

**CITY OF MISSISSAUGA
SPECIFICATIONS FOR THE DECOMMISSIONING OF
AN ABANDONED WELL AND CISTERN
AT THE ADAMSON ESTATE PROPERTY**

**850 Enola Avenue
Mississauga, ON L5G 4B2**

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1. INTRODUCTION

The purpose of this project is to decommission an abandoned 100-year-old (approximate) well and cistern at the Adamson Estate property, which is located at 850 Enola Avenue, Mississauga, Ontario (ON), the "Site", with the objective of decommissioning the two subsurface structures to ensure the health and safety of the general public for use of the Site as a public park area. Refer to Figure 1 for the Site's geographical location and Appendix A for Site photographs.

The Adamson Estate property is a historic property set on expansive grounds bordering Lake Ontario. The estate lands comprise a 13.2 acre parcel. The main structure comprises a two-storey manor house. Surrounding the house are extensive landscaped grounds, which include formal gardens, lawns, mature trees, and pathways. The structures of the original estate, with its house, barn outbuildings and grounds are a significant waterfront cultural landscape and the Site was recognised for its heritage value by the City of Mississauga By-law 461-78, on January 5, 1993.

This specification defines the procedures and requirements for the proper abandonment (decommissioning) of the historic well and cistern at the Site. Refer to Figure 2 for the well and cistern location and the general Site layout. The purpose is to ensure that the well is abandoned in strict compliance with the Ontario Water Resources Act, R.R.O. 1990, Regulation 903 (WELLS), particularly Sections 21 and 21.1, thereby protecting groundwater resources and public safety. This specification is intended for use by qualified and licensed Ontario Well Contractors and Well Technicians.

The purpose of this specification is to provide clear, actionable instructions for qualified well contractors and technicians to perform the work safely and correctly, preventing movement of water, contaminants, or other material between subsurface formations or between a subsurface formation and the ground surface *via* the well bore or annular space. Note, there is no "National Master Specification" (NMS) section solely dedicated to the decommissioning of a water well or an underground water cistern. Relevant information and requirements can be found within other regulatory documents, particularly at the provincial level.

➤ Provincial Regulations (Ontario):

- Wells Regulation, Ontario Regulation 903: Although primarily focused on wells, this regulation highlights the importance of preventing contamination and ensuring the safe abandonment of underground structures that could pose a risk to groundwater or cause physical hazards. The principles of plugging and sealing to prevent pathways for contaminants is relevant to the water cistern, and as such, select procedures for decommissioning of the water well have been applied to the cistern.

2. PROJECT INFORMATION

Project Name: Adam Estate Property - Abandon Well and Cistern

Site Location: 850 Enola Avenue, Mississauga, Ontario

Specific Well ID: N/A

Estimated Well Depth: 7.5 metres below ground surface (mbgs)

Estimated Well Diameter(s): 0.8 metres (m)

Observed Well Construction: Brick lined

Estimated Cistern Depth(s): 1.34 mbgs

Estimated Cistern Diameter(s): 1.33 m

Observed Cistern Construction: Brick lined

Specific Site Hazards: Underground services, nearby structures, softscape lands, nearby trees, limited access.

Responsible Professional Engineer/Geoscientist (P.Eng./P.Geo.): Keystone Environmental Ltd.

Engaged Well Contractor Name and License Number: [TBD]

3. APPLICABLE REGULATIONS AND STANDARDS

The work shall be performed in accordance with the following regulations and standards, as amended:

- Ontario Water Resources Act, R.R.O. 1990, Regulation 903 (WELLS): Specifically, but not limited to:
 - Section 1: Definitions (e.g., sealant, suitable sealant, bentonite, tremie pipe).
 - Section 12.1: Log and Field Notes (required during abandonment).
 - Section 16.5: Records — Well Abandonment (Well Record completion and submission).
 - Section 21: Abandonment Conditions (conditions requiring abandonment).
 - Section 21.1: Abandonment Procedure (detailed steps and material requirements).
 - Section 22: Protection of Well Tag (removal procedures).
- Relevant Standards referenced in R.R.O. 903 for materials:
 - ASTM, ANSI, AWWA, NSF/ANSI/CAN standards for casing/materials as cross-referenced by R.R.O. 903 Section 1 and 21.1(3). Abandonment materials must meet the requirements of Section 21.1(3) regarding composition and freedom from contamination.
- Occupational Health and Safety Act, R.S.O. 1990, c. O.1 and its regulations.

4. PERSONNEL QUALIFICATIONS AND RESPONSIBILITIES

- All well abandonment activities shall be performed by or under the direct supervision of a Well Technician holding a valid licence from the Ontario Ministry of the Environment, Conservation and Parks (MECP) with the appropriate class for the type of work and well being abandoned, unless specifically exempted by R.R.O. 903 Section 21(13)(a-d).

-
- The work shall be conducted under the oversight of a licensed Well Contractor as required by R.R.O. 903 Section 21(13).
 - The Engaged Well Contractor is responsible for ensuring all personnel on site are appropriately qualified and that all work strictly adheres to this specification and R.R.O. 903.
 - The well technician supervising or performing the work must have their licence on site and produce it upon request. All personnel shall comply with the requirements of the Act and the Regulation.
 - The Responsible Professional Engineer/Geoscientist will provide technical oversight and validation for the project scope and objectives but the Well Contractor/Technician holds direct responsibility for the safe and compliant execution of the well abandonment work as required by R.R.O. 903.

5. SUBMITTALS

Submit the following to the City of Mississauga or their designated representative for review and acceptance prior to commencing work:

- Detailed Work Plan and Schedule.
- Site-specific Health and Safety Plan (HASP), including provisions for confined space entry (if required), excavation safety, and personal protective equipment (PPE).
- Site-specific Environmental Protection Plan (EPP), including spill prevention and response procedures, dust control, erosion and sediment control.
- Waste Management Plan, including anticipated waste streams, proposed disposal facilities, and waste tracking procedures.
- Proposed method for emptying the cistern, including proposed disposal of any pumped water or sludge.
- For well and cistern decommissioning: Proposed source and type of inert fill material, including any required documentation (e.g., gradation, contamination testing if required by Professional or regulations).
- For cistern removal: Proposed method for dismantling and removing the cistern structure, and planned staging area for materials prior to disposal.
- Traffic management plan.
- Emergency contact information.

6. SITE PREPARATION

- Delineate the work area and install temporary fencing or barriers as required for safety and security.
 - Implement traffic control measures as per the approved plan.
 - Establish temporary erosion and sediment control measures.
 - Implement dust control measures as needed.
-

-
- Identify and locate all adjacent underground and above-ground utilities. Ensure protection of all utilities that are to remain in service. Contact Ontario One Call (or equivalent) for utility locates.

7. REQUIRED MATERIALS

- **Abandonment Barrier Materials:** Materials used for abandonment shall constitute a "suitable sealant" or "abandonment barrier" as defined in R.R.O. 903 Section 1 and specified in Section 21.1(3) and (5). These materials must be compatible with the quality of water in the well and shall not contain soil or drill cuttings or any other materials that may impair the integrity of the abandonment barrier (21.1(3)). If the well is in contact with contaminants, the barrier must be stable in their presence (21.1(3) Para 3).
 - **Specific Materials for Large Diameter Wells [> 65 cm diameter, per 21.1(5)]:** As detailed in the procedure (Section 6.0, Step 4), the abandonment barrier for large diameter wells (> 65 cm) involves the specific sequential placement of:
 - Clean sand or pea gravel.
 - Bentonite chips or pellets.
 - Bentonite slurry (clean water and at least 20% bentonite solids) or the chosen abandonment barrier from 21.1(3).
 - Clean gravel, sand, silt, or clay or abandonment barrier interspersed with sand/pea gravel.
 - **Placement Method:** Bentonite chips/pellets shall be screened and placed according to the manufacturer's specifications (21.1(3) Para 7 vii).
 - **Sealant Properties:** The abandonment barrier must be compatible with the quality of water found in the well and must not contain any materials that may impair its integrity, including soil or drill cuttings (R.R.O. 903 21.1(3) Para 1, 2). If the well is in contact with contaminants, the barrier must be stable in their presence (R.R.O. 903 21.1(3) Para 3).
 - **Sand/Gravel (for >65 cm wells or minimizing sealant loss):** Clean sand or pea gravel (for use at the bottom of >65 cm wells or adjacent to water zones/fractures per R.R.O. 903 21.1(4) and 21.1(5)).
 - **Bentonite for Surface Seal:** Bentonite chips, pellets, granules, or powder for the surface seal (R.R.O. 903 21.1(1) Para 8(ii)). Must be placed according to manufacturer's specifications.
 - **Soil Cover:** Clean soil or other material native to the site surface for final backfill (R.R.O. 903 21.1(1) Para 8(ii)).
 - **Water:** Clean water for mixing slurries.
 - **Estimated Material Quantities:** The Contractor shall verify required quantities based on actual well dimensions and conditions.
 - **Structural Strength:** For wells greater than 65.0 cm in diameter, sealing materials shall be selected and placed to provide appropriate structural strength to support the weight of persons and vehicles that may move over the area after it is filled (21.1(6)).
-

8. ABANDONMENT PROCEDURE

8.1 Water Well

The abandonment procedure shall follow the steps outlined in R.R.O. 903 Section 21.1, paying particular attention to the specific requirements for dug wells (> 65 cm diameter) in Section 21.1(5) and well pits in Section 21.1(9).

