-77	0.00	1.22	Brown Topsoil	12.19	11.58	3.05		3.96	Silt	-	-	5.18	Limestone	6.40	Bedrock
						1.22	5.18	Grey Silt												
						5.18	12.19	Grey Limestone												
1516204	Drilled	5008542	463030.8		29-Aug-77	0.00	7.32	Grey Clay / Stones	13.41	11.58	2.44		7.32	Clay / Stones	-	-	7.32	Limestone	4.27	Bedrock
						7.32	13.41	Grey Limestone												
1516340	Drilled	5008340	463000	Box 450, RR #5, Ottawa	27-Oct-77	0.00	7.32	Grey Clay	13.11	12.19	1.52		7.32	Clay	-	-	7.32	Limestone	4.88	Bedrock
						7.32	13.11	Grey Limestone												
1516853	Drilled	5008762	463010.9		23-Nov-78	0.00	2.13	Brown Hardpan	12.19	12.19	3.05		2.13	Hardpan	-	-	2.13	Sandstone	10.06	Bedrock
						2.13	5.49	Black Shale Rock												
						5.49	12.19	Grey Sandstone												
1517633	Drilled	5008921	462929.9		13-May-81	0.00	3.35	Brown Clay	13.72	12.80	1.52		7.32	Clay / Hardpan	-	-	7.32	Limestone	5.49	Bedrock
						3.35	7.32	Grey Hardpan												
						7.32	13.72	Grey Limestone												
1517977	Drilled	5008921	462929.9		24-Aug-82	0.00	1.83	Red Clay	12.19	11.58	0.91		5.49	Clay / Hardpan	-	-	5.49	Limestone	6.10	Bedrock
						1.83	5.49	Grey Clay / Hardpan												
						5.49	12.19	Grey Limestone												
1518025	Drilled	5008921	462829.9	RR # 1, Winchester	28-Oct-82	0.00	2.44	Grey Clay	13.11	12.19	1.83		5.18	Clay / Hardpan	-	-	5.18	Limestone	7.01	Bedrock
						2.44	5.18	Grey Hardpan / Stones												
						5.18	13.11	Grey Limestone												
1518388	Drilled	5008621	463029.9		10-Aug-83	0.00	3.05	Grey Clay	13.11	11.58	2.44		7.92	Clay / Hardpan	-	-	7.92	Limestone	3.66	Bedrock
						3.05	7.92	Grey Hardpan / Stones												
						7.92	13.11	Grey Limestone												
1518676	Drilled	5008621	463029.9		13-Sep-83	0.00	1.52	Brown Sand / Gravel	38.10	24.38	6.10		2.74	Sand / Gavel	-	-	2.74	Limestone	21.64	Bedrock
						1.52	2.74	Brown Sand / Gravel / Boulders												
						2.74	38.10	Grey Limestone												
1519255	Drilled	5008621	463029.9		06-Aug-84	0.00	1.83	Brown Sand	19.81	19.20	3.66		3.35	Clay / Hardpan	-	-	6.10	Limestone	13.11	Bedrock
						1.83	5.18	Red Clay												
						5.18	6.10	Grey Hardpan / Gravel												
						6.10	19.81	Grey Limestone												
1528839	Drilled	5008279	463430.8		04-Dec-95	0.00	4.88	Clay / Boulders	24.69	18.90	7.92		4.88	Clay / Boulders	-	-	4.88	Limestone	14.02	Bedrock
						4.88	24.69	Grey Limestone												
1529156	Drilled	5008320	463485.8	Rosemeadow, Metcalfe	18-Oct-96	0.00	7.01	Brown Hardpan / Boulders	37.49	35.05	6.10		7.01	Hardpan	-	-	7.01	Limestone	28.04	Bedrock
						7.01	9.14	Grey Limestone Shale Layered												
						9.14	9.75	Grey Limestone												
						9.75	37.49	Grey Limestone												
1529440	Drilled	5008279	463527.8	Rosemeadow, Metcalfe	16-May-97	0.00	3.05	Brown Hardpan (Dense)	25.91	21.34	8.53		8.53	Hardpan	-	-	8.53	Limestone	12.80	Bedrock
						3.05	8.53	Grey Hardpan (Dense)												
						8.53	25.91	Grey Limestone / Red Shale Layered												
1533379	Drilled	5008835	463532.4	8323 Van Rens Street, Metcalfe	08-Nov-02	0.00	3.96	Brown Clay / Gravel / Boulder (Loose)	38.71	10.67	2.74		3.96	Clay / Gravel / Boulders	-	-	3.96	Grey Dolomite	6.71	Bedrock
						3.96	10.06	Grey Limestone (Hard)												
						10.06	12.19	Grey Shale (Hard)												
						12.19	34.75	Grey Limestone (Hard)												
						34.75	38.71	Grey Dolomite (Hard)												

