



G5820

JANUARY 2024

**PRELIMINARY
GEOHYDROLOGY ASSESSMENT
NORTHWESTERN CORNER OF REGIONAL ROAD 25
AND BRITANNIA ROAD
MILTON, ONTARIO**

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PREPARED FOR:

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1.0 INTRODUCTION

Mattamy (Milton West) Limited (the Client) intends to redevelop the property located at North-western corner of the intersection of Regional Road 25 and Britannia Road, Milton, Ontario (hereafter referred to as 'the Site'). MCR Engineers Ltd. (MCR) was retained to conduct a Geohydrology Assessment for the Site to evaluate the temporary dewatering and permanent drainage in relation to the proposed redevelopment.

1.1 SCOPE OF WORK

The objectives of the Geohydrology Assessment are to determine the following:

- Hydrogeological conditions of the Site, including the groundwater and phreatic surface, subsurface elevations and flow patterns and the interaction with the design and construction of the proposed development.
- Reviewing the available background information for the Site obtained from MCR's files, and architectural drawings.
- Estimate the potential temporary dewatering flow rates during construction and assessment of potential impacts on the surrounding environment.
- Estimate the long term flow rates from the Private Water Drainage System (PWDS) of the proposed building.
- Assess the permitting requirements for both dewatering and discharge with the Ministry of Environment, Conservation and Parks (MECP) and the Municipality of Halton (the City), respectively.
- Summarize the findings in a Geohydrology Assessment Report.

1.2 SITE DESCRIPTION

The Site is located at the northwestern corner of Regional Road 25 and Britannia Road, in a mixed-use rural, residential and commercial area of the city of Milton, Ontario. The site is irregular in shape with an approximate area of 41,511 m².

The Site is bounded by a pond to the north, Regional Road 25 to the east,

Britannia Road to the south, and a pond/channel to the west. Etheridge Avenue bisects the Site, running west to east. The Site is presently a vacant lot.

Currently the Site does not have a Legal description. The topographic surveys are attached in Appendix A.

1.3 PROPOSED DEVELOPMENT

The Site is proposed for residential development (Appendix B) and will consist of:

- **North Block:** A fifteen [15] storey building (Building 5), a twelve [12] storey building (Building 6), and a fourteen [14] storey building (Building 7) over two [2] levels of underground parking.
- **South Block:** A fifteen [15] storey building (Building 1), a thirteen [13] storey building (Building 2), an eleven [11] storey building (Building 3), and a fourteen [14] storey building (Building 4) over two [2] levels of underground parking.

The finished floor elevation (FFE) at ground level is expected to range from elevations of 188.15 to 189.20 meters above sea level (masl). The P2 FFE will range from approximate elevations of 181.25 to 181.75 masl for the North Block and at 181.05 masl for the South Block.

Presently it is assumed that the proposed buildings will be supported by conventional spread/strip footings founded in silty to sandy/clayey silt soils. The size of the shoring play layout was assumed to cover approximately:

- **North Block:** 165 m by 80 m
- **South Block:** 210 m by 82 m

A sub-floor Private Water Drainage System (PWDS) with perimeter weeping tile will be required for the proposed development. A soldier pile and lagging shoring system is expected for temporary excavation.

1.4 PROPERTY OWNERSHIP

The Site is owned and intended for redevelopment by Mattamy (Milton West) Limited. The Owner is represented by Ms. Christine Chea, with the following contact information:

Ms. Christine Chea, MCIP, RPP
Direction, Development, GTA Urban
3300 Bloor Street West, Suite 1800
Toronto, Ontario
M8X 2X2
Email: christine.chea@mattamycorp.com

1.5 REVIEW OF PREVIOUS REPORTS

The following geo-environmental reports were provided for review prior to initiating the investigation:

- Shad & Associates Inc. report titled, *Geotechnical Investigation Report, Proposed Residential Condominium Development, Framgard Property – Major Node, Regional Road 25, North of Britannia Road, Milton, Ontario*, prepared for Mattamy Willmott Limited, dated March 2018.
- MCR report titled, *Geotechnical Report, Residential Development, Regional Road 25 and Britannia Road, Milton, Ontario*, prepared for Mattamy (Milton West) Limited, dated January 2024.

2.0 HYDROGEOLOGICAL CONDITIONS

2.1 PHYSICAL SETTING

The Site is located in the Town of Milton and is situated in a mixed-use rural, residential, and commercial area. The nearest major intersection is Regional Road 25 and Britannia Road, located southeast of the Site. A branch of The West Tributary of the Sixteen Mile Creek is located approximately 30 m west of the Site.

The Site is located at an elevation of approximately 184 to 186 m above sea level (asl) and the topography across the Site slopes from the north to south. The surrounding area slopes from northwest to southeast, towards the Sixteen Mile Creek.

The Site is bounded by the following properties/features:

| | |
|--------------|------------------|
| North | A pond |
| South | Britannia Road |
| East | Regional Road 25 |
| West | Pond/Channel |

2.2 TOPOGRAPHY

According to the topographic map, published by the Government of Canada; Natural Resources Canada at the Government of Canada website: <http://atlas.gc.ca/toporama/en/index.html>, the ground surface at the Site slopes from north to south and the surrounding area sloping from northwest to southeast towards the Sixteen Mile Creek.

2.3 REGIONAL GEOLOGY AND HYDROGEOLOGY

According to the geological map entitled "Quaternary Geology of Ontario, Southern Sheet", published by the Ontario Ministry of Development and Mines, dated 1991, the overburden in the study area consists mainly of Halton till, predominantly silt and clay, minor sand, basin and quiet water deposits. Groundwater flow is expected to be directed southeast towards the Sixteen Mile

Creek.

According to the Ontario Ministry of Development and Mines, Map No. 2554 “Bedrock Geology of Ontario, Southern Sheet, 1991”, the bedrock typically consists of Upper Ordovician shale, limestone, dolostone and siltstone Queenston Formation. On a regional scale, groundwater is expected to flow south-east, towards the Sixteen Mile Creek.

2.4 LOCAL GEOLOGY AND HYDROGEOLOGY

On a local scale, geological conditions and hydrogeology are similar to the ones at a regional scale. Locally, near surface groundwater flow may be influenced by underground structures (e.g., service trenches, catch basins, and building foundations or surface watercourses). No surface water features are present onsite and there are no Provincially Significant Wetlands in the vicinity of the Site.

3.0 SCOPE OF INVESTIGATION

3.1 OVERVIEW OF SITE INVESTIGATION

- Initially, twelve boreholes (BH 1 to BH 12) were drilled by Shad & Associates Inc. from February to March 2018 to depths ranging from 7.80 to 8.10 m.
- Nine boreholes (BH 101 to BH 109) were drilled by MCR in December 2022 to January 2023 to depths ranging from 7.30 to 21.40 m.
- Boreholes 1, 3 to 5, 8 to 10 and 12 were equipped with monitoring wells for long-term groundwater monitoring and sampling.
- The borehole locations are shown in Drawing No. 1 and the records are presented in Appendix C.
- Groundwater levels were recorded from all available monitoring wells over various dates and the data is presented in Table 1.
- Groundwater samples were collected from BH 1 and 10 in December 2022 for chemical analysis of the Municipality of Halton Sewers By-Law criteria.

3.2 MONITORING WELL INSTALLATION

It is assumed that all monitoring wells by Shad and Associates Inc. were installed with a 50 mm diameter schedule, 40 PVC pipe and a 3.05 m long slotted well screen. Well screens were surrounded by a silica sand pack to at least 0.6 m above the top of screen with a bentonite seal extending from above the sand pack to within 0.5 m of the ground surface. All monitoring wells were completed with a flush mounted cover at ground surface. Monitoring well installation was done in accordance with the *Ontario Water Resources Act*, Sections 35 to 50.

3.3 ELEVATION SURVEYING

MCR elevations referred to in this report are metric and geodetic and are interpolated from the provided topographic survey prepared by Rady-Pentek & Edward Surveying Ltd., dated February 9 and April 13, 2018. Borehole elevations are shown on the borehole logs in Appendix C.

3.4 GROUNDWATER SAMPLING

All groundwater sampling activities were conducted in accordance with Ontario Regulation (O.Reg.)153/04, as amended to O.Reg.511/09, July 2011. All monitoring wells were developed prior to sampling activities using a Waterra Hydrolift II (HL-1217) inertial lift pump by purging at least three well volumes or until the monitoring well was purged dry. Groundwater samples were obtained at least 24 hours' post-development under static conditions. No samples were field filtered prior to laboratory analysis, in accordance with the standard.

3.5 GROUNDWATER ANALYSIS

A groundwater sample collected in December was submitted to ALS Laboratory Group (ALS) of Richmond Hill, Ontario, certified by the Canadian Association for Laboratory Accreditation (CALA), for chemical analysis. The Certificates of Analysis received are included in Appendix D. The contact information for the laboratory used is included below.

ALS Laboratory Group

95 West Beaver Creek Road
Richmond Hill, ON L4B 1H2

All groundwater samples were submitted for bulk chemical analysis for the criteria provided in the *Ontario Halton Sanitary Sewer By-Law No. 02-03 (March 2003)*. The results of chemical analysis were compared to the criteria provided in *Table 1 – Limits for Sanitary and Combined Sewers Discharge* and *Table 2 – Limits for Storm Sewer Discharge*. These guidelines establish the maximum allowable concentrations of specific analytical parameters for water discharged into either the municipal sanitary and/or storm sewer system respectively.

4.0 INVESTIGATION RESULTS

4.1 GEOLOGY

The ground surface elevation across the Site varies from 187.50 masl (BH 104) to 184.70 masl (BH 1). Based on the investigations by MCR and Shad and Associates Inc., the geologic formations beneath the Site are illustrated in borehole logs (Appendix C) and include the following (from surface to depth):

Please note that boreholes 102, 103, 106 and 108 were straight drilled to 9.15 m due to proximity to Shad and Associates Inc. boreholes.

Fill: Compact fill material was encountered at the surface of all boreholes. The fill material extended to depths ranging from 0.4 to 0.9 m. The fill consisted of silty sand/sandy silt/clayey silt/silty clay, sand and gravel soils. The brown/dark brown to reddish brown fill was in a moist condition and contained some to trace of organics, clay, gravel, and rootlets.

For the purpose of offsite disposal, the type/quantity and extent of the existing fill should be explored by further test pit investigation prior to general excavation (prior to contract award).

Silty Sand/Sandy Silt: A dense silty sand/sandy silt till layer was encountered below the fill in boreholes 104, 105, 107 and 109. The brown silty sand/sandy silt layer was in a moist condition and contained traces of clay. The silty sand/sandy silt layer extended to the full depth of borehole 104 and a depth of 2.30 m in boreholes 105, 107 and 109.

Clayey Silt/Silty Clay (Till): A very stiff to hard clayey silt/silty clay till layer was encountered below the fill and silty sand/sandy silt layer in all boreholes (except 102, 103, 106 and 108). The reddish brown to grey clayey silt/silty clay till layer was in a moist to wet condition and contained some to trace of sand, gravel and shale fragments. The clayey silt/silty clay till layer extended to the full depth of boreholes 2, 3, 5, 8, 11 and 109 and to depths ranging from 4.55 to 10.65 m in all other boreholes.

Sand and Gravel/Silty Sand/Sandy Silt (Till): A very dense sand and gravel/silty sand/sandy silt till deposit was observed below the clayey silt/silty clay till layer in all boreholes. The brown to reddish brown sand and gravel/silty sand/sandy silt (till) deposit was in a moist to wet condition and contained traces of clay, gravel and shale fragments. The sand and gravel/silty sand/sandy silt till layer extended to a depth of 18.30 m in borehole 101 and to the full depth of all other boreholes.

Clayey Silt Till: A hard layer of clayey silt till was detected below the sand and gravel/silty sand/sandy silt till deposit in borehole 101. The reddish brown layer was in a moist condition and contained traces of sand, gravel and shale fragments. The clayey silt till layer extended to the full depth of borehole exploration.

It should be noted that the silt/clay/sand/till soil is unsorted deposit; therefore, boulders and cobbles are anticipated.

Groundwater: Upon completion of drilling all monitoring wells by Shad and Associates Inc. were dry.

On March 9, 2018, ground water levels were measured at depths ranging from 2.8 to 4.2 m in boreholes 1, 3 to 5, 9 to 10 and 12. On March 16, 2018, groundwater levels were measured at depths ranging from 2.9 to 6.4 m in boreholes 1, 3 to 5, 8 to 10 and 12.

On January 6, 2023, groundwater levels were measured at depths ranging from 0.74 to 3.76 m in boreholes 1, 3 to 5, 9 to 10 and 12. The results are summarized on the Record of Borehole Sheets in Appendix C and Table 1.

4.2 GROUNDWATER LEVEL MONITORING

All current and past groundwater monitoring data is presented in Table 1. It should be noted that groundwater levels are subject to seasonal fluctuations. All groundwater levels were measured manually using an electric water level meter and with respect to the geodetic borehole elevations within the property boundary. The monitoring wells must be decommissioned, prior to construction,

in accordance with Regulation 903 by a qualified contractor.

The interpreted groundwater flow direction is based on the 2018 and 2022 – 2023 round of water table elevation measurements, since this event provided the water table elevations from the majority of the monitoring wells. The interpreted local direction of hydraulic movement across the Site is inferred to be in a southern direction, towards the West Tributary of the Sixteen Mile Creek.

4.3 GROUNDWATER QUALITY

The groundwater samples collected from BH 1 and 10 in December 2022 were analyzed for the Municipality of Halton Sewers By-Law criteria. The results of chemical analysis (Table 2) indicate that the sample complies with the *Table 1 Limits for Sanitary & Combined Sewers Discharge* and *Table 2 Limits for Storm Sewer Discharge* for all parameters analyzed.

4.4 GROUNDWATER DISCHARGE ASSESSMENT

Presently, the groundwater onsite can be discharged to the Municipal sanitary/combined sewer system or storm sewer system with no additional filtration/treatment.

5.0 REVIEW AND EVALUATION

5.1 TEMPORARY DEWATERING ASSESSMENT

The excavation for the proposed two level underground parking structure will extend into native sandy silt soils. In order to protect the sides/bottom of the excavation from being disturbed by excess groundwater pressure, i.e., to prevent quicksand/dilating silt conditions, the groundwater table must be lowered 1.0 m below the bottom of the footing excavations.

Positive dewatering such as well points/eductors will be required for the proposed excavation. Onsite soil might be subject to localized piping during dewatering. Creation of piping channels may result in a substantial increase in the volume of both temporary dewatering and permanent drainage.

For the proposed two underground levels, groundwater is required to be drawn down 1 m below the underside of the combined footings. The assumed elevation of the footings is at approximately 179.75 masl for the North Block and 179.55 for the South Block. Therefore, groundwater will need to be lowered to an elevation of 178.75 masl for the North Block and 178.55 masl for the South Block.

The average ground water level recorded in the monitoring wells is at an elevation of 182.54 masl (Table 3), representing an approximate 3 – 4 m hydrostatic head requiring dewatering. The size of the shoring plan layout was assumed to cover approximately 165 m by 80 m and 210 m by 82 m for the North and South Blocks, respectively.

Theoretically, the groundwater drawdown for a single well pumping can be described as:

$$Q = -2\pi rKh \frac{dh}{dr} \quad (1)$$

And further we have:

$$h^2 = -\frac{Q}{\pi K} \ln(r / r_w) + h_w^2 \quad (2)$$

Where:

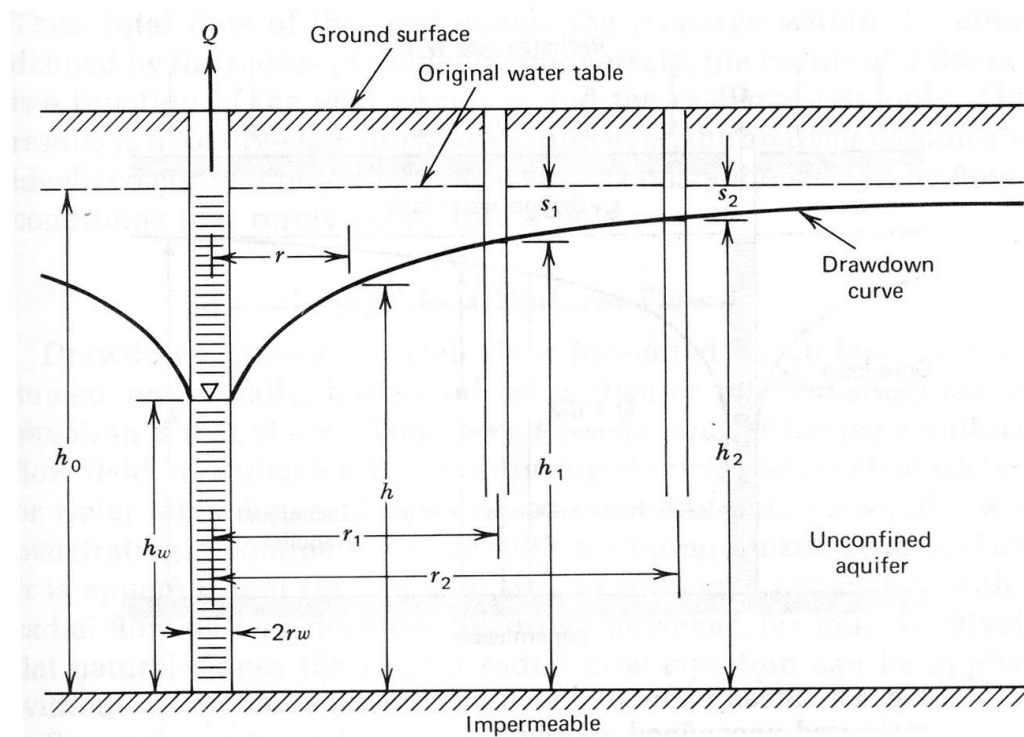
h [m] is the height of the water table above an impervious base

Q [m^3/day] is the rate of pumping discharge

K [m/day] is hydraulic conductivity

R [m] is the radius from the centre of well location

r_w [m] is the radius of pumping well (see Schematic A below).



Schematic A: Radial flow to an unconfined aquifer (Todd 1980)

5.1.1 Numerical Analysis

The abovementioned Site parameters were used to calculate the estimated steady state discharge rate for temporary construction dewatering. Groundwater monitoring data is presented in Table 3. The calculations for temporary dewatering rates are shown in Tables 4.

From the observed soil types and based on soil sample descriptions (Todd, 1980; Mays, 2001; and Craig, 2004), the average hydraulic conductivity (K) of

the aquifer was estimated at 0.40 m/day.

The estimated steady state discharge rate for temporary construction dewatering was calculated at approximately:

| Block | Discharge (m ³ /day) |
|-------|---------------------------------|
| North | 174 |
| South | 201 |

It should be noted that the initial drawdown pumping rate and accumulation from rainfall will likely be higher.

5.2 PERMANENT FOUNDATION DRAIN FLOW RATES

For the proposed redevelopment, it is understood that average ground floor slab elevation (FFE) is expected to range from elevations of 188.15 to 189.20 meters above sea level (masl). The lowest P2 floor slab elevation is expected to range from elevations of 181.05 to 181.25 masl.

A sub-floor Private Water Drainage System (PWDS) with perimeter/underfloor weeping tile is proposed below the P2 level slab. The invert of the PWDS is assumed to be approximately 0.5 m below the FFE of the P2 slab, i.e., at approximately 179.55 to 180.75 masl.

The proposed PWDS is shown in Drawing No. 6. The slotted pipes should slope to a sump at a minimum 1% slope. Perimeter drainage pipes, with a positive gravity outlet, should be solid PVC with a minimum of 0.5% slope. In addition, silt traps must be provided at convenient/accessible locations.

5.2.1 Numerical Analysis

The abovementioned Site parameters were used to calculate the estimated steady state discharge rate for the PWDS. Groundwater monitoring data is presented in Table 3. The calculations for permanent drainage flow rates are shown in Table 5.

From the observed soil types and based on soil sample descriptions (*Todd, 1980; Mays, 2001; and Craig, 2004*), the average hydraulic conductivity (K) of the aquifer was estimated at 0.40 m/day.

The estimated steady state discharge rate for the PWDS was calculated at:

| Block | Discharge (m ³ /day) |
|-------|---------------------------------|
| North | 78 |
| South | 94 |

5.3 MECP PERMIT TO TAKE WATER REQUIREMENT

The Permit to Take Water (PTTW) requirements for construction site dewatering have been updated to the current O.Reg.63/16 amendment to Environmental Protection Act. In accordance with the updated regulation, construction site dewatering will require a complete PTTW application when water takings greater than 400,000 L/day are predicted. Groundwater taking between 50,000 L/day and 400,000 L/day will require a PTTW through a limited online application process. Groundwater taking from a proposed building structure by means of a PWDS will require a PTTW when water taking is greater than 50,000 L/day. The complete permit application process for PTTW takes approximately twelve weeks to review and is required prior to applying for the discharge permits.

The anticipated steady state temporary dewatering discharge rate was calculated at 174 m³/day and 201 m³/day for the North and South Blocks, respectively. Therefore, a limited PTTW application will be required to be applied for with the MECP for each Block.

The steady state flow rate from the PWDS was calculated at 78 m³/day and 94 m³/day for the North and South Blocks, respectively. Therefore, a complete PTTW application for the PWDS will be required for each Block.

In accordance with the current Ontario Regulation 387/04 for Water Taking, every person to whom a permit has been issued under Section 34 of the Act shall collect and record data on the volume of water taken daily. The data collected shall be measured by a flow meter or calculated using a method

acceptable to a Director.

5.4 MUNICIPAL DISCHARGE PERMIT REQUIREMENTS

The Municipality of Halton requires that any private water to be discharged into the city sewer system must have a permit or agreement in place in order to discharge; this applies to all water not purchased from the city water supply. For temporary dewatering during the construction phase, this includes all groundwater and storm water that is collected or encountered during site excavation. For the PWDS, this includes all groundwater that is constantly pumped as a result of the PWDS elevation located below the groundwater table elevation or through storm water infiltration.

The groundwater quality sample collected in December 2022 indicates that the water onsite could be discharged into the Municipal sanitary and combined sewer system or storm sewer system with no additional filtration or treatment. A short-term temporary discharge permit must be applied for construction dewatering with Municipality.

A long-term permanent discharge permit must be applied for the proposed PWDS since the drainage system is located below the long-term groundwater elevation. The permanent discharge permit will involve coordination with the mechanical and site servicing consultant to provide calculations and drawing specifications for the ultimate discharge location and the sampling port required by the Municipality.

5.5 ENVIRONMENTAL PROTECTION

The Site is located in the Sixteen Mile Creek drainage basin and a branch is approximately 30 m west of the Site. The Site is located within the Regional Municipality of Halton and there are potential potable groundwater issuers in the Vicinity of the Site. Therefore, the Site is located in a potable groundwater region as defined in Sections 35 to 37 of O.Reg. 153/04.

The proposed redevelopment plan will remove all the overburden to a depth of approximately 9 – 10 mbgs, from the interior Site area. Temporary groundwater

dewatering will lower the groundwater table to below the underground parking foundation levels. The extracted water will be discharged into the sanitary sewer or into the storm sewer. Updated groundwater monitoring will be conducted by the dewatering contractor prior to and during construction activities to ensure that no additional adverse groundwater impacts are identified throughout the project's construction.

6.0 CONCLUSIONS AND RECOMMENDATIONS

MCR Engineers Ltd. was retained to conduct a Geohydrology Assessment for the Site in relation to an administrative Plan of Subdivision and rezoning application. Etheridge Avenue bisects the Site, running west to east. The Site is presently a vacant lot.

The Site is proposed for residential development (Appendix B) and will consist of:

- **North Block:** A fifteen [15] storey building (Building 5), a twelve [12] storey building (Building 6), and a fourteen [14] storey building (Building 7) over two [2] levels of underground parking.
- **South Block:** A fifteen [15] storey building (Building 1), a thirteen [13] storey building (Building 2), an eleven [11] storey building (Building 3), and a fourteen [14] storey building (Building 4) over two [2] levels of underground parking.

The finished floor elevation (FFE) at ground level is expected to range from elevations of 188.15 to 189.20 meters above sea level (masl). The P2 FFE will range from approximate elevations of 181.25 to 181.75 masl for the North Block and at 181.05 masl for the South Block.

Presently it is assumed that the proposed buildings will be supported by conventional spread/strip footings founded in silty to sandy/clayey silt soils. The size of the shoring play layout was assumed to cover approximately:

- **North Block:** 165 m by 80 m
- **South Block:** 210 m by 82 m

A sub-floor Private Water Drainage System (PWDS) with perimeter weeping tile will be required for the proposed development. A soldier pile and lagging shoring system is expected for temporary excavation.

The excavation for the proposed two level underground parking structure will extend into native sandy silt soils. In order to protect the sides/bottom of the excavation from being disturbed by excess groundwater pressure, i.e., to prevent quicksand/dilating

silt conditions, the groundwater table must be lowered 1.0 m below the bottom of the footing excavations.

Positive dewatering such as well points/eductors will be required for the proposed excavation. Onsite soil might be subject to localized piping during dewatering. Creation of piping channels may result in a substantial increase in the volume of both temporary dewatering and permanent drainage.

For the proposed two underground levels, groundwater is required to be drawn down 1 m below the underside of the combined footings. The assumed elevation of the footings is at approximately 179.75 masl for the North Block and 179.55 for the South Block. Therefore, groundwater will need to be lowered to an elevation of 178.75 masl for the North Block and 178.55 masl for the South Block.

The average ground water level recorded in the monitoring wells is at an elevation of 182.54 masl (Table 3), representing an approximate 3 – 4 m hydrostatic head requiring dewatering.

The steady-state discharge rate for temporary construction dewatering was calculated at 174 m³/day (32 USG/min) and 201 m³/day (37 USG/min) for the North and South Blocks, respectively. Therefore, based on the amended O.Reg. 63/16 to the Environmental Protection Act, a limited PTTW application will be required from the MECP, and a temporary discharge permit might be required from the Municipality for each Block. It should be noted that the initial drawdown pumping rate and accumulation from rainfall will be higher and this should be confirmed by the dewatering contractor.

The steady state discharge rate for the PWDS was calculated at approximately 78 m³/day (14 USG/min) and 94 m³/day (17 USG/min) for the North and South Blocks, respectively. Therefore, a complete PTTW will be required from the MECP for the PWDS for each Phase. A long-term permanent discharge permit might be required from the Municipality since the drainage will be installed below the long-term groundwater elevation.

The selected dewatering contract must be performance driven and the contractor must provide a performance bond. In addition, upon completion of system's

installation, the contractor must produce a written statement that “The system installed is robust enough to lower and maintain groundwater at least 1.0 m below the lowest footing elevation, without impacting the integrity of shoring or foundation soils.”

The Zone of Influence (ZOI) for construction dewatering ranges from 24 to 26 m. The ZOI for permanent drainage ranges from 11 to 13 m. As the ZOI for construction dewatering and permanent drainage may intercept the branch of the Sixteen Mile Creek to the west and south, an infiltration gallery, **with approval from the Municipality and the MECP with an Environmental Compliance Approval (ECA)**, could be implemented to offset the potential of drying out the creek.

Presently, the groundwater onsite can be discharged to the Municipal sanitary/combined sewer system or storm sewer system with no additional filtration/treatment.

The application process, where a PTTW is required, can take at least three months for a review by the MECP and is required to be approved prior to applying for discharge permits. It is recommended that applications to the Municipality for discharge permits be applied for at least three months prior to the required start dates. Applications are to be supported by drawings and calculations provided by the mechanical and the site servicing consultant and coordination is required amongst all disciplines.

7.0 REFERENCES

1. Ontario Ministry of the Environment. *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*. April 15, 2011.
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6. R.F. Craig, *Soil Mechanics*, 7th Edition, Spon Press, London, 2004.
7. Shad & Associates Inc. report titled, *Geotechnical Investigation Report, Proposed Residential Condominium Development, Framgard Property – Major Node, Regional Road 25, North of Britannia Road, Milton, Ontario*, prepared for Mattamy Willmott Limited, dated March 2018.
8. MCR report titled, *Geotechnical Report, Residential Development, Regional Road 25 and Britannia Road, Milton, Ontario*, prepared for Mattamy (Milton West) Limited, dated January 2024.

8.0 STATEMENT OF LIMITATIONS

MCR Engineers Ltd. (MCR) conducted the work associated with this report in accordance with the scope of services, time and budget limitations imposed for this work. The work has been conducted according to reasonable and generally accepted local standards for an environmental consultant at the time of the work. No other warranty or representation, expressed or implied, is included or intended in this report.

The work was designed to provide an overall assessment of the environmental conditions at the Site. The conclusions presented in this report are based on the information obtained during the investigation. The work is intended to reduce the client's risk with respect to environmental impairment. No work can completely eliminate the possibility of further environmental impairment on the Site.

It should be noted that subsurface conditions might vary at locations and depths other than those locations where borings, surveys or explorations were made by MCR. Other contaminants, not tested for in this work, may also potentially be present on the Site. Even with exhaustive investigation, it is not possible to warranty the Site will be free of contaminants. Should conditions, not observed during the work, become apparent, MCR should be immediately notified to assess the situation and conduct additional work, where required. The findings of this report are based on conditions as they were observed at the time of the work.

No assurance is made regarding changes in conditions subsequent to the time of the work. Remediation cost estimates is based on the available information. The estimated costs for remediation only represent the costs for the clean-up of known contaminants that have been identified during the work. Additional costs may be incurred as a result of other contaminants or areas of contamination identified by subsequent work.

Regulatory statutes are subject to interpretation. These statutes and their interpretation may change over time, thus these issues should be reviewed with appropriate legal counsel.

MCR relied on information provided by others in this report. MCR cannot guarantee the accuracy, completeness and reliability of the information provided by others, although MCR staff attempted to seek clarification on information provided and verify authenticity, where practical.

The report and its attachments were prepared for and made available for the sole use of the client. MCR will not be responsible for any use or interpretation of the information contained in this report by any other party without the prior expressed written consent of MCR.

9.0 CLOSURE

In accordance with your request and authorization, MCR Engineers Ltd. completed this Geohydrology Assessment Report. This report presented the methodology, findings and conclusions of the investigation. The Statement of Limitations for all work performed as part of this investigation is included.

We trust that the information provided in this report is sufficient for your present requirements. Should you have any further questions, please do not hesitate to contact our office. Thank you for retaining MCR Engineers Ltd. for this project.