8.1.1 Pre-Abandonment Activities:

- Verify site hazards identified in Project Information (Section 2.0) and take appropriate precautions.
- Confirm well and cistern location, estimated dimensions, and observed construction details.
- Review any available well records or historical information (as applicable).
- Ensure that the conditions requiring abandonment under R.R.O. 903 Section 21 have been met or addressed (Note: the well and cistern is not being used or maintained).
- Step-by-Step Procedure (Based on R.R.O. 903 Section 21.1(1), (5), and (9)):
 - Well Tag Removal: Not Applicable – there is no applicable well tag.
 - Equipment and Debris Removal: Remove all equipment (e.g., piping) and debris (e.g., collapsed casing sections, foreign materials) from the well bore (21.1(1) Para 2). Make reasonable efforts to remove collapsed casing if present.
 - Well Pit Handling: If a well pit is present, Section 21.1 applies to the well pit as well as the well bore (21.1(9)). Removal of below-ground concrete structures, foundations, and slabs associated with the well pit shall be performed to a depth adequate to accommodate surface sealing measures (Step 8), unless removal would destabilize remaining structures (21.1(1) Para 7, 21.1(9)). The well pit volume shall be filled as part of the overall abandonment process, integrating the requirements for plugging the well bore and surface sealing. The large diameter well procedure (Step 4 below) should be applied within the well pit area extending downwards.
 - Plugging the Well Bore and Annular Space: Plug the well bore and any annular space with a continuous column of abandonment barrier material(s) from the bottom of the well upward to approximately two metres (2 m) below the ground surface (21.1(1) Para 3).
- Crucially, for wells greater than 65.0 cm in diameter (typical of dug wells), the following specific sequential steps from R.R.O. 903 Section 21.1(5) must be followed:
 - Place clean sand or pea gravel from the bottom of the well to the top of the deepest water producing zone or the top of the well screen, whichever is deeper (21.1(5) Para 1). Clean sand or gravel may also be placed adjacent to water producing zones/fractures to minimize sealant loss (21.1(4)).
 - Place at least 0.1 metres (10 cm) of bentonite chips or pellets over the sand or pea gravel placed in Step 4a (21.1(5) Para 2). Ensure chips/pellets are screened and placed per manufacturer's specifications (21.1(3) Para 7 vii).

- If the water level can be drawn down to the top of the bentonite chips or pellets:
 - Draw down the water level to the top of the bentonite chips or pellets (21.1(5) Para 3 i).
 - Place at least 0.3 metres (30 cm) of a bentonite slurry (clean water and at least 20% bentonite solids, compatible with water quality) over the bentonite chips or pellets (21.1(5) Para 3 ii). Place slurry using a tremie pipe, keeping the pipe immersed in the rising accumulation (21.1(3) Para 8).
 - Drop clean gravel, sand, silt, or clay over the bentonite slurry to fill the remainder of the well bore upward to approximately two metres below ground surface, while maintaining at least 0.3 metres of the bentonite slurry above the rising accumulation of gravel, sand, silt, or clay (21.1(5) Para 3 iii).
 - If the water level cannot be drawn down to the top of the bentonite chips or pellets (e.g., well refills too quickly):
 - Fill the remainder of the well bore upward to approximately two metres below ground surface with an abandonment barrier selected from the list in Section 5.2 (21.1(5) Para 4).
 - This abandonment barrier may be interspersed with clean sand or pea gravel placed in each water producing zone of the well (21.1(5) Para 4). Wet barriers must be placed using a tremie pipe (21.1(3) Para 8).
 - **Casing/Screen Handling During Plugging:** If well casing or screen was not removed in Step 2, remove it where reasonably possible during the plugging process (Step 4), keeping the bottom of the casing immersed in the rising accumulation of the abandonment barrier until the required level (approx. 2m bgs) is reached (21.1(1) Para 4).
 - **Casing/Screen Removal After Plugging:** If casing or screen was not removed in Step 2 or Step 5, remove it where reasonably possible to a minimum depth of two metres (2 m) below the ground surface after plugging is complete (21.1(1) Para 5).
 - **Setting Time (if cement used):** If the abandonment barrier placed in Step 4 contains cement (e.g., cement-bentonite grout, concrete slurry), allow it to set until firm according to the manufacturer's specifications or for 12 hours, whichever is longer (21.1(1) Para 6). If, after setting, the material has settled or subsided, top it up to approximately two metres (2 m) below the ground surface (21.1(1) Para 6).
 - **Removal of Near-Surface Structures:** Ensure below-ground concrete structures, foundations, and slabs (including well pit structures not previously removed in Step 3) are removed to a depth adequate to accommodate the surface sealing measures described in Step 8, unless removal would destabilize remaining structures (21.1(1) Para 7, 21.1(9)).
 - **Surface Sealing:** Seal the well opening at the ground surface (21.1(1) Para 8). This involves:
 - Placing between 50 and 150 centimetres (0.5 - 1.5 m) in vertical thickness of bentonite chips, pellets, granules, or powder in the well opening, placed in accordance with the manufacturer's specifications (21.1(1) Para 8 i).
-

- Filling the remaining well opening from the top of the bentonite seal to the ground surface with soil cover, or other material that is more in keeping with the surface material immediately adjacent to the well opening (21.1(1) Para 8 ii). This prevents inadvertent or unauthorized access.

➤ Site Stabilization: Stabilize the disturbed area to prevent erosion (21.1(1) Para 9).

➤ Alternative Abandonment Method (Excavation):

- As an alternative to the steps above, the well may be abandoned by excavation of the entire well in the course of work carried out for another purpose (21.1(8)). If this method is used, paragraphs 2 to 9 of subsection 21.1(1) and subsections 21.1(3) to (7) do not apply. The well record must still be completed and submitted.

8.2 Cistern

Complete Removal

- a) Safely demolish and remove the entire cistern structure (walls, floor, roof/crown).
- b) Break down excavated brick and concrete into manageable sizes for hauling.
- c) Load and transport demolition debris to an approved receiving facility (e.g., construction and demolition waste landfill, recycling facility) in accordance with the Waste Management Plan.
- d) Obtain and retain documentation (e.g., manifests, weigh tickets) for all disposed materials.

Backfilling and Compactions: After removal, backfill the excavation using approved backfill material as directed by the Project Geotechnical Professional. Place backfill material in lifts and compact each lift to the required density specified by the Project Geotechnical Professional. Use appropriate compaction equipment and techniques. Perform density testing as required by the Project Geotechnical Professional to confirm adequate compaction.

9. QUALITY CONTROL

➤ The Contractor shall ensure strict adherence to all requirements of R.R.O. 903 and this specification.

➤ The well contractor shall ensure that:

- All work strictly adheres to the requirements of R.R.O. 1990, Regulation 903 (WELLS) and this specification.
 - Abandonment barrier materials are selected and placed correctly according to regulatory requirements, manufacturer specifications, and accepted industry practice.
 - Slurry mixtures are properly mixed to achieve the required consistency and solids content.
 - Bentonite chips/pellets are placed according to manufacturer's specifications for hydration/placement depth.
-

- Sufficient abandonment barrier is placed to form a continuous column from the bottom of the well to approximately two metres below ground surface, preventing the movement of water, contaminants, or other material between subsurface formations or between a subsurface formation and the top of the abandonment barrier (R.R.O. 903 21.1(1) Para 3).
- For wells >65 cm diameter, the specific placement sequence described in R.R.O. 903 21.1(5) is followed.
- Near-surface structures are removed to the required depth.
- The surface seal uses the correct thickness of bentonite material as specified (50-150 cm).
- Sealing materials for >65 cm wells provide appropriate structural strength at the surface (R.R.O. 903 21.1(6)).

10. WASTE DISPOSAL

- Waste disposal must comply with Ontario Ministry of the Environment, Conservation and Parks (MECP) regulations and any local waste disposal facility requirements.

11. SITE RESTORATION

- The disturbed area around the former well and cistern location shall be graded and stabilized to prevent erosion (R.R.O. 903 21.1(1) Para 9).
- Restore the site to a condition as agreed upon with the City of Mississauga or as it existed prior to abandonment activities, to the extent practicable.
- Notify the Environmental Engineer of the source site for any imported soil (as defined under O. Reg. 153/04), for testing by the Environmental Engineer under separate contract prior to importation.

12. DOCUMENTATION AND REPORTING

- The Contractor shall complete a well record (Form 9 supplied by the MECP) for the well abandonment in accordance with R.R.O. 903 Section 16.5(1)(a). The well record must accurately detail the abandonment procedures, materials used (including quantities), depths of different materials/layers placed (especially for > 65 cm wells), casing/screen handling, well tag disposition, and any issues encountered. Field notes and logs of materials encountered during any initial clearing/preparation should support the well record (R.R.O. 903 12.1(1)).
 - Deliver a copy of the completed well record to the owner of the land on which the well is situated within 14 days after the date on which the well construction equipment is removed from the site (R.R.O. 903 16.5(1)(b)(i)).
 - Forward a copy of the completed well record, and any well tag that was removed from the well, to the Director (MECP) within 30 days after the date on which the well construction equipment is removed from the site (R.R.O. 903 16.5(1)(c)(i)).
 - Retain a copy of the well record for a minimum of two years (implied by 16.3(1)(d) which applies to construction records; good practice for abandonment).
-

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- Maintain a daily log of all decommissioning activities, including personnel on site, weather, work performed, materials used, quantities of waste generated, observations, and any issues encountered.
 - Record details of waste disposal, including dates, quantities, types of waste, transporter information, and disposal facility name and location. Retain copies of all waste manifests, weigh tickets, and disposal receipts.
 - Take progress photographs documenting key stages of the work (e.g., pre-excavation, excavation, dewatering/cleaning, cistern condition, filling/removal, backfilling, final surface restoration).
 - Submit daily logs and progress reports as required by the Professional.
 - Within 20 business days of completing the field work, submit a final Decommissioning Report to the City of Mississauga. The final report shall include:
 - Summary of work performed and dates of field activities.
 - Details of the decommissioning method implemented (filling or removal).
 - Quantities and types of materials used (e.g., fill material).
 - Documentation of waste disposal (manifests, receipts).
 - Summary of any issues encountered and corrective actions taken.
 - Copies of permits and approvals.
 - Photographic log.
 - Confirmation that the work was completed in accordance with the approved Work Plan and this specification.