Table A-1: MECP Well Record Database for the Area identified in Drawing G1.0

Well Information		Location			Date Constructed	Borehole Log			Well Depth (m)	Depth to Water (m)	Static Water Level (m)	Casing Length	Stratigraphy						Accessed Aquifer	
ID	Type	Northing	Easting	Address		Start Depth (m)	End Depth (m)	Description					Overburden Thickness (m)	Description	Contact Zone (m)	Description	Depth to Bedrock (m)	Description	Depth to Water from Bedrock (m)	Unit
1533508	Drilled	5008782	463556	8372 Van Rens street, Metcalfe	02-Oct-02	0.00	3.05	Brown Hardpan / Stone / Clay	30.48	28.96	6.10		3.05	Brown Hardpan / Stone / Clay	-	-	3.05	Limestone	25.91	Bedrock
						3.05	30.48	Grey Limestone / Hard Rock												
1535033	Drilled	5008489	463143	2800 Albert Street, Metcalfee	11-Aug-04	0.00	1.52	Brown Clay / Packed Stones	83.21	29.87	8.30		1.52	Brown Clay / Packed Stones	-	-	1.52	Limestone	28.35	Bedrock
						1.52	83.21	Grey Limestone (Dark, Broken Layers)												
1536636	Drilled	5008889	463007	2714 Albert ST, Metcalfe	28-Jul-06	0.00	4.27	Brown Hardpan / Stones / Gravel	22.86	21.95	3.94		4.27	Brown Hardpan / Stones / Gravel	-	-	4.27	Limestone	17.68	Bedrock
						4.27	13.72	Brown Rock												
						13.72	22.86	Grey Rock												
7115939	Drilled	5008638	463084	2759 Heatherlyn Cres. Metcalfe	04-Nov-08	0.00	0.91	Brown Clay (Soft)	27.27	12.12	5.00		3.64	Clay	-	-	3.64	Limestone	8.48	Bedrock
						0.91	3.64	Red Clay (Soft)												
						3.64	27.27	Grey Limestone												
7274826	Drilled	5008423	462870	2810 Eldo Street, Metcalfe	30-Sep-16	0.00	6.06	Grey Clay (Soft)	30.90	8.48	2.96		6.06	Clay	2.42	Grey Sand	8.48	Limestone	0.00	Bedrock
						6.06	8.48	Grey Sand (Soft)												
						8.48	30.90	Grey Limestone (Hard)												
7287869	Drilled	5008364	462781	2824 Eldo Street, Metcalfe	17-May-17	0.00	8.53	Sand / Clay / Boulders	30.78	23.16	22.56		8.53	Sand / Clay / Boulders	-	-	8.53	Limestone	14.63	Bedrock
						8.53	23.16	Black Limestone												
						23.16	28.35	Black Limestone												
						28.35	28.96	Black Limestone												
						28.96	30.78	Black Limestone												
7296310	Drilled	5008330	462758	2834 Eldo Street, Metcalfe	09-Aug-17	0.00	1.52	Clay	25.60	20.42	2.64		7.32	Clay / Silt / Gravel	-	-	7.32	Limestone	13.11	Bedrock
						1.52	7.32	Fine Silt / Gravel												
						7.32	20.42	Grey Limestone												
						20.42	21.64	Grey Limestone												
						21.64	25.60	Grey Limestone												
7383631	Drilled	5008428	462793	2811 Eldo Street, Metcalfe	14-Sep-20	0.00	3.66	Sand	24.38	20.42	3.66		7.01	Clay	-	-	10.67	Limestone	9.75	Bedrock
						3.66	10.67	Clay with Stones												
						10.67	11.58	Fractured Bedrock												
						11.58	24.38	Med Limestone												
Average									22.25	16.31	3.47		5.35		2.08		5.85		10.57	
Maximum									83.21	35.05	22.56		15.54		4.27		15.54		28.35	
Minimum									5.18	5.18	0.61		0.00		0.30		1.22		0.00	
1515182	Drilled	5008521	463129.8		05-Dec-75	0.00	4.57	Grey Clay / Boulders	37.49	36.58	2.44		13.72	Clay / Hardpan	-	-	13.72	Limestone	22.86	Bedrock
						4.57	7.62	Grey Hardpan / Boulders												
						7.62	13.72	Red Hardpan / Boulders												