Respectfully,
MCR Engineers Ltd.



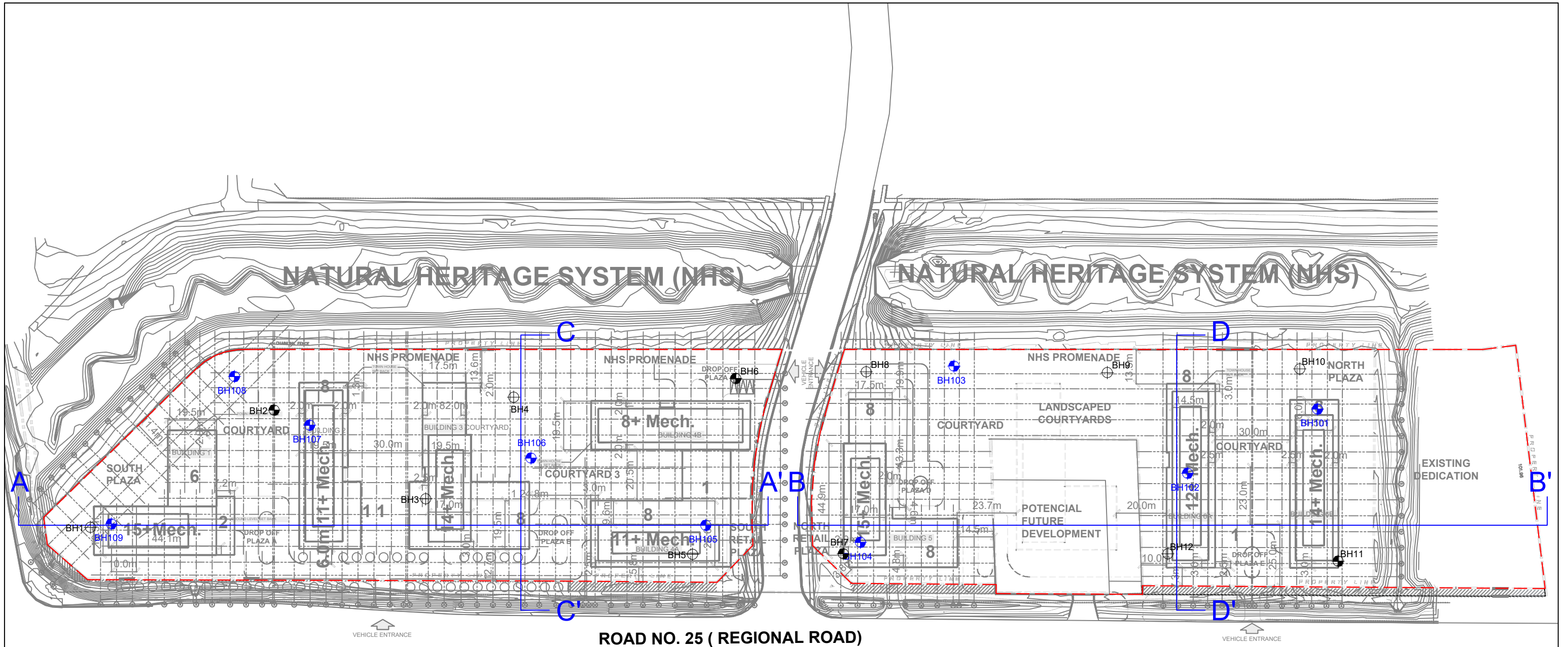
Prepared By:
Richard Sukhu, P.Eng., B.Eng.

A handwritten signature in black ink, appearing to read "Lad Rak".

Reviewed By:
Lad Rak, P.Eng., M.Eng., QP_{ESA}

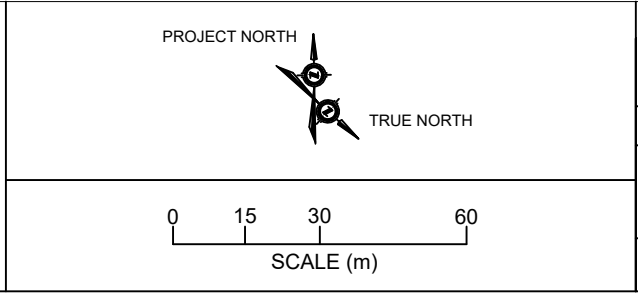
Date of Issue: January 19, 2024

FIGURES

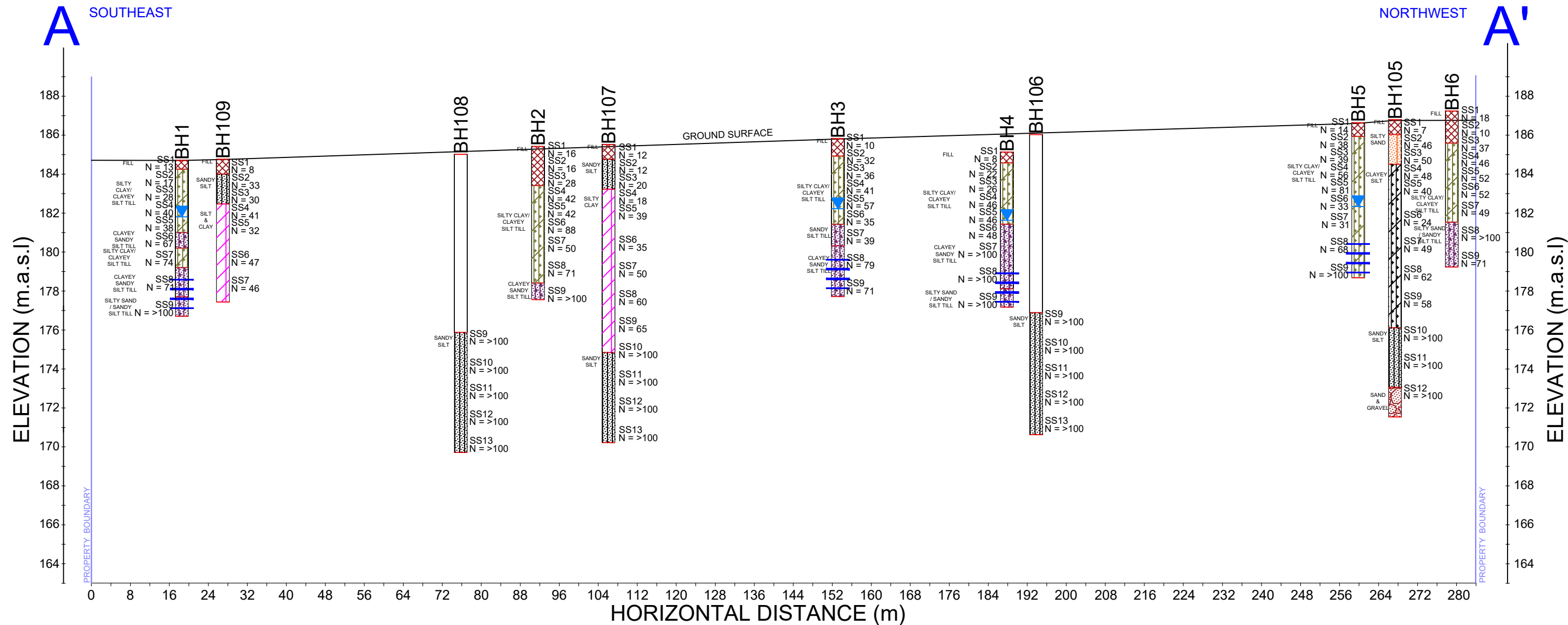


- LEGEND:**
- PROPERTY BOUNDARY
 - BOREHOLE/MONITORING WELL BY SHAD & ASSOCIATES, 2018
 - MONITORING WELL INSTALLED BY MCR, JUL.-AUG. 2022

Drawing Notes: Image drafted from property survey, Toronto Maps, Google Maps, and site inspections. Not for construction purposes.



| | | | | |
|--|----------------------|-----------------|-------------------|------------------|
| MCR ENGINEERS LTD. GEO-ENVIRONMENTAL CONSULTANTS | | | | |
| NORTH-WESTERN CORNER OF REGIONAL ROAD 25 & BRITANNIA ROAD, MILTON, ONTARIO | | | | |
| BOREHOLE LOCATION PLAN | | | | |
| Project No. G5820 | Date JANUARY 2023 | Drawn by: CM | Checked by: ST | Drawing No. 1 |



LEGEND:

- SCREENED INTERVALS
- ELEVATION MARK (masl)
- APPROXIMATE WATER LEVEL
- FILL
- SAND
- SILTY SAND
- SHALE
- SILT
- CLAYEY SILT
- SANDY SILT

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GEO-ENVIRONMENTAL CONSULTANTS

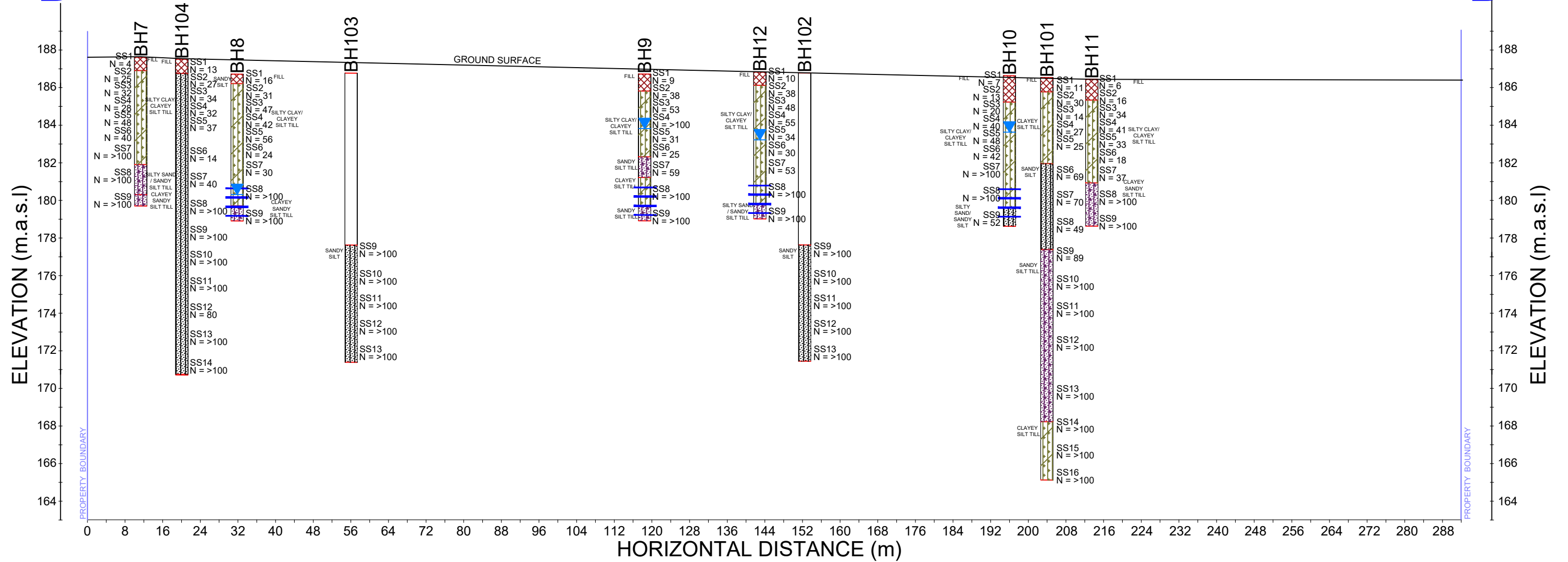
NORTH-WESTERN CORNER OF REGIONAL ROAD 25 & BRITANNIA ROAD, MILTON, ONTARIO

CROSS-SECTION A-A'

| | | | | |
|----------------------|----------------------|-----------------|-------------------|------------------|
| Project No. G5820 | Date JANUARY 2023 | Drawn by: CM | Checked by: ST | Drawing No. 2 |
|----------------------|----------------------|-----------------|-------------------|------------------|

B SOUTHEAST

NORTHWEST **B'**



LEGEND:

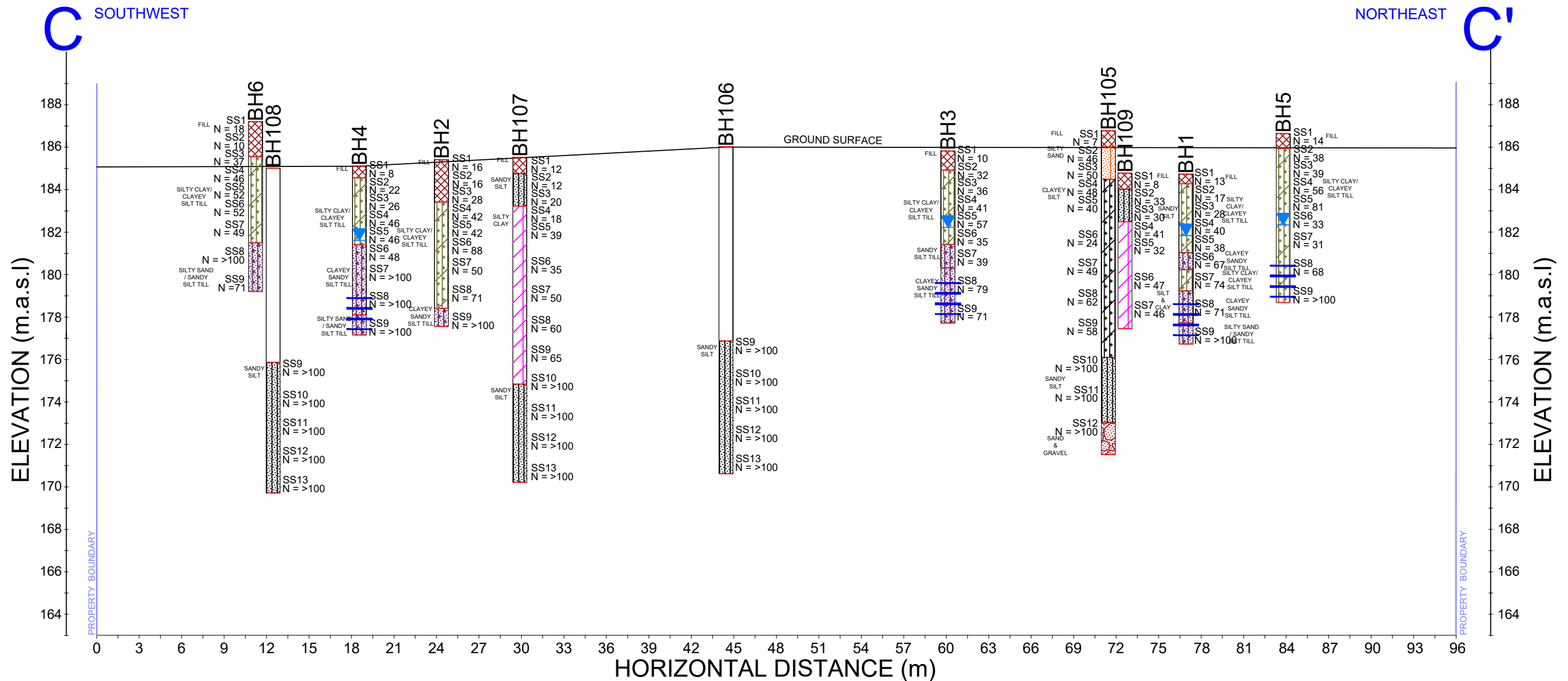
- SCREENED INTERVALS
- ELEVATION MARK (masl)
- APPROXIMATE WATER LEVEL
- FILL
- SAND
- SILTY SAND
- SHALE
- SILT
- CLAYEY SILT
- SANDY SILT

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GEO-ENVIRONMENTAL CONSULTANTS

NORTH-WESTERN CORNER OF REGIONAL ROAD 25 & BRITANNIA
ROAD, MILTON, ONTARIO

CROSS-SECTION B-B'

| | | | | |
|----------------------|----------------------|-----------------|-------------------|------------------|
| Project No. G5820 | Date JANUARY 2023 | Drawn by: CM | Checked by: ST | Drawing No. 3 |
|----------------------|----------------------|-----------------|-------------------|------------------|



LEGEND:

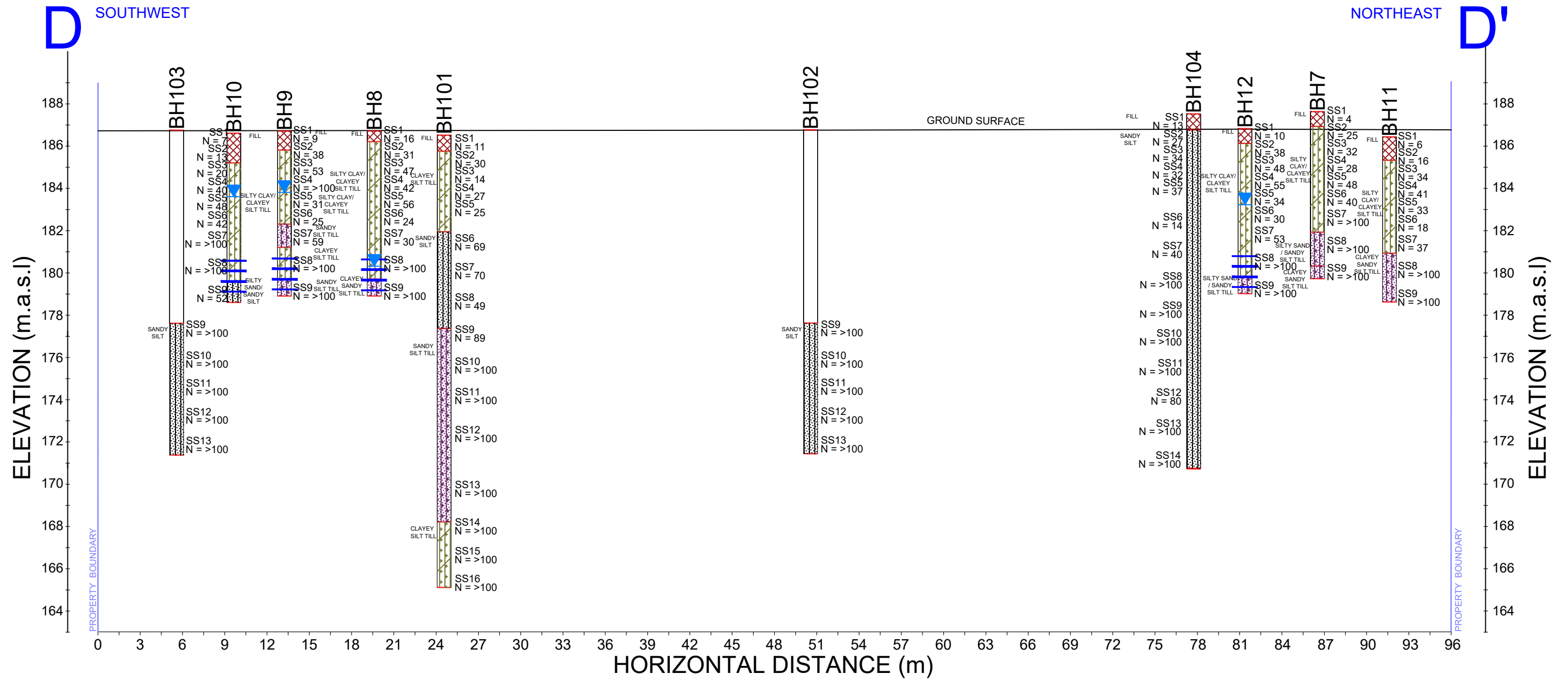
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|--|-------------------------|--|-------------|--|-------|--|------------|
| | SCREENED INTERVALS | | FILL | | SHALE | | SANDY SILT |
| | ELEVATION MARK (masl) | | SAND | | SILT | | SILTY SAND |
| | APPROXIMATE WATER LEVEL | | CLAYEY SILT | | | | |

MOR | **MCR ENGINEERS LTD.**
GEO-ENVIRONMENTAL CONSULTANTS

NORTH-WESTERN CORNER OF REGIONAL ROAD 25 & BRITANNIA ROAD, MILTON, ONTARIO

CROSS-SECTION C-C'

| | | | | |
|----------------------|----------------------|-----------------|-------------------|------------------|
| Project No. G5820 | Date JANUARY 2023 | Drawn by: CM | Checked by: ST | Drawing No. 4 |
|----------------------|----------------------|-----------------|-------------------|------------------|



LEGEND:

- SCREENED INTERVALS
- ELEVATION MARK (masl)
- APPROXIMATE WATER LEVEL
- FILL
- SAND
- SILTY SAND
- SHALE
- SILT
- CLAYEY SILT
- SANDY SILT

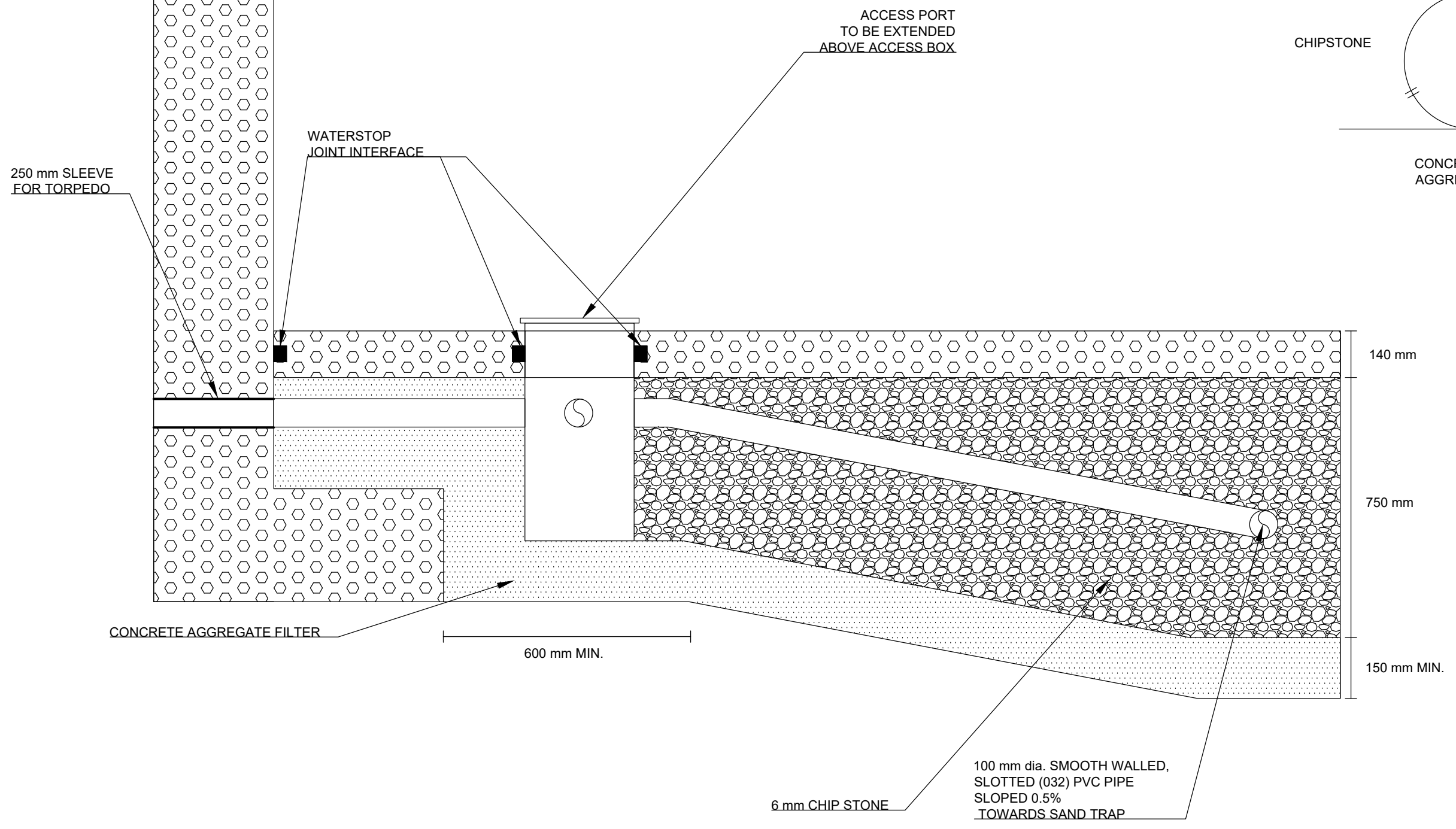
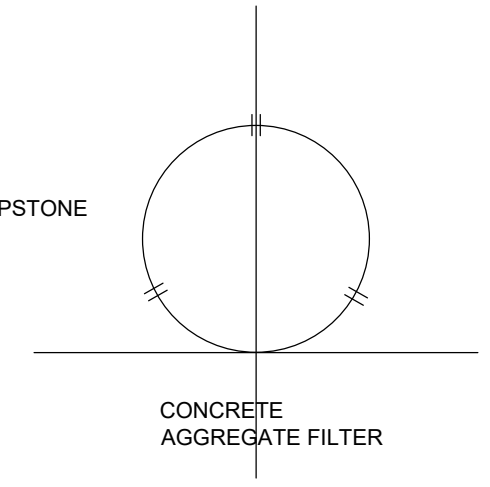
MCR ENGINEERS LTD.
GEO-ENVIRONMENTAL CONSULTANTS

NORTH-WESTERN CORNER OF REGIONAL ROAD 25 & BRITANNIA ROAD, MILTON, ONTARIO

CROSS-SECTION D-D'

| | | | | |
|----------------------|----------------------|-----------------|-------------------|------------------|
| Project No. G5820 | Date JANUARY 2023 | Drawn by: CM | Checked by: ST | Drawing No. 5 |
|----------------------|----------------------|-----------------|-------------------|------------------|

CROSS SECTION:
100 mm dia.
SMOOTH PVC PIPE



TABLES

MCR ENGINEERS LTD.
GEO-ENVIRONMENTAL CONSULTANTS

TABLE 1
CONSTRUCTION DETAILS AND ELEVATION OF MONITORING WELLS

| MONITORING WELL ID | GROUND SURFACE ELEVATION (masl) | WATER LEVEL (mbgs) | GROUNDWATER ELEVATION (masl) | DATE OF MEASUREMENT (mm/dd/yyyy) | DEPTH OF WELL (mbgs) | DEPTH OF BENTONITE (mbgs) | LENGTH OF SCREEN (m) | INSIDE DIAMETER OF PIPE (mm) | TOP OF MONITORING WELL |
|--------------------|---------------------------------|--------------------|------------------------------|----------------------------------|----------------------|---------------------------|----------------------|------------------------------|------------------------|
| BH 1 | 184.70 | 2.80 | 181.90 | 3/9/2018 | 7.70 | 5.70 | 3.05 | 50 | STICK-UP |
| | | 2.90 | 181.80 | 3/16/2018 | | | | | |
| | | 3.10 | 181.60 | 12/5/2022 | | | | | |
| | | 2.80 | 181.90 | 1/6/2023 | | | | | |
| | | 2.78 | 181.92 | 2/8/2023 | | | | | |
| | | 2.82 | 182.06 | 3/8/2023 | | | | | |
| | | 2.22 | 182.46 | 4/6/2023 | | | | | |
| | | 2.52 | 182.16 | 5/8/2023 | | | | | |
| | | 2.50 | 182.20 | 6/16/2023 | | | | | |
| | | 2.52 | 182.16 | 7/12/2023 | | | | | |
| | | 2.38 | 182.32 | 8/11/2023 | | | | | |
| | | 2.60 | 182.10 | 9/15/2023 | | | | | |
| | | 2.79 | 181.91 | 10/18/2023 | | | | | |
| | | 2.82 | 181.88 | 11/17/2023 | | | | | |
| | | BH 3 | 185.80 | 3.70 | | | | | |
| 3.60 | 182.20 | | | 3/16/2018 | | | | | |
| 3.96 | 181.84 | | | 12/5/2022 | | | | | |
| 3.74 | 182.06 | | | 1/6/2023 | | | | | |
| 3.05 | 182.75 | | | 2/8/2023 | | | | | |
| 2.73 | 183.07 | | | 3/8/2023 | | | | | |
| 2.35 | 183.45 | | | 4/6/2023 | | | | | |
| 2.40 | 183.40 | | | 5/8/2023 | | | | | |
| 2.83 | 182.97 | | | 6/16/2023 | | | | | |
| 2.90 | 182.90 | | | 7/12/2023 | | | | | |
| 2.78 | 183.02 | | | 8/11/2023 | | | | | |
| 2.86 | 182.94 | | | 9/15/2023 | | | | | |
| 3.28 | 182.52 | | | 10/18/2023 | | | | | |
| 3.32 | 182.46 | | | 11/17/2023 | | | | | |
| BH 4 | 185.10 | | | 3.60 | 181.50 | 3/9/2018 | 7.70 | 5.70 | 3.05 |
| | | 3.50 | 181.60 | 3/16/2018 | | | | | |
| | | 3.33 | 181.77 | 12/5/2022 | | | | | |
| | | 3.26 | 181.84 | 1/6/2023 | | | | | |
| | | 2.95 | 182.15 | 2/8/2023 | | | | | |
| | | 2.76 | 182.34 | 3/8/2023 | | | | | |
| | | 2.35 | 182.75 | 4/6/2023 | | | | | |
| | | 2.35 | 182.75 | 5/8/2023 | | | | | |
| | | 2.44 | 182.66 | 6/16/2023 | | | | | |
| | | 2.49 | 182.61 | 7/12/2023 | | | | | |
| | | 2.27 | 182.83 | 8/11/2023 | | | | | |
| | | 2.51 | 182.58 | 9/15/2023 | | | | | |
| | | 2.78 | 182.32 | 10/18/2023 | | | | | |
| | | 2.84 | 182.26 | 11/17/2023 | | | | | |
| | | BH 5 | 186.60 | 4.20 | 182.40 | 3/9/2018 | | | |
| 4.30 | 182.30 | | | 3/16/2018 | | | | | |
| 4.45 | 182.15 | | | 12/5/2022 | | | | | |
| 0.74 | 185.86 | | | 1/6/2023 | | | | | |
| 1.87 | 184.73 | | | 2/8/2023 | | | | | |
| 1.30 | 185.30 | | | 3/8/2023 | | | | | |
| 1.06 | 185.54 | | | 4/6/2023 | | | | | |
| 3.01 | 183.59 | | | 5/8/2023 | | | | | |
| 3.88 | 182.92 | | | 6/16/2023 | | | | | |
| 3.65 | 182.95 | | | 7/12/2023 | | | | | |
| 3.46 | 183.14 | | | 8/11/2023 | | | | | |
| 3.67 | 182.93 | | | 9/15/2023 | | | | | |
| 3.94 | 182.66 | | | 10/18/2023 | | | | | |
| 4.02 | 182.58 | | | 11/17/2023 | | | | | |
| BH 8 | 186.70 | | | DRY | - | 3/9/2018 | 7.70 | 5.70 | 3.05 |
| | | 6.40 | 180.30 | 3/16/2018 | | | | | |
| | | DESTROYED | - | 12/5/2022 | | | | | |
| BH 9 | 186.70 | 2.90 | 183.80 | 3/9/2018 | 7.70 | 5.70 | 3.05 | 50 | STICK-UP |
| | | 2.90 | 183.80 | 3/16/2018 | | | | | |
| | | 3.92 | 182.78 | 12/5/2022 | | | | | |
| | | 3.76 | 182.94 | 1/6/2023 | | | | | |
| | | 3.29 | 183.41 | 2/8/2023 | | | | | |
| | | 2.96 | 183.74 | 3/8/2023 | | | | | |
| | | 2.58 | 184.12 | 4/6/2023 | | | | | |
| | | 2.53 | 184.17 | 5/8/2023 | | | | | |
| | | 2.55 | 184.15 | 6/16/2023 | | | | | |
| | | 2.50 | 184.20 | 7/12/2023 | | | | | |
| | | 2.17 | 184.53 | 8/11/2023 | | | | | |
| | | 2.57 | 184.13 | 9/15/2023 | | | | | |
| | | 2.77 | 183.93 | 10/18/2023 | | | | | |
| | | 2.88 | 183.82 | 11/17/2023 | | | | | |
| | | BH 10 | 186.60 | 2.90 | | | | | |
| 3.00 | 183.60 | | | 3/16/2018 | | | | | |
| 3.15 | 183.45 | | | 12/5/2022 | | | | | |
| 2.94 | 183.66 | | | 1/6/2023 | | | | | |
| 2.94 | 183.66 | | | 2/8/2023 | | | | | |
| 2.71 | 183.89 | | | 3/8/2023 | | | | | |
| 2.42 | 184.18 | | | 4/6/2023 | | | | | |
| 2.65 | 183.95 | | | 5/8/2023 | | | | | |
| 2.60 | 184.00 | | | 6/16/2023 | | | | | |
| 2.58 | 184.02 | | | 7/12/2023 | | | | | |
| 2.53 | 184.07 | | | 8/11/2023 | | | | | |
| 2.64 | 183.96 | | | 9/15/2023 | | | | | |
| 2.84 | 183.76 | | | 10/18/2023 | | | | | |
| 2.93 | 183.67 | | | 11/17/2023 | | | | | |
| BH 12 | 186.80 | | | 3.60 | 183.20 | 3/9/2018 | 7.70 | 5.70 | 3.05 |
| | | 3.60 | 183.20 | 3/16/2018 | | | | | |
| | | 4.03 | 182.77 | 12/5/2022 | | | | | |
| | | 3.72 | 183.08 | 1/6/2023 | | | | | |
| | | 3.55 | 183.25 | 2/8/2023 | | | | | |
| | | 3.29 | 183.51 | 3/8/2023 | | | | | |
| | | 2.97 | 183.83 | 4/6/2023 | | | | | |
| | | 3.23 | 183.57 | 5/8/2023 | | | | | |
| | | 3.16 | 183.62 | 6/16/2023 | | | | | |
| | | 3.13 | 183.67 | 7/12/2023 | | | | | |
| | | 2.98 | 183.82 | 8/11/2023 | | | | | |
| | | 3.25 | 183.55 | 9/15/2023 | | | | | |
| | | 3.42 | 183.38 | 10/18/2023 | | | | | |
| | | 3.46 | 183.34 | 11/17/2023 | | | | | |
| | | Min | 184.70 | 0.74 | 180.30 | - | | | |
| Max | 186.80 | 6.40 | 185.86 | - | 7.70 | - | - | - | - |
| Average | 186.13 | 3.00 | 183.05 | - | 7.70 | - | - | - | - |