13. HEALTH AND SAFETY

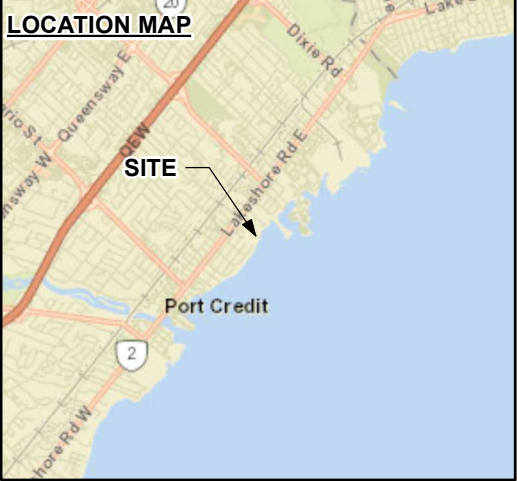
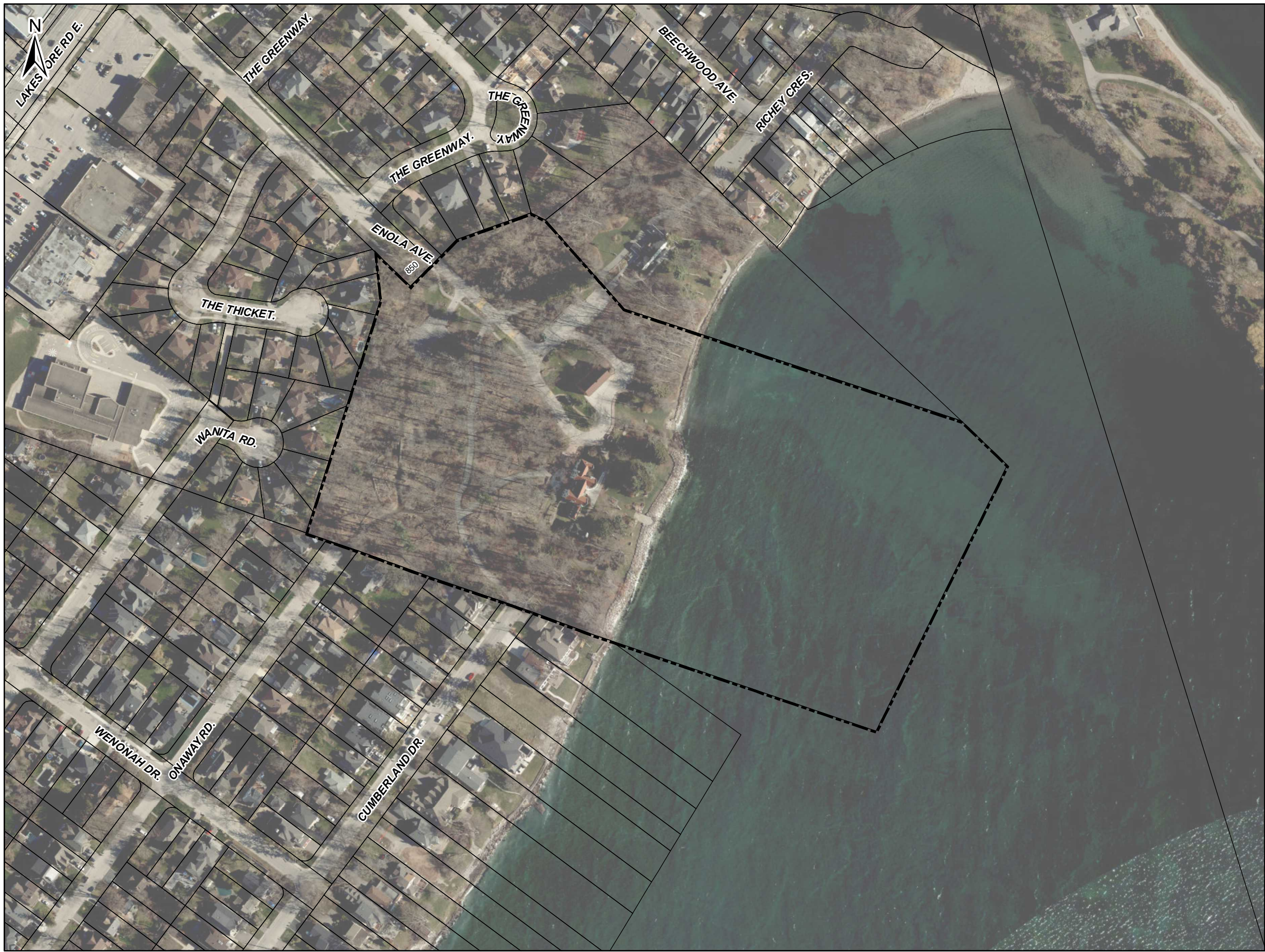
All work shall be performed in accordance with the Health and Safety requirements in the City of Mississauga bid / contracts documents, including but not limited to:

- All work shall be performed in compliance with the latest version of the Occupational Health and Safety Act (Ontario) and its regulations.
 - The Contractor shall develop and implement a site-specific health and safety plan covering all aspects of the abandonment work, including but not limited to:
 - Excavation safety (if applicable).
 - Confined space entry (if accessing the well bore directly is necessary and safe).
 - Handling of materials (bentonite, cement, etc.).
 - Potential hazards from the well (e.g., unstable ground, contaminated water, gases per 21(6)). * Site-specific hazards (Section 2.0).
 - All personnel shall be trained on the site-specific safety plan and required procedures.
-

14. REFERENCES

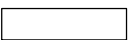
- Ontario Water Resources Act, R.R.O. 1990, Regulation 903 (WELLS)
- Occupational Health and Safety Act, R.S.O. 1990, c. O.1

FIGURES



INFERRED LOCAL
GROUNDWATER
FLOW DIRECTION

LEGEND

-  SITE
-  LOT LINES



Keystone Environmental

NOTES:
1. THIS DRAWING IS FOR GENERAL INFORMATION ONLY.
LOT BOUNDARIES AND FEATURES ARE APPROXIMATE.
2. THE DATE OF AERIAL PHOTO IS 2021.



SCALE: 1:2,500 (approx.)

Adamson Estate Property - 850 Enola Ave, Mississauga, ON		
Stephenson Engineering (a company of Salas O'Brien)		
REVISION No.	DATE	PROJECT No.
A	May, 2025	20550-24

Figure 1

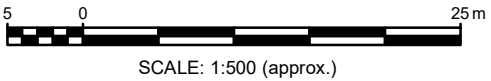
Site Location Map



LEGEND

- SITE
- LOT LINES
- STRUCTURES
- BLOCKED PIPE
- CATCH BASIN
- CISTERN
- SUMP
- WELL

NOTES:
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Adamson Estate Property - 850 Enola Ave, Mississauga, ON Stephenson Engineering (a company of Salas O'Brien)		
REVISION No.	DATE	PROJECT No.
A	May. 2025	20550-24

Figure 2
Site Layout Plan

APPENDIX A

SITE PHOTOGRAPHS



Photograph 1: General Access to the Well and Cistern Area



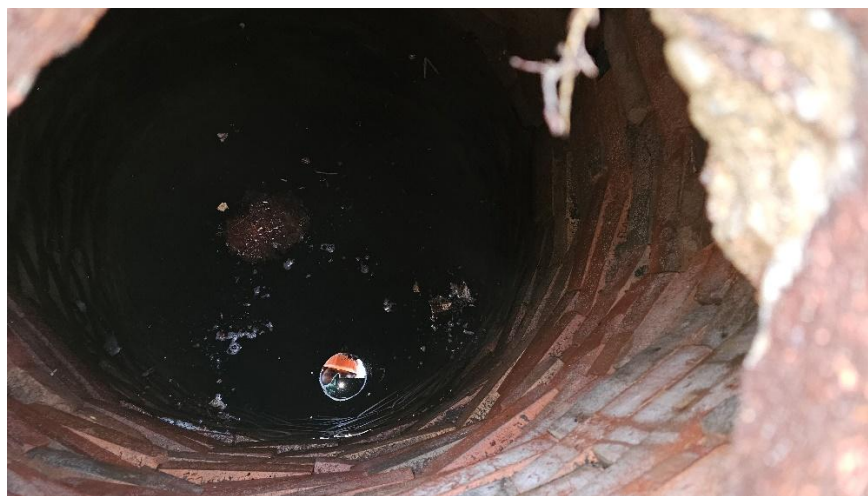
Photograph 2: General View of Well Area



Photograph 3: General View of Cistern Area



Photograph 4: Well Opening



Photograph 5: Well Interior



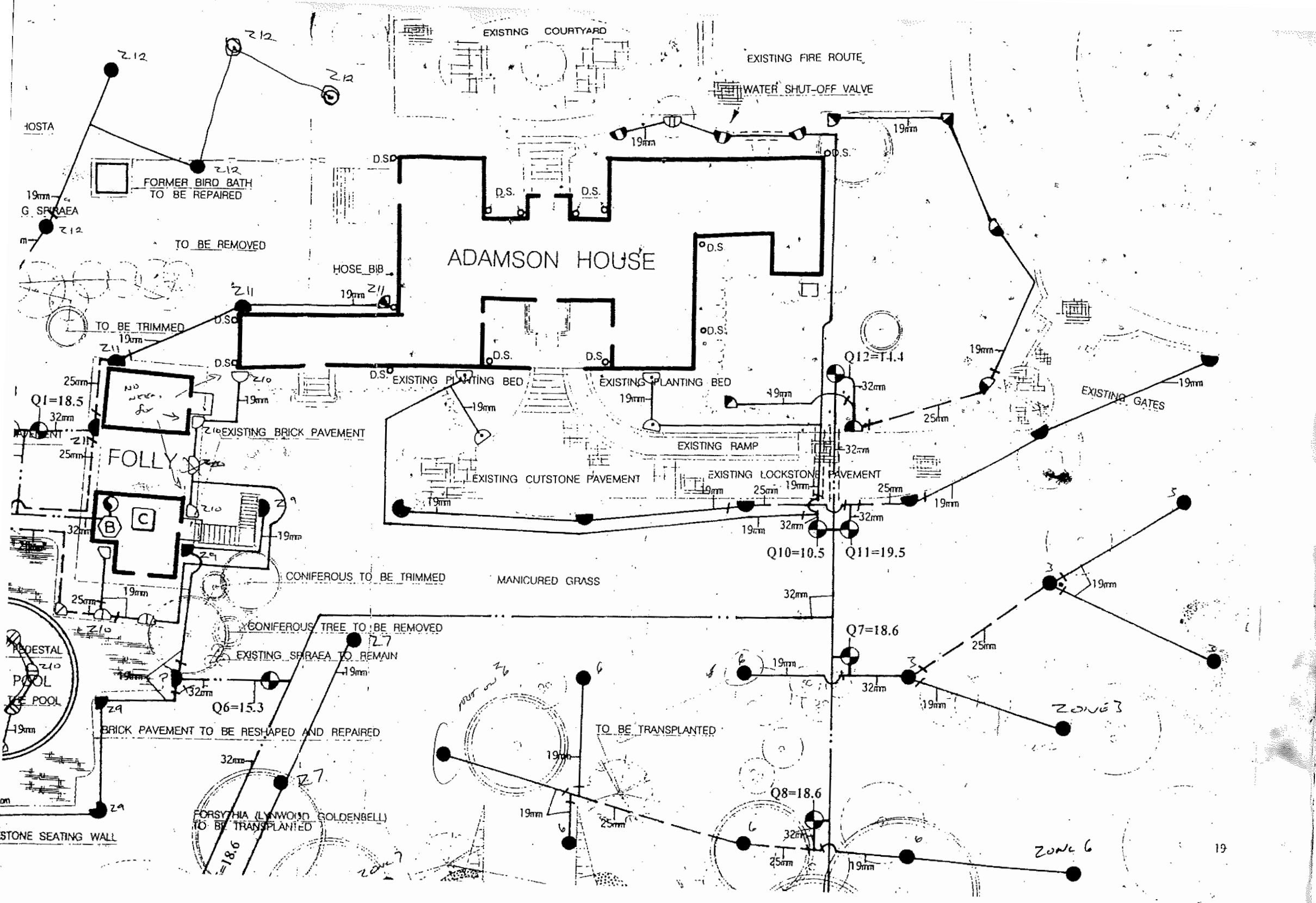
Photograph 6: Cistern Exterior Surface



Photograph 7: Cistern Interior

APPENDIX B

IRRIGATION LAYOUT PLAN



APPENDIX C

WATER SAMPLE ANALYTICAL RESULTS

Your Project #: 20550
Your C.O.C. #: 1043796-01-01

Attention: Jeff Muir

Keystone Environmental Ontario Ltd.
700 – 6733 Mississauga Road
Mississauga, ON
CANADA L5N 6J5