						13.72	37.49	Grey Limestone												
1507627	Drilled	5008730	463070		20-Jul-60	0.00	36.58	Limestone	36.58	36.58	2.74	4.57	0.00	-	-	-	0.00	Limestone	36.58	Bedrock
1517002	Drilled	5008521	463229.8		05-Jun-79	0.00	0.91	Brown Clay / Sand	39.62	38.71	6.71		0.91	Clay / Sand	-	-	0.91	Limestone	37.80	Bedrock
						0.91	28.96	Grey Limestone												
						28.96	39.62	Black Limestone												
7197615	Drilled	5008901	463489	8332 Lourdes Way, Metcalfe	23-Nov-12	0.00	2.74	Brown Hardpan / Stones	40.54	39.62	9.30		2.74	Hardpan / Stones	-	-	2.74	Limestone	36.88	Bedrock
						2.74	40.54	Grey Limestone												
1507650	Drilled	5008460	463240		11-Aug-60	0.00	0.91	Clay	48.77	42.67	3.66	3.66	0.91	Clay	-	-	0.91	Limestone	41.76	Bedrock
						0.91	48.77	Grey Limestone												
1516601	Drilled	5008362	463170.8		25-Jul-78	0.00	5.18	Grey Gravel / Boulders / Pebbles	91.44	42.67	5.18		5.18	Gravel / Boulders / Pebbles	-	-	5.18	Limestone	37.49	Bedrock
						5.18	91.44	Grey Limestone												
1535213	Drilled	5009021	463334	8279 Novia Lux Way, Metcalfe	12-Oct-04	0.00	0.50	Brown Till	48.76	48.00	6.87		0.50	Brown Till	-	-	0.50	Limestone	47.50	Bedrock
						0.50	48.76	Grey Limestone												
1536635	Drilled	5008965	463409	8290 Nova Lux Way, Metcalfe	18-Aug-06	0.00	0.91	Brown Flat Rock	99.06	45.72	7.62				-	-	0.91	Limestone	44.81	Bedrock
						0.91	99.06	Grey Limestone												
7166845	Drilled	5008714	463125	2761 8th Line Road, Metcalfe	04-May-11	0.00	3.65	Brown Soil / Stones	106.06	59.43	8.66		3.65	Brown Soil / Stones	-	-	3.65	Limestone	55.78	Bedrock
						3.65	106.06	Grey Limestone (Dark Layers)												
Average									60.92	43.33	5.91		3.45				3.17		40.16	
Maximum									106.06	59.43	9.30		13.72				13.72		55.78	
Minimum									36.58	36.58	2.44		0.00				0.00		22.86	
7054471	Drilled	5008921	463364	8292 Lourdes Way, Metcalfe	04-Dec-07	0.00	1.50	Brown Clay / Sand / Stones	73.76	70.00	10.00		1.50	Brown Clay / Sand / Stones	-	-	1.50	Limestone	68.50	Bedrock
						1.50	73.76	Grey Limestone												
1533384	Drilled	5008369	463577.4	434-300 Earl Grey Dr, Kanata	07-Nov-02	0.00	10.06	Brown Clay / Stones	73.46	71.63	21.34		10.06	Clay / Stones	-	-	10.06	Limestone	61.57	Bedrock
						10.06	73.46	Grey Limestone / Dolomite Layered (Hard)												
7171814	Drilled	5008875	463378	8312 Lourdes Way, Osgoode	12-Oct-11	0.00	3.66	Boulder / Sand Clay	73.15	69.49	12.85		3.66	Boulder / Sand Clay	-	-	3.66	Limestone	65.84	Bedrock
						3.66	69.49	Grey Limestone												
						69.49	73.15	Grey Limestone												
1532274	Drilled	5008811	463393		13-Jul-01	0.00	1.52	Sandy Clay	89.61	87.17	12.19		1.52	Sandy Clay	-	-	1.52	Limestone	85.65	Bedrock
						1.52	89.61	Grey Limestone												
1534637	Drilled	5008929	463352	8282 Lourdes, Metcalfe	28-Apr-04	0.00	1.80	Sand / Rock Fill	134.10	121.30	4.80		1.80	Sand / Rock Fill	-	-	1.80	Limestone	119.50	Bedrock
						1.80	118.20	Grey Limestone												
						118.20	134.10	Grey Sandstone Limestone Mixed												
Average									88.82	83.92	12.24		3.71				3.71		80.21	
Maximum									134.10	121.30	21.34		10.06				10.06		119.50	
Minimum									73.15	69.49	4.80		1.50				1.50		61.57	