NOTE:
mbgs - meters below ground surface
masl - meters above sea level
N/A - Not Applicable
NF - Not Found

MCR ENGINEERS LTD.
GEO-ENVIRONMENTAL CONSULTANTS

TABLE 2
GROUNDWATER ANALYTICAL RESULTS - HALTON REGION SEWERS BY-LAW DISCHARGE CRITERIA By-Law No. 02-03
MCR JOB#: G5820
SITE ADDRESS: Northwestern Corner of Regional Road 25 & Britannia Road, Milton, ON

| PARAMETER | UNITS | LIMITS FOR STORM SEWER DISCHARGE | LIMITS FOR SANITARY & COMBINED SEWERS DISCHARGE | BH 1 | BH 10 |
|---------------------------------------|-----------|----------------------------------|---|------------|------------|
| | | | | 08-Dec-22 | 08-Dec-22 |
| pH | pH Units | 6.5 - 8.5 | 5.5 - 10.0 | 8.22 | 8.09 |
| Total Suspended Solids | mg/L | - | 350 | 11.8 | 35.6 |
| Fluoride (F-) | mg/L | - | 10 | 0.182 | 0.246 |
| Total Kjeldahl Nitrogen (TKN) | mg/L | - | 100 | 0.112 | 0.259 |
| Total Phosphorus (P) | mg/L | - | 10 | 0.0167 | 0.0244 |
| Sulfate (SO4) | mg/L | - | 1500 | 305 | 385 |
| Total Cyanide (CN) | mg/L | - | 2 | <0.0020 | <0.0020 |
| Escherichia Coli | CFU/100mL | 200 | - | <1 | <1 |
| Total Aluminum (Al) | mg/L | - | 50 | 0.387 | 0.514 |
| Total Antimony (Sb) | mg/L | - | 5 | <0.00100 | <0.00100 |
| Total Arsenic (As) | mg/L | - | 1 | 0.00461 | 0.00555 |
| Total Beryllium (Be) | mg/L | - | 5 | <0.000200 | <0.000200 |
| Total Cadmium (Cd) | mg/L | - | 0.7 | <0.0000500 | <0.0000500 |
| Total Chromium (Cr) | mg/L | - | 5 | <0.00500 | <0.00500 |
| Total Cobalt (Co) | mg/L | - | 5 | 0.00108 | 0.00144 |
| Total Copper (Cu) | mg/L | - | 3 | <0.00500 | <0.00500 |
| Total Iron (Fe) | mg/L | - | 50 | 0.777 | 0.879 |
| Total Lead (Pb) | mg/L | - | 3 | <0.000500 | 0.000546 |
| Total Manganese (Mn) | mg/L | - | 5 | 0.51 | 0.304 |
| Total Mercury (Hg) | mg/L | - | 0.01 | <0.0000050 | <0.0000050 |
| Total Molybdenum (Mo) | mg/L | - | 5 | 0.00532 | 0.0041 |
| Total Nickel (Ni) | mg/L | - | 3 | <0.00500 | <0.00500 |
| Total Selenium (Se) | mg/L | - | 1 | <0.000500 | <0.000500 |
| Total Silver (Ag) | mg/L | - | 5 | <0.000100 | <0.000100 |
| Total Tin (Sn) | mg/L | - | 5 | 0.00198 | 0.00173 |
| Total Titanium (Ti) | mg/L | - | 5 | 0.00848 | 0.0109 |
| Total Zinc (Zn) | mg/L | - | 3 | <0.0300 | <0.0300 |
| Biological Oxygen Demand | mg/L | - | 300 | <3.0 | 3.4 |
| Total Oil & Grease (Animal/Vegetable) | mg/L | - | 150 | <5.0 | <5.0 |
| Total Oil & Grease Mineral/Synthetic | mg/L | - | 15 | <5.0 | <5.0 |
| Phenols-4AAP | mg/L | - | 1 | <0.0010 | 0.0012 |
| Benzene | µg/L | - | 10 | <0.50 | <0.50 |
| Chloroform | µg/L | - | 40 | <0.50 | <0.50 |
| 1,4-Dichlorobenzene | µg/L | - | 80 | <0.50 | <0.50 |
| Dichloromethane (Methylene Chloride) | µg/L | - | 2000 | <1.0 | <1.0 |
| Ethylbenzene | µg/L | - | 160 | <0.50 | <0.50 |
| Tetrachloroethylene | µg/L | - | 1000 | <0.50 | <0.50 |
| Toluene | µg/L | - | 16 | <0.50 | <0.50 |
| Trichloroethylene | µg/L | - | 400 | <0.50 | <0.50 |
| Naphthalene | µg/L | - | 140 | 97.4 | 103 |

Note:

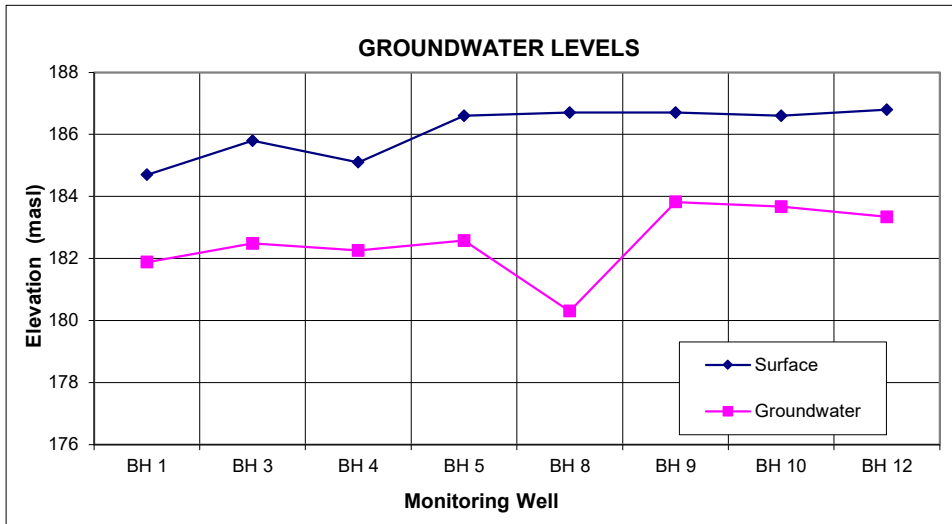
| | |
|-------------|---|
| BOLD | Exceeds Criteria - Halton Region Sanitary By-Law |
| BOLD | Non-Detect Exceeds Criteria - Halton Region Sanitary By-Law |
| BOLD | Exceeds Criteria - Halton Region Storm By-Law |
| BOLD | Non-Detect Exceeds Criteria - Halton Region Storm By-Law |

| | | |
|------------|--------------------------------------|--------------------|
| MCR | MCR ENGINEERS LTD. | GROUNDWATER |
| | GEO-ENVIRONMENTAL CONSULTANTS | |

Project: Proposed Residential Development
Location: Northwest corner of Regional Road 25 & Britannia Road, Toronto, ON
Date: January-24
Project #: G5820

**TABLE 3
GROUNDWATER MONITORING DATA**

| Borehole Number | Surface Elevation | Water Level Depth | Water Level Elevation | Monitoring Date | NOTES |
|------------------------|--------------------------|--------------------------|------------------------------|------------------------|--------------|
| | (masl) | (mbgs) | (masl) | (mm/dd/yyyy) | |
| BH 1 | 184.70 | 2.82 | 181.88 | 11/17/2023 | |
| BH 3 | 185.80 | 3.32 | 182.48 | 11/17/2023 | |
| BH 4 | 185.10 | 2.84 | 182.26 | 11/17/2023 | |
| BH 5 | 186.60 | 4.02 | 182.58 | 11/17/2023 | |
| BH 8 | 186.70 | 6.40 | 180.30 | 3/16/2018 | |
| BH 9 | 186.70 | 2.88 | 183.82 | 11/17/2023 | |
| BH 10 | 186.60 | 2.93 | 183.67 | 11/17/2023 | |
| BH 12 | 186.80 | 3.46 | 183.34 | 11/17/2023 | |
| Average | 186.13 | 3.58 | 182.54 | | |
| Max | | | 183.82 | | |



| | | |
|------------|--------------------------------------|--------------------|
| MCR | MCR ENGINEERS LTD. | GROUNDWATER |
| | GEO-ENVIRONMENTAL CONSULTANTS | |

Project: Proposed Residential Development
 Location: Northwest corner of Regional Road 25 & Britannia Road, Toronto, ON
 Date: January-24
 Project #: G5820

TABLE 4
DISCHARGE ESTIMATION OF CONSTRUCTION DEWATERING

| Site Parameters | North Block | South Block | Units |
|--|--------------------|--------------------|--------------|
| Initial Water Level before Dewatering | 182.54 | 182.54 | (m) |
| Lowest Water Level during Construction Dewatering | 178.75 | 178.55 | (m) |
| Length of Site X | 165.00 | 210.00 | (m) |
| Width of Site W | 80.00 | 82.00 | (m) |
| Equivalent Radius r_e | 64.82 | 74.04 | (m) |
| Hydraulic Conductivity of Aquifer (k) | 0.40 | 0.40 | (m/day) |
| Aquifer Bottom Elevation | 176.75 | 176.55 | (m) |
| Applied Radius of Influence (Ro) | 24.47 | 25.76 | (m) |
| Height btw Initial Water Level and Aquifer Bottom (H) | 5.79 | 5.99 | (m) |
| Height btw Lowest Water Level and Aquifer Bottom (h_w) | 2.00 | 2.00 | (m) |
| Radius of Influence (R) | 89.29 | 99.80 | (m) |
| Factor of Safety (FS) | 1.50 | 1.50 | |

$$Q = \frac{\pi k (H^2 - h_w^2)}{\ln(R/r)}$$

| | | |
|---|------------|----------------------------------|
| Estimated steady-state discharge of dewatering | 174 | 201 (m ³ /day) |
| | 32 | 37 (USG/min) |

| | | |
|------------|--------------------------------------|--------------------|
| MCR | MCR ENGINEERS LTD. | GROUNDWATER |
| | GEO-ENVIRONMENTAL CONSULTANTS | |

Project: Proposed Residential Development
Location: Northwest corner of Regional Road 25 & Britannia Road, Toronto, ON
Date: January-24
Project #: G5820

TABLE 5
DISCHARGE ESTIMATION OF PERMANENT DRAINAGE SYSTEM

| Site Parameters | North Block | South Block | Units |
|--|--------------------|--------------------|--------------|
| Initial Water Level before Dewatering | 182.54 | 182.54 | (m) |
| Lowest Water Level under PDS conditions | 180.75 | 180.55 | (m) |
| Length of Site X | 165.00 | 210.00 | (m) |
| Width of Site W | 80.00 | 82.00 | (m) |
| Equivalent Radius r_e | 64.82 | 74.04 | (m) |
| Hydraulic Conductivity of Aquifer (k) | 0.40 | 0.40 | (m/day) |
| Aquifer Bottom Elevation | 179.75 | 179.55 | (m) |
| Applied Radius of Influence (Ro) | 11.56 | 12.85 | (m) |
| Height btw Initial Water Level and Aquifer Bottom (H) | 2.79 | 2.99 | (m) |
| Height btw Lowest Water Level and Aquifer Bottom (h_w) | 1.00 | 1.00 | (m) |
| Radius of Influence (R) | 76.38 | 86.89 | (m) |
| Factor of Safety (FS) | 1.50 | 1.50 | |

$$Q = \frac{\pi k (H^2 - h_w^2)}{\ln(R/r)}$$

| | | |
|---|-----------|---------------------------------|
| Estimated steady-state discharge of dewatering | 78 | 94 (m ³ /day) |
| | 14 | 17 (USG/min) |

APPENDIX A

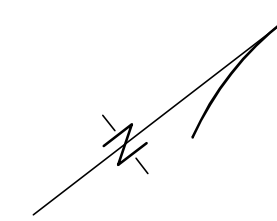
PLAN OF TOPOGRAPHY

SCALE 1:1000



RADY-PENTEK & EDWARD SURVEYING LTD., O.L.S.

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.



LEGEND

| | |
|------|----------------------------------|
| -W- | DENOTES OVERHEAD WIRE |
| -GR- | DENOTES GUIDE RAIL METAL |
| UP | DENOTES UTILITY POLE |
| INV | DENOTES INVERT ELEVATION |
| GLB | DENOTES GROUND LEVEL BOX UTILITY |
| MH | DENOTES MANHOLE |
| MHW | DENOTES MANHOLE WATER |
| MHSA | DENOTES MANHOLE SANITARY |
| MHST | DENOTES MANHOLE STORM |
| LS | DENOTES LAMP STANDARD |
| CB | DENOTES CATCH BASIN |
| WV | DENOTES WATER VALVE |
| Ø | DENOTES DIAMETER |
| ⊥ | DENOTES ANCHOR |

BOUNDARY NOTE

THIS IS NOT A PLAN OF SURVEY. BOUNDARIES ARE NOT CERTIFIED BY THIS PLAN, AND ARE HAS BEEN TAKEN FROM R-PE CAD FILE Nos. 14014S8F AND 14235S10.

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND REFERRED TO THE MTO BENCHMARK No 00819828156 HAVING AN ORTHOMETRIC ELEVATION OF 187.173 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD-1928:1978).

BENCHMARK LOCATED ON A CONCRETE AND STEEL BRIDGE CARRYING HWY 25 OVER SIXTEEN MILE CREEK, 3.2 KM SOUTH OF HWY 25, AND CPR OVERPASS AT MILTON, 71.0 M SOUTH OF DRIVEWAY TO SARGENT FARMS. TABLET IS SET HORIZONTALLY IN EAST FACE OF CONCRETE COPING, 7.1 M EAST OF CENTRELINE OF HWY 25, 87 CM NORTH OF SOUTHEAST END OF BRIDGE, 10 CM BELOW TOP OF COPING, 54 CM ABOVE GROUND.

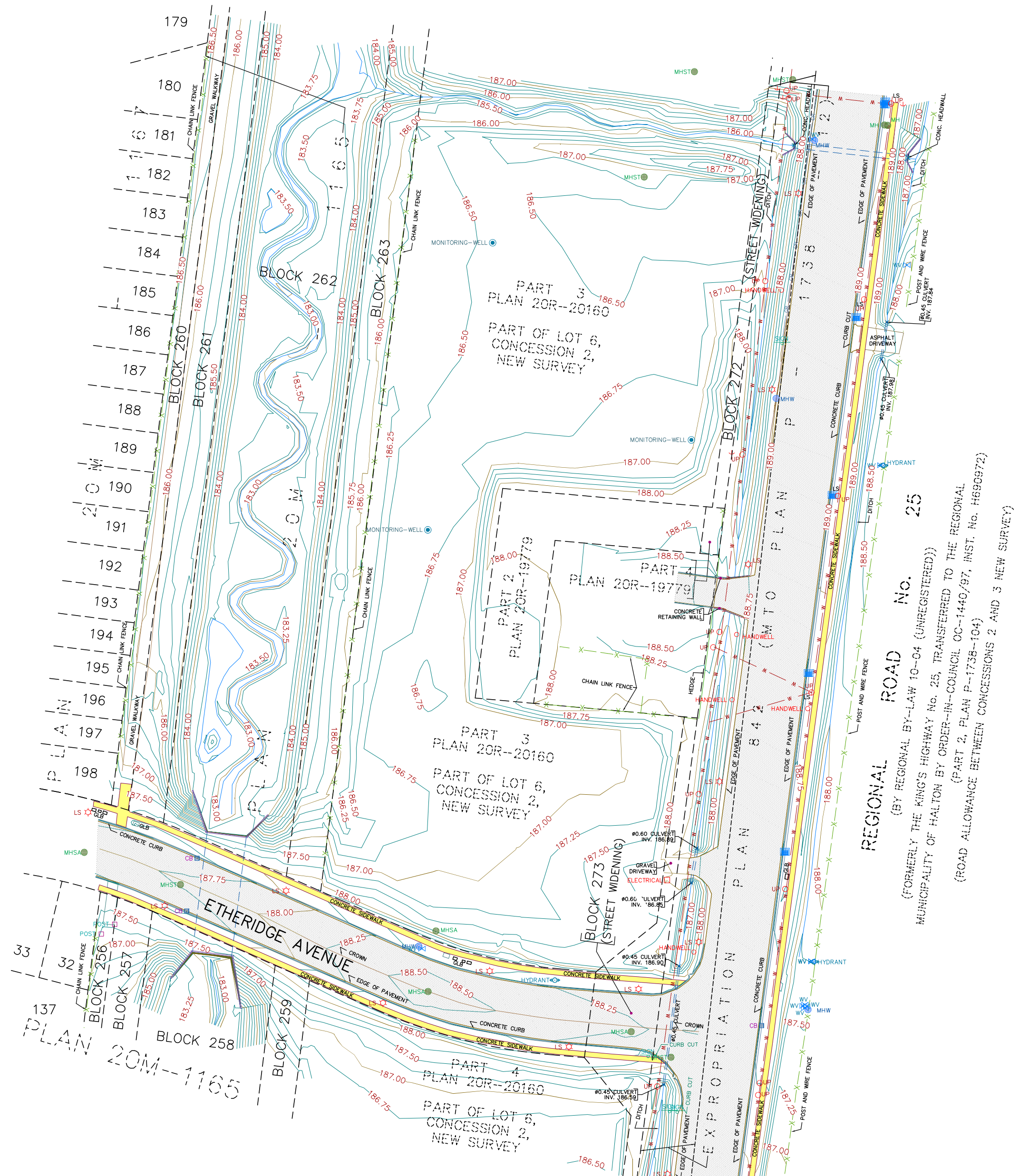
FIELD OBSERVATIONS

THE FIELD OBSERVATIONS REPRESENTED ON THIS PLAN WERE COMPLETED ON THE 27th DAY OF MARCH, 2018

AMENDED PLAN TO SHOW ADDITIONAL TOPOGRAPHIC FEATURES ON THE HOLDOUT PARCEL WITH FIELD OBSERVATIONS COMPLETED THE 13th DAY OF APRIL, 2018



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 Tel. (905) 264-0881 Fax (905) 264-2099
 Website: www.r-pe.ca
 DRAWN: S.G.
 JOB No. 14-014 CAD FILE 14014tp22a



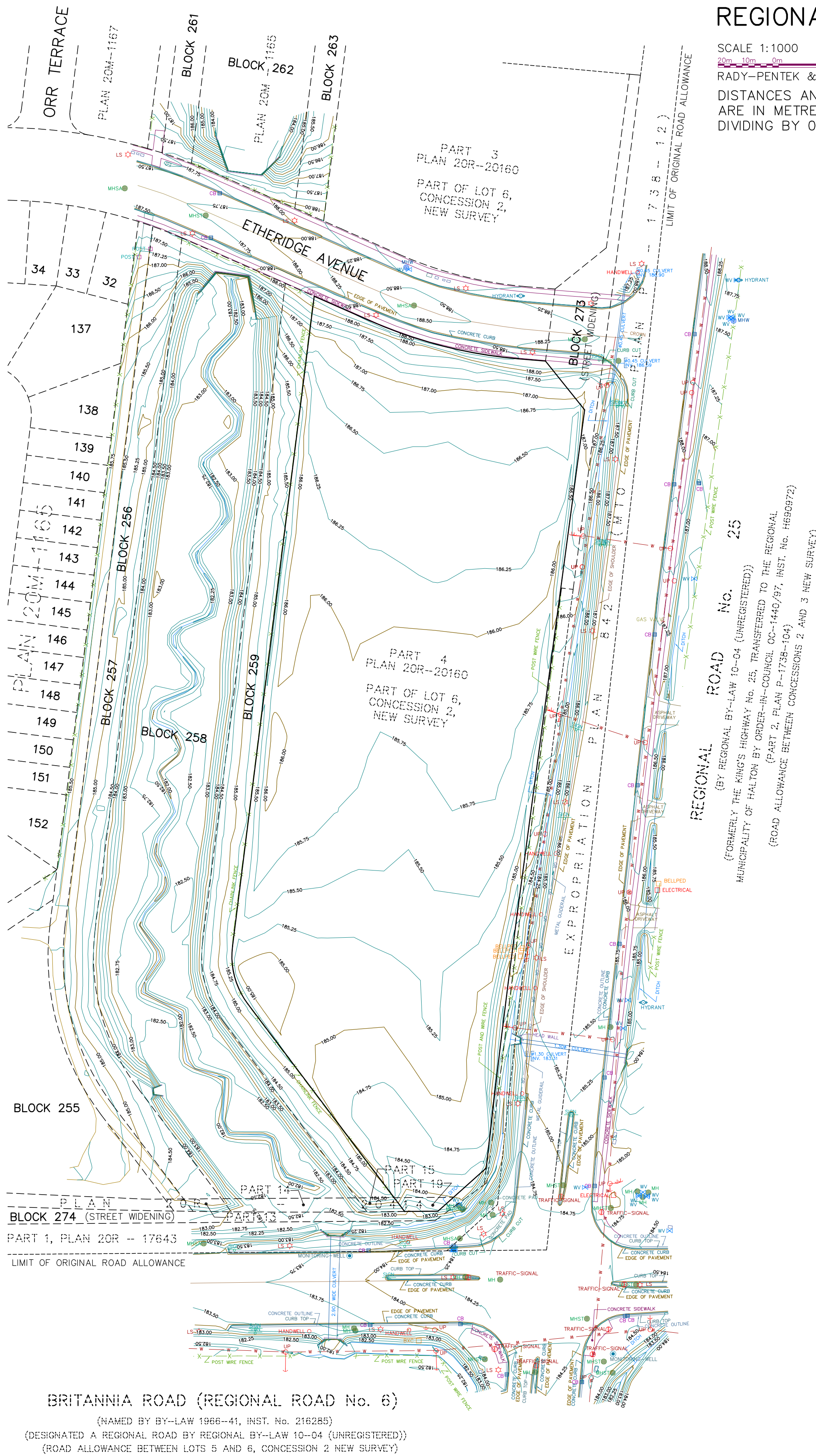
SKETCH SHOWING ELEVATIONS OF PART OF LOT 5, CONCESSION 2, NEW SURVEY (GEOGRAPHIC TOWNSHIP OF TRAFALGAR) AND PART OF PLAN 20M-1165 TOWN OF MILTON REGIONAL MUNICIPALITY OF HALTON

SCALE 1:1000

20m 10m 0m 20m 40m 60m 80m

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DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.



LEGEND

- W- DENOTES OVERHEAD WIRE
- UP DENOTES UTILITY POLE
- INV DENOTES INVERT ELEVATION
- MH DENOTES MANHOLE
- MHSA DENOTES MANHOLE SANITARY
- LS DENOTES LAMP STANDARD
- WV DENOTES WATER VALVE
- Ø DENOTES DIAMETER
- ⊥ DENOTES ANCHOR

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND REFERRED TO THE MTO BENCHMARK No 00819828156 HAVING AN ELEVATION OF 187.173 METRES. CONCRETE AND STEEL BRIDGE CARRYING HWY 25 OVER SIXTEEN MILE CREEK, 3.2 KM SOUTH OF HWY 25, AND CPR OVERPASS AT MILTON, 71.0 M SOUTH OF DRIVEWAY TO SARGENT FARMS. TABLET IS SET HORIZONTALLY IN EAST FACE OF CONCRETE COPING, 7.1 M EAST OF CENTRELINE OF HWY 25, 87 CM NORTH OF SOUTHEAST END OF BRIDGE, 10 CM BELOW TOP OF COPING, 54 CM ABOVE GROUND.

SURVEYOR'S CERTIFICATE

THE FIELD OBSERVATIONS REPRESENTED ON THIS PLAN WERE COMPLETED ON THE 5th DAY OF FEBRUARY, 2018
DATE FEBRUARY 9, 2018

PHILLIP S. SWIFT
ONTARIO LAND SURVEYOR

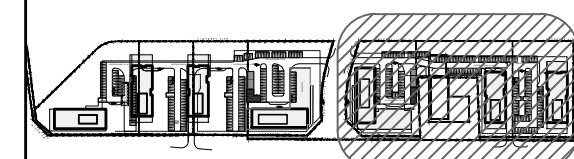


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Tel. (416) 635-5000 Fax (416) 635-5001
Tel. (905) 264-0881 Fax (905) 264-2099
Website: www.r-pe.ca
DRAWN: A.R./P.S.S. CHECKED: R.D.
JOB No. 14-014 CAD FILE 14014tp17a

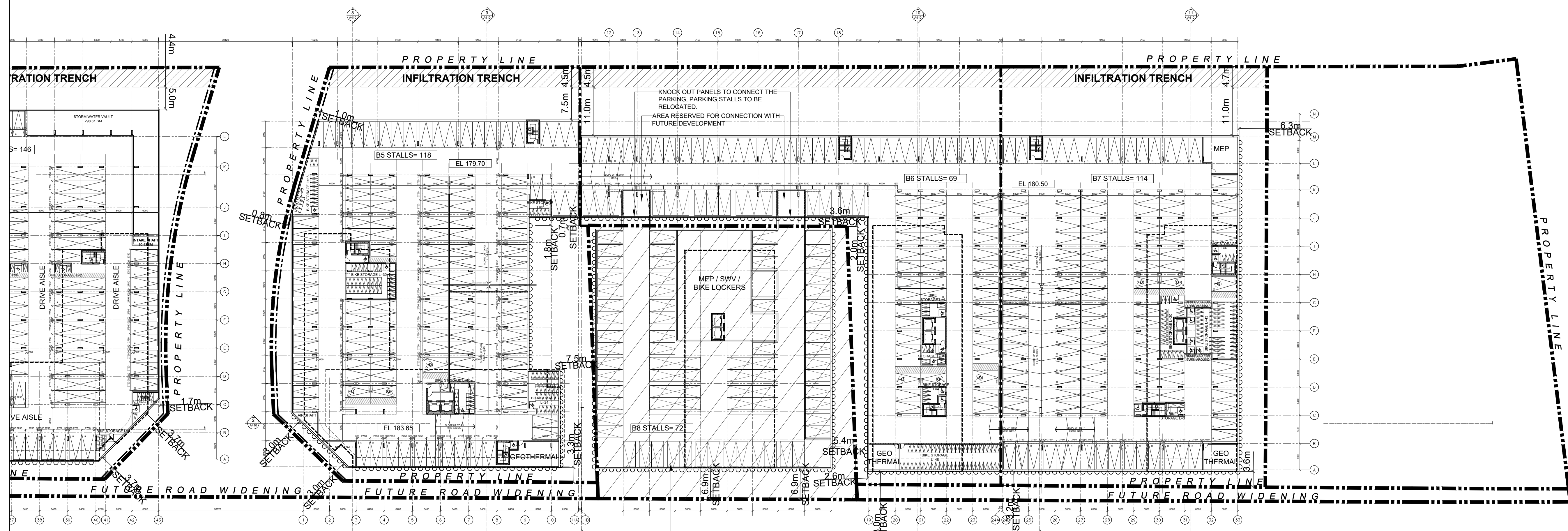
BOUNDARY NOTE

THIS IS NOT A PLAN OF SURVEY. BOUNDARIES ARE NOT CERTIFIED BY THIS PLAN, AND ARE SUBJECT TO CLARIFICATION UPON THE INCORPORATION OF ADDITIONAL DOCUMENTARY AND FIELD SURVEY EVIDENCE.