Report Date: 2025/05/08
Report #: R8534567
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C548490

Received: 2025/04/30, 18:18

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Biochemical Oxygen Demand (BOD)	2	2025/05/01	2025/05/06	CAM SOP-00427	SM 24 5210B m
Total Residual Chlorine	2	2025/05/01	2025/05/01	CAM SOP 00425	SM 24 4500-CL G m
Chromium (VI) in Water	2	N/A	2025/05/03	CAM SOP-00436	EPA 7199 m
Total Cyanide	2	2025/05/01	2025/05/01	CAM SOP-00457	OMOE E3015 5 m
Petroleum Hydro. CCME F1 & BTEX in Water	2	N/A	2025/05/08	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (1)	2	2025/05/05	2025/05/06	CAM SOP-00316	CCME PHC-CWS m
Mercury in Water by CVAA	1	2025/05/05	2025/05/05	CAM SOP-00453	EPA 7470A m
Mercury in Water by CVAA	1	2025/05/07	2025/05/07	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	2	2025/05/06	2025/05/07	CAM SOP-00447	EPA 6020B m
E.coli, (CFU/100mL)	2	N/A	2025/05/01	CAM SOP-00552	SM9222B, MECP E3371
PAH Compounds in Water by GC/MS (SIM)	2	2025/05/05	2025/05/06	CAM SOP-00318	EPA 8270E
Polychlorinated Biphenyl in Water	2	2025/05/06	2025/05/06	CAM SOP-00309	EPA 8082A m
Phenols (4AAP)	2	N/A	2025/05/06	CAM SOP-00444	OMOE E3179 m
pH	2	2025/05/01	2025/05/02	CAM SOP-00413	SM 24th-4500H+ B
Total PAHs: Barrie/Mississauga Sewer Use (2)	2	N/A	2025/05/06	CAM SOP - 00301	
Total Suspended Solids	2	2025/05/05	2025/05/07	CAM SOP-00428	SM 24 2540D m
Volatile Organic Compounds in Water	2	N/A	2025/05/04	CAM SOP-00228	EPA 8260D

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the

Your Project #: 20550
Your C.O.C. #: 1043796-01-01

Attention: Jeff Muir

Keystone Environmental Ontario Ltd.
700 – 6733 Mississauga Road
Mississauga, ON
CANADA L5N 6J5

Report Date: 2025/05/08
Report #: R8534567
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C548490

Received: 2025/04/30, 18:18

customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

(2) Total PAHs include only those PAHs specified in the sewer use by-law.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:

Kudrat Bajwa, B.Sc., Project Manager
Email: Kudrat.Bajwa@bureauveritas.com
Phone# (905)817-5755

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This report has been generated and distributed using a secure automated process.

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.



BUREAU
VERITAS

Bureau Veritas Job #: C548490

Report Date: 2025/05/08

Keystone Environmental Ontario Ltd.

Client Project #: 20550

Sampler Initials: AA

MISSISSAUGA STORM SEWER BYLAW (46-2022)

Bureau Veritas ID				AQKL28			AQKL28		
Sampling Date				2025/04/30 03:00			2025/04/30 03:00		
COC Number				1043796-01-01			1043796-01-01		
	UNITS	Criteria	Criteria-2	W-1	RDL	QC Batch	W-1 Lab-Dup	RDL	QC Batch
Inorganics									
Total BOD	mg/L	15	-	<2	2	9920065			
Total Chlorine	mg/L	1.0	-	<0.1	0.1	9920180	<0.1	0.1	9920180
pH	pH	6:9	-	8.18		9920606			
Phenols-4AAP	mg/L	0.008	-	<0.0010	0.0010	9923394			
Total Suspended Solids	mg/L	15	-	<10	10	9922416			
Total Cyanide (CN)	mg/L	0.02	-	<0.0050	0.0050	9920299			
Metals									
Chromium (VI)	ug/L	40	140	<0.50	0.50	9921706			
Mercury (Hg)	mg/L	0.0004	0.00029	<0.00010	0.00010	9922133			
Total Aluminum (Al)	ug/L	1000	-	<4.9	4.9	9923483			
Total Arsenic (As)	ug/L	20	1900	1.3	1.0	9923483			
Total Cadmium (Cd)	ug/L	8	2.7	<0.090	0.090	9923483			
Total Chromium (Cr)	ug/L	80	810	<5.0	5.0	9923483			
Total Copper (Cu)	ug/L	40	87	<0.90	0.90	9923483			
Total Lead (Pb)	ug/L	120	25	<0.50	0.50	9923483			
Total Manganese (Mn)	ug/L	2000	-	17	2.0	9923483			
Total Nickel (Ni)	ug/L	80	490	<1.0	1.0	9923483			
Total Phosphorus (P)	ug/L	400	-	120	100	9923483			
Total Selenium (Se)	ug/L	20	63	<2.0	2.0	9923483			
Total Silver (Ag)	ug/L	120	1.5	<0.090	0.090	9923483			
Total Zinc (Zn)	ug/L	200	1100	7.3	5.0	9923483			
Calculated Parameters									
Total PAHs	ug/L	2	-	<0.20	0.20	9919766			
Polyaromatic Hydrocarbons									
Acenaphthene	ug/L	-	600	<0.050	0.050	9922362			
Acenaphthylene	ug/L	-	1.8	<0.050	0.050	9922362			
Anthracene	ug/L	-	2.4	<0.050	0.050	9922362			
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Lab-Dup = Laboratory Initiated Duplicate									
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022									
Criteria-2: Ontario Reg. 153/04 (Amended April 15, 2011)									
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition									
Non- Potable Ground Water - All Types of Property Uses - Coarse Textured Soil									



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Bureau Veritas ID				AQKL28			AQKL28		
Sampling Date				2025/04/30 03:00			2025/04/30 03:00		
COC Number				1043796-01-01			1043796-01-01		
	UNITS	Criteria	Criteria-2	W-1	RDL	QC Batch	W-1 Lab-Dup	RDL	QC Batch
Benzo(a)anthracene	ug/L	-	4.7	<0.050	0.050	9922362			
Benzo(a)pyrene	ug/L	-	0.81	<0.0090	0.0090	9922362			
Benzo(g,h,i)perylene	ug/L	-	0.2	<0.050	0.050	9922362			
Benzo(k)fluoranthene	ug/L	-	0.4	<0.050	0.050	9922362			
Chrysene	ug/L	-	1	<0.050	0.050	9922362			
Dibenzo(a,h)anthracene	ug/L	-	0.52	<0.050	0.050	9922362			
Fluoranthene	ug/L	-	130	<0.050	0.050	9922362			
Fluorene	ug/L	-	400	<0.050	0.050	9922362			
Indeno(1,2,3-cd)pyrene	ug/L	-	0.2	<0.050	0.050	9922362			
1-Methylnaphthalene	ug/L	-	1800	<0.050	0.050	9922362			
2-Methylnaphthalene	ug/L	-	1800	<0.050	0.050	9922362			
Naphthalene	ug/L	-	1400	<0.050	0.050	9922362			
Phenanthrene	ug/L	-	580	<0.030	0.030	9922362			
Pyrene	ug/L	-	68	<0.050	0.050	9922362			
Benzo(b)fluoranthene	ug/L	-	0.75	<0.030	0.030	9922362			
Volatile Organics									
Benzene	ug/L	2	44	<0.20	0.20	9920930	<0.20	0.20	9920930
1,2-Dichlorobenzene	ug/L	5.6	4600	<0.40	0.40	9920930	<0.40	0.40	9920930
1,4-Dichlorobenzene	ug/L	6.8	8	<0.40	0.40	9920930	<0.40	0.40	9920930
Ethylbenzene	ug/L	2	2300	<0.20	0.20	9920930	<0.20	0.20	9920930
Methylene Chloride(Dichloromethane)	ug/L	5.2	610	<2.0	2.0	9920930	<2.0	2.0	9920930
1,1,1,2-Tetrachloroethane	ug/L	-	3.3	<0.50	0.50	9920930	<0.50	0.50	9920930
1,1,2,2-Tetrachloroethane	ug/L	17	3.2	<0.40	0.40	9920930	<0.40	0.40	9920930
Tetrachloroethylene	ug/L	4.4	1.6	<0.20	0.20	9920930	<0.20	0.20	9920930
Toluene	ug/L	2	18000	<0.20	0.20	9920930	<0.20	0.20	9920930
Trichloroethylene	ug/L	7.6	1.6	<0.20	0.20	9920930	<0.20	0.20	9920930
p+m-Xylene	ug/L	-	-	<0.20	0.20	9920930	<0.20	0.20	9920930
o-Xylene	ug/L	-	-	<0.20	0.20	9920930	<0.20	0.20	9920930
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Lab-Dup = Laboratory Initiated Duplicate									
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022									
Criteria-2: Ontario Reg. 153/04 (Amended April 15, 2011)									
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Non- Potable Ground Water - All Types of Property Uses - Coarse Textured Soil									



BUREAU
VERITAS

Bureau Veritas Job #: C548490

Report Date: 2025/05/08

Keystone Environmental Ontario Ltd.