APPENDIX B

Lab Data

CADUCEON ENVIRONMENTAL LABORATORIES

Client committed. Quality assured. Proudly Canadian.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: -

REPORT No: 25-019277 - Rev. 0

Report To:
EVB Engineering
800 Second St. W
Cornwall, ON K6J 1H6

CADUCEON Environmental Laboratories
2378 Holly Lane
Ottawa, ON K1V 7P1

Attention: Adam Poapst

DATE RECEIVED: 2025-Jul-04
DATE REPORTED: 2025-Jul-17
SAMPLE MATRIX: Drinking Water

CUSTOMER PROJECT: Larry Robinson Arena
P.O. NUMBER: 23211

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Anions (Liquid)	2	OTTAWA	PCURIEL	2025-Jul-04	A-IC-01	SM 4110B
Colour (Liquid)	2	OTTAWA	LMACGREGOR	2025-Jul-04	A-COL-01	SM 2120C
Cond/pH/Alk Auto (Liquid)	2	OTTAWA	SBOUDREAU	2025-Jul-04	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
Coliforms - DC Media (Liquid)	2	OTTAWA	AHIRSI	2025-Jul-04	ECTC-001	MECP E3407
DOC/DIC (Liquid)	2	OTTAWA	TPRICE	2025-Jul-04	C-OC-01	EPA 415.2
Ion Balance (Calc)	2	OTTAWA	ASCHNEIDER		CP-028	MECP E3196
ICP/OES (Liquid)	2	OTTAWA	SGORMAN	2025-Jul-07	D-ICP-01	SM 3120B
Ammonia (Liquid)	2	KINGSTON	VHAMMOND	2025-Jul-09	NH3-001	SM 4500NH3
Organic Nitrogen (Liquid)	2	KINGSTON	YLIEN	2025-Jul-16	TPTKN-001	MECP E3516.2
Phenols (Liquid)	2	KINGSTON	EHINCH	2025-Jul-09	PHEN-01	MECP E3179
Sulphide (Liquid)	2	KINGSTON	MWILSON	2025-Jul-07	H2S-001	SM 4500-S2
Tannins (Liquid)	2	KINGSTON	MWILSON	2025-Jul-08	TAN-001	SM 5550
TP & TKN (Liquid)	2	KINGSTON	YLIEN	2025-Jul-15	TPTKN-001	MECP E3516.2
Turbidity (Liquid)	2	OTTAWA	MMIRELLA	2025-Jul-04	A-TURB-01	SM 2130B

R.L. = Reporting Limit
NC = Not Calculated
Test methods may be modified from specified reference method unless indicated by an *

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Microbiology Supervisor

Parameter	Units	R.L.	Limits	DWG	Client I.D.	TW1	TW2
					Sample I.D.	25-019277-1	25-019277-2
					Date Collected	2025-Jul-03	2025-Jul-03
					DWG	-	-
Total Coliform (DC Media)	CFU/100mL	1	0	MAC		0	0
E coli (DC Media)	CFU/100mL	1	0	MAC		0	0
Background (DC Media)	CFU/100mL	1				0	0
Alkalinity(CaCO3) to pH4.5	mg/L	5	500	OG		326	340
Conductivity @25°C	uS/cm	1				2780	1440
pH @25°C	pH units	-	8.5	OG		8.02	7.86
Colour	TCU	2	5	AO		<2	<2
Turbidity	NTU	0.1	5	AO		1.6	0.2
Fluoride	mg/L	0.1	1.5	MAC		<0.1	<0.1
Chloride	mg/L	0.5	250	AO		705	224
Nitrate (N)	mg/L	0.05	10.0	MAC		<0.05	0.69
Nitrite (N)	mg/L	0.05	1.0	MAC		<0.05	<0.05
Sulphate	mg/L	1	500	AO		123	83
Total Kjeldahl Nitrogen	mg/L	0.1				0.4	0.1
Ammonia (N)-Total (NH3+NH4)	mg/L	0.05				0.17	0.05
Organic Nitrogen	mg/L	0.1	0.15	OG		0.2	<0.1
Dissolved Organic Carbon	mg/L	0.8	5	AO		2.3	3.0
Tannin & Lignin	mg/L	0.5				<0.5	<0.5
Sulphide	mg/L	0.01	0.05	AO		<0.01	0.04
Phenolics	mg/L	0.001				<0.001	<0.001
Hardness (as CaCO3)	mg/L as CaCO3	0.02	100	OG		720	506