APPENDIX B



KEYPLAN



DIAGONAL HATCH INDICATES
EXTENT OF POTENTIAL FUTURE
DEVELOPMENT SITE (NOT PART
OF SUBJECT SITE)

| | |
|--------------------|----------------|
| 02. ISSUED FOR ZBA | 31 AUGUST 2023 |
| 01. ISSUED FOR ZBA | 28 JULY 2023 |

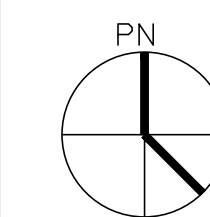
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FRAMGARD MATTAMY

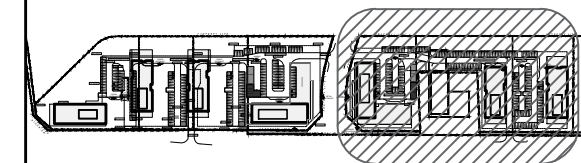
MILTON WEST, ONTARIO



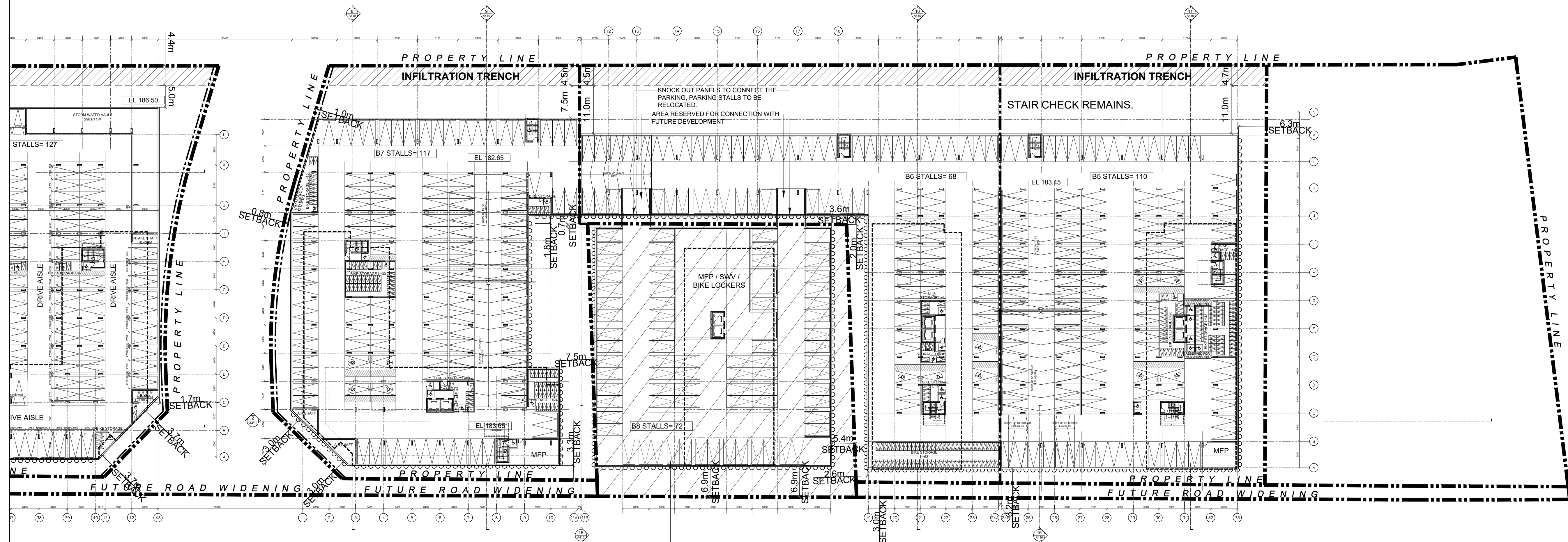
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|---------------|--------------------|
| Drawn JA | Scale 1:500 |
| Checked BL | Date 2024-01-16 |

Title
NORTH BLOCK PARKING LEVEL P2

Project No.
22-210 Drawing No.
A203



KEYPLAN

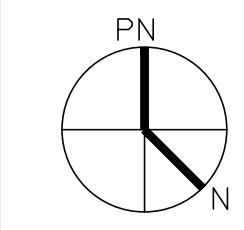


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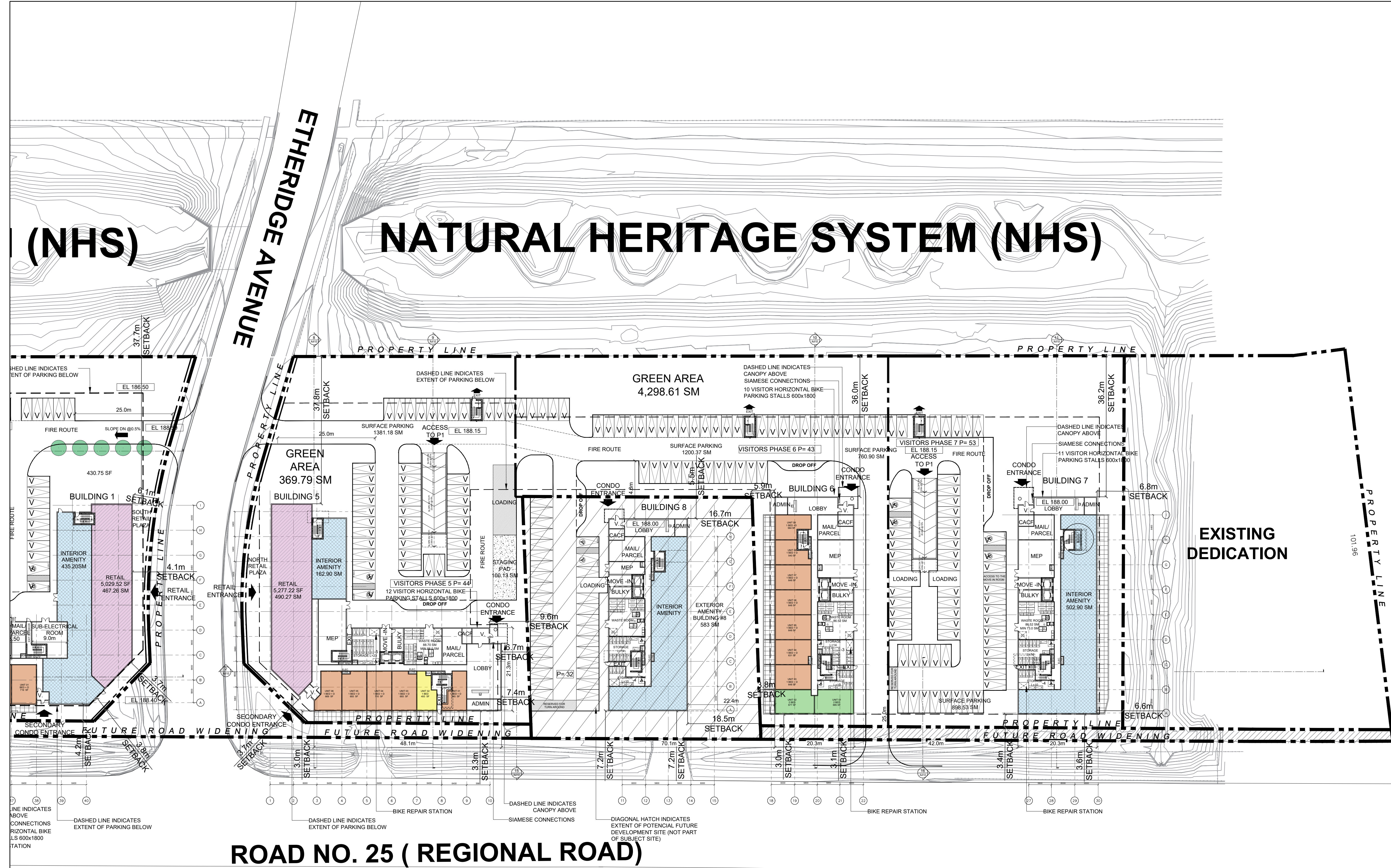
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|---------------|--------------------|
| Drawn JA | Scale 1:500 |
| Checked BL | Date 2024-01-16 |

Title
**NORTH BLOCK
PARKING LEVEL P1**

(NHS)

NATURAL HERITAGE SYSTEM (NHS)

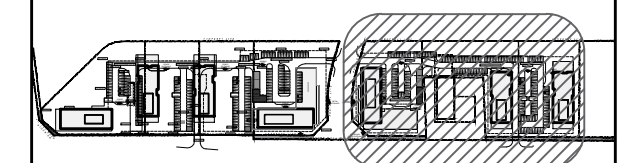
ETHERIDGE AVENUE



ROAD NO. 25 (REGIONAL ROAD)

NOTES

NOTE 1: (LOADING AREA)
 1. THE BINS SHOULD BE PROPERLY POSITIONED IN THE COLLECTION AREA ON THE DAY OF COLLECTION BEFORE 7 AM.
 2. THE DRIVER IS NOT REQUIRED TO EXIT THE COLLECTION VEHICLE TO FACILITATE COLLECTION.
 3. PROPERTY MANAGEMENT IS RESPONSIBLE FOR MOVING BINS THAT ARE INACCESSIBLE TO THE COLLECTION VEHICLE.
 4. THE REGION WILL NOT BE RESPONSIBLE FOR EMPTYING BINS THAT ARE INACCESSIBLE TO THE COLLECTION VEHICLE.
 5. PROPERTY MANAGEMENT MUST BE VISIBLE TO WASTE COLLECTION VEHICLE ON APPROACH TO SITE. OTHERWISE THE WASTE COLLECTION VEHICLE WILL NOT ENTER THE SITE.
 6. PROPERTY MANAGEMENT WILL BE RESPONSIBLE FOR SAFELY MANEUVERING WASTE COLLECTION VEHICLES INTO AND/OR OUT OF AS WELL AS AROUND THE SITE.
 7. PROPERTY MANAGEMENT STAFF WILL BE RESPONSIBLE FOR MOVING BINS TO THE STAGING AREA AT THE TIME OF COLLECTION AND RETURNING TO STORAGE ROOM FOLLOWING COLLECTION.



KEYPLAN

| | | |
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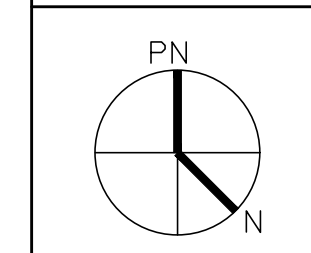
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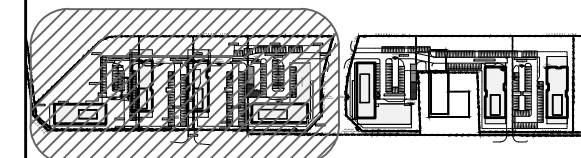
MILTON WEST, ONTARIO



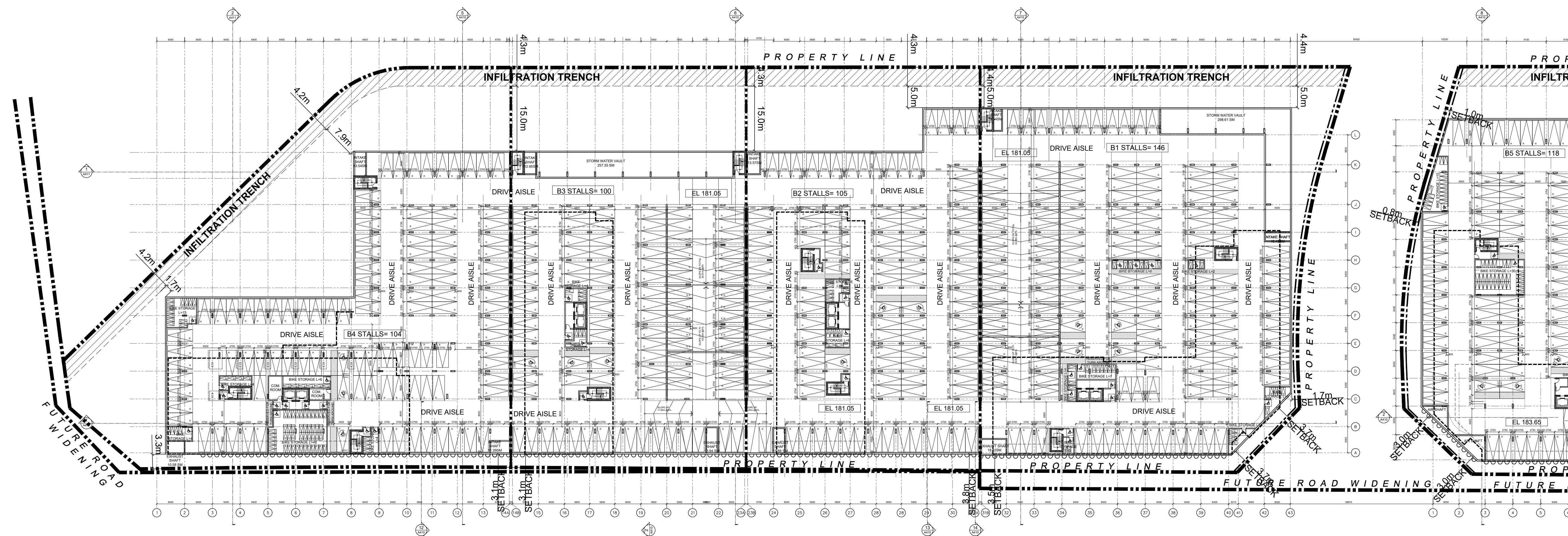
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|---------------|--------------------|
| Drawn JA | Scale 1:500 |
| Checked BL | Date 2024-01-16 |

NORTH BLOCK
GROUND FLOOR PLAN

Project No. 22-210 Drawing No. **A205**



KEYPLAN



| | | |
|----|-----------------|----------------|
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| 01 | ISSUED FOR ZBA | 28 JULY 2023 |

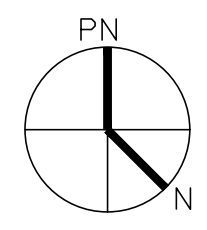
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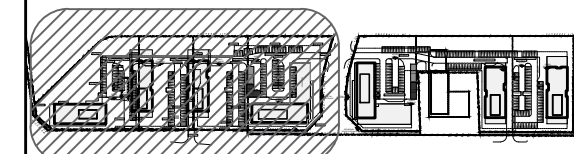


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| Drawn JA | Scale 1:500 |
| Checked BL | Date 2024-01-16 |

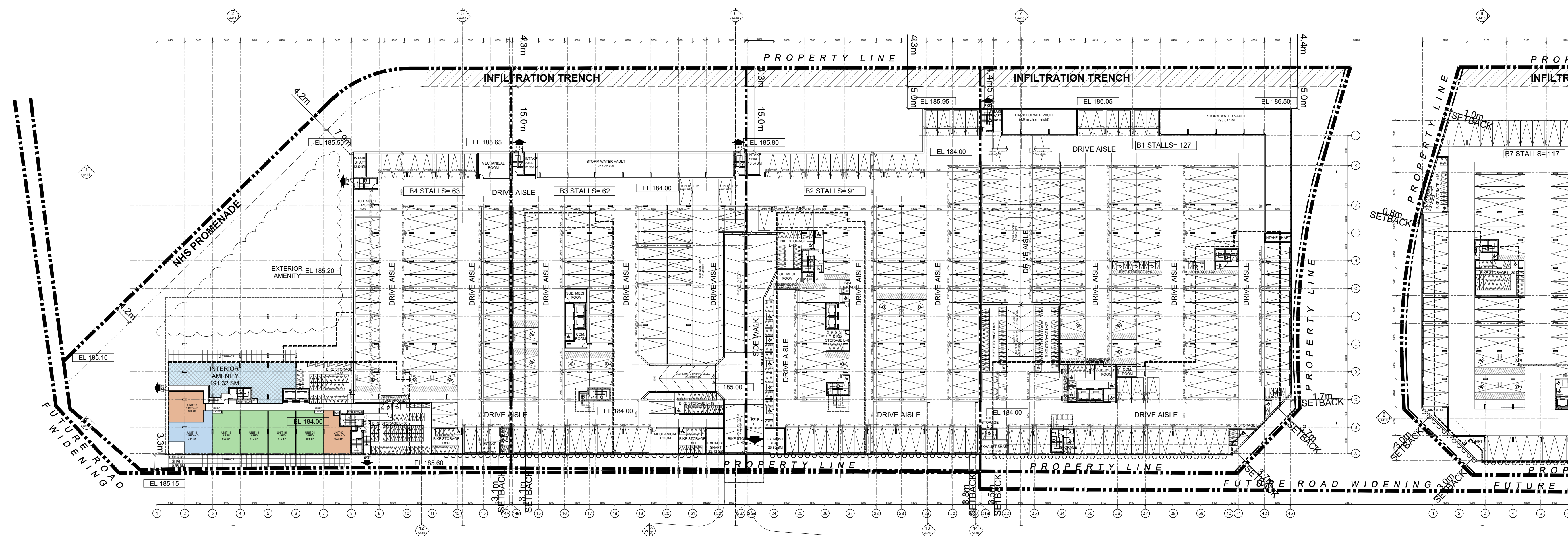
Title
**SOUTH BLOCK
 PARKING LEVEL P2**

Project No.
22-210

Drawing No.
A252



KEYPLAN

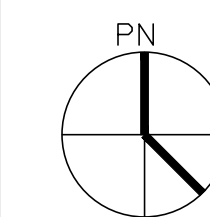


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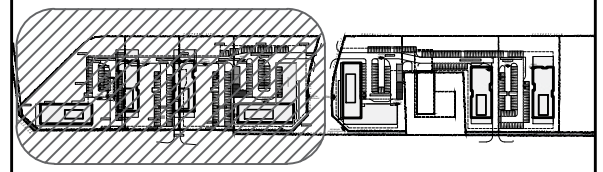
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| Drawn JA | Scale 1:500 |
| Checked BL | Date 2024-01-16 |

SOUTH BLOCK
PARKING LEVEL P1

Project No.
22-210

Drawing No.
A253

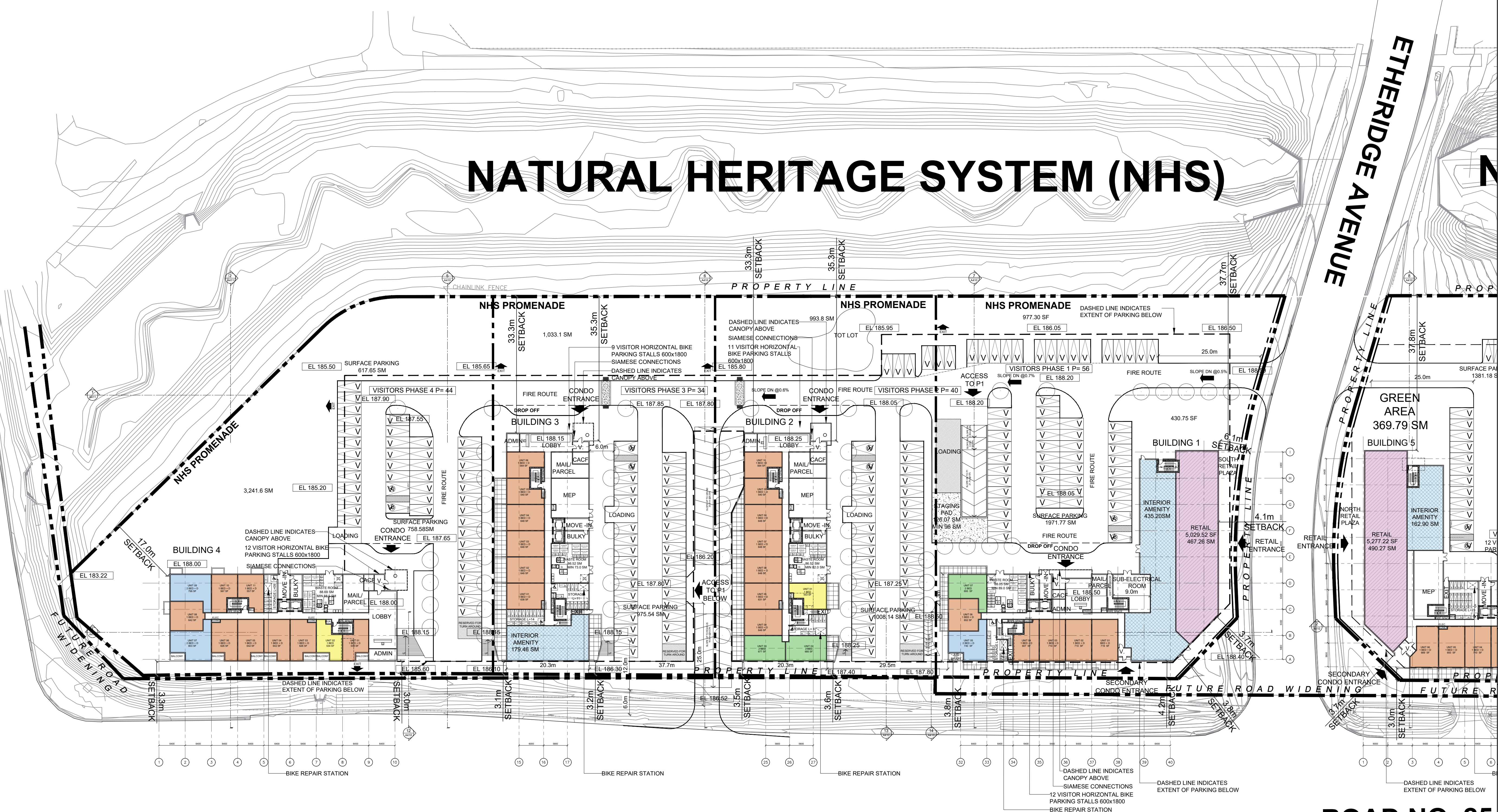
NATURAL HERITAGE SYSTEM (NHS)



KEYPLAN

BRITANNIA ROAD

ETHERIDGE AVENUE



| No. | Revisions | Date |
|-----|----------------|--------------|
| 01 | ISSUED FOR ZBA | 28 JULY 2023 |

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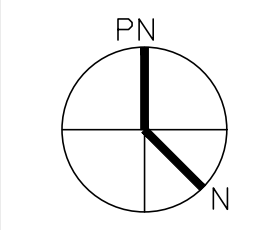
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ROAD NO. 25

FRAMGARD MATTAMY

MILTON WEST, ONTARIO



| | |
|---------------|--------------------|
| Drawn JA | Scale 1:500 |
| Checked BL | Date 2024-01-16 |

SOUTH BLOCK
GROUND FLOOR PLAN

Project No.
22-210

Drawing No.
A254

APPENDIX C

RECORD OF BOREHOLE 101

PROJECT : G5820
 LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
 STARTED : December 20, 2022
 COMPLETED : December 20, 2022

**MC CLYMONT & RAK
 ENGINEERS, INC.**

SHEET 1 OF 1
 DATUM Geodetic

| DEPTH SCALE (metres) | BORING METHOD | SOIL PROFILE | | | SAMPLES | | ORGANIC VAPOUR READINGS (ppm) | | | | SHEAR STRENGTH: Cu, KPa | | | | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION | | | | |
|-------------------------|--|---|---------------------|-----------------------|---------|------|----------------------------------|--|-----|-----|-------------------------|--------------------------------------|----|----|----------------------------|---|------|------|--|--|
| | | DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.3m | nat V - \otimes rem V - \bullet | | | | Q - \times U - \blacktriangle | | | | | | | | |
| | | | | | | | | % LEL - (hexane) \square | | | | WATER CONTENT, PERCENT | | | | | | | | |
| | | | | | | | 100 | 200 | 300 | 400 | 20 | 40 | 60 | 80 | wp ----- w ----- wl | | | | | |
| | | GROUND SURFACE | | 186.50 | | | | | | | | | | | | | | | | |
| | POWER BORING HOLLOW STEM AUGER | FILL: clayey silt, trace of gravel, organics, topsoil inclusions, rootlets, dark brown, moist, stiff. | [diagonal hatching] | 185.74 0.76 | 1 | SS | 11 | | | | | | | | | 16.9 | | | | |
| | | | | 185.74 0.76 | 2 | SS | 30 | | | | | | | | | | | 14.5 | | |
| 2 | | CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, very stiff. | [diagonal hatching] | | | 3 | SS | 14 | | | | | | | | | 16.9 | | | |
| | | | | | | 4 | SS | 27 | | | | | | | | | | 12.7 | | |
| | | | | | | 5 | SS | 25 | | | | | | | | | | 14 | | |
| 4 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | SANDY SILT: some clay and gravel, reddish brown, moist to wet, very dense to dense. | [diagonal hatching] | 181.93 4.57 | 6 | SS | 69 | | | | | | | | | | 5.4 | | | |
| | | | | | | 7 | SS | 70 | | | | | | | | | | 5.5 | | |
| 6 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | SANDY SILT TILL: trace of gravel, clay, reddish brown, moist to wet, very dense. | [diagonal hatching] | 177.36 9.14 | 9 | SS | 89 | | | | | | | | | | 14.8 | | | |
| 10 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | |
| | CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard. | [diagonal hatching] | 168.21 18.29 | 14 | SS | 100 | | | | | | | | | | 8.3 | | | | |
| 18 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | |
| | CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard. | [diagonal hatching] | 165.11 21.39 | 16 | SS | 100 | | | | | | | | | | 9.3 | | | | |
| 22 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | | | | |
| 26 | | | | | | | | | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | | | | | | | | |

GROUNDWATER ELEVATIONS

∇ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL: m bgs

\blacktriangledown DEEP/DUAL INSTALLATION
 WATER LEVEL: m bgs

LOGGED : VL
 CHECKED : CM

RECORD OF BOREHOLE 102

PROJECT : G5820
 LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
 STARTED : December 21, 2022
 COMPLETED : December 21, 2022

**MC CLYMONT & RAK
 ENGINEERS, INC.**

SHEET 1 OF 1
 DATUM Geodetic

| DEPTH SCALE (metres) | BORING METHOD | SOIL PROFILE | | | SAMPLES | | ORGANIC VAPOUR READINGS (ppm) | | | | SHEAR STRENGTH: Cu, KPa | | | | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION | |
|-------------------------|-----------------------------------|------------------------------|---|-----------------------|---------|------|----------------------------------|--------------------|-----|-----|-------------------------|------------------------|----|----|----------------------------|---|--|
| | | DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.3m | ⊗ | | | | ● | | | | | |
| | | | | | | | | % LEL - (hexane) □ | | | | WATER CONTENT, PERCENT | | | | | |
| | | GROUND SURFACE | | 186.75 | | | 100 | 200 | 300 | 400 | 20 | 40 | 60 | 80 | | | |
| | | STRAIGHT DRILLING TO 9.14 m. | | | | | | | | | | | | | | | |
| 2 | POWER BORING HOLLOW STEM AUGER | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 10 | | | SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense. | 177.61 9.14 | 9 | SS | >100 | | | | | 8.3 | | | | | |
| 12 | | | | | | | | | | | | 8.5 | | | | | |
| 14 | | | | | | | | | | | | 8 | | | | | |
| 16 | | | | | | | | | | | | 13.3 | | | | | |
| 18 | | | | | | | | | | | | 12 | | | | | |
| | | | End of Borehole | 171.43 15.32 | 13 | SS | >100 | | | | | | | | | | |
| | | | Note: | | | | | | | | | | | | | | |

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION
 WATER LEVEL: m bgs

LOGGED : BR
 CHECKED : CM

RECORD OF BOREHOLE 103

PROJECT : G5820
 LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
 STARTED : December 21, 2022
 COMPLETED : December 21, 2022

**MC CLYMONT & RAK
 ENGINEERS, INC.**

SHEET 1 OF 1
 DATUM Geodetic

| DEPTH SCALE (metres) | BORING METHOD | SOIL PROFILE | | | SAMPLES | | ORGANIC VAPOUR READINGS (ppm) | | | | SHEAR STRENGTH: Cu, KPa | | | | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION | | | |
|-------------------------|-----------------------------------|---|-------------|-----------------------|---------|------|----------------------------------|--------------------|-----|-----|-------------------------|--|----|----|----------------------------|---|--|--|--|
| | | DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.3m | ⊗ | | | | nat V - ● rem V - ○ Q - ✕ U - ▲ | | | | | | | |
| | | | | | | | | % LEL - (hexane) □ | | | | WATER CONTENT, PERCENT | | | | | | | |
| | | | | | | | 100 | 200 | 300 | 400 | 20 | 40 | 60 | 80 | wp ----- wl | | | | |
| | | GROUND SURFACE | | | | | | | | | | | | | | | | | |
| | | STRAIGHT DRILLING TO 9.14 m. | | | | | | | | | | | | | | | | | |
| 2 | POWER BORING HOLLOW STEM AUGER | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | |
| 10 | | SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense. | | 177.61 9.14 | 9 | SS | >100 | | | | | 8.5 | | | | | | | |
| 12 | | | | 10 | SS | >100 | | | | | 8.2 | | | | | | | | |
| 14 | | | | 11 | SS | >100 | | | | | | 11.1 | | | | | | | |
| 16 | | | | 12 | SS | >100 | | | | | | 11 | | | | | | | |
| 18 | | End of Borehole Note: | | 171.38 15.37 | 13 | SS | >100 | | | | | 12.7 | | | | | | | |

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION
 WATER LEVEL: m bgs

LOGGED : BR
 CHECKED : CM

RECORD OF BOREHOLE 104

PROJECT : G5820
 LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
 STARTED : December 19, 2022
 COMPLETED : December 19, 2022