Client Project #: 20550

Sampler Initials: AA

MISSISSAUGA STORM SEWER BYLAW (46-2022)

Bureau Veritas ID				AQKL28			AQKL28		
Sampling Date				2025/04/30 03:00			2025/04/30 03:00		
COC Number				1043796-01-01			1043796-01-01		
	UNITS	Criteria	Criteria-2	W-1	RDL	QC Batch	W-1 Lab-Dup	RDL	QC Batch
Total Xylenes	ug/L	4.4	4200	<0.20	0.20	9920930	<0.20	0.20	9920930
PCBs									
Total PCB	ug/L	0.4	7.8	<0.05	0.05	9923194			
Microbiological									
Escherichia coli	CFU/100mL	200	-	<10	10	9920446			
Surrogate Recovery (%)									
D10-Anthracene	%	-	-	91		9922362			
D14-Terphenyl (FS)	%	-	-	83		9922362			
D8-Acenaphthylene	%	-	-	109		9922362			
Decachlorobiphenyl	%	-	-	101		9923194			
4-Bromofluorobenzene	%	-	-	95		9920930	96		9920930
D4-1,2-Dichloroethane	%	-	-	111		9920930	115		9920930
D8-Toluene	%	-	-	102		9920930	100		9920930
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Lab-Dup = Laboratory Initiated Duplicate									
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022									
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Keystone Environmental Ontario Ltd.

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MISSISSAUGA STORM SEWER BYLAW (46-2022)

Bureau Veritas ID				AQKL29			AQKL29		
Sampling Date				2025/04/30 04:30			2025/04/30 04:30		
COC Number				1043796-01-01			1043796-01-01		
	UNITS	Criteria	Criteria-2	C-1	RDL	QC Batch	C-1 Lab-Dup	RDL	QC Batch
Inorganics									
Total BOD	mg/L	15	-	<2	2	9920065	<2	2	9920065
Total Chlorine	mg/L	1.0	-	<0.1	0.1	9920180			
pH	pH	6:9	-	8.09		9920606			
Phenols-4AAP	mg/L	0.008	-	<0.0010	0.0010	9923394			
Total Suspended Solids	mg/L	15	-	410	10	9922416			
Total Cyanide (CN)	mg/L	0.02	-	<0.0050	0.0050	9920351			
Metals									
Chromium (VI)	ug/L	40	140	<0.50	0.50	9921706			
Mercury (Hg)	mg/L	0.0004	0.00029	0.00027	0.00010	9923818			
Total Aluminum (Al)	ug/L	1000	-	1200	4.9	9923483			
Total Arsenic (As)	ug/L	20	1900	1.2	1.0	9923483			
Total Cadmium (Cd)	ug/L	8	2.7	0.16	0.090	9923483			
Total Chromium (Cr)	ug/L	80	810	<5.0	5.0	9923483			
Total Copper (Cu)	ug/L	40	87	40	0.90	9923483			
Total Lead (Pb)	ug/L	120	25	8.9	0.50	9923483			
Total Manganese (Mn)	ug/L	2000	-	59	2.0	9923483			
Total Nickel (Ni)	ug/L	80	490	2.9	1.0	9923483			
Total Phosphorus (P)	ug/L	400	-	370	100	9923483			
Total Selenium (Se)	ug/L	20	63	<2.0	2.0	9923483			
Total Silver (Ag)	ug/L	120	1.5	3.4	0.090	9923483			
Total Zinc (Zn)	ug/L	200	1100	50	5.0	9923483			
Calculated Parameters									
Total PAHs	ug/L	2	-	<0.20	0.20	9919766			
Polyaromatic Hydrocarbons									
Acenaphthene	ug/L	-	600	<0.050	0.050	9922362	<0.050	0.050	9922362
Acenaphthylene	ug/L	-	1.8	<0.050	0.050	9922362	<0.050	0.050	9922362
Anthracene	ug/L	-	2.4	<0.050	0.050	9922362	<0.050	0.050	9922362
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
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RDL = Reportable Detection Limit									
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Bureau Veritas ID				AQKL29			AQKL29		
Sampling Date				2025/04/30 04:30			2025/04/30 04:30		
COC Number				1043796-01-01			1043796-01-01		
	UNITS	Criteria	Criteria-2	C-1	RDL	QC Batch	C-1 Lab-Dup	RDL	QC Batch
Benzo(a)anthracene	ug/L	-	4.7	<0.050	0.050	9922362	<0.050	0.050	9922362
Benzo(a)pyrene	ug/L	-	0.81	<0.0090	0.0090	9922362	<0.0090	0.0090	9922362
Benzo(g,h,i)perylene	ug/L	-	0.2	<0.050	0.050	9922362	<0.050	0.050	9922362
Benzo(k)fluoranthene	ug/L	-	0.4	<0.050	0.050	9922362	<0.050	0.050	9922362
Chrysene	ug/L	-	1	<0.050	0.050	9922362	<0.050	0.050	9922362
Dibenzo(a,h)anthracene	ug/L	-	0.52	<0.050	0.050	9922362	<0.050	0.050	9922362
Fluoranthene	ug/L	-	130	<0.050	0.050	9922362	<0.050	0.050	9922362
Fluorene	ug/L	-	400	<0.050	0.050	9922362	<0.050	0.050	9922362
Indeno(1,2,3-cd)pyrene	ug/L	-	0.2	<0.050	0.050	9922362	<0.050	0.050	9922362
1-Methylnaphthalene	ug/L	-	1800	<0.050	0.050	9922362	<0.050	0.050	9922362
2-Methylnaphthalene	ug/L	-	1800	<0.050	0.050	9922362	<0.050	0.050	9922362
Naphthalene	ug/L	-	1400	<0.050	0.050	9922362	<0.050	0.050	9922362
Phenanthrene	ug/L	-	580	<0.030	0.030	9922362	<0.030	0.030	9922362
Pyrene	ug/L	-	68	<0.050	0.050	9922362	<0.050	0.050	9922362
Benzo(b)fluoranthene	ug/L	-	0.75	<0.030	0.030	9922362	<0.030	0.030	9922362
Volatile Organics									
Benzene	ug/L	2	44	<0.20	0.20	9920930			
1,2-Dichlorobenzene	ug/L	5.6	4600	<0.40	0.40	9920930			
1,4-Dichlorobenzene	ug/L	6.8	8	<0.40	0.40	9920930			
Ethylbenzene	ug/L	2	2300	<0.20	0.20	9920930			
Methylene Chloride(Dichloromethane)	ug/L	5.2	610	<2.0	2.0	9920930			
1,1,1,2-Tetrachloroethane	ug/L	-	3.3	<0.50	0.50	9920930			
1,1,2,2-Tetrachloroethane	ug/L	17	3.2	<0.40	0.40	9920930			
Tetrachloroethylene	ug/L	4.4	1.6	<0.20	0.20	9920930			
Toluene	ug/L	2	18000	<0.20	0.20	9920930			
Trichloroethylene	ug/L	7.6	1.6	<0.20	0.20	9920930			
p+m-Xylene	ug/L	-	-	<0.20	0.20	9920930			
o-Xylene	ug/L	-	-	<0.20	0.20	9920930			
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
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Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022									
Criteria-2: Ontario Reg. 153/04 (Amended April 15, 2011)									
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Sampler Initials: AA

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Bureau Veritas ID				AQKL29			AQKL29		
Sampling Date				2025/04/30 04:30			2025/04/30 04:30		
COC Number				1043796-01-01			1043796-01-01		
	UNITS	Criteria	Criteria-2	C-1	RDL	QC Batch	C-1 Lab-Dup	RDL	QC Batch
Total Xylenes	ug/L	4.4	4200	<0.20	0.20	9920930			
PCBs									
Total PCB	ug/L	0.4	7.8	<0.05	0.05	9923194			
Microbiological									
Escherichia coli	CFU/100mL	200	-	<10	10	9920446			
Surrogate Recovery (%)									
D10-Anthracene	%	-	-	91		9922362	86		9922362
D14-Terphenyl (FS)	%	-	-	82		9922362	77		9922362
D8-Acenaphthylene	%	-	-	107		9922362	101		9922362
Decachlorobiphenyl	%	-	-	94		9923194			
4-Bromofluorobenzene	%	-	-	95		9920930			
D4-1,2-Dichloroethane	%	-	-	115		9920930			
D8-Toluene	%	-	-	102		9920930			
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Lab-Dup = Laboratory Initiated Duplicate									
Criteria: City of Mississauga Storm Sewer Use By-Law 0046-2022									
Criteria-2: Ontario Reg. 153/04 (Amended April 15, 2011)									
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Bureau Veritas Job #: C548490

Report Date: 2025/05/08

Keystone Environmental Ontario Ltd.

Client Project #: 20550

Sampler Initials: AA

O.REG 153 PHCS, BTEX/F1-F4 (WATER)

Bureau Veritas ID			AQKL28			AQKL28			AQKL29		
Sampling Date			2025/04/30 03:00			2025/04/30 03:00			2025/04/30 04:30		
COC Number			1043796-01-01			1043796-01-01			1043796-01-01		
	UNITS	Criteria	W-1	RDL	QC Batch	W-1 Lab-Dup	RDL	QC Batch	C-1	RDL	QC Batch
BTEX & F1 Hydrocarbons											
F1 (C6-C10)	ug/L	750	<25	25	9924502	<25	25	9924502	<25	25	9924502
F1 (C6-C10) - BTEX	ug/L	750	<25	25	9924502	<25	25	9924502	<25	25	9924502
F2-F4 Hydrocarbons											
F2 (C10-C16 Hydrocarbons)	ug/L	150	<90	90	9922397				<90	90	9922397
F3 (C16-C34 Hydrocarbons)	ug/L	500	<200	200	9922397				<200	200	9922397
F4 (C34-C50 Hydrocarbons)	ug/L	500	<200	200	9922397				<200	200	9922397
Reached Baseline at C50	ug/L	-	Yes		9922397				Yes		9922397
Surrogate Recovery (%)											
1,4-Difluorobenzene	%	-	109		9924502	108		9924502	108		9924502
4-Bromofluorobenzene	%	-	111		9924502	106		9924502	104		9924502
D10-o-Xylene	%	-	114		9924502	113		9924502	110		9924502
D4-1,2-Dichloroethane	%	-	107		9924502	108		9924502	106		9924502
o-Terphenyl	%	-	98		9922397				100		9922397
No Fill	No Exceedance										
Grey	Exceeds 1 criteria policy/level										
Black	Exceeds both criteria/levels										
RDL = Reportable Detection Limit											
QC Batch = Quality Control Batch											
Lab-Dup = Laboratory Initiated Duplicate											
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Bureau Veritas Job #: C548490

Report Date: 2025/05/08

Keystone Environmental Ontario Ltd.