Shelly Lozo
Microbiology Supervisor

Final Report

REPORT No: 25-019277 - Rev. 0

Parameter	Units	R.L.	Limits	DWG	Client I.D.	TW1	TW2
					Sample I.D.	25-019277-1	25-019277-2
					Date Collected	2025-Jul-03	2025-Jul-03
					DWG	-	-
Calcium	mg/L	0.02				181	119
Copper	mg/L	0.002	1	AO		0.012	0.003
Iron	mg/L	0.005	0.3	AO		0.241	0.005
Magnesium	mg/L	0.02				65.0	50.7
Manganese	mg/L	0.001	0.05	AO		**0.071**	0.021
Potassium	mg/L	0.1				12.8	12.2
Silicon	mg/L	0.01				4.68	4.72
Silica	mg/L	2				10	10
Sodium	mg/L	0.2	200, 20, 20	AO, WL, MAC		**286**	**98.5**
Zinc	mg/L	0.005	5	AO		0.013	0.010
Anion Sum	meq/L	-				29.0	14.9
Cation Sum	meq/L	-				27.6	14.8
% Difference	%	-				2.42	0.229
TDS (Ion Sum Calc)	mg/L	1	500	AO		**1570**	**794**
Conductivity Calc	µmho/cm	-				2700	1410

DWG - Drinking Water Guidelines
ODWS - Ontario Drinking Water Standards
AO - Aesthetic Objectives
IMAC - Interim Maximum Acceptable Concentration
MAC - Maximum Acceptable Concentration
ODWO - D-5-5 Objective
OG - Operational Guidelines
WL - Warning Level - Sodium Restricted Diets

Shelly Lozo

Shelly Lozo
Microbiology Supervisor

Summary of Exceedances

Aesthetic Objectives		
TW1	**Found Value**	**Limit**
Chloride	705	250
Manganese	0.071	0.05
Sodium	286	200
TDS (Ion Sum Calc)	1570	500
TW2	**Found Value**	**Limit**
Sodium	98.5	200
TDS (Ion Sum Calc)	794	500

Maximum Acceptable Concentration		
TW1	**Found Value**	**Limit**
Sodium	286	20
TW2	**Found Value**	**Limit**
Sodium	98.5	20

Operational Guidelines		
TW1	**Found Value**	**Limit**
Organic Nitrogen	0.2	0.15
Hardness (as CaCO3)	720	100
TW2	**Found Value**	**Limit**
Hardness (as CaCO3)	506	100

Warning Level - Sodium Restricted Diets		
TW1	**Found Value**	**Limit**
Sodium	286	20
TW2	**Found Value**	**Limit**
Sodium	98.5	20

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Microbiology Supervisor

APPENDIX C

Treatment System Literature

Canature™ WaterGroup Commercial

Reverse Osmosis Systems
CAN 2540 / 4040 SERIES



Canature WaterGroup™ has a dedicated team of professionals with decades of commercial water treatment experience. They have built a reputation for designing efficient, high-quality commercial water softener systems.

Our **CAN 2540** and **4040 RO Series** are affordable solutions for applications up to 20,000 gallons per day and removes up to 98% of total dissolved solids in raw feed water.

Materials of Construction

- Frame: Epoxy powder coated carbon steel
- Industrial Nema rated control box
- Membrane elements: Low Energy (XLE)
- Membrane housings: 304SS
- Piping: Sch 80 PVC, Brass, Stainless Steel
- Tubing: NSF 61 High Density Polyethylene

Pump and Motor

- Pump: Multi-Stage Centrifugal
- Motor: ODP, 115 / 230 VAC, 1-phase, 60 Hz.

Standard Features

- Electronic controller with indicator for tank full, low pressure, pre-treatment lock out, flushing, and processing
- Unit on / off switch
- Large capacity 20” BB 5-micron sediment pre-filter
- Automatic inlet shut-off valve with air purge on start up
- Automatic feed water flush
- Liquid filled pre-filter, post-filter, and membrane pressure gauges
- Product, waste, and recycle flow meters
- Stainless steel flow control valves
- Low pressure pump protection
- Pump throttle valve

Optional Features

- Stainless steel pump
- S-100, S-150 Controllers
- Permeate water flush
- TDS monitor
- High rejection or Nano membranes
- 304 Stainless Steel Frame