**MC CLYMONT & RAK
 ENGINEERS, INC.**

SHEET 1 OF 1
 DATUM Geodetic

| DEPTH SCALE (metres) | BORING METHOD | SOIL PROFILE | | | SAMPLES | | ORGANIC VAPOUR READINGS (ppm) | | | | SHEAR STRENGTH: Cu, KPa | | | | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION | |
|-------------------------|----------------------------------|---|---|-----------------------|---------|------|----------------------------------|--------------------|-----|-----|-------------------------|------------------------|----|----|----------------------------|---|--|
| | | DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.3m | ⊗ | | | | ● | | | | | |
| | | | | | | | | % LEL - (hexane) □ | | | | WATER CONTENT, PERCENT | | | | | |
| | | GROUND SURFACE | | 187.50 | | | 100 | 200 | 300 | 400 | 20 | 40 | 60 | 80 | | | |
| | POWER BORING SOLID STEM AUGER | FILL: sand and gravel, reddish brown, dry, compact. | | 186.74 | 1 | SS | 13 | | | | | | | | | | |
| | | SANDY SILT: trace of gravel, reddish brown, moist to wet, compact to very dense. | | 0.76 | 2 | SS | 27 | | | | | | | | | | |
| 2 | | | | | 3 | SS | 34 | | | | | | | | | | |
| | | | | | 4 | SS | 32 | | | | | | | | | | |
| 4 | | | | | 5 | SS | 37 | | | | | | | | | | |
| | | | - trace of clay, compact from 4.57 m to 6.10 m. | | 6 | SS | 14 | | | | | | | | | | |
| 6 | | | | | 7 | SS | 40 | | | | | | | | | | |
| | | | - some clay, some gravel, shale fragments from 6.10 m to 16.79 m. | | 8 | SS | >100 | | | | | | | | | | |
| 8 | | | | | 9 | SS | >100 | | | | | | | | | | |
| 10 | | | | | 10 | SS | >100 | | | | | | | | | | |
| 12 | | | | | 11 | SS | >100 | | | | | | | | | | |
| 14 | | | | | 12 | SS | 80 | | | | | | | | | | |
| 16 | | | | | 13 | SS | >100 | | | | | | | | | | |
| 18 | | | End of Borehole | | 170.71 | 14 | SS | >100 | | | | | | | | | |
| | | Note: | | 16.79 | | | | | | | | | | | | | |

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION
 WATER LEVEL: m bgs

LOGGED : BR
 CHECKED : CM

MCR LOG ENVIRONMENTAL_5820.GPJ 1-26-23

RECORD OF BOREHOLE 105

PROJECT : G5820
 LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
 STARTED : December 22, 2022
 COMPLETED : December 22, 2022

**MC CLYMONT & RAK
 ENGINEERS, INC.**

SHEET 1 OF 1
 DATUM Geodetic

| DEPTH SCALE (metres) | BORING METHOD | SOIL PROFILE | | | SAMPLES | | | | ORGANIC VAPOUR READINGS (ppm) | | | | SHEAR STRENGTH: Cu, KPa | | | | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|-------------------------|-----------------------------------|--|---|-----------------------|-----------------|------|------------|--|----------------------------------|--|--|--------------------------------------|-------------------------|--|--|--|----------------------------|---|
| | | DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.3m | nat V - \otimes rem V - \bullet | | | | Q - \times U - \blacktriangle | | | | | | |
| | | | | | | | | % LEL - (hexane) \square | | | | WATER CONTENT, PERCENT | | | | | | |
| | | | | | | | | 20 40 60 80 | | | | 20 40 60 80 | | | | | | |
| | | | | | | | | 20 40 60 80 | | | | wp 10 20 30 40 wl | | | | | | |
| | | GROUND SURFACE | | 186.75 | | | | | | | | | | | | | | |
| | POWER BORING HOLLOW STEM AUGER | FILL: sand, organics, rootlets, dark brown, moist, loose. | | 185.99 0.76 | 1 | SS | 7 | | | | | | | | | | 19.2 | |
| | | SILTY SAND: brown, moist, dense. | | | 2 | SS | 46 | | | | | | | | | | | 19.5 |
| | | | | | 3 | SS | 50 | | | | | | | | | | | 19.5 |
| 2 | | | CLAYEY SILT: some sand, shale fragments, reddish brown to grey, moist to wet, hard to very stiff. | | 184.46 2.29 | 4 | SS | 48 | | | | | | | | | | 11.9 |
| | | | | | 5 | SS | 40 | | | | | | | | | | | 10.2 |
| 4 | | | | | 6 | SS | 24 | | | | | | | | | | | 11.4 |
| | | | - hard from 6.10 m to 10.67 m. | | | 7 | SS | 49 | | | | | | | | | | 7.2 |
| 6 | | | | | 8 | SS | 62 | | | | | | | | | | | 7.4 |
| 8 | | | | | 9 | SS | 58 | | | | | | | | | | | 10.3 |
| 10 | | | | | 10 | SS | >100 | | | | | | | | | | | 10 |
| 12 | | | SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense. | | 176.08 10.67 | 11 | SS | >100 | | | | | | | | | | 12.3 |
| 14 | | | SAND & GRAVEL: brown, wet, very dense. | | 173.03 13.72 | 12 | SS | >100 | | | | | | | | | | 12.4 |
| 16 | | End of Borehole Note: | | 171.51 15.24 | | | | | | | | | | | | | | |

GROUNDWATER ELEVATIONS

∇ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL: m bgs

\blacktriangledown DEEP/DUAL INSTALLATION
 WATER LEVEL: m bgs

LOGGED : BR
 CHECKED : CM

RECORD OF BOREHOLE 106

PROJECT : G5820
 LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
 STARTED : January 3, 2023
 COMPLETED : January 3, 2023

**MC CLYMONT & RAK
 ENGINEERS, INC.**

SHEET 1 OF 1
 DATUM Geodetic

| DEPTH SCALE (metres) | BORING METHOD | SOIL PROFILE | | | SAMPLES | | ORGANIC VAPOUR READINGS (ppm) | | | | SHEAR STRENGTH: Cu, KPa | | | | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION | |
|-------------------------|-----------------------------------|------------------------------|---|-----------------------|---------|------|----------------------------------|--------------------|-----|-----|-------------------------|------------------------|----|----|----------------------------|---|--|
| | | DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.3m | ⊗ | | | | ● | | | | | |
| | | | | | | | | % LEL - (hexane) □ | | | | WATER CONTENT, PERCENT | | | | | |
| | | GROUND SURFACE | | 186.00 | | | 100 | 200 | 300 | 400 | 20 | 40 | 60 | 80 | | | |
| | | STRAIGHT DRILLING TO 9.14 m. | | | | | | | | | | | | | | | |
| 2 | POWER BORING HOLLOW STEM AUGER | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 10 | | | SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense. | 176.86 9.14 | 9 | SS | >100 | | | | | 13 | | | | | |
| 12 | | | - trace of shale, gravel from 10.67 m to 15.24 m. | | 10 | SS | >100 | | | | | 9.4 | | | | | |
| 14 | | | - moist from 13.72 m to 15.24 m. | | 11 | SS | >100 | | | | | 9.6 | | | | | |
| 16 | | | | | 12 | SS | >100 | | | | | 11 | | | | | |
| 18 | | | | | 13 | SS | >100 | | | | | 11.1 | | | | | |
| | | | End of Borehole | 170.61 15.39 | | | | | | | | | | | | | |
| | | | Note: | | | | | | | | | | | | | | |

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION
 WATER LEVEL: m bgs

LOGGED : BR
 CHECKED : CM

RECORD OF BOREHOLE 107

PROJECT : G5820
 LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
 STARTED : January 3, 2023
 COMPLETED : January 3, 2023

**MC CLYMONT & RAK
 ENGINEERS, INC.**

SHEET 1 OF 1
 DATUM Geodetic

| DEPTH SCALE (metres) | BORING METHOD | SOIL PROFILE | | SAMPLES | | ORGANIC VAPOUR READINGS (ppm) | | | | SHEAR STRENGTH: Cu, KPa | | | | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION | | |
|-------------------------|-----------------------------------|--|-------------|-----------------------|--------|----------------------------------|------------|--|--|-------------------------|--|---|------|----------------------------|---|--|--|
| | | DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.3m | nat V - \otimes rem V - \bullet Q - \times U - \blacktriangle | | | | WATER CONTENT, PERCENT wp \ominus wl | | | | | |
| | | | | | | | | % LEL - (hexane) \square | | | | 20 40 60 80 20 40 60 80 | | | | | |
| | | GROUND SURFACE | | 185.50 | | | | | | | | | | | | | |
| | POWER BORING HOLLOW STEM AUGER | FILL: sand, trace of gravel, organics, brown, moist, compact. | | 184.74 | 1 | SS | 12 | | | | | | | | | | |
| | | SANDY SILT: trace of clay, brown, moist, compact. | | 183.21 | 2 | SS | 12 | | | | | | | | | | |
| 2 | | | | 183.21 | 3 | SS | 20 | | | | | | | | | | |
| | | SILTY CLAY: reddish brown, moist to wet, very stiff to hard. | | 174.83 | 4 | SS | 18 | | | | | | 14.4 | | | | |
| 4 | | | | 174.83 | 5 | SS | 39 | | | | | | 12.8 | | | | |
| | | | | 174.83 | 6 | SS | 35 | | | | | | 12.3 | | | | |
| 6 | | | | 174.83 | 7 | SS | 50 | | | | | | 17.4 | | | | |
| | | | | 174.83 | 8 | SS | 60 | | | | | | 11.4 | | | | |
| 8 | | | | 174.83 | 9 | SS | 65 | | | | | | 10.7 | | | | |
| 10 | | | | 174.83 | 10 | SS | >100 | | | | | | 12.7 | | | | |
| | | SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense. | | 170.21 | 11 | SS | >100 | | | | | | 9.9 | | | | |
| 12 | | | | 170.21 | 12 | SS | >100 | | | | | | 9.1 | | | | |
| 14 | | | | 170.21 | 13 | SS | >100 | | | | | | 14.8 | | | | |
| 16 | | End of Borehole Note: | 170.21 | 13 | SS | >100 | | | | | | | | | | | |

GROUNDWATER ELEVATIONS

∇ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL: m bgs

\blacktriangledown DEEP/DUAL INSTALLATION
 WATER LEVEL: m bgs

LOGGED : BR
 CHECKED : CM

RECORD OF BOREHOLE 108

PROJECT : G5820
 LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
 STARTED : January 3, 2023
 COMPLETED : January 3, 2023

**MC CLYMONT & RAK
 ENGINEERS, INC.**

SHEET 1 OF 1
 DATUM Geodetic

| DEPTH SCALE (metres) | BORING METHOD | SOIL PROFILE | | | SAMPLES | | ORGANIC VAPOUR READINGS (ppm) | | | | SHEAR STRENGTH: Cu, KPa | | | | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION | | |
|-------------------------|-----------------------------------|---|-------------|-----------------------|---------|-----------------|----------------------------------|--------------------|-----|-----|-------------------------|------------------------|----|----|----------------------------|---|-----|--|
| | | DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.3m | ⊗ | | | | ● | | | | | | |
| | | | | | | | | % LEL - (hexane) □ | | | | WATER CONTENT, PERCENT | | | | | | |
| | | GROUND SURFACE | | 185.00 | | | 100 | 200 | 300 | 400 | 20 | 40 | 60 | 80 | | | | |
| | | STRAIGHT DRILLING TO 9.14 m. | | | | | | | | | | | | | | | | |
| 2 | POWER BORING HOLLOW STEM AUGER | SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense. | | 175.86 9.14 | 9 | SS >100 | | | | | | | | | 10.9 | | | |
| 4 | | | | | | | | | | | | | | | | 12.7 | | |
| 6 | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | 9.2 | |
| 10 | | | | | | | | | | | | | | | | | 9.2 | |
| 12 | | | | | | | | | | | | | | | | | 8.6 | |
| 14 | | | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | | |
| | | | | End of Borehole | | 169.71 15.29 | 13 | SS >100 | | | | | | | | | | |
| | | | | Note: | | | | | | | | | | | | | | |

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION
 WATER LEVEL: m bgs

LOGGED : BR
 CHECKED : CM

RECORD OF BOREHOLE 109

PROJECT : G5820
 LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario
 STARTED : January 3, 2023
 COMPLETED : January 3, 2023

**MC CLYMONT & RAK
 ENGINEERS, INC.**

SHEET 1 OF 1
 DATUM Geodetic

| DEPTH SCALE (metres) | BORING METHOD | SOIL PROFILE | | | SAMPLES | | ORGANIC VAPOUR READINGS (ppm) | | | | SHEAR STRENGTH: Cu, KPa | | | | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION | |
|-------------------------|-----------------------------------|---|-------------|-----------------------|---------|------|----------------------------------|--------------------|-----|-----|-------------------------|------------------------|----|----|----------------------------|---|--|
| | | DESCRIPTION | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.3m | ⊗ | | | | ● | | | | | |
| | | | | | | | | % LEL - (hexane) □ | | | | WATER CONTENT, PERCENT | | | | | |
| | | GROUND SURFACE | | 184.75 | | | 100 | 200 | 300 | 400 | 20 | 40 | 60 | 80 | | | |
| | POWER BORING HOLLOW STEM AUGER | FILL: sand, trace of gravel, organics, rootlets, brown, moist, loose. | | 183.99 0.76 | 1 | SS | 8 | | | | | | | | | | |
| | | SANDY SILT: trace of clay, reddish brown, moist, dense. | | | 2 | SS | 33 | | | | | | | | | | |
| 2 | | | | | 3 | SS | 30 | | | | | | | | | | |
| | | SILT & CLAY: some sand, trace of gravel, shale fragments, reddish brown, moist, hard. | | 182.46 2.29 | 4 | SS | 41 | | | | | | | | | | |
| | | | | | 5 | SS | 32 | | | | | | | | | | |
| 4 | | | | | 6 | SS | 47 | | | | | | | | | | |
| | | | | | 7 | SS | 46 | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| | | End of Borehole | | 177.43 7.32 | | | | | | | | | | | | | |
| 8 | | Note: | | | | | | | | | | | | | | | |

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION
 WATER LEVEL: m bgs

LOGGED : BR
 CHECKED : CM

RECORD OF BOREHOLE 1

Project No.: T18721

CLIENT: Mattamy Willmott Limited

ORIGINATED BY: M.Z.

DATE: March 1, 2018

LOCATION: Milton, ON

COMPILED BY: M.Z.

DATUM: Geodetic

BOREHOLE TYPE: Solid Stem Augers

CHECKED BY: H.S.



83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

| SOIL PROFILE | | | SAMPLES | | | | GROUND WATER CONDITIONS | DYNAMIC CONE PENETRATION RESISTANCE PLOT | | WATER CONTENT (%) | | MONITORING WELL | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL | |
|--------------------|----------------------|---|-------------|---------------|------|---------------|-------------------------|--|--------------------|-------------------|---------------------|-----------------|--|--|
| ELEVATION (metres) | DEPTH SCALE (metres) | DESCRIPTION | STRATA PLOT | SAMPLE NUMBER | TYPE | RECOVERY (cm) | | " N " VALUES | 20 40 60 80 100 | | 5 15 25 35 | | | |
| | | | | | | | | | SHEAR STRENGTH kPa | | ▲ 20 40 60 80 100 ▲ | | | |
| 184.7 | 0 | Ground Surface | | | | | | | | | | | | |
| 184.3 | 0.5 | dark mottled brown Silty Clay/Clayey Silt Fill some topsoil, some organic stains some rootlets, damp | | 1 | SS | 33 | 13 | | | 24 | | | | |
| | 1 | reddish brown Silty Clay/Clayey Silt Till some sand, occ. oxidized fissures damp, very stiff | | 2 | SS | 25 | 17 | | | 13 | | | | |
| | 2 | | | 3 | SS | 28 | 28 | | | 13 | | | | |
| | 2.5 | occ. shale fragments hard | | 4 | SS | 25 | 40 | | | 13 | | | | |
| | 3 | | | 5 | SS | 30 | 38 | | | 13 | | | | |
| 181.0 | 4 | reddish brown Clayey Sandy Silt Till occ. silt seams, trace sand seams occ. oxidized fissures damp, hard | | 6 | SS | 41 | 67 | | | 9 | | | | |
| 180.2 | 5 | reddish brown Silty Clay/Clayey Silt Till occ. gravel, occ. oxidized fissures damp, hard | | 7 | SS | 38 | 74 | | | 9 | | | | |
| 179.2 | 6 | grey Clayey Sandy Silt Till occ. oxidized fissures damp, hard | | 8 | SS | 25 | 71 | | | 10 | | | | |
| 177.7 | 7 | | | | | | | | | | | | | |

Gradation Analysis
S(4);
2 15 51 32

Practical Auger Refusal @ ~5.5m due to possible cobble/boulder, borehole moved 1m to the east and re-drilled.

RECORD OF BOREHOLE 3

Project No.: T18721

CLIENT: Mattamy Willmott Limited

ORIGINATED BY: M.Z.

DATE: March 1, 2018

LOCATION: Milton, ON

COMPILED BY: M.Z.

DATUM: Geodetic

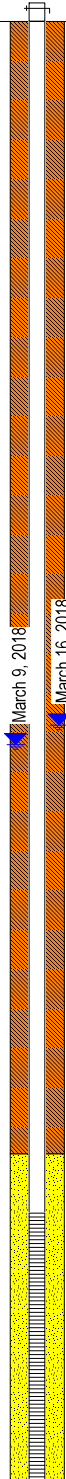
BOREHOLE TYPE: Solid Stem Augers

CHECKED BY: H.S.



83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

| SOIL PROFILE | | | | SAMPLES | | | | GROUND WATER CONDITIONS | DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa ▲ 20 40 60 80 100 ▲ | WATER CONTENT (%) 5 15 25 35 | MONITORING WELL | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|-----------------------|-------------------------|---|-------------|---------------|------|---------------|--------------|----------------------------|---|------------------------------------|--------------------|---|
| ELEVATION (metres) | DEPTH SCALE (metres) | DESCRIPTION | STRATA PLOT | SAMPLE NUMBER | TYPE | RECOVERY (cm) | " N " VALUES | | | | | |
| 185.8 | 0 | Ground Surface | | | | | | | | | | |
| 185.4 | 0.4 | dark mottled brown Silty Clay/Clayey Silt Fill some topsoil, some organic stains some rootlets, damp | | 1 | SS | 33 | 10 | | | 25 | | |
| 184.9 | 0.9 | mottled reddish brown Compacted Silty Clay/Clayey Silt Fill damp, stiff | | | | | | | | 14 | | |
| | 1 | brown, occ. reddish brown Silty Clay/Clayey Silt Till trace to some sand occ. oxidized fissures damp, hard | | 2 | SS | 25 | 32 | | | 13 | | |
| | 2 | | | 3 | SS | 23 | 36 | | | 18 | | |
| | 3 | | | 4 | SS | 35 | 41 | | | 12 | | |
| | 4 | | | 5 | SS | 28 | 57 | | | 11 | | |
| 181.4 | 4.4 | grey | | 6 | SS | 38 | 35 | | | 13 | | |
| | 5 | grey Sandy Silt Till some clay, occ. oxidized fissures damp, hard | | 7 | SS | 35 | 39 | | | 9 | | |
| 180.3 | 5.3 | grey Clayey Sandy Silt Till trace shale fragments damp, hard | | 8 | SS | 30 | 79 | | | 9 | | |
| | 6 | | | | | | | | | | | |
| | 7 | | | | | | | | | | | |



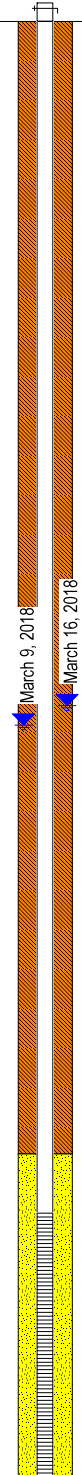
RECORD OF BOREHOLE 4

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.
DATE: March 1, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.
DATUM: Geodetic **BOREHOLE TYPE:** Solid Stem Augers **CHECKED BY:** H.S.



83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

| SOIL PROFILE | | | SAMPLES | | | | GROUND WATER CONDITIONS | DYNAMIC CONE PENETRATION RESISTANCE PLOT | | WATER CONTENT (%) | MONITORING WELL | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|-----------------------|-------------------------|---|-------------|---------------|------|---------------|----------------------------|---|---------------------|----------------------|--------------------|---|
| ELEVATION (metres) | DEPTH SCALE (metres) | DESCRIPTION | STRATA PLOT | SAMPLE NUMBER | TYPE | RECOVERY (cm) | | SHEAR STRENGTH kPa | | | | |
| | | | | | | | | ▲ 20 40 60 80 100 ▲ | ▲ 20 40 60 80 100 ▲ | | | |
| 185.1 | 0 | Ground Surface | | | | | | | | | | |
| | 0 | dark brown Silty Clay/Clayey Silt Fill some topsoil, damp | | 1 | SS | 38 | 8 | | | 16 | | |
| 184.5 | | occ. organic stains | | | | | | | | | | |
| | 1 | reddish brown Silty Clay/Clayey Silt Till trace to some sand occ. oxidized fissures damp, very stiff | | 2 | SS | 30 | 22 | | | 15 | | |
| | | | | | | | | | | | | |
| | 2 | | | 3 | SS | 25 | 26 | | | 17 | | |
| | | | | | | | | | | | | |
| | 3 | hard | | 4 | SS | 28 | 46 | | | 13 | | |
| | | | | | | | | | | | | |
| | 4 | reddish brown Clayey Sandy Silt Till occ. oxidized fissures damp, hard | | 5 | SS | 20 | 46 | | | 13 | | |
| 181.4 | | | | | | | | | | | | |
| | 4 | | | 6 | SS | 20 | 48 | | | 10 | | |
| | | | | | | | | | | | | |
| | 5 | occ. shale fragments | | 7 | SS | 13 | 50/8cm | | | 9 | | |
| | | | | | | | | | | | | |
| | 6 | | | 8 | SS | 15 | 78/23cm | | | 10 | | |
| | | | | | | | | | | | | |
| 178.1 | 7 | | | | | | | | | | | |



RECORD OF BOREHOLE 5

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.
DATE: March 1, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.
DATUM: Geodetic **BOREHOLE TYPE:** Solid Stem Augers **CHECKED BY:** H.S.



83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

| SOIL PROFILE | | | SAMPLES | | | | GROUND WATER CONDITIONS | DYNAMIC CONE PENETRATION RESISTANCE PLOT | | WATER CONTENT (%) | | MONITORING WELL | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL | |
|-----------------------|-------------------------|---|-------------|---------------|------|---------------|----------------------------|---|---|-------------------|------------|--------------------|---|--|
| ELEVATION (metres) | DEPTH SCALE (metres) | DESCRIPTION | STRATA PLOT | SAMPLE NUMBER | TYPE | RECOVERY (cm) | | " N " VALUES | 20 40 60 80 100 | | 5 15 25 35 | | | |
| | | | | | | | | | SHEAR STRENGTH kPa ▲ 20 40 60 80 100 ▲ | | | | | |
| 186.6 | 0 | Ground Surface | | | | | | | | | | | | |
| | 0 | dark brown Silty Clay/Clayey Silt Fill some topsoil, some organic stains damp | | 1 | SS | 20 | 14 | | | | 23 | | | |
| 185.9 | 1 | reddish brown Silty Clay/Clayey Silt Till trace to some sand occ. oxidized fissures damp, hard | | 2 | SS | 23 | 38 | | | | 14 | | | |
| | 2 | | | 3 | SS | 20 | 39 | | | | 14 | | | |
| | 3 | occ. shale fragments | | 4 | SS | 30 | 56 | | | | 13 | | | |
| | 4 | greyish reddish brown | | 5 | SS | 35 | 81 | | | | 12 | | | |
| | 5 | occ. clayey sandy silt till seams/interbeddings | | 6 | SS | 18 | 33 | | | | 13 | | | |
| | 6 | | | 7 | SS | 20 | 31 | | | | 11 | | | |
| | 7 | grey | | 8 | SS | 25 | 68 | | | | 12 | | | |



RECORD OF BOREHOLE 6

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.
DATE: February 28, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.
DATUM: Geodetic **BOREHOLE TYPE:** Solid Stem Augers **CHECKED BY:** H.S.



83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

| SOIL PROFILE | | | SAMPLES | | | | GROUND WATER CONDITIONS | DYNAMIC CONE PENETRATION RESISTANCE PLOT | | | | WATER CONTENT (%) | | | | MONITORING WELL | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL | |
|-----------------------|-------------------------|--|-------------|---------------|------|---------------|----------------------------|---|--------------------|----|----|-------------------|----|-----|---|--------------------|---|---|
| ELEVATION (metres) | DEPTH SCALE (metres) | DESCRIPTION | STRATA PLOT | SAMPLE NUMBER | TYPE | RECOVERY (cm) | | " N " VALUES | SHEAR STRENGTH kPa | | | | | | | | | |
| | | | | | | | | | ▲ | 20 | 40 | 60 | 80 | 100 | ▲ | | | 5 |
| 187.2 | 0 | Ground Surface | | | | | | | | | | | | | | | | |
| | 0 | dark mottled brown, occ. reddish brown Silty Clay/Clayey Silt Fill some topsoil, some organic stains occ. gravel, damp | | 1 | SS | 46 | 18 | | | | | | | | | | | |
| | 1 | | | 2 | SS | 13 | 10 | | | | | | | | | | | |
| 185.5 | 2 | brown, occ. reddish brown Silty Clay/Clayey Silt Till some sand, occ. oxidized fissures damp, hard | | 3 | SS | 35 | 37 | | | | | | | | | | | |
| | 2 | reddish brown occ. shale fragments | | 4 | SS | 15 | 46 | | | | | | | | | | | |
| | 3 | | | 5 | SS | 46 | 52 | | | | | | | | | | | |
| | 4 | | | 6 | SS | 20 | 52 | | | | | | | | | | | |
| | 5 | grey | | 7 | SS | 35 | 49 | | | | | | | | | | | |
| 181.5 | 6 | greyish reddish brown Silty Sand/Sandy Silt Till occ. oxidized fissures damp, very dense | | 8 | SS | 20 | 79/28cm | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | | | | | | |

February 28, 2018

Gradation Analysis
S(4):
2 18 47 33

Gradation Analysis
S(8):
12 33 46 9

RECORD OF BOREHOLE 7

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.
DATE: February 28, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.
DATUM: Geodetic **BOREHOLE TYPE:** Solid Stem Augers **CHECKED BY:** H.S.



83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

| SOIL PROFILE | | | | SAMPLES | | | | GROUND WATER CONDITIONS | DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa ▲ 20 40 60 80 100 ▲ | WATER CONTENT (%) 5 15 25 35 | MONITORING WELL | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|-----------------------|-------------------------|--|-------------|---------------|------|---------------|--------------|----------------------------|---|------------------------------------|--------------------|---|
| ELEVATION (metres) | DEPTH SCALE (metres) | DESCRIPTION | STRATA PLOT | SAMPLE NUMBER | TYPE | RECOVERY (cm) | " N " VALUES | | | | | |
| 187.6 | 0 | Ground Surface | | | | | | | | | | |
| 187.5 | 0 | Granular Fill | | | | | | | | | | |
| | | dark brown Silty Clay/Clayey Silt Fill some topsoil, some organic stains damp | | 1 | SS | 25 | 4 | | | | | |
| 186.9 | | | | | | | | | | | | |
| | 1 | brown, occ. reddish brown Silty Clay/Clayey Silt Till some sand, occ. oxidized fissures damp, very stiff | | 2 | SS | 35 | 25 | | | | | |
| | | hard | | 3 | SS | 25 | 32 | | | | | |
| | 2 | very stiff | | 4 | SS | 30 | 28 | | | | | |
| | 3 | hard | | 5 | SS | 28 | 48 | | | | | |
| | 4 | grey | | 6 | SS | 38 | 40 | | | | | |
| | 5 | | | 7 | SS | 30 | 70/28cm | | | | | |
| 181.9 | | | | | | | | | | | | |
| | 6 | grey Silty Sand/Sandy Silt Till occ. oxidized fissures moist, very dense | | 8 | SS | 30 | 80/28cm | | | | | |
| | 7 | | | | | | | | | | | |
| 180.3 | | | | | | | | | | | | |

February 28, 2018

Gradation Analysis
S(4):
8 15 43 34

Gradation Analysis
S(8):
8 38 46 8

RECORD OF BOREHOLE 8

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.
DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.
DATUM: Geodetic **BOREHOLE TYPE:** Solid Stem Augers **CHECKED BY:** H.S.



83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

| SOIL PROFILE | | | SAMPLES | | | | GROUND WATER CONDITIONS | DYNAMIC CONE PENETRATION | | WATER CONTENT | | MONITORING WELL | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|-----------------------|-------------------------|---|-------------|---------------|------|---------------|----------------------------|--------------------------|--|-------------------|----|--------------------|---|
| ELEVATION (metres) | DEPTH SCALE (metres) | DESCRIPTION | STRATA PLOT | SAMPLE NUMBER | TYPE | RECOVERY (cm) | | RESISTANCE PLOT | | WATER CONTENT (%) | | | |
| | | | | | | | | SHEAR STRENGTH kPa | | 5 | 15 | | |
| 186.7 | 0 | Ground Surface | | | | | | | | | | | |
| 186.2 | 0 | dark brown Silty Clay/Clayey Silt Fill some organic stains, some topsoil damp | | 1 | SS | 35 | 16 | | | 15 | | | |
| | 1 | reddish brown Silty Clay/Clayey Silt Till trace to some sand occ. oxidized fissures damp, hard | | 2 | SS | 30 | 31 | | | 12 | | | |
| | 2 | | | 3 | SS | 30 | 47 | | | 12 | | | |
| | 3 | | | 4 | SS | 35 | 42 | | | 12 | | | |
| | 4 | very stiff | | 5 | SS | 30 | 56 | | | 12 | | | |
| | 4 | grey | | 6 | SS | 30 | 24 | | | 11 | | | |
| | 5 | | | 7 | SS | 38 | 30 | | | 14 | | | |
| | 6 | occ. gravel, hard | | 8 | SS | 10 | 50/10cm | | | 9 | | | |
| 179.7 | 7 | | | | | | | | | | | | |



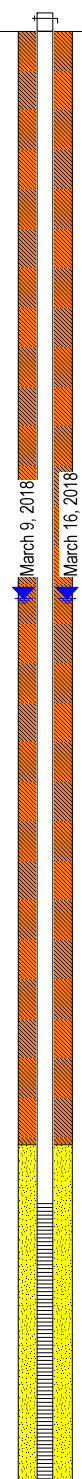
RECORD OF BOREHOLE 9

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.
DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.
DATUM: Geodetic **BOREHOLE TYPE:** Solid Stem Augers **CHECKED BY:** H.S.