Client Project #: 20550

Sampler Initials: AA

O.REG 153 PHCS, BTEX/F1-F4 (WATER)

Bureau Veritas ID			AQKL29		
Sampling Date			2025/04/30 04:30		
COC Number			1043796-01-01		
	UNITS	Criteria	C-1 Lab-Dup	RDL	QC Batch
F2-F4 Hydrocarbons					
F2 (C10-C16 Hydrocarbons)	ug/L	150	<90	90	9922397
F3 (C16-C34 Hydrocarbons)	ug/L	500	<200	200	9922397
F4 (C34-C50 Hydrocarbons)	ug/L	500	<200	200	9922397
Reached Baseline at C50	ug/L	-	Yes		9922397
Surrogate Recovery (%)					
o-Terphenyl	%	-	97		9922397
No Fill	No Exceedance				
Grey	Exceeds 1 criteria policy/level				
Black	Exceeds both criteria/levels				
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Lab-Dup = Laboratory Initiated Duplicate					
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)					
Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition					
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**BUREAU
VERITAS**

Bureau Veritas Job #: C548490
Report Date: 2025/05/08

9.1

Keystone Environmental Ontario Ltd.
Client Project #: 20550
Sampler Initials: AA

TEST SUMMARY

Bureau Veritas ID: AQKL28
Sample ID: W-1
Matrix: Water

Collected: 2025/04/30
Shipped:
Received: 2025/04/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Biochemical Oxygen Demand (BOD)	DO	9920065	2025/05/01	2025/05/06	Nusrat Naz
Total Residual Chlorine	SPEC	9920180	2025/05/01	2025/05/01	Gurpartee K AUR
Chromium (VI) in Water	IC	9921706	N/A	2025/05/03	Rupinder Sihota
Total Cyanide	SKAL/CN	9920299	2025/05/01	2025/05/01	Jency Sara Johnson
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	9924502	N/A	2025/05/08	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	9922397	2025/05/05	2025/05/06	Mohammed Abdul Nafay Shoeb
Mercury in Water by CVAA	CV/AA	9922133	2025/05/05	2025/05/05	Maitri PATIL
Total Metals Analysis by ICPMS	ICP/MS	9923483	2025/05/06	2025/05/07	Thuy Linh Nguyen
E.coli, (CFU/100mL)	PL	9920446	N/A	2025/05/01	Jessica (Ya Ping) Qiang
PAH Compounds in Water by GC/MS (SIM)	GC/MS	9922362	2025/05/05	2025/05/06	Mitesh Raj
Polychlorinated Biphenyl in Water	GC/ECD	9923194	2025/05/06	2025/05/06	Debashis Saha
Phenols (4AAP)	TECH/PHEN	9923394	N/A	2025/05/06	Shivani Shivani
pH	AT	9920606	2025/05/01	2025/05/02	Nachiketa Gohil
Total PAHs: Barrie/Mississauga Sewer Use	CALC	9919766	N/A	2025/05/06	Automated Statchk
Total Suspended Solids	BAL	9922416	2025/05/05	2025/05/07	Madhav Somani
Volatile Organic Compounds in Water	GC/MS	9920930	N/A	2025/05/04	Narayan Ghimire

Bureau Veritas ID: AQKL28 Dup
Sample ID: W-1
Matrix: Water

Collected: 2025/04/30
Shipped:
Received: 2025/04/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Residual Chlorine	SPEC	9920180	2025/05/01	2025/05/01	Gurpartee K AUR
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	9924502	N/A	2025/05/08	Georgeta Rusu
Volatile Organic Compounds in Water	GC/MS	9920930	N/A	2025/05/04	Narayan Ghimire

Bureau Veritas ID: AQKL29
Sample ID: C-1
Matrix: Water

Collected: 2025/04/30
Shipped:
Received: 2025/04/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Biochemical Oxygen Demand (BOD)	DO	9920065	2025/05/01	2025/05/06	Nusrat Naz
Total Residual Chlorine	SPEC	9920180	2025/05/01	2025/05/01	Gurpartee K AUR
Chromium (VI) in Water	IC	9921706	N/A	2025/05/03	Rupinder Sihota
Total Cyanide	SKAL/CN	9920351	2025/05/01	2025/05/01	Jency Sara Johnson
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	9924502	N/A	2025/05/08	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	9922397	2025/05/05	2025/05/06	Mohammed Abdul Nafay Shoeb
Mercury in Water by CVAA	CV/AA	9923818	2025/05/07	2025/05/07	Maitri PATIL
Total Metals Analysis by ICPMS	ICP/MS	9923483	2025/05/06	2025/05/07	Thuy Linh Nguyen
E.coli, (CFU/100mL)	PL	9920446	N/A	2025/05/01	Jessica (Ya Ping) Qiang
PAH Compounds in Water by GC/MS (SIM)	GC/MS	9922362	2025/05/05	2025/05/06	Mitesh Raj
Polychlorinated Biphenyl in Water	GC/ECD	9923194	2025/05/06	2025/05/06	Debashis Saha
Phenols (4AAP)	TECH/PHEN	9923394	N/A	2025/05/06	Shivani Shivani
pH	AT	9920606	2025/05/01	2025/05/02	Nachiketa Gohil
Total PAHs: Barrie/Mississauga Sewer Use	CALC	9919766	N/A	2025/05/06	Automated Statchk



BUREAU
VERITAS

Bureau Veritas Job #: C548490

Report Date: 2025/05/08

Keystone Environmental Ontario Ltd.

Client Project #: 20550

Sampler Initials: AA

TEST SUMMARY

Bureau Veritas ID: AQKL29

Sample ID: C-1

Matrix: Water

Collected: 2025/04/30

Shipped:

Received: 2025/04/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Suspended Solids	BAL	9922416	2025/05/05	2025/05/07	Madhav Somani
Volatile Organic Compounds in Water	GC/MS	9920930	N/A	2025/05/04	Narayan Ghimire

Bureau Veritas ID: AQKL29 Dup

Sample ID: C-1

Matrix: Water

Collected: 2025/04/30

Shipped:

Received: 2025/04/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Biochemical Oxygen Demand (BOD)	DO	9920065	2025/05/01	2025/05/06	Nusrat Naz
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	9922397	2025/05/05	2025/05/06	Mohammed Abdul Nafay Shoeb
PAH Compounds in Water by GC/MS (SIM)	GC/MS	9922362	2025/05/05	2025/05/06	Mitesh Raj

**BUREAU
VERITAS**

Bureau Veritas Job #: C548490

Report Date: 2025/05/08

Keystone Environmental Ontario Ltd.

Client Project #: 20550

Sampler Initials: AA

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	5.3°C
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Results relate only to the items tested.

BUREAU
VERITAS

Bureau Veritas Job #: C548490

Report Date: 2025/05/08

QUALITY ASSURANCE REPORT

Keystone Environmental Ontario Ltd.

Client Project #: 20550

Sampler Initials: AA

9.1

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9920930	4-Bromofluorobenzene	2025/05/04	95 (5)	70 - 130	95	70 - 130	94	%				
9920930	D4-1,2-Dichloroethane	2025/05/04	108 (5)	70 - 130	111	70 - 130	118	%				
9920930	D8-Toluene	2025/05/04	104 (5)	70 - 130	104	70 - 130	102	%				
9922362	D10-Anthracene	2025/05/06	97	50 - 130	96	50 - 130	93	%				
9922362	D14-Terphenyl (FS)	2025/05/06	94	50 - 130	95	50 - 130	91	%				
9922362	D8-Acenaphthylene	2025/05/06	114	50 - 130	114	50 - 130	110	%				
9922397	o-Terphenyl	2025/05/06	98 (9)	60 - 140	100	60 - 140	96	%				
9923194	Decachlorobiphenyl	2025/05/06	97	60 - 130	98	60 - 130	101	%				
9924502	1,4-Difluorobenzene	2025/05/07	96 (10)	70 - 130	98	70 - 130	107	%				
9924502	4-Bromofluorobenzene	2025/05/07	100 (10)	70 - 130	97	70 - 130	101	%				
9924502	D10-o-Xylene	2025/05/07	100 (10)	70 - 130	113	70 - 130	102	%				
9924502	D4-1,2-Dichloroethane	2025/05/07	96 (10)	70 - 130	93	70 - 130	106	%				
9920065	Total BOD	2025/05/06					<2	mg/L	NC (1)	30	93	80 - 120
9920180	Total Chlorine	2025/05/01	97 (2)	85 - 115	101	85 - 115	<0.1	mg/L	NC (3)	25		
9920299	Total Cyanide (CN)	2025/05/01	92	80 - 120	102	80 - 120	<0.0050	mg/L	NC (4)	20		
9920351	Total Cyanide (CN)	2025/05/01	91	80 - 120	92	80 - 120	<0.0050	mg/L	NC (4)	20		
9920606	pH	2025/05/02			102	98 - 103			0.19 (4)	N/A		
9920930	1,1,1,2-Tetrachloroethane	2025/05/04	109 (5)	70 - 130	104	70 - 130	<0.50	ug/L	NC (6)	30		
9920930	1,1,2,2-Tetrachloroethane	2025/05/04	109 (5)	70 - 130	101	70 - 130	<0.40	ug/L	NC (6)	30		
9920930	1,2-Dichlorobenzene	2025/05/04	110 (5)	70 - 130	100	70 - 130	<0.40	ug/L	NC (6)	30		
9920930	1,4-Dichlorobenzene	2025/05/04	108 (5)	70 - 130	97	70 - 130	<0.40	ug/L	NC (6)	30		
9920930	Benzene	2025/05/04	96 (5)	70 - 130	94	70 - 130	<0.20	ug/L	NC (6)	30		
9920930	Ethylbenzene	2025/05/04	101 (5)	70 - 130	97	70 - 130	<0.20	ug/L	NC (6)	30		
9920930	Methylene Chloride(Dichloromethane)	2025/05/04	98 (5)	70 - 130	97	70 - 130	<2.0	ug/L	NC (6)	30		
9920930	o-Xylene	2025/05/04	104 (5)	70 - 130	99	70 - 130	<0.20	ug/L	NC (6)	30		
9920930	p+m-Xylene	2025/05/04	100 (5)	70 - 130	95	70 - 130	<0.20	ug/L	NC (6)	30		
9920930	Tetrachloroethylene	2025/05/04	89 (5)	70 - 130	85	70 - 130	<0.20	ug/L	NC (6)	30		
9920930	Toluene	2025/05/04	101 (5)	70 - 130	98	70 - 130	<0.20	ug/L	NC (6)	30		
9920930	Total Xylenes	2025/05/04					<0.20	ug/L	NC (6)	30		
9920930	Trichloroethylene	2025/05/04	94 (5)	70 - 130	92	70 - 130	<0.20	ug/L	NC (6)	30		
9921706	Chromium (VI)	2025/05/03	99	80 - 120	103	80 - 120	<0.50	ug/L	NC (4)	20		

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Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

BUREAU
VERITAS

Bureau Veritas Job #: C548490

Report Date: 2025/05/08

QUALITY ASSURANCE REPORT(CONT'D)

Keystone Environmental Ontario Ltd.