Operating Parameters

- Operating pressure: 110 - 150PSI (758kPa - 1034kPa)
- Minimum inlet pressure: 30PSI (207kPa)
- Operating temperature: 33 - 100 °F (1-38 °C)
- Nominal recovery: 50 - 75%
- Nominal salt rejection: >98%

For Applications Such As:

Boiler Treatment • Spot-free Rinse • Ice Making • Greenhouses • Research and Medical Labs
Process Make-up Water • Humidification • Ion exchange Pre-treatment • Bottle Water • Food and Beverage Processing

Reverse Osmosis Systems

Model	Qty Membranes	Nominal Rating		Recovery	Motor		Voltage	Connections (inches)			Dimensions, HxWxD		Shipping weight	
		USGPD	m^3/d		HP	kW		Inlet	Waste	Product	in	mm	lbs	kg
CAN 2540-1	1	600	2.3	Up to 75%	0.75	0.56	120V/230V	3/4	1/2	1/2	55 x 28 x 24	1397 x 711 x 610	170	77
CAN 2540-2	2	1200	4.5	Up to 75%	0.75	0.56	120V/230V	3/4	1/2	1/2	55 x 28 x 24	1397 x 711 x 610	180	82
CAN 2540-3	3	1800	6.8	Up to 75%	0.75	0.56	120V/230V	3/4	1/2	1/2	55 x 28 x 24	1397 x 711 x 610	200	91
CAN 4040-1	1	2000	7.6	Up to 75%	1	0.75	230V	3/4	1/2	1/2	55 x 28 x 24	1397 x 711 x 610	200	91
CAN 4040-2	2	4000	15.1	Up to 75%	1	0.75	230V	3/4	1/2	1/2	55 x 28 x 24	1397 x 711 x 610	220	100
CAN 4040-3	3	6000	22.7	Up to 75%	1.5	1.12	230V	3/4	1/2	1/2	55 x 28 x 24	1397 x 711 x 610	240	109
CAN 4040-4	4	8000	30.3	Up to 75%	2	1.49	230V	1	3/4	3/4	55 x 28 x 24	1397 x 711 x 610	260	118
CAN 4040-5	5	10000	37.9	Up to 75%	3	2.24	230V	1	3/4	3/4	55 x 28 x 29	1397 x 711 x 737	300	136
CAN 4040-6	6	12000	45.4	Up to 75%	3	2.24	230V	1	3/4	3/4	55 x 28 x 29	1397 x 711 x 737	320	145
CAN 4040-8	8	16000	60.6	Up to 75%	3	2.24	230V	1.5	3/4	3/4	59 x 28 x 29	1499 x 711 x 737	360	164
CAN 4040-10	10	20000	75.7	Up to 75%	3	2.24	230V	1.5	3/4	3/4	59 x 28 x 29	1499 x 711 x 737	400	182

1 The maximum permeate flow as defined by the membrane specifications and the feed water conditions of 2,000 ppm NaCl, 77 deg. F, 200 psi operating to atmosphere.

2 TDS rejection (>98%) and water recovery (>75%) are variable and can be affected by temperature and feed water conditions.

3 Max operating pressure 180 psi

Open Storage Tank Systems (Constant Pressure Pump)

Storage systems available with Durojet SS pumps or Constant Pressure Pumps with associated installation fittings. Storage volumes from 100USG to 710USG available that are able to fit in standard 30" doorways. Other sizes based on project needs. Inquire for options and pricing within.

DUROJET™

Feed Water Guidelines	
Feed Water Pressure	30 - 65 psi
Temperature	33 F - 100 F
pH	3.0 - 11.0
Maximum TDS	2,500 mg/l
Turbidity	< 1.0 NTU
Maximum SDI	< 5.0
Hardness	<1 grains per gallon
Iron	< 0.1
Manganese	< 0.05
Hydrogen Sulfide	zero
Organics	zero
Chlorine	zero
Oil (Hydrocarbons)	zero

Pressurized Storage Tanks						
Item	Description	Dimensions (WxDxH inches)	Tank Volume	Total Drawdown		
				30/50	40/60	
33335	FWRO 15 Composite RO tank	26x16x16	15 Gal	9.3	10	
33336	FWRO 22 Composite RO tank	34x16x16	20 Gal	13.6	14.7	
33337	FWRO 40 Composite RO tank	37x21x21	40 Gal	24.7	26.8	
33338	FWRO 80 Composite RO tank	64x24x24	80 Gal	49.5	53.6	

Canature™ WaterGroup Commercial

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