83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

| SOIL PROFILE | | | SAMPLES | | | | GROUND WATER CONDITIONS | DYNAMIC CONE PENETRATION RESISTANCE PLOT | | WATER CONTENT (%) | | MONITORING WELL | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|-----------------------|-------------------------|---|-------------|---------------|------|---------------|----------------------------|---|--|-------------------|----|--------------------|---|
| ELEVATION (metres) | DEPTH SCALE (metres) | DESCRIPTION | STRATA PLOT | SAMPLE NUMBER | TYPE | RECOVERY (cm) | | SHEAR STRENGTH kPa | | | | | |
| | | | | | | | | ▲ 20 40 60 80 100 ▲ | | 5 15 25 35 | | | |
| 186.7 | 0 | Ground Surface | | | | | | | | | | | |
| | 0 | dark brown Silty Clay/Clayey Silt Fill some topsoil some organic stains, some rootlets damp | | 1 | SS | 35 | 9 | | | | 25 | | |
| 185.8 | 1 | reddish brown Silty Clay/Clayey Silt Till trace to some sand occ. oxidized fissures damp, hard | | 2 | SS | 25 | 38 | | | | 14 | | |
| | 1 | | | 3 | SS | 20 | 53 | | | | 12 | | |
| | 2 | | | 4 | SS | 15 | 50/13cm | | | | 11 | | |
| | 3 | greyish reddish brown | | 5 | SS | 30 | 31 | | | | 12 | | |
| | 4 | grey very stiff | | 6 | SS | 35 | 25 | | | | 11 | | |
| 182.3 | 5 | brownish grey Sandy Silt Till trace to some clay damp, very dense | | 7 | SS | 28 | 59 | | | | 9 | | |
| 181.2 | 6 | brownish grey Clayey Silt Till occ. clayey sandy silt till interbeddings damp, hard | | 8 | SS | 35 | 95/23cm | | | | 8 | | |
| 179.7 | 7 | | | | | | | | | | | | |



RECORD OF BOREHOLE 10

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.
DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.
DATUM: Geodetic **BOREHOLE TYPE:** Solid Stem Augers **CHECKED BY:** H.S.



83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

| SOIL PROFILE | | | SAMPLES | | | | GROUND WATER CONDITIONS | DYNAMIC CONE PENETRATION RESISTANCE PLOT | | WATER CONTENT (%) | | MONITORING WELL | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|-----------------------|-------------------------|---|-------------|---------------|------|---------------|----------------------------|---|--|-------------------|----|--------------------|---|
| ELEVATION (metres) | DEPTH SCALE (metres) | DESCRIPTION | STRATA PLOT | SAMPLE NUMBER | TYPE | RECOVERY (cm) | | SHEAR STRENGTH kPa | | | | | |
| | | | | | | | | ▲ 20 40 60 80 100 ▲ | | 5 15 25 35 | | | |
| 186.6 | 0 | Ground Surface | | | | | | | | | | | |
| | 0 | dark brown Clayey Silt Fill some topsoil, some organic stains, some rootlets, damp to moist | | 1 | SS | 30 | 7 | | | | 13 | | |
| 185.9 | 1 | brown Compacted Silty Clay/Clayey Silt Fill damp, stiff | | 2 | SS | 28 | 13 | | | | 10 | | |
| 185.2 | 2 | trace organic stains reddish brown Silty Clay/Clayey Silt Till trace to some sand occ. oxidized fissures damp, very stiff | | 3 | SS | 18 | 20 | | | | 15 | | |
| | 2 | hard | | 4 | SS | 23 | 40 | | | | 14 | | |
| | 3 | | | 5 | SS | 30 | 48 | | | | 13 | | |
| | 4 | | | 6 | SS | 28 | 42 | | | | 16 | | |
| | 5 | grey | | 7 | SS | 30 | 90/28cm | | | | 11 | | |
| | 6 | occ. sandy silt till seams | | 8 | SS | 23 | 50/13cm | | | | 8 | | |
| 179.6 | 7 | | | | | | | | | | | | |



RECORD OF BOREHOLE 11

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.
DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.
DATUM: Geodetic **BOREHOLE TYPE:** Solid Stem Augers **CHECKED BY:** H.S.



83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

| SOIL PROFILE | | | SAMPLES | | | | GROUND WATER CONDITIONS | DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa ▲ 20 40 60 80 100 ▲ | WATER CONTENT (%) 5 15 25 35 | MONITORING WELL | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL | |
|-----------------------|-------------------------|---|-------------|---------------|------|---------------|----------------------------|---|------------------------------------|--------------------|---|--------------|
| ELEVATION (metres) | DEPTH SCALE (metres) | DESCRIPTION | STRATA PLOT | SAMPLE NUMBER | TYPE | RECOVERY (cm) | | | | | | " N " VALUES |
| 178.6 | | grey Clayey Sandy Silt Till damp, hard | | 9 | SS | 13 | | | | | | 50/13cm |
| | 8 | End of Borehole Cave-in Depth on Completion: None Groundwater Depth on Completion: Dry | | | | | | | | | | |
| | 9 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |
| | 11 | | | | | | | | | | | |
| | 12 | | | | | | | | | | | |
| | 13 | | | | | | | | | | | |
| | 14 | | | | | | | | | | | |

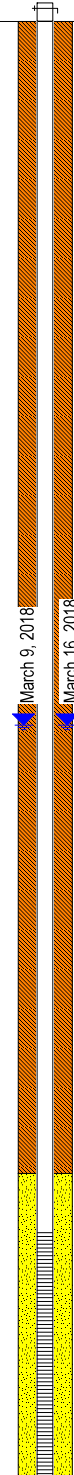
RECORD OF BOREHOLE 12

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.
DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.
DATUM: Geodetic **BOREHOLE TYPE:** Solid Stem Augers **CHECKED BY:** H.S.



83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

| SOIL PROFILE | | | SAMPLES | | | | GROUND WATER CONDITIONS | DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa ▲ 20 40 60 80 100 ▲ | WATER CONTENT (%) 5 15 25 35 | MONITORING WELL | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL | |
|-----------------------|-------------------------|--|-------------|---------------|------|---------------|----------------------------|---|------------------------------------|--------------------|---|--------------|
| ELEVATION (metres) | DEPTH SCALE (metres) | DESCRIPTION | STRATA PLOT | SAMPLE NUMBER | TYPE | RECOVERY (cm) | | | | | | " N " VALUES |
| 186.8 | 0 | Ground Surface | | | | | | | | | | |
| | 0 | dark brown Silty Clay/Clayey Silt Fill some topsoil, some organic stains some rootlets, damp to moist | | 1 | SS | 38 | 10 | | | | | |
| 186.1 | 1 | brown to reddish brown Silty Clay/Clayey Silt Till trace to some sand some topsoil, occ. oxidized fissures damp, hard | | 2 | SS | 30 | 38 | | | | | |
| | 2 | occ. shale fragments | | 3 | SS | 35 | 48 | | | | | |
| | 3 | | | 4 | SS | 23 | 55 | | | | | |
| | 4 | greyish reddish brown | | 5 | SS | 30 | 34 | | | | | |
| | 5 | grey | | 6 | SS | 35 | 30 | | | | | |
| | 6 | | | 7 | SS | 35 | 53 | | | | | |
| | 7 | occ. gravel | | 8 | SS | 20 | 50/13cm | | | | | |
| 179.8 | 7 | | | | | | | | | | | |



RECORD OF BOREHOLE 12

Project No.: T18721 **CLIENT:** Mattamy Willmott Limited **ORIGINATED BY:** M.Z.
DATE: March 2, 2018 **LOCATION:** Milton, ON **COMPILED BY:** M.Z.
DATUM: Geodetic **BOREHOLE TYPE:** Solid Stem Augers **CHECKED BY:** H.S.

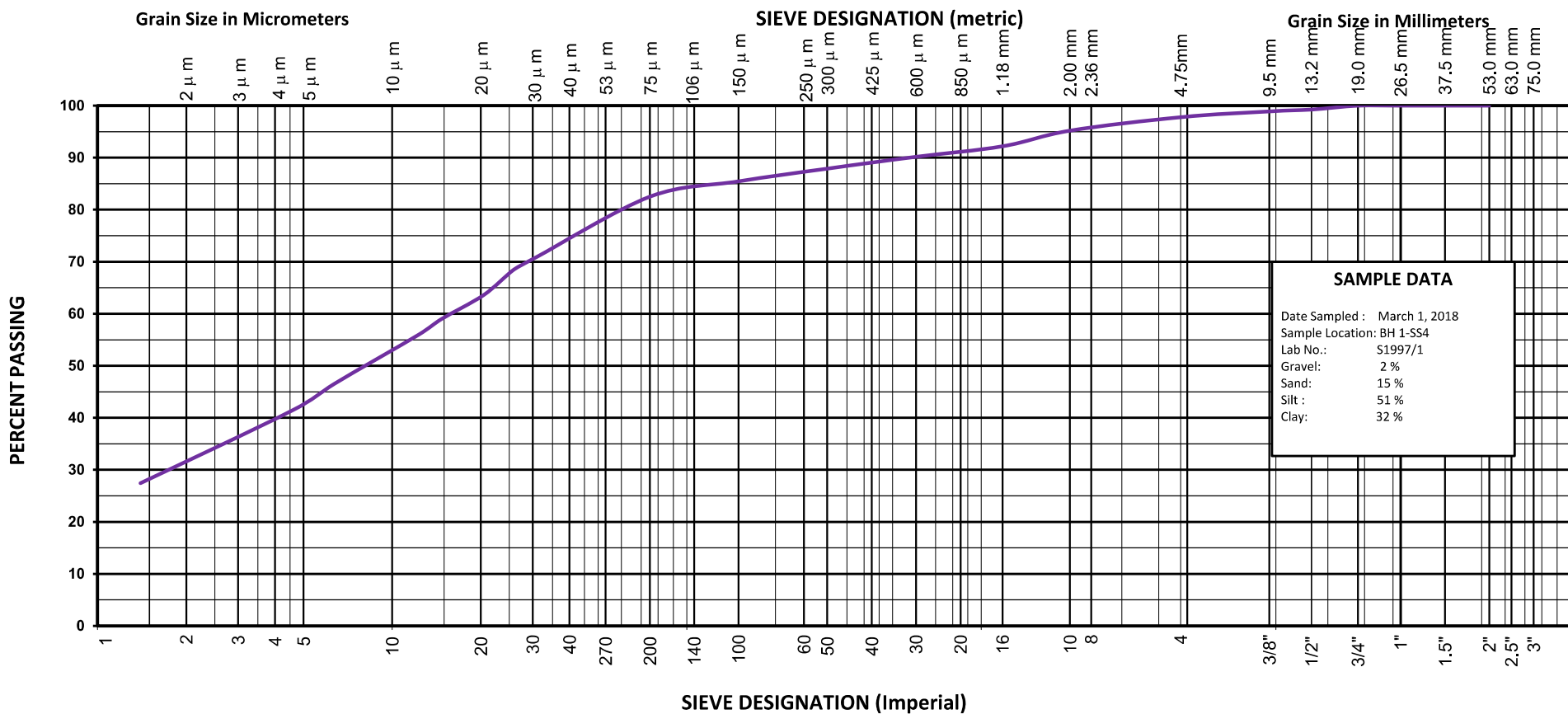


83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

| SOIL PROFILE | | | SAMPLES | | | | GROUND WATER CONDITIONS | DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa ▲ 20 40 60 80 100 ▲ | WATER CONTENT (%) 5 15 25 35 | MONITORING WELL | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|-----------------------|-------------------------|--|-------------|---------------|------|---------------|----------------------------|---|------------------------------------|--------------------|---|
| ELEVATION (metres) | DEPTH SCALE (metres) | DESCRIPTION | STRATA PLOT | SAMPLE NUMBER | TYPE | RECOVERY (cm) | | | | | |
| 179.0 | | grey Silty Sand/ Sandy Silt Till damp, very dense | | 9 | SS | 10 | 50/13cm | | 6 | | |
| | 8 | End of Borehole Cave-in Depth on Completion: 6.7m Groundwater Depth on Completion: Dry Measured Water Level in installed Monitoring Well on: March 9, 2018: 3.6m March 16, 2018: 3.6m | | | | | | | | | |
| | 9 | | | | | | | | | | |
| | 10 | | | | | | | | | | |
| | 11 | | | | | | | | | | |
| | 12 | | | | | | | | | | |
| | 13 | | | | | | | | | | |
| | 14 | | | | | | | | | | |

UNIFIED SOIL CLASSIFICATION SYSTEM

| | | | | | |
|------------------------|-------------|--------|--------|---------------|--------|
| CLAY & SILT | SAND | | | GRAVEL | |
| | FINE | MEDIUM | COARSE | FINE | COARSE |



| SAMPLE DATA | |
|------------------|---------------|
| Date Sampled : | March 1, 2018 |
| Sample Location: | BH 1-SS4 |
| Lab No.: | S1997/1 |
| Gravel: | 2 % |
| Sand: | 15 % |
| Silt : | 51 % |
| Clay: | 32 % |

SHAD & ASSOCIATES INC.

83 Citation Drive, Unit 9
Vaughan, Ontario
L4K 2Z6
Tel: (905) 760-5566
Fax: (905) 760-5567
www.shadinc.ca



GRAIN SIZE ANALYSIS

Project :

Framgard Property- Major Node

Project No.:

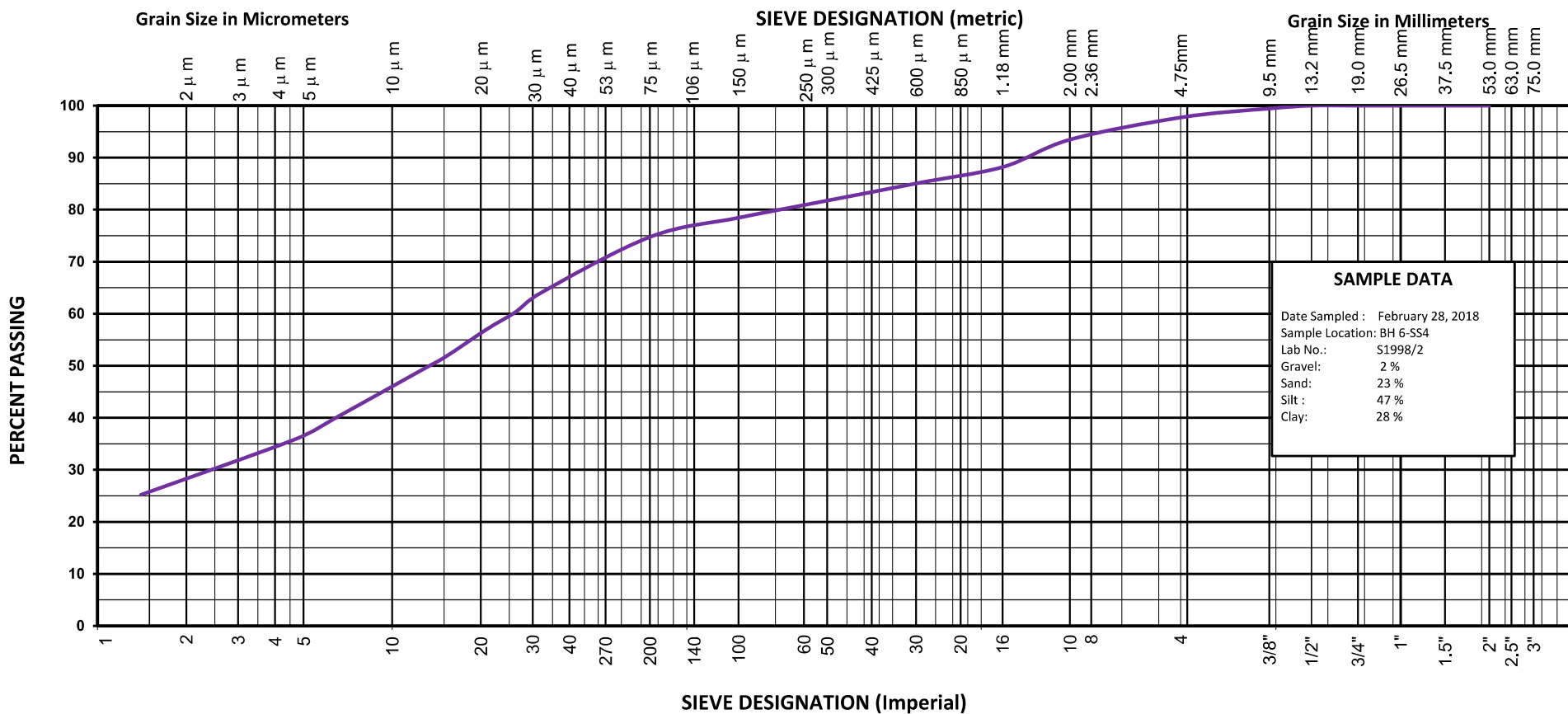
T18721

Client:

Mattamy Development Corporation

UNIFIED SOIL CLASSIFICATION SYSTEM

| | | | | | |
|------------------------|-------------|--------|--------|---------------|--------|
| CLAY & SILT | SAND | | | GRAVEL | |
| | FINE | MEDIUM | COARSE | FINE | COARSE |



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GRAIN SIZE ANALYSIS

Project :

Framgard Property- Major Node

Project No.:

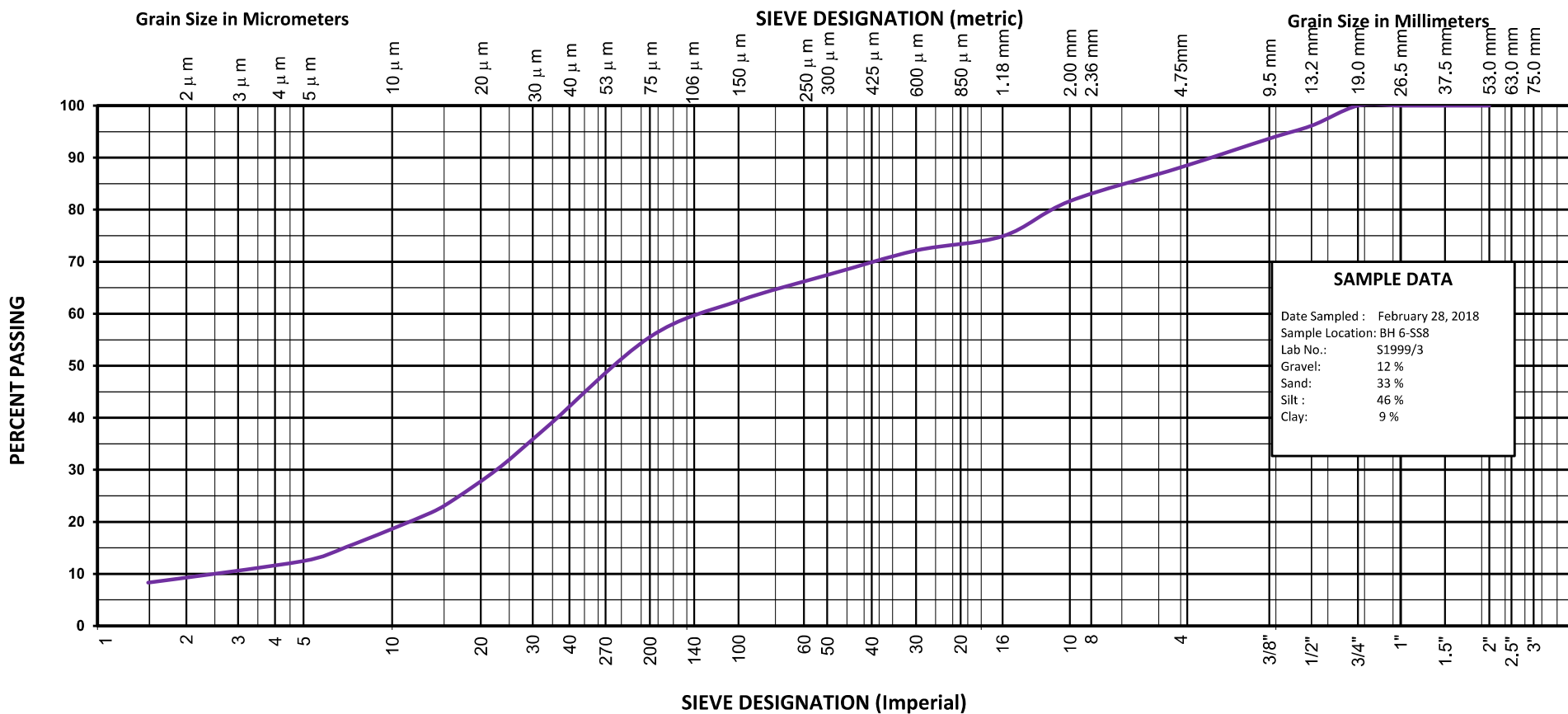
T18721

Client:

Mattamy Development Corporation

UNIFIED SOIL CLASSIFICATION SYSTEM

| | | | | | |
|------------------------|-------------|--------|--------|---------------|--------|
| CLAY & SILT | SAND | | | GRAVEL | |
| | FINE | MEDIUM | COARSE | FINE | COARSE |



| SAMPLE DATA | |
|------------------|-------------------|
| Date Sampled : | February 28, 2018 |
| Sample Location: | BH 6-SS8 |
| Lab No.: | 51999/3 |
| Gravel: | 12 % |
| Sand: | 33 % |
| Silt : | 46 % |
| Clay: | 9 % |

SHAD & ASSOCIATES INC.

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GRAIN SIZE ANALYSIS

Project :

Framgard Property- Major Node

Project No.:

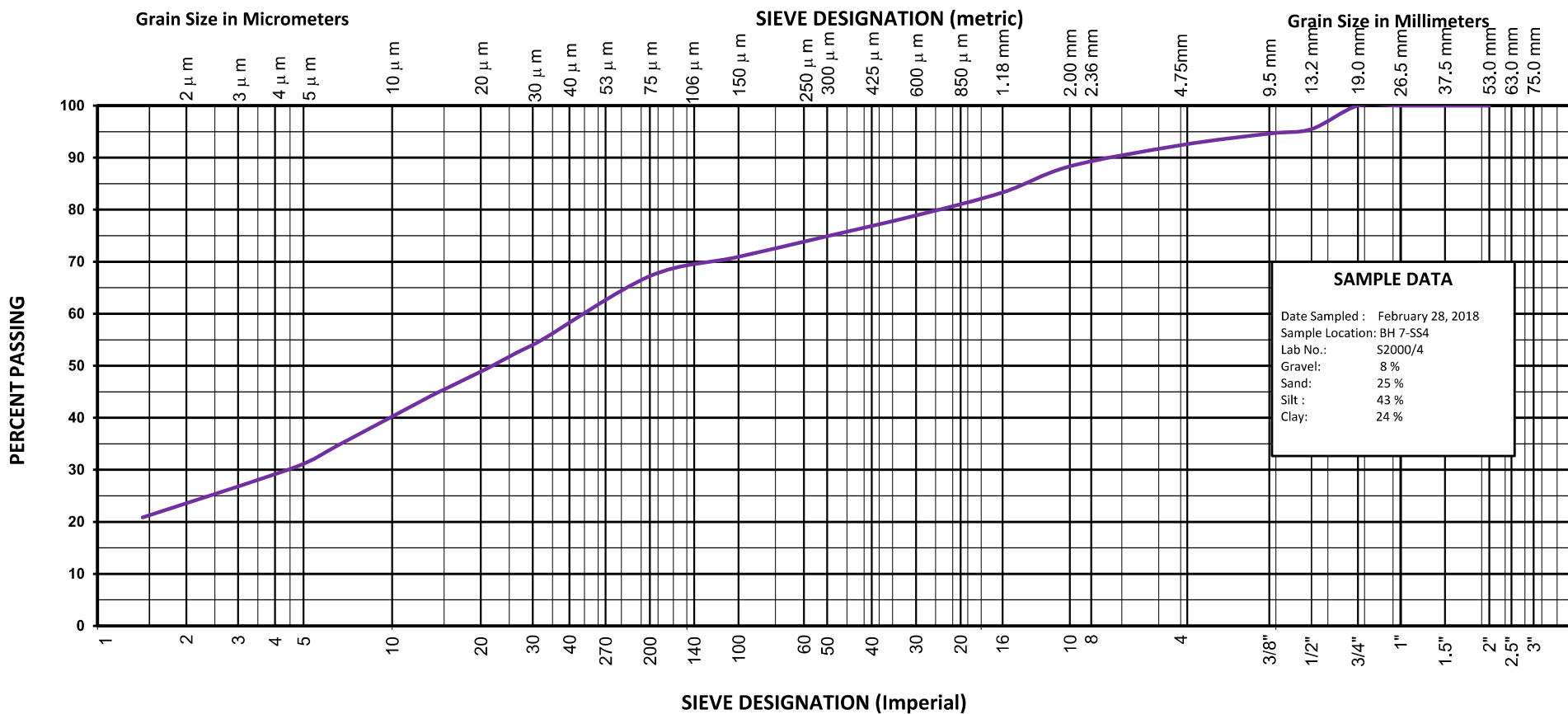
T18721

Client:

Mattamy Development Corporation

UNIFIED SOIL CLASSIFICATION SYSTEM

| | | | | | |
|------------------------|-------------|--------|--------|---------------|--------|
| CLAY & SILT | SAND | | | GRAVEL | |
| | FINE | MEDIUM | COARSE | FINE | COARSE |



| SAMPLE DATA | |
|------------------|-------------------|
| Date Sampled : | February 28, 2018 |
| Sample Location: | BH 7-SS4 |
| Lab No.: | S2000/4 |
| Gravel: | 8 % |
| Sand: | 25 % |
| Silt : | 43 % |
| Clay: | 24 % |

SHAD & ASSOCIATES INC.

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GRAIN SIZE ANALYSIS

Project :

Framgard Property- Major Node

Project No.:

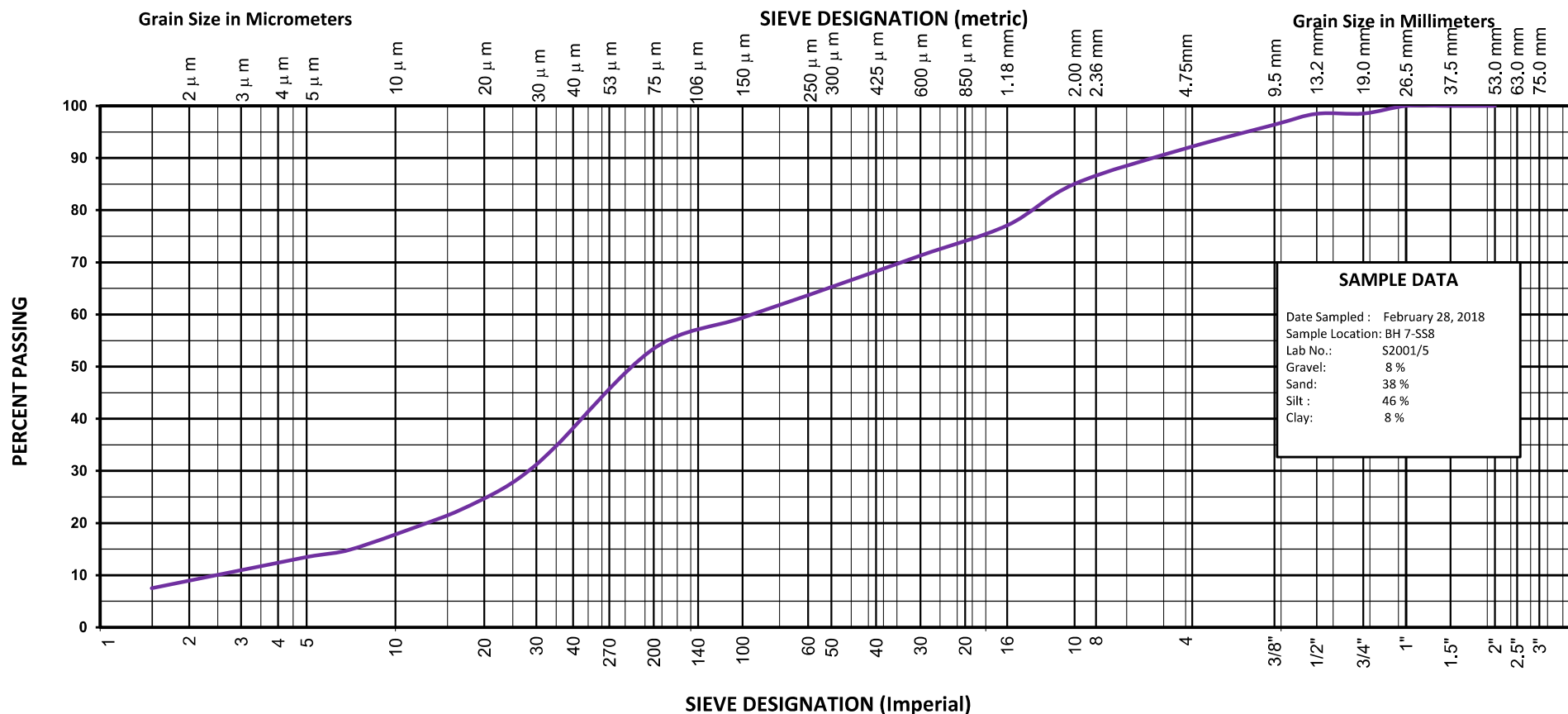
T18721

Client:

Mattamy Development Corporation

UNIFIED SOIL CLASSIFICATION SYSTEM

| | | | | | |
|------------------------|-------------|--------|--------|---------------|--------|
| CLAY & SILT | SAND | | | GRAVEL | |
| | FINE | MEDIUM | COARSE | FINE | COARSE |



SHAD & ASSOCIATES INC.

83 Citation Drive, Unit 9
 Vaughan, Ontario
 L4K 2Z6
 Tel: (905) 760-5566
 Fax: (905) 760-5567
www.shadinc.ca



GRAIN SIZE ANALYSIS

Project :

Framgard Property- Major Node

Project No.:

T18721

Client:

Mattamy Development Corporation

APPENDIX D

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

| | |
|---|---|
| <p>Work Order : WT2224508</p> <p>Amendment : 1</p> <p>Client : McClymont & Rak Engineers Inc.</p> <p>Contact : Richard Sukhu</p> <p>Address : 111 Zenway Blvd. Unit 4 Vaughan ON Canada L4H 3H9</p> <p>Telephone : 416 675 0160</p> <p>Project : 5820</p> <p>PO : ----</p> <p>C-O-C number : 20-1000498</p> <p>Sampler : CLIENT</p> <p>Site : ----</p> <p>Quote number : 2022 Price List</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p> | <p>Page : 1 of 5</p> <p>Laboratory : Waterloo - Environmental</p> <p>Account Manager : Emily Smith</p> <p>Address : 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8</p> <p>Telephone : +1 519 886 6910</p> <p>Date Samples Received : 08-Dec-2022 13:54</p> <p>Date Analysis Commenced : 08-Dec-2022</p> <p>Issue Date : 15-Mar-2023 16:31</p> |
|---|---|

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| <i>Signatories</i> | <i>Position</i> | <i>Laboratory Department</i> |
|--------------------|---|---------------------------------|
| Jeremy Gingras | Team Leader - Semi-Volatile Instrumentation | Organics, Waterloo, Ontario |
| Jocelyn Kennedy | Department Manager - Semi-Volatile Organics | Organics, Waterloo, Ontario |
| Jon Fisher | Department Manager - Inorganics | Inorganics, Waterloo, Ontario |
| Jon Fisher | Department Manager - Inorganics | Metals, Waterloo, Ontario |
| Manuel Tavaratello | Supervisor - Semi-Volatile Extractions | Organics, Waterloo, Ontario |
| Ruby Sujeepan | | Microbiology, Waterloo, Ontario |
| Sarah Birch | VOC Section Supervisor | Organics, Waterloo, Ontario |

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

| <i>Unit</i> | <i>Description</i> |
|-------------|--|
| µg/L | micrograms per litre |
| CFU/100mL | colony forming units per hundred millilitres |
| mg/L | milligrams per litre |
| pH units | pH units |

>: greater than.

<: less than.

Red shading is applied where the result is greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.

For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit .

Qualifiers

| <i>Qualifier</i> | <i>Description</i> |
|------------------|--|
| DLDS | <i>Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.</i> |
| DLHC | <i>Detection Limit Raised: Dilution required due to high concentration of test analyte(s).</i> |



Analytical Results

| Analyte | Method | LOR | Unit | Client sample ID | BH-10 | | HALSUB SAN | HALSUB STM | | | | |
|--|----------|-----------|-----------|--------------------|-------------|-------|-----------------|--------------------|----|----|----|----|
| | | | | Sampling date/time | 08-Dec-2022 | 09:57 | | | | | | |
| Sub-Matrix: Groundwater (Matrix: Water) | | | | WT2224508-001 | | | | | | | | |
| Physical Tests | | | | | | | | | | | | |
| pH | E108 | 0.10 | pH units | 8.09 | | | 6 - 10 pH units | 6.5 - 8.5 pH units | -- | -- | -- | -- |
| Solids, total suspended [TSS] | E160 | 3.0 | mg/L | 35.6 | | | 350 mg/L | -- | -- | -- | -- | -- |
| Anions and Nutrients | | | | | | | | | | | | |
| Fluoride | E235.F | 0.020 | mg/L | 0.246 | DLDS | | 10 mg/L | -- | -- | -- | -- | -- |
| Kjeldahl nitrogen, total [TKN] | E318 | 0.050 | mg/L | 0.259 | | | 100 mg/L | -- | -- | -- | -- | -- |
| Phosphorus, total | E372-U | 0.0020 | mg/L | 0.0244 | | | 10 mg/L | -- | -- | -- | -- | -- |
| Sulfate (as SO4) | E235.SO4 | 0.30 | mg/L | 385 | DLDS | | 1500 mg/L | -- | -- | -- | -- | -- |
| Cyanides | | | | | | | | | | | | |
| Cyanide, strong acid dissociable (Total) | E333 | 0.0020 | mg/L | <0.0020 | | | 2 mg/L | -- | -- | -- | -- | -- |
| Microbiological Tests | | | | | | | | | | | | |
| Coliforms, Escherichia coli [E. coli] | E012A.EC | 1 | CFU/100mL | Not Detected | | | -- | 200 CFU/100mL | -- | -- | -- | -- |
| Total Metals | | | | | | | | | | | | |
| Aluminum, total | E420 | 0.0030 | mg/L | 0.514 | DLHC | | 50 mg/L | -- | -- | -- | -- | -- |
| Antimony, total | E420 | 0.00010 | mg/L | <0.00100 | DLHC | | 5 mg/L | -- | -- | -- | -- | -- |
| Arsenic, total | E420 | 0.00010 | mg/L | 0.00555 | DLHC | | 1 mg/L | -- | -- | -- | -- | -- |
| Beryllium, total | E420 | 0.000020 | mg/L | <0.000200 | DLHC | | 5 mg/L | -- | -- | -- | -- | -- |
| Cadmium, total | E420 | 0.0000050 | mg/L | <0.0000500 | DLHC | | 1 mg/L | -- | -- | -- | -- | -- |
| Chromium, total | E420 | 0.00050 | mg/L | <0.00500 | DLHC | | 3 mg/L | -- | -- | -- | -- | -- |
| Cobalt, total | E420 | 0.00010 | mg/L | 0.00144 | DLHC | | 5 mg/L | -- | -- | -- | -- | -- |
| Copper, total | E420 | 0.00050 | mg/L | <0.00500 | DLHC | | 3 mg/L | -- | -- | -- | -- | -- |
| Iron, total | E420 | 0.010 | mg/L | 0.879 | DLHC | | 50 mg/L | -- | -- | -- | -- | -- |
| Lead, total | E420 | 0.000050 | mg/L | 0.000546 | DLHC | | 3 mg/L | -- | -- | -- | -- | -- |
| Manganese, total | E420 | 0.00010 | mg/L | 0.304 | DLHC | | 5 mg/L | -- | -- | -- | -- | -- |
| Mercury, total | E508 | 0.0000050 | mg/L | <0.0000050 | | | 0.05 mg/L | -- | -- | -- | -- | -- |
| Molybdenum, total | E420 | 0.000050 | mg/L | 0.00410 | DLHC | | 5 mg/L | -- | -- | -- | -- | -- |
| Nickel, total | E420 | 0.00050 | mg/L | <0.00500 | DLHC | | 3 mg/L | -- | -- | -- | -- | -- |
| Selenium, total | E420 | 0.000050 | mg/L | <0.000500 | DLHC | | 5 mg/L | -- | -- | -- | -- | -- |
| Silver, total | E420 | 0.000010 | mg/L | <0.000100 | DLHC | | 5 mg/L | -- | -- | -- | -- | -- |
| Tin, total | E420 | 0.00010 | mg/L | 0.00173 | DLHC | | 5 mg/L | -- | -- | -- | -- | -- |



| Analyte | Method | LOR | Unit | WT2224508-001 (Continued) | HALSUB SAN | HALSUB STM | | | | | |
|---|-----------|---------|------|------------------------------|---------------|---------------|----|----|----|----|----|
| Total Metals - Continued | | | | | | | | | | | |
| Titanium, total | E420 | 0.00030 | mg/L | 0.0109 DLHC | 5 mg/L | -- | -- | -- | -- | -- | -- |
| Zinc, total | E420 | 0.0030 | mg/L | <0.0300 DLHC | 3 mg/L | -- | -- | -- | -- | -- | -- |
| Aggregate Organics | | | | | | | | | | | |
| Biochemical oxygen demand [BOD] | E550 | 2.0 | mg/L | 3.4 | 300 mg/L | -- | -- | -- | -- | -- | -- |
| Oil & grease (gravimetric) | E567 | 5.0 | mg/L | <5.0 | -- | -- | -- | -- | -- | -- | -- |
| Oil & grease, animal/vegetable (gravimetric) | EC567A.SG | 5.0 | mg/L | <5.0 | 150 mg/L | -- | -- | -- | -- | -- | -- |
| Oil & grease, mineral (gravimetric) | E567SG | 5.0 | mg/L | <5.0 | 15 mg/L | -- | -- | -- | -- | -- | -- |
| Phenols, total (4AAP) | E562 | 0.0010 | mg/L | 0.0012 | 1 mg/L | -- | -- | -- | -- | -- | -- |
| Volatile Organic Compounds [Drycleaning] | | | | | | | | | | | |
| Dichloromethane | E611F | 1.0 | µg/L | <1.0 | 2000 µg/L | -- | -- | -- | -- | -- | -- |
| Tetrachloroethylene | E611F | 0.50 | µg/L | <0.50 | 1000 µg/L | -- | -- | -- | -- | -- | -- |
| Trichloroethylene | E611F | 0.50 | µg/L | <0.50 | 400 µg/L | -- | -- | -- | -- | -- | -- |
| Benzene | E611F | 0.50 | µg/L | <0.50 | 10 µg/L | -- | -- | -- | -- | -- | -- |
| Ethylbenzene | E611F | 0.50 | µg/L | <0.50 | 160 µg/L | -- | -- | -- | -- | -- | -- |
| Toluene | E611F | 0.50 | µg/L | <0.50 | 16 µg/L | -- | -- | -- | -- | -- | -- |
| Chloroform | E611F | 0.50 | µg/L | <0.50 | 40 µg/L | -- | -- | -- | -- | -- | -- |
| Dichlorobenzene, 1,4- | E611F | 0.50 | µg/L | <0.50 | 80 µg/L | -- | -- | -- | -- | -- | -- |
| Volatile Organic Compounds Surrogates | | | | | | | | | | | |
| Bromofluorobenzene, 4- | E611F | 1.0 | % | 93.8 | -- | -- | -- | -- | -- | -- | -- |
| Difluorobenzene, 1,4- | E611F | 1.0 | % | 101 | -- | -- | -- | -- | -- | -- | -- |

Please refer to the General Comments section for an explanation of any qualifiers detected.

No Breaches Found

Key:

HALSUB Ontario Halton Sanitary Sewer By-law No. 02-03 (MAR, 2003)
 SAN Halton Sanitary Sewer By-Law No. 02-03
 STM Halton Storm Sewer By-Law No. 02-03



Analytical Results

| Sub-Matrix: Water (Matrix: Water) | | Client sample ID | | | | | | | | | |
|---|--------|--------------------|------|---------------|---------------|----|----|----|----|----|----|
| | | Sampling date/time | | | | | | | | | |
| Analyte | Method | LOR | Unit | WT2224508-002 | HALSUB SAN | | | | | | |
| Polycyclic Aromatic Hydrocarbons | | | | | | | | | | | |
| Naphthalene | E641A | 0.050 | µg/L | <0.050 | 140 µg/L | -- | -- | -- | -- | -- | -- |
| Chrysene-d12 | E641A | 0.1 | % | 97.2 | -- | -- | -- | -- | -- | -- | -- |
| Naphthalene-d8 | E641A | 0.1 | % | 103 | -- | -- | -- | -- | -- | -- | -- |
| Phenanthrene-d10 | E641A | 0.1 | % | 111 | -- | -- | -- | -- | -- | -- | -- |

Please refer to the General Comments section for an explanation of any qualifiers detected.

No Breaches Found

Key:

HALSUB Ontario Halton Sanitary Sewer By-law No. 02-03 (MAR, 2003)
SAN Halton Sanitary Sewer By-Law No. 02-03

QUALITY CONTROL INTERPRETIVE REPORT

| | |
|---|--|
| <p>Work Order : WT2224508</p> <p>Amendment : 1</p> <p>Client : McClymont & Rak Engineers Inc.</p> <p>Contact : Richard Sukhu</p> <p>Address : 111 Zenway Blvd. Unit 4 Vaughan ON Canada L4H 3H9</p> <p>Telephone : 416 675 0160</p> <p>Project : 5820</p> <p>PO : ----</p> <p>C-O-C number : 20-1000498</p> <p>Sampler : CLIENT</p> <p>Site : ----</p> <p>Quote number : 2022 Price List</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p> | <p>Page : 1 of 10</p> <p>Laboratory : Waterloo - Environmental</p> <p>Account Manager : Emily Smith</p> <p>Address : 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8</p> <p>Telephone : +1 519 886 6910</p> <p>Date Samples Received : 08-Dec-2022 13:54</p> <p>Issue Date : 15-Mar-2023 15:19</p> |
|---|--|

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|----------|---------------|--------------------------|---------------|--------|------|---------------|---------------|--------|------|
| | | | Preparation Date | Holding Times | | Eval | Analysis Date | Holding Times | | Eval |
| | | | | Rec | Actual | | | Rec | Actual | |
| Aggregate Organics : Biochemical Oxygen Demand - 5 day | | | | | | | | | | |
| HDPE [BOD HT-4d] BH-10 | E550 | 08-Dec-2022 | ---- | ---- | ---- | | 12-Dec-2022 | 4 days | 4 days | ✓ |
| Aggregate Organics : Mineral Oil & Grease by Gravimetry | | | | | | | | | | |
| Amber glass (hydrochloric acid) BH-10 | E567SG | 08-Dec-2022 | 15-Dec-2022 | 28 days | 7 days | ✓ | 15-Dec-2022 | 40 days | 0 days | ✓ |
| Aggregate Organics : Oil & Grease by Gravimetry | | | | | | | | | | |
| Amber glass (hydrochloric acid) BH-10 | E567 | 08-Dec-2022 | 15-Dec-2022 | 28 days | 7 days | ✓ | 15-Dec-2022 | 40 days | 0 days | ✓ |
| Aggregate Organics : Phenols (4AAP) in Water by Colorimetry | | | | | | | | | | |
| Amber glass total (sulfuric acid) BH-10 | E562 | 08-Dec-2022 | 14-Dec-2022 | ---- | ---- | | 15-Dec-2022 | 28 days | 7 days | ✓ |
| Anions and Nutrients : Fluoride in Water by IC | | | | | | | | | | |
| HDPE [ON MECP] BH-10 | E235.F | 08-Dec-2022 | 13-Dec-2022 | ---- | ---- | | 13-Dec-2022 | 28 days | 5 days | ✓ |
| Anions and Nutrients : Sulfate in Water by IC | | | | | | | | | | |
| HDPE [ON MECP] BH-10 | E235.SO4 | 08-Dec-2022 | 13-Dec-2022 | ---- | ---- | | 13-Dec-2022 | 28 days | 5 days | ✓ |
| Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level) | | | | | | | | | | |
| Amber glass total (sulfuric acid) BH-10 | E318 | 08-Dec-2022 | 15-Dec-2022 | ---- | ---- | | 16-Dec-2022 | 28 days | 8 days | ✓ |



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

| Analyte Group Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | | |
|---|----------|---------------|--------------------------|---------------|---------|------|---------------|---------------|--------|------|--|
| | | | Preparation Date | Holding Times | | Eval | Analysis Date | Holding Times | | Eval | |
| | | | | Rec | Actual | | | Rec | Actual | | |
| Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L) | | | | | | | | | | | |
| Amber glass total (sulfuric acid) BH-10 | E372-U | 08-Dec-2022 | 15-Dec-2022 | ---- | ---- | | 16-Dec-2022 | 28 days | 8 days | ✔ | |
| Cyanides : Total Cyanide | | | | | | | | | | | |
| UV-inhibited HDPE - total (sodium hydroxide) BH-10 | E333 | 08-Dec-2022 | 09-Dec-2022 | ---- | ---- | | 09-Dec-2022 | 14 days | 1 days | ✔ | |
| Microbiological Tests : E. coli (MF-mFC-BCIG) | | | | | | | | | | | |
| Sterile HDPE (Sodium thiosulphate) [ON MECP] BH-10 | E012A.EC | 08-Dec-2022 | ---- | ---- | ---- | | 10-Dec-2022 | 48 hrs | 47 hrs | ✔ | |
| Physical Tests : pH by Meter | | | | | | | | | | | |
| HDPE [ON MECP] BH-10 | E108 | 08-Dec-2022 | 13-Dec-2022 | ---- | ---- | | 14-Dec-2022 | 14 days | 6 days | ✔ | |
| Physical Tests : TSS by Gravimetry | | | | | | | | | | | |
| HDPE [ON MECP] BH-10 | E160 | 08-Dec-2022 | ---- | ---- | ---- | | 13-Dec-2022 | 7 days | 5 days | ✔ | |
| Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS | | | | | | | | | | | |
| Amber glass/Teflon lined cap (sodium bisulfate) BH-10 | E641A | 09-Mar-2023 | 10-Mar-2023 | 105 days | 92 days | ✔ | 13-Mar-2023 | 40 days | 3 days | ✔ | |
| Total Metals : Total Mercury in Water by CVAAS | | | | | | | | | | | |
| Glass vial total (hydrochloric acid) [ON MECP] BH-10 | E508 | 08-Dec-2022 | 14-Dec-2022 | ---- | ---- | | 14-Dec-2022 | 28 days | 6 days | ✔ | |
| Total Metals : Total metals in Water by CRC ICPMS | | | | | | | | | | | |
| HDPE total (nitric acid) BH-10 | E420 | 08-Dec-2022 | 08-Dec-2022 | ---- | ---- | | 09-Dec-2022 | 180 days | 1 days | ✔ | |
| Volatile Organic Compounds : VOCs (Full List) by Headspace GC-MS | | | | | | | | | | | |
| Glass vial (sodium bisulfate) BH-10 | E611F | 08-Dec-2022 | 13-Dec-2022 | ---- | ---- | | 13-Dec-2022 | 14 days | 5 days | ✔ | |



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

| Analyte Group Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|--------|---------------|--------------------------|---------------|--------|------|---------------|---------------|--------|------|
| | | | Preparation Date | Holding Times | | Eval | Analysis Date | Holding Times | | Eval |
| | | | | Rec | Actual | | | Rec | Actual | |
| Volatile Organic Compounds [Drycleaning] : VOCs (Full List) by Headspace GC-MS | | | | | | | | | | |
| Glass vial (sodium bisulfate) BH-10 | E611F | 08-Dec-2022 | 13-Dec-2022 | ---- | ---- | | 13-Dec-2022 | 14 days | 5 days | ✔ |
| Volatile Organic Compounds [Fuels] : VOCs (Full List) by Headspace GC-MS | | | | | | | | | | |
| Glass vial (sodium bisulfate) BH-10 | E611F | 08-Dec-2022 | 13-Dec-2022 | ---- | ---- | | 13-Dec-2022 | 14 days | 5 days | ✔ |
| Volatile Organic Compounds [THMs] : VOCs (Full List) by Headspace GC-MS | | | | | | | | | | |
| Glass vial (sodium bisulfate) BH-10 | E611F | 08-Dec-2022 | 13-Dec-2022 | ---- | ---- | | 13-Dec-2022 | 14 days | 5 days | ✔ |

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

| Quality Control Sample Type | Method | QC Lot # | Count | | Frequency (%) | | |
|---|----------|----------|-------|---------|---------------|----------|------------|
| | | | QC | Regular | Actual | Expected | Evaluation |
| Analytical Methods | | | | | | | |
| Laboratory Duplicates (DUP) | | | | | | | |
| Biochemical Oxygen Demand - 5 day | E550 | 775463 | 1 | 16 | 6.2 | 5.0 | ✓ |
| E. coli (MF-mFC-BCIG) | E012A.EC | 774372 | 1 | 10 | 10.0 | 5.0 | ✓ |
| Fluoride in Water by IC | E235.F | 776533 | 1 | 10 | 10.0 | 5.0 | ✓ |
| pH by Meter | E108 | 776528 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Phenols (4AAP) in Water by Colorimetry | E562 | 778198 | 1 | 19 | 5.2 | 5.0 | ✓ |
| Sulfate in Water by IC | E235.SO4 | 776531 | 1 | 11 | 9.0 | 5.0 | ✓ |
| Total Cyanide | E333 | 773103 | 1 | 8 | 12.5 | 5.0 | ✓ |
| Total Kjeldahl Nitrogen by Fluorescence (Low Level) | E318 | 778196 | 1 | 16 | 6.2 | 5.0 | ✓ |
| Total Mercury in Water by CVAAS | E508 | 777748 | 1 | 8 | 12.5 | 5.0 | ✓ |
| Total metals in Water by CRC ICPMS | E420 | 772785 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Total Phosphorus by Colourimetry (0.002 mg/L) | E372-U | 778197 | 1 | 20 | 5.0 | 5.0 | ✓ |
| TSS by Gravimetry | E160 | 775520 | 1 | 18 | 5.5 | 4.7 | ✓ |
| VOCs (Full List) by Headspace GC-MS | E611F | 776870 | 1 | 3 | 33.3 | 5.0 | ✓ |
| Laboratory Control Samples (LCS) | | | | | | | |
| Biochemical Oxygen Demand - 5 day | E550 | 775463 | 1 | 16 | 6.2 | 5.0 | ✓ |
| Fluoride in Water by IC | E235.F | 776533 | 1 | 10 | 10.0 | 5.0 | ✓ |
| Mineral Oil & Grease by Gravimetry | E567SG | 772961 | 1 | 11 | 9.0 | 5.0 | ✓ |
| Oil & Grease by Gravimetry | E567 | 772960 | 1 | 13 | 7.6 | 5.0 | ✓ |
| PAHs by Hexane LVI GC-MS | E641A | 859428 | 1 | 11 | 9.0 | 5.0 | ✓ |
| pH by Meter | E108 | 776528 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Phenols (4AAP) in Water by Colorimetry | E562 | 778198 | 1 | 19 | 5.2 | 5.0 | ✓ |
| Sulfate in Water by IC | E235.SO4 | 776531 | 1 | 11 | 9.0 | 5.0 | ✓ |
| Total Cyanide | E333 | 773103 | 1 | 8 | 12.5 | 5.0 | ✓ |
| Total Kjeldahl Nitrogen by Fluorescence (Low Level) | E318 | 778196 | 1 | 16 | 6.2 | 5.0 | ✓ |
| Total Mercury in Water by CVAAS | E508 | 777748 | 1 | 8 | 12.5 | 5.0 | ✓ |
| Total metals in Water by CRC ICPMS | E420 | 772785 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Total Phosphorus by Colourimetry (0.002 mg/L) | E372-U | 778197 | 1 | 20 | 5.0 | 5.0 | ✓ |
| TSS by Gravimetry | E160 | 775520 | 1 | 18 | 5.5 | 4.7 | ✓ |
| VOCs (Full List) by Headspace GC-MS | E611F | 776870 | 1 | 3 | 33.3 | 5.0 | ✓ |
| Method Blanks (MB) | | | | | | | |
| Biochemical Oxygen Demand - 5 day | E550 | 775463 | 1 | 16 | 6.2 | 5.0 | ✓ |
| E. coli (MF-mFC-BCIG) | E012A.EC | 774372 | 1 | 10 | 10.0 | 5.0 | ✓ |
| Fluoride in Water by IC | E235.F | 776533 | 1 | 10 | 10.0 | 5.0 | ✓ |
| Mineral Oil & Grease by Gravimetry | E567SG | 772961 | 1 | 11 | 9.0 | 5.0 | ✓ |
| Oil & Grease by Gravimetry | E567 | 772960 | 1 | 13 | 7.6 | 5.0 | ✓ |



Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

| Quality Control Sample Type | Method | QC Lot # | Count | | Frequency (%) | | |
|---|----------|----------|-------|---------|---------------|----------|------------|
| | | | QC | Regular | Actual | Expected | Evaluation |
| <i>Analytical Methods</i> | | | | | | | |
| Method Blanks (MB) - Continued | | | | | | | |
| PAHs by Hexane LVI GC-MS | E641A | 859428 | 1 | 11 | 9.0 | 5.0 | ✔ |
| Phenols (4AAP) in Water by Colorimetry | E562 | 778198 | 1 | 19 | 5.2 | 5.0 | ✔ |
| Sulfate in Water by IC | E235.SO4 | 776531 | 1 | 11 | 9.0 | 5.0 | ✔ |
| Total Cyanide | E333 | 773103 | 1 | 8 | 12.5 | 5.0 | ✔ |
| Total Kjeldahl Nitrogen by Fluorescence (Low Level) | E318 | 778196 | 1 | 16 | 6.2 | 5.0 | ✔ |
| Total Mercury in Water by CVAAS | E508 | 777748 | 1 | 8 | 12.5 | 5.0 | ✔ |
| Total metals in Water by CRC ICPMS | E420 | 772785 | 1 | 20 | 5.0 | 5.0 | ✔ |
| Total Phosphorus by Colourimetry (0.002 mg/L) | E372-U | 778197 | 1 | 20 | 5.0 | 5.0 | ✔ |
| TSS by Gravimetry | E160 | 775520 | 1 | 18 | 5.5 | 4.7 | ✔ |
| VOCs (Full List) by Headspace GC-MS | E611F | 776870 | 1 | 3 | 33.3 | 5.0 | ✔ |
| Matrix Spikes (MS) | | | | | | | |
| Fluoride in Water by IC | E235.F | 776533 | 1 | 10 | 10.0 | 5.0 | ✔ |
| Phenols (4AAP) in Water by Colorimetry | E562 | 778198 | 1 | 19 | 5.2 | 5.0 | ✔ |
| Sulfate in Water by IC | E235.SO4 | 776531 | 1 | 11 | 9.0 | 5.0 | ✔ |
| Total Cyanide | E333 | 773103 | 1 | 8 | 12.5 | 5.0 | ✔ |
| Total Kjeldahl Nitrogen by Fluorescence (Low Level) | E318 | 778196 | 1 | 16 | 6.2 | 5.0 | ✔ |
| Total Mercury in Water by CVAAS | E508 | 777748 | 1 | 8 | 12.5 | 5.0 | ✔ |
| Total metals in Water by CRC ICPMS | E420 | 772785 | 1 | 20 | 5.0 | 5.0 | ✔ |
| Total Phosphorus by Colourimetry (0.002 mg/L) | E372-U | 778197 | 1 | 20 | 5.0 | 5.0 | ✔ |
| VOCs (Full List) by Headspace GC-MS | E611F | 776870 | 1 | 3 | 33.3 | 5.0 | ✔ |



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

| Analytical Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|--------------------------------------|--------|-------------------------|--|
| E. coli (MF-mFC-BCIG) | E012A.EC Waterloo - Environmental | Water | ON E3433 (mod) | Following filtration (0.45 µm), and incubation at 44.5±0.2°C for 24 hours, colonies exhibiting characteristic morphology of the target organism are enumerated. |
| pH by Meter | E108 Waterloo - Environmental | Water | APHA 4500-H (mod) | pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time. |
| TSS by Gravimetry | E160 Waterloo - Environmental | Water | APHA 2540 D (mod) | Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples. |
| Fluoride in Water by IC | E235.F Waterloo - Environmental | Water | EPA 300.1 (mod) | Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. |
| Sulfate in Water by IC | E235.SO4 Waterloo - Environmental | Water | EPA 300.1 (mod) | Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. |
| Total Kjeldahl Nitrogen by Fluorescence (Low Level) | E318 Waterloo - Environmental | Water | Method Fialab 100, 2018 | TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021). |
| Total Cyanide | E333 Waterloo - Environmental | Water | ISO 14403 (mod) | Total or Strong Acid Dissociable (SAD) Cyanide is determined by Continuous Flow Analyzer (CFA) with in-line UV digestion followed by colourmetric analysis. Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration). |
| Total Phosphorus by Colourimetry (0.002 mg/L) | E372-U Waterloo - Environmental | Water | APHA 4500-P E (mod). | Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample. |
| Total metals in Water by CRC ICPMS | E420 Waterloo - Environmental | Water | EPA 200.2/6020B (mod) | Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method. |



| Analytical Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---------------------------------------|--------|--|---|
| Total Mercury in Water by CVAAS | E508 Waterloo - Environmental | Water | EPA 1631E (mod) | Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS |
| Biochemical Oxygen Demand - 5 day | E550 Waterloo - Environmental | Water | APHA 5210 B (mod) | Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples. |
| Phenols (4AAP) in Water by Colorimetry | E562 Waterloo - Environmental | Water | EPA 9066 | This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K ₃ Fe(CN) ₆) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically. |
| Oil & Grease by Gravimetry | E567 Waterloo - Environmental | Water | BC MOE Lab Manual (Oil & Grease) (mod) | The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease. |
| Mineral Oil & Grease by Gravimetry | E567SG Waterloo - Environmental | Water | BC MOE Lab Manual (Oil & Grease) (mod) | The entire water sample is extracted with hexane, followed by silica gel treatment after which the extract is evaporated to dryness. The residue is then weighed to determine Mineral Oil and Grease. |
| VOCs (Full List) by Headspace GC-MS | E611F Waterloo - Environmental | Water | EPA 8260D (mod) | Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law. |
| PAHs by Hexane LVI GC-MS | E641A Waterloo - Environmental | Water | EPA 8270E (mod) | Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS. |
| Animal & Vegetable Oil & Grease by Gravimetry | EC567A.SG Waterloo - Environmental | Water | APHA 5520 (mod) | Animal & vegetable oil and grease is calculated as follows: Oil & Grease (gravimetric) minus Mineral Oil & Grease (gravimetric) |

| Preparation Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|-----------------------------------|--------|------------------------|---|
| Digestion for TKN in water | EP318 Waterloo - Environmental | Water | APHA 4500-Norg D (mod) | Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low. |
| Digestion for Total Phosphorus in water | EP372 Waterloo - Environmental | Water | APHA 4500-P E (mod). | Samples are heated with a persulfate digestion reagent. |



| <i>Preparation Methods</i> | <i>Method / Lab</i> | <i>Matrix</i> | <i>Method Reference</i> | <i>Method Descriptions</i> |
|---|---------------------------------------|---------------|--|---|
| Oil & Grease Extraction for Gravimetry | EP567 Waterloo - Environmental | Water | BC MOE Lab Manual (Oil & Grease) (mod) | The entire water sample is extracted with hexane by liquid-liquid extraction. |
| VOCs Preparation for Headspace Analysis | EP581 Waterloo - Environmental | Water | EPA 5021A (mod) | Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system. |
| PHCs and PAHs Hexane Extraction | EP601 Waterloo - Environmental | Water | EPA 3511 (mod) | Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction. |

QUALITY CONTROL REPORT

| | | | |
|--------------------------------|--|--------------------------------|---|
| Work Order | : WT2224508 | Page | : 1 of 10 |
| Amendment | : 1 | | |
| Client | : McClymont & Rak Engineers Inc. | Laboratory | : Waterloo - Environmental |
| Contact | : Richard Sukhu | Account Manager | : Emily Smith |
| Address | : 111 Zenway Blvd. Unit 4 Vaughan ON Canada L4H 3H9 | Address | : 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8 |
| Telephone | : | Telephone | : +1 519 886 6910 |
| Project | : 5820 | Date Samples Received | : 08-Dec-2022 13:54 |
| PO | : ---- | Date Analysis Commenced | : 08-Dec-2022 |
| C-O-C number | : 20-1000498 | Issue Date | : 15-Mar-2023 15:41 |
| Sampler | : CLIENT 416 675 0160 | | |
| Site | : ---- | | |
| Quote number | : 2022 Price List | | |
| No. of samples received | : 2 | | |
| No. of samples analysed | : 2 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| <i>Signatories</i> | <i>Position</i> | <i>Laboratory Department</i> |
|--------------------|---|--|
| Jeremy Gingras | Team Leader - Semi-Volatile Instrumentation | Waterloo Organics, Waterloo, Ontario |
| Jocelyn Kennedy | Department Manager - Semi-Volatile Organics | Waterloo Organics, Waterloo, Ontario |
| Jon Fisher | Department Manager - Inorganics | Waterloo Inorganics, Waterloo, Ontario |
| Jon Fisher | Department Manager - Inorganics | Waterloo Metals, Waterloo, Ontario |
| Manuel Tavaratello | Supervisor - Semi-Volatile Extractions | Waterloo Organics, Waterloo, Ontario |
| Ruby Sujeepan | | Waterloo Microbiology, Waterloo, Ontario |
| Sarah Birch | VOC Section Supervisor | Waterloo Organics, Waterloo, Ontario |

Page : 2 of 10
Work Order : WT2224508 Amendment 1
Client : McClymont & Rak Engineers Inc.
Project : 5820



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

| Sub-Matrix: Water | | | | | Laboratory Duplicate (DUP) Report | | | | | | |
|---|------------------|--|------------|----------|-----------------------------------|-----------|-----------------|------------------|----------------------|------------------|-----------|
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | LOR | Unit | Original Result | Duplicate Result | RPD(%) or Difference | Duplicate Limits | Qualifier |
| Physical Tests (QC Lot: 775520) | | | | | | | | | | | |
| WT2224429-001 | Anonymous | Solids, total suspended [TSS] | ---- | E160 | 5.0 | mg/L | 218 | 234 | 7.09% | 20% | ---- |
| Physical Tests (QC Lot: 776528) | | | | | | | | | | | |
| WT2224728-001 | Anonymous | pH | ---- | E108 | 0.10 | pH units | 8.00 | 7.99 | 0.125% | 4% | ---- |
| Anions and Nutrients (QC Lot: 776531) | | | | | | | | | | | |
| WT2224766-002 | Anonymous | Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.30 | mg/L | 31.3 | 31.1 | 0.474% | 20% | ---- |
| Anions and Nutrients (QC Lot: 776533) | | | | | | | | | | | |
| WT2224766-002 | Anonymous | Fluoride | 16984-48-8 | E235.F | 0.020 | mg/L | 0.051 | 0.051 | 0.00003 | Diff <2x LOR | ---- |
| Anions and Nutrients (QC Lot: 778196) | | | | | | | | | | | |
| WT2224280-002 | Anonymous | Kjeldahl nitrogen, total [TKN] | ---- | E318 | 2.50 | mg/L | 68.6 | 70.7 | 3.04% | 20% | ---- |
| Anions and Nutrients (QC Lot: 778197) | | | | | | | | | | | |
| WT2224280-002 | Anonymous | Phosphorus, total | 7723-14-0 | E372-U | 0.0200 | mg/L | 5.35 | 5.37 | 0.359% | 20% | ---- |
| Cyanides (QC Lot: 773103) | | | | | | | | | | | |
| WT2224459-002 | Anonymous | Cyanide, strong acid dissociable (Total) | ---- | E333 | 0.0020 | mg/L | <0.0020 | <0.0020 | 0 | Diff <2x LOR | ---- |
| Microbiological Tests (QC Lot: 774372) | | | | | | | | | | | |
| WT2224517-001 | Anonymous | Coliforms, Escherichia coli [E. coli] | ---- | E012A.EC | 1 | CFU/100mL | <1 | <1 | 0 | Diff <2x LOR | ---- |
| Total Metals (QC Lot: 772785) | | | | | | | | | | | |
| WT2224434-001 | Anonymous | Aluminum, total | 7429-90-5 | E420 | 0.0030 | mg/L | <0.0030 | <0.0030 | 0 | Diff <2x LOR | ---- |
| | | Antimony, total | 7440-36-0 | E420 | 0.00010 | mg/L | <0.00010 | <0.00010 | 0 | Diff <2x LOR | ---- |
| | | Arsenic, total | 7440-38-2 | E420 | 0.00010 | mg/L | 0.00406 | 0.00416 | 2.46% | 20% | ---- |
| | | Beryllium, total | 7440-41-7 | E420 | 0.000020 | mg/L | <0.000020 | <0.000020 | 0 | Diff <2x LOR | ---- |
| | | Cadmium, total | 7440-43-9 | E420 | 0.0000050 | mg/L | 0.0000081 | 0.0000065 | 0.0000016 | Diff <2x LOR | ---- |
| | | Chromium, total | 7440-47-3 | E420 | 0.00050 | mg/L | <0.00050 | <0.00050 | 0 | Diff <2x LOR | ---- |
| | | Cobalt, total | 7440-48-4 | E420 | 0.00010 | mg/L | 0.00013 | 0.00012 | 0.0000008 | Diff <2x LOR | ---- |
| | | Copper, total | 7440-50-8 | E420 | 0.00050 | mg/L | <0.00050 | <0.00050 | 0 | Diff <2x LOR | ---- |
| | | Iron, total | 7439-89-6 | E420 | 0.010 | mg/L | 0.571 | 0.581 | 1.67% | 20% | ---- |
| | | Lead, total | 7439-92-1 | E420 | 0.000050 | mg/L | 0.000132 | 0.000135 | 0.000003 | Diff <2x LOR | ---- |
| | | Manganese, total | 7439-96-5 | E420 | 0.00010 | mg/L | 0.0672 | 0.0690 | 2.67% | 20% | ---- |
| | | Molybdenum, total | 7439-98-7 | E420 | 0.000050 | mg/L | 0.00240 | 0.00249 | 3.61% | 20% | ---- |
| | | Nickel, total | 7440-02-0 | E420 | 0.00050 | mg/L | <0.00050 | <0.00050 | 0 | Diff <2x LOR | ---- |



| Sub-Matrix: Water | | | | | Laboratory Duplicate (DUP) Report | | | | | | |
|--|------------------|---------------------------------|------------|--------|-----------------------------------|------|-----------------|------------------|----------------------|------------------|-----------|
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | LOR | Unit | Original Result | Duplicate Result | RPD(%) or Difference | Duplicate Limits | Qualifier |
| Total Metals (QC Lot: 772785) - continued | | | | | | | | | | | |
| WT2224434-001 | Anonymous | Selenium, total | 7782-49-2 | E420 | 0.000050 | mg/L | <0.000050 | <0.000050 | 0 | Diff <2x LOR | ---- |
| | | Silver, total | 7440-22-4 | E420 | 0.000010 | mg/L | <0.000010 | <0.000010 | 0 | Diff <2x LOR | ---- |
| | | Tin, total | 7440-31-5 | E420 | 0.00010 | mg/L | <0.00010 | <0.00010 | 0 | Diff <2x LOR | ---- |
| | | Titanium, total | 7440-32-6 | E420 | 0.00030 | mg/L | <0.00030 | <0.00030 | 0 | Diff <2x LOR | ---- |
| | | Zinc, total | 7440-66-6 | E420 | 0.0030 | mg/L | <0.0030 | <0.0030 | 0 | Diff <2x LOR | ---- |
| Total Metals (QC Lot: 777748) | | | | | | | | | | | |
| WT2224508-001 | BH-10 | Mercury, total | 7439-97-6 | E508 | 0.0000050 | mg/L | <0.0000050 | <0.0000050 | 0 | Diff <2x LOR | ---- |
| Aggregate Organics (QC Lot: 775463) | | | | | | | | | | | |
| WT2224508-001 | BH-10 | Biochemical oxygen demand [BOD] | ---- | E550 | 3.0 | mg/L | 3.4 | <3.0 | 12.8% | 30% | ---- |
| Aggregate Organics (QC Lot: 778198) | | | | | | | | | | | |
| WT2224462-001 | Anonymous | Phenols, total (4AAP) | ---- | E562 | 0.0010 | mg/L | 0.0015 | <0.0010 | 0.0005 | Diff <2x LOR | ---- |
| Volatile Organic Compounds (QC Lot: 776870) | | | | | | | | | | | |
| WT2224508-001 | BH-10 | Benzene | 71-43-2 | E611F | 0.50 | µg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| | | Chloroform | 67-66-3 | E611F | 0.50 | µg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| | | Dichlorobenzene, 1,4- | 106-46-7 | E611F | 0.50 | µg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| | | Dichloromethane | 75-09-2 | E611F | 1.0 | µg/L | <1.0 | <1.0 | 0 | Diff <2x LOR | ---- |
| | | Ethylbenzene | 100-41-4 | E611F | 0.50 | µg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| | | Tetrachloroethylene | 127-18-4 | E611F | 0.50 | µg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| | | Toluene | 108-88-3 | E611F | 0.50 | µg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| | | Trichloroethylene | 79-01-6 | E611F | 0.50 | µg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|--|------------|----------|----------|-----------|------------|-----------|
| Physical Tests (QCLot: 775520) | | | | | | |
| Solids, total suspended [TSS] | --- | E160 | 3 | mg/L | <3.0 | --- |
| Anions and Nutrients (QCLot: 776531) | | | | | | |
| Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.3 | mg/L | <0.30 | --- |
| Anions and Nutrients (QCLot: 776533) | | | | | | |
| Fluoride | 16984-48-8 | E235.F | 0.02 | mg/L | <0.020 | --- |
| Anions and Nutrients (QCLot: 778196) | | | | | | |
| Kjeldahl nitrogen, total [TKN] | --- | E318 | 0.05 | mg/L | <0.050 | --- |
| Anions and Nutrients (QCLot: 778197) | | | | | | |
| Phosphorus, total | 7723-14-0 | E372-U | 0.002 | mg/L | <0.0020 | --- |
| Cyanides (QCLot: 773103) | | | | | | |
| Cyanide, strong acid dissociable (Total) | --- | E333 | 0.002 | mg/L | <0.0020 | --- |
| Microbiological Tests (QCLot: 774372) | | | | | | |
| Coliforms, Escherichia coli [E. coli] | --- | E012A.EC | 1 | CFU/100mL | <1 | --- |
| Total Metals (QCLot: 772785) | | | | | | |
| Aluminum, total | 7429-90-5 | E420 | 0.003 | mg/L | <0.0030 | --- |
| Antimony, total | 7440-36-0 | E420 | 0.0001 | mg/L | <0.00010 | --- |
| Arsenic, total | 7440-38-2 | E420 | 0.0001 | mg/L | <0.00010 | --- |
| Beryllium, total | 7440-41-7 | E420 | 0.00002 | mg/L | <0.000020 | --- |
| Cadmium, total | 7440-43-9 | E420 | 0.000005 | mg/L | <0.0000050 | --- |
| Chromium, total | 7440-47-3 | E420 | 0.0005 | mg/L | <0.00050 | --- |
| Cobalt, total | 7440-48-4 | E420 | 0.0001 | mg/L | <0.00010 | --- |
| Copper, total | 7440-50-8 | E420 | 0.0005 | mg/L | <0.00050 | --- |
| Iron, total | 7439-89-6 | E420 | 0.01 | mg/L | <0.010 | --- |
| Lead, total | 7439-92-1 | E420 | 0.00005 | mg/L | <0.000050 | --- |
| Manganese, total | 7439-96-5 | E420 | 0.0001 | mg/L | <0.00010 | --- |
| Molybdenum, total | 7439-98-7 | E420 | 0.00005 | mg/L | <0.000050 | --- |
| Nickel, total | 7440-02-0 | E420 | 0.0005 | mg/L | <0.00050 | --- |
| Selenium, total | 7782-49-2 | E420 | 0.00005 | mg/L | <0.000050 | --- |
| Silver, total | 7440-22-4 | E420 | 0.00001 | mg/L | <0.000010 | --- |
| Tin, total | 7440-31-5 | E420 | 0.0001 | mg/L | <0.00010 | --- |
| Titanium, total | 7440-32-6 | E420 | 0.0003 | mg/L | <0.00030 | --- |
| Zinc, total | 7440-66-6 | E420 | 0.003 | mg/L | <0.0030 | --- |



Sub-Matrix: **Water**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|------------|--------|----------|------|------------|-----------|
| Total Metals (QCLot: 77748) | | | | | | |
| Mercury, total | 7439-97-6 | E508 | 0.000005 | mg/L | <0.0000050 | ---- |
| Aggregate Organics (QCLot: 772960) | | | | | | |
| Oil & grease (gravimetric) | ---- | E567 | 5 | mg/L | <5.0 | ---- |
| Aggregate Organics (QCLot: 772961) | | | | | | |
| Oil & grease, mineral (gravimetric) | ---- | E567SG | 5 | mg/L | <5.0 | ---- |
| Aggregate Organics (QCLot: 775463) | | | | | | |
| Biochemical oxygen demand [BOD] | ---- | E550 | 2 | mg/L | <2.0 | ---- |
| Aggregate Organics (QCLot: 778198) | | | | | | |
| Phenols, total (4AAP) | ---- | E562 | 0.001 | mg/L | <0.0010 | ---- |
| Volatile Organic Compounds (QCLot: 776870) | | | | | | |
| Benzene | 71-43-2 | E611F | 0.5 | µg/L | <0.50 | ---- |
| Chloroform | 67-66-3 | E611F | 0.5 | µg/L | <0.50 | ---- |
| Dichlorobenzene, 1,4- | 106-46-7 | E611F | 0.5 | µg/L | <0.50 | ---- |
| Dichloromethane | 75-09-2 | E611F | 1 | µg/L | <1.0 | ---- |
| Ethylbenzene | 100-41-4 | E611F | 0.5 | µg/L | <0.50 | ---- |
| Tetrachloroethylene | 127-18-4 | E611F | 0.5 | µg/L | <0.50 | ---- |
| Toluene | 108-88-3 | E611F | 0.5 | µg/L | <0.50 | ---- |
| Trichloroethylene | 79-01-6 | E611F | 0.5 | µg/L | <0.50 | ---- |
| Polycyclic Aromatic Hydrocarbons (QCLot: 859428) | | | | | | |
| Naphthalene | 91-20-3 | E641A | 0.05 | µg/L | <0.050 | ---- |



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

| | | | | | Laboratory Control Sample (LCS) Report | | | | |
|---|------------|----------|----------|----------|--|--------------|---------------------|------|-----------|
| | | | | | Spike | Recovery (%) | Recovery Limits (%) | | |
| Analyte | CAS Number | Method | LOR | Unit | Concentration | LCS | Low | High | Qualifier |
| Physical Tests (QCLot: 775520) | | | | | | | | | |
| Solids, total suspended [TSS] | ---- | E160 | 3 | mg/L | 150 mg/L | 100 | 85.0 | 115 | ---- |
| Physical Tests (QCLot: 776528) | | | | | | | | | |
| pH | ---- | E108 | ---- | pH units | 7 pH units | 101 | 98.0 | 102 | ---- |
| Anions and Nutrients (QCLot: 776531) | | | | | | | | | |
| Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.3 | mg/L | 100 mg/L | 100 | 90.0 | 110 | ---- |
| Anions and Nutrients (QCLot: 776533) | | | | | | | | | |
| Fluoride | 16984-48-8 | E235.F | 0.02 | mg/L | 1 mg/L | 102 | 90.0 | 110 | ---- |
| Anions and Nutrients (QCLot: 778196) | | | | | | | | | |
| Kjeldahl nitrogen, total [TKN] | ---- | E318 | 0.05 | mg/L | 4 mg/L | 110 | 75.0 | 125 | ---- |
| Anions and Nutrients (QCLot: 778197) | | | | | | | | | |
| Phosphorus, total | 7723-14-0 | E372-U | 0.002 | mg/L | 0.845 mg/L | 98.3 | 80.0 | 120 | ---- |
| Cyanides (QCLot: 773103) | | | | | | | | | |
| Cyanide, strong acid dissociable (Total) | ---- | E333 | 0.002 | mg/L | 0.25 mg/L | 91.0 | 80.0 | 120 | ---- |
| Total Metals (QCLot: 772785) | | | | | | | | | |
| Aluminum, total | 7429-90-5 | E420 | 0.003 | mg/L | 0.1 mg/L | 96.7 | 80.0 | 120 | ---- |
| Antimony, total | 7440-36-0 | E420 | 0.0001 | mg/L | 0.05 mg/L | 99.0 | 80.0 | 120 | ---- |
| Arsenic, total | 7440-38-2 | E420 | 0.0001 | mg/L | 0.05 mg/L | 102 | 80.0 | 120 | ---- |
| Beryllium, total | 7440-41-7 | E420 | 0.00002 | mg/L | 0.005 mg/L | 93.7 | 80.0 | 120 | ---- |
| Cadmium, total | 7440-43-9 | E420 | 0.000005 | mg/L | 0.005 mg/L | 97.1 | 80.0 | 120 | ---- |
| Chromium, total | 7440-47-3 | E420 | 0.0005 | mg/L | 0.0125 mg/L | 95.6 | 80.0 | 120 | ---- |
| Cobalt, total | 7440-48-4 | E420 | 0.0001 | mg/L | 0.0125 mg/L | 96.5 | 80.0 | 120 | ---- |
| Copper, total | 7440-50-8 | E420 | 0.0005 | mg/L | 0.0125 mg/L | 95.6 | 80.0 | 120 | ---- |
| Iron, total | 7439-89-6 | E420 | 0.01 | mg/L | 0.05 mg/L | 94.5 | 80.0 | 120 | ---- |
| Lead, total | 7439-92-1 | E420 | 0.00005 | mg/L | 0.025 mg/L | 94.7 | 80.0 | 120 | ---- |
| Manganese, total | 7439-96-5 | E420 | 0.0001 | mg/L | 0.0125 mg/L | 96.7 | 80.0 | 120 | ---- |
| Molybdenum, total | 7439-98-7 | E420 | 0.00005 | mg/L | 0.0125 mg/L | 96.4 | 80.0 | 120 | ---- |
| Nickel, total | 7440-02-0 | E420 | 0.0005 | mg/L | 0.025 mg/L | 95.7 | 80.0 | 120 | ---- |
| Selenium, total | 7782-49-2 | E420 | 0.00005 | mg/L | 0.05 mg/L | 95.6 | 80.0 | 120 | ---- |
| Silver, total | 7440-22-4 | E420 | 0.00001 | mg/L | 0.005 mg/L | 88.7 | 80.0 | 120 | ---- |
| Tin, total | 7440-31-5 | E420 | 0.0001 | mg/L | 0.025 mg/L | 94.9 | 80.0 | 120 | ---- |



Sub-Matrix: **Water**

| | | | | | Laboratory Control Sample (LCS) Report | | | | |
|---|------------|--------|----------|------|--|--------------|---------------------|------|-----------|
| | | | | | Spike | Recovery (%) | Recovery Limits (%) | | |
| Analyte | CAS Number | Method | LOR | Unit | Concentration | LCS | Low | High | Qualifier |
| Total Metals (QCLot: 772785) - continued | | | | | | | | | |
| Titanium, total | 7440-32-6 | E420 | 0.0003 | mg/L | 0.0125 mg/L | 90.9 | 80.0 | 120 | ---- |
| Zinc, total | 7440-66-6 | E420 | 0.003 | mg/L | 0.025 mg/L | 97.8 | 80.0 | 120 | ---- |
| Total Metals (QCLot: 777748) | | | | | | | | | |
| Mercury, total | 7439-97-6 | E508 | 0.000005 | mg/L | 0.0001 mg/L | 99.0 | 80.0 | 120 | ---- |
| Aggregate Organics (QCLot: 772960) | | | | | | | | | |
| Oil & grease (gravimetric) | ---- | E567 | 5 | mg/L | 200 mg/L | 98.0 | 70.0 | 130 | ---- |
| Aggregate Organics (QCLot: 772961) | | | | | | | | | |
| Oil & grease, mineral (gravimetric) | ---- | E567SG | 5 | mg/L | 100 mg/L | 85.7 | 70.0 | 130 | ---- |
| Aggregate Organics (QCLot: 775463) | | | | | | | | | |
| Biochemical oxygen demand [BOD] | ---- | E550 | 2 | mg/L | 198 mg/L | 105 | 85.0 | 115 | ---- |
| Aggregate Organics (QCLot: 778198) | | | | | | | | | |
| Phenols, total (4AAP) | ---- | E562 | 0.001 | mg/L | 0.02 mg/L | 105 | 85.0 | 115 | ---- |
| Volatile Organic Compounds (QCLot: 776870) | | | | | | | | | |
| Benzene | 71-43-2 | E611F | 0.5 | µg/L | 100 µg/L | 95.6 | 70.0 | 130 | ---- |
| Chloroform | 67-66-3 | E611F | 0.5 | µg/L | 100 µg/L | 90.5 | 70.0 | 130 | ---- |
| Dichlorobenzene, 1,4- | 106-46-7 | E611F | 0.5 | µg/L | 100 µg/L | 96.4 | 70.0 | 130 | ---- |
| Dichloromethane | 75-09-2 | E611F | 1 | µg/L | 100 µg/L | 102 | 70.0 | 130 | ---- |
| Ethylbenzene | 100-41-4 | E611F | 0.5 | µg/L | 100 µg/L | 92.6 | 70.0 | 130 | ---- |
| Tetrachloroethylene | 127-18-4 | E611F | 0.5 | µg/L | 100 µg/L | 93.2 | 70.0 | 130 | ---- |
| Toluene | 108-88-3 | E611F | 0.5 | µg/L | 100 µg/L | 99.0 | 70.0 | 130 | ---- |
| Trichloroethylene | 79-01-6 | E611F | 0.5 | µg/L | 100 µg/L | 94.9 | 70.0 | 130 | ---- |
| Polycyclic Aromatic Hydrocarbons (QCLot: 859428) | | | | | | | | | |
| Naphthalene | 91-20-3 | E641A | 0.05 | µg/L | 0.5263 µg/L | 76.1 | 50.0 | 140 | ---- |



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

| | | | | | Matrix Spike (MS) Report | | | | | |
|---|------------------|--|------------|----------|--------------------------|-------------|--------------|---------------------|------|-----------|
| | | | | | Spike | | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | Concentration | Target | MS | Low | High | Qualifier |
| Anions and Nutrients (QCLot: 776531) | | | | | | | | | | |
| WT2224766-002 | Anonymous | Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 96.7 mg/L | 100 mg/L | 96.7 | 75.0 | 125 | ---- |
| Anions and Nutrients (QCLot: 776533) | | | | | | | | | | |
| WT2224766-002 | Anonymous | Fluoride | 16984-48-8 | E235.F | 0.956 mg/L | 1 mg/L | 95.6 | 75.0 | 125 | ---- |
| Anions and Nutrients (QCLot: 778196) | | | | | | | | | | |
| WT2224280-002 | Anonymous | Kjeldahl nitrogen, total [TKN] | ---- | E318 | ND mg/L | 2.5 mg/L | ND | 70.0 | 130 | ---- |
| Anions and Nutrients (QCLot: 778197) | | | | | | | | | | |
| WT2224280-002 | Anonymous | Phosphorus, total | 7723-14-0 | E372-U | ND mg/L | 0.1 mg/L | ND | 70.0 | 130 | ---- |
| Cyanides (QCLot: 773103) | | | | | | | | | | |
| WT2224459-002 | Anonymous | Cyanide, strong acid dissociable (Total) | ---- | E333 | 0.232 mg/L | 0.25 mg/L | 92.6 | 75.0 | 125 | ---- |
| Total Metals (QCLot: 772785) | | | | | | | | | | |
| WT2224480-001 | Anonymous | Aluminum, total | 7429-90-5 | E420 | ND mg/L | 0.1 mg/L | ND | 70.0 | 130 | ---- |
| | | Antimony, total | 7440-36-0 | E420 | 0.0486 mg/L | 0.05 mg/L | 97.2 | 70.0 | 130 | ---- |
| | | Arsenic, total | 7440-38-2 | E420 | 0.0504 mg/L | 0.05 mg/L | 101 | 70.0 | 130 | ---- |
| | | Beryllium, total | 7440-41-7 | E420 | 0.00491 mg/L | 0.005 mg/L | 98.3 | 70.0 | 130 | ---- |
| | | Cadmium, total | 7440-43-9 | E420 | 0.00480 mg/L | 0.005 mg/L | 96.1 | 70.0 | 130 | ---- |
| | | Chromium, total | 7440-47-3 | E420 | 0.0127 mg/L | 0.0125 mg/L | 102 | 70.0 | 130 | ---- |
| | | Cobalt, total | 7440-48-4 | E420 | 0.0120 mg/L | 0.0125 mg/L | 96.1 | 70.0 | 130 | ---- |
| | | Copper, total | 7440-50-8 | E420 | 0.0113 mg/L | 0.0125 mg/L | 90.8 | 70.0 | 130 | ---- |
| | | Iron, total | 7439-89-6 | E420 | ND mg/L | 0.05 mg/L | ND | 70.0 | 130 | ---- |
| | | Lead, total | 7439-92-1 | E420 | 0.0239 mg/L | 0.025 mg/L | 95.7 | 70.0 | 130 | ---- |
| | | Manganese, total | 7439-96-5 | E420 | ND mg/L | 0.0125 mg/L | ND | 70.0 | 130 | ---- |
| | | Molybdenum, total | 7439-98-7 | E420 | 0.0122 mg/L | 0.0125 mg/L | 97.6 | 70.0 | 130 | ---- |
| | | Nickel, total | 7440-02-0 | E420 | 0.0232 mg/L | 0.025 mg/L | 92.8 | 70.0 | 130 | ---- |
| | | Selenium, total | 7782-49-2 | E420 | 0.0494 mg/L | 0.05 mg/L | 98.8 | 70.0 | 130 | ---- |
| | | Silver, total | 7440-22-4 | E420 | 0.00456 mg/L | 0.005 mg/L | 91.1 | 70.0 | 130 | ---- |
| | | Tin, total | 7440-31-5 | E420 | 0.0235 mg/L | 0.025 mg/L | 94.0 | 70.0 | 130 | ---- |
| | | Titanium, total | 7440-32-6 | E420 | ND mg/L | 0.0125 mg/L | ND | 70.0 | 130 | ---- |
| | | Zinc, total | 7440-66-6 | E420 | 0.0228 mg/L | 0.025 mg/L | 91.0 | 70.0 | 130 | ---- |
| Total Metals (QCLot: 777748) | | | | | | | | | | |
| WT2224854-001 | Anonymous | Mercury, total | 7439-97-6 | E508 | 0.0000953 mg/L | 0.0001 mg/L | 95.3 | 70.0 | 130 | ---- |



Sub-Matrix: **Water**

| | | | | | Matrix Spike (MS) Report | | | | | |
|---|------------------|-----------------------|------------|--------|--------------------------|-----------|--------------|---------------------|------|-----------|
| | | | | | Spike | | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | Concentration | Target | MS | Low | High | Qualifier |
| Aggregate Organics (QCLot: 778198) | | | | | | | | | | |
| WT2224462-001 | Anonymous | Phenols, total (4AAP) | ---- | E562 | 0.0203 mg/L | 0.02 mg/L | 102 | 75.0 | 125 | ---- |
| Volatile Organic Compounds (QCLot: 776870) | | | | | | | | | | |
| WT2224508-001 | BH-10 | Benzene | 71-43-2 | E611F | 96.8 µg/L | 100 µg/L | 96.8 | 60.0 | 140 | ---- |
| | | Chloroform | 67-66-3 | E611F | 94.8 µg/L | 100 µg/L | 94.8 | 60.0 | 140 | ---- |
| | | Dichlorobenzene, 1,4- | 106-46-7 | E611F | 101 µg/L | 100 µg/L | 101 | 60.0 | 140 | ---- |
| | | Dichloromethane | 75-09-2 | E611F | 105 µg/L | 100 µg/L | 105 | 60.0 | 140 | ---- |
| | | Ethylbenzene | 100-41-4 | E611F | 94.1 µg/L | 100 µg/L | 94.1 | 60.0 | 140 | ---- |
| | | Tetrachloroethylene | 127-18-4 | E611F | 91.2 µg/L | 100 µg/L | 91.2 | 60.0 | 140 | ---- |
| | | Toluene | 108-88-3 | E611F | 101 µg/L | 100 µg/L | 101 | 60.0 | 140 | ---- |
| | | Trichloroethylene | 79-01-6 | E611F | 94.2 µg/L | 100 µg/L | 94.2 | 60.0 | 140 | ---- |



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Chain of Custody (COC) / Analytical Request Form

COC Number: 20-1000498

Page 2 of 1

Report To: **Richard & Rachel Eng**
Company: **Richard & Rachel Eng**
Contact: **Richard & Rachel Eng**
Phone: **416-561-9264**
Company address below will appear on the final report

Street: **11120 Hurontario Blvd**
City/Province: **Leedsbridge**
Postal Code:
Invoice To: **Same as Report To** YES NO
Copy of Invoice with Report YES NO

Company:
Contact:
Project Information

ALS Account # / Quote #: **5820**
Job #:
PO / AFE:
LSD:

ALS Lab Work Order # (ALS use only):
Sample Identification and/or Coordinates
(This description will appear on the report)
BH-10

ALS Sample # (ALS use only):
Date: **8/24/2022**
Time: **9:57**
Sample Type: **Gas**

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Drinking Water (DW) Samples (client use)
 YES NO
Are samples taken from a Regulated DW System? YES NO
Are samples for human consumption/ use? YES NO

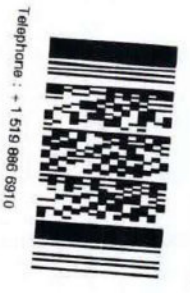
Released by: Date:
SHIPMENT RELEASE (client use)

Initial Shipment Reception (ALS use only)
Time: Received by: Date:

Turnaround Time (TAT) Requested
 Routine (R) if received by 3pm M-F - no surcharges apply
 4 day (P4) if received by 3pm M-F - 20% rush surcharge minimum