Client Project #: 20550

Sampler Initials: AA

9.1

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9922133	Mercury (Hg)	2025/05/05	89	75 - 125	98	80 - 120	<0.00010	mg/L	NC (4)	20		
9922362	1-Methylnaphthalene	2025/05/06	128	50 - 130	129	50 - 130	<0.050	ug/L	NC (8)	30		
9922362	2-Methylnaphthalene	2025/05/06	128	50 - 130	130 (7)	50 - 130	<0.050	ug/L	NC (8)	30		
9922362	Acenaphthene	2025/05/06	107	50 - 130	109	50 - 130	<0.050	ug/L	NC (8)	30		
9922362	Acenaphthylene	2025/05/06	109	50 - 130	111	50 - 130	<0.050	ug/L	NC (8)	30		
9922362	Anthracene	2025/05/06	109	50 - 130	109	50 - 130	<0.050	ug/L	NC (8)	30		
9922362	Benzo(a)anthracene	2025/05/06	111	50 - 130	112	50 - 130	<0.050	ug/L	NC (8)	30		
9922362	Benzo(a)pyrene	2025/05/06	107	50 - 130	109	50 - 130	<0.0090	ug/L	NC (8)	30		
9922362	Benzo(b)fluoranthene	2025/05/06	109	50 - 130	112	50 - 130	<0.030	ug/L	NC (8)	30		
9922362	Benzo(g,h,i)perylene	2025/05/06	105	50 - 130	108	50 - 130	<0.050	ug/L	NC (8)	30		
9922362	Benzo(k)fluoranthene	2025/05/06	106	50 - 130	107	50 - 130	<0.050	ug/L	NC (8)	30		
9922362	Chrysene	2025/05/06	106	50 - 130	108	50 - 130	<0.050	ug/L	NC (8)	30		
9922362	Dibenzo(a,h)anthracene	2025/05/06	107	50 - 130	109	50 - 130	<0.050	ug/L	NC (8)	30		
9922362	Fluoranthene	2025/05/06	111	50 - 130	111	50 - 130	<0.050	ug/L	NC (8)	30		
9922362	Fluorene	2025/05/06	109	50 - 130	110	50 - 130	<0.050	ug/L	NC (8)	30		
9922362	Indeno(1,2,3-cd)pyrene	2025/05/06	106	50 - 130	109	50 - 130	<0.050	ug/L	NC (8)	30		
9922362	Naphthalene	2025/05/06	108	50 - 130	110	50 - 130	<0.050	ug/L	NC (8)	30		
9922362	Phenanthrene	2025/05/06	108	50 - 130	108	50 - 130	<0.030	ug/L	NC (8)	30		
9922362	Pyrene	2025/05/06	109	50 - 130	110	50 - 130	<0.050	ug/L	NC (8)	30		
9922397	F2 (C10-C16 Hydrocarbons)	2025/05/06	92 (9)	60 - 140	96	60 - 140	<90	ug/L	NC (8)	30		
9922397	F3 (C16-C34 Hydrocarbons)	2025/05/06	96 (9)	60 - 140	103	60 - 140	<200	ug/L	NC (8)	30		
9922397	F4 (C34-C50 Hydrocarbons)	2025/05/06	88 (9)	60 - 140	95	60 - 140	<200	ug/L	NC (8)	30		
9922416	Total Suspended Solids	2025/05/07			98	80 - 120	<10	mg/L				
9923194	Total PCB	2025/05/06	91	60 - 130	85	60 - 130	<0.05	ug/L	NC (4)	40		
9923394	Phenols-4AAP	2025/05/06	101	80 - 120	99	80 - 120	<0.0010	mg/L	NC (4)	20		
9923483	Total Aluminum (Al)	2025/05/07	102	80 - 120	96	80 - 120	<4.9	ug/L	NC (4)	20		
9923483	Total Arsenic (As)	2025/05/07	103	80 - 120	97	80 - 120	<1.0	ug/L	7.2 (4)	20		
9923483	Total Cadmium (Cd)	2025/05/07	99	80 - 120	95	80 - 120	<0.090	ug/L	NC (4)	20		
9923483	Total Chromium (Cr)	2025/05/07	102	80 - 120	99	80 - 120	<5.0	ug/L	8.1 (4)	20		
9923483	Total Copper (Cu)	2025/05/07	105	80 - 120	99	80 - 120	<0.90	ug/L	10 (4)	20		
9923483	Total Lead (Pb)	2025/05/07	97	80 - 120	97	80 - 120	<0.50	ug/L	NC (4)	20		



**BUREAU
VERITAS**

Bureau Veritas Job #: C548490

Report Date: 2025/05/08

QUALITY ASSURANCE REPORT(CONT'D)

Keystone Environmental Ontario Ltd.

Client Project #: 20550

Sampler Initials: AA

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9923483	Total Manganese (Mn)	2025/05/07	100	80 - 120	96	80 - 120	<2.0	ug/L	NC (4)	20		
9923483	Total Nickel (Ni)	2025/05/07	99	80 - 120	97	80 - 120	<1.0	ug/L	5.9 (4)	20		
9923483	Total Phosphorus (P)	2025/05/07	100	80 - 120	83	80 - 120	<100	ug/L	4.9 (4)	20		
9923483	Total Selenium (Se)	2025/05/07	101	80 - 120	101	80 - 120	<2.0	ug/L	NC (4)	20		
9923483	Total Silver (Ag)	2025/05/07	97	80 - 120	95	80 - 120	<0.090	ug/L	NC (4)	20		
9923483	Total Zinc (Zn)	2025/05/07	101	80 - 120	100	80 - 120	<5.0	ug/L	20 (4)	20		
9923818	Mercury (Hg)	2025/05/07	98	75 - 125	98	80 - 120	<0.00010	mg/L	NC (4)	20		
9924502	F1 (C6-C10) - BTEX	2025/05/08					<25	ug/L	NC (11)	30		

BUREAU
VERITAS

Bureau Veritas Job #: C548490

Report Date: 2025/05/08

QUALITY ASSURANCE REPORT(CONT'D)

Keystone Environmental Ontario Ltd.

Client Project #: 20550

Sampler Initials: AA

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9924502	F1 (C6-C10)	2025/05/08	102 (10)	60 - 140	112	60 - 140	<25	ug/L	NC (11)	30		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference $\leq 2 \times \text{RDL}$).

(1) Duplicate Parent ID [AQKL29-07]

(2) Matrix Spike Parent ID [AQKL28-15]

(3) Duplicate Parent ID [AQKL28-15]

(4) Duplicate Parent ID

(5) Matrix Spike Parent ID [AQKL28-13]

(6) Duplicate Parent ID [AQKL28-13]

(7) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(8) Duplicate Parent ID [AQKL29-04]

(9) Matrix Spike Parent ID [AQKL28-04]

(10) Matrix Spike Parent ID [AQKL28-14]

(11) Duplicate Parent ID [AQKL28-14]



BUREAU
VERITAS

Bureau Veritas Job #: C548490

Report Date: 2025/05/08

Keystone Environmental Ontario Ltd.

Client Project #: 20550

Sampler Initials: AA

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Handwritten signature of Cristina Carriere in black ink.

Cristina Carriere, Senior Scientific Specialist

Handwritten signature of Yizhou Han in black ink.

Yizhou Han, Analyst 1

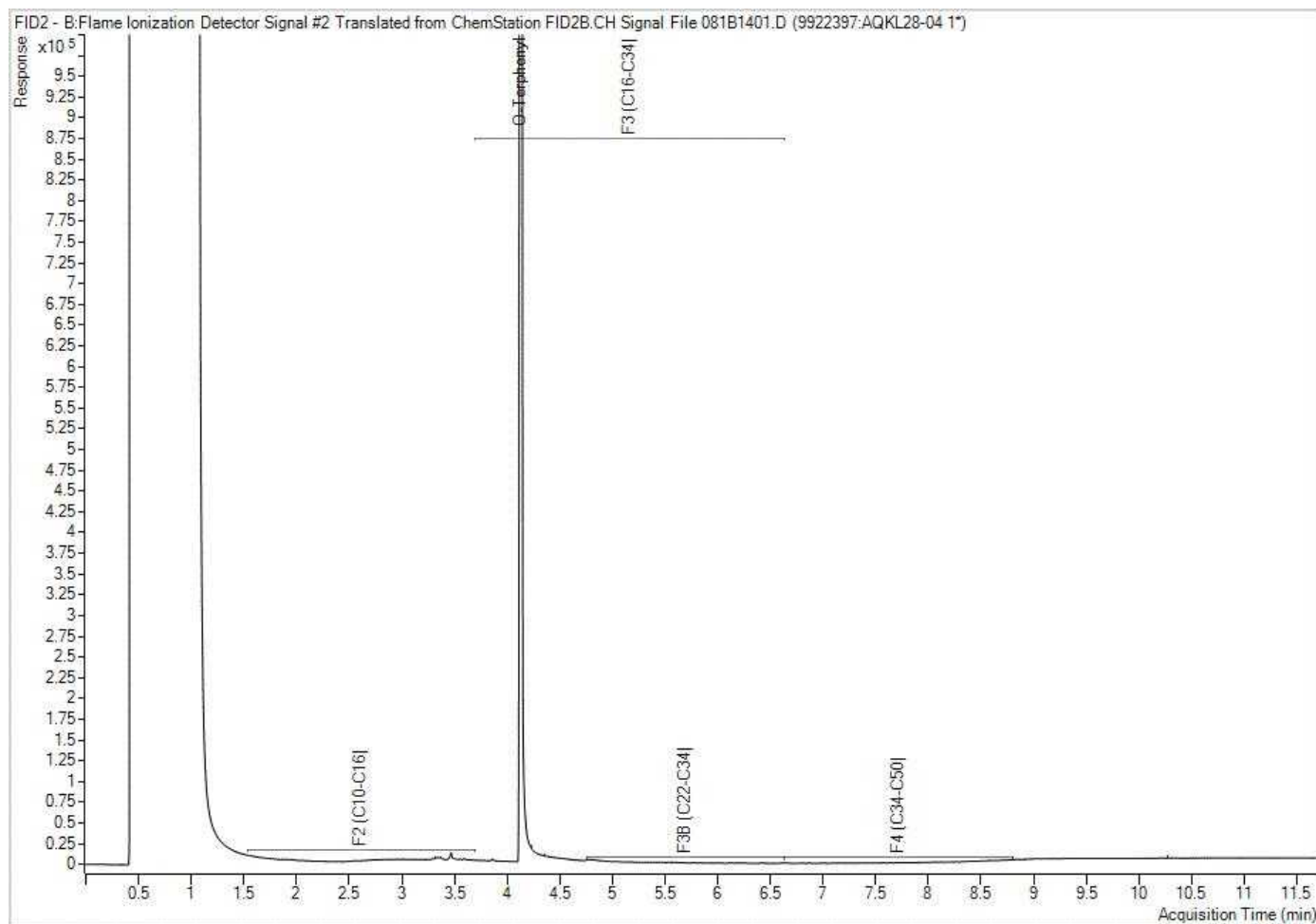
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

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Bureau Veritas Job #: C548490
Report Date: 2025/05/08
Bureau Veritas Sample: AQKL28

Keystone Environmental Ontario Ltd.
Client Project #: 20550
Client ID: W-1

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

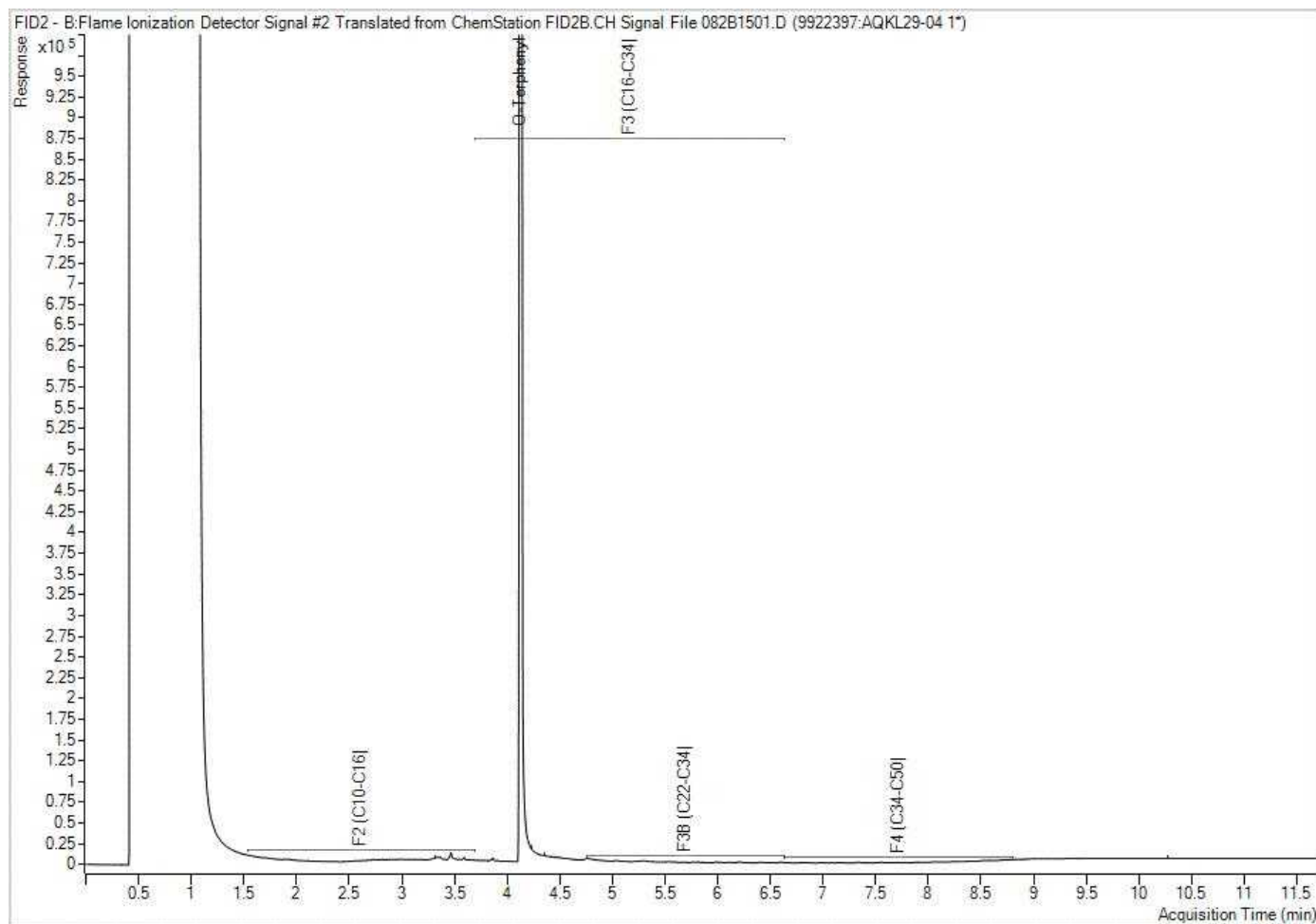


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C548490
Report Date: 2025/05/08
Bureau Veritas Sample: AQKL29

Keystone Environmental Ontario Ltd.
Client Project #: 20550
Client ID: C-1

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

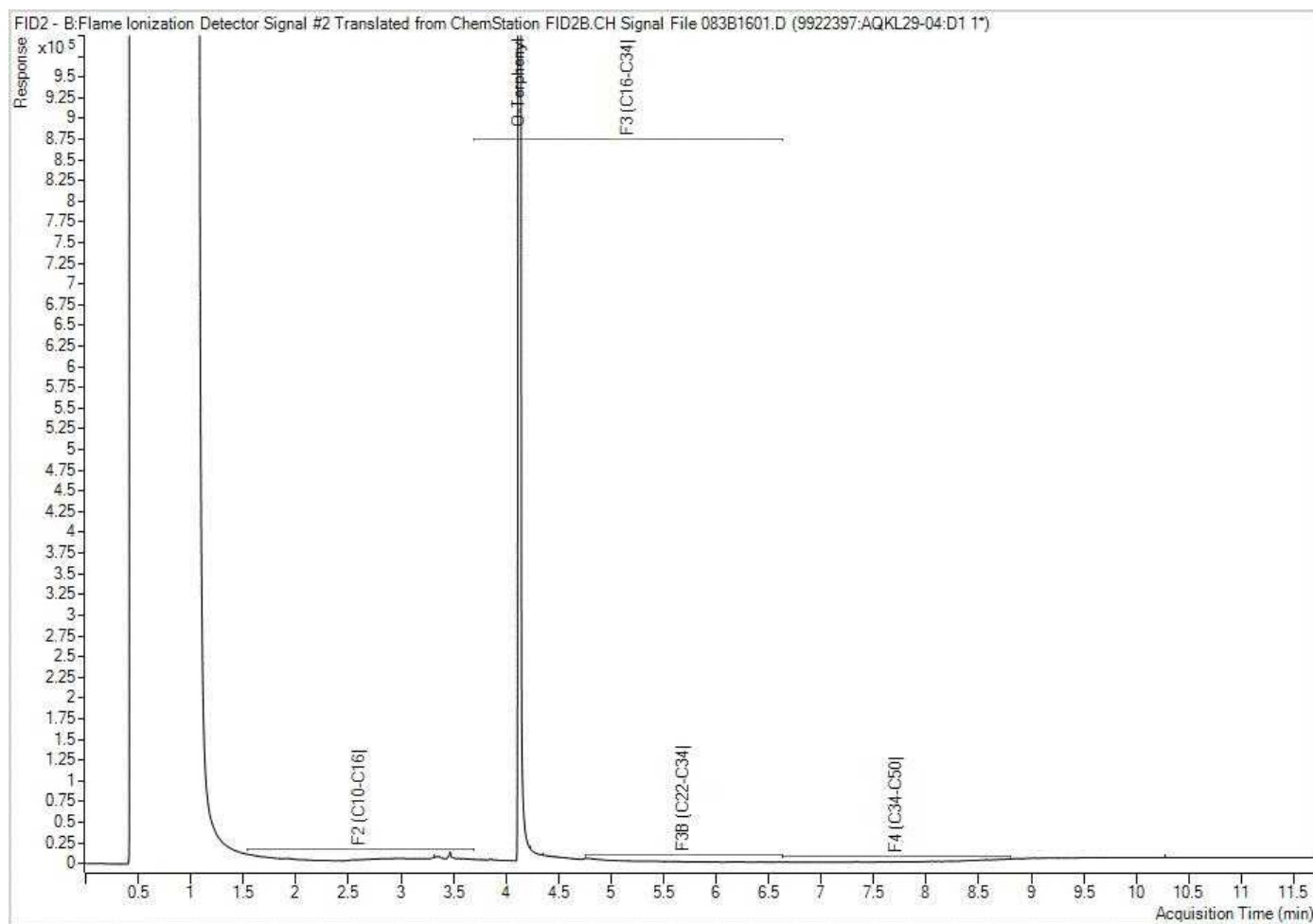


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Bureau Veritas Job #: C548490
Report Date: 2025/05/08
Bureau Veritas Sample: AQKL29 Lab-Dup

Keystone Environmental Ontario Ltd.
Client Project #: 20550
Client ID: C-1

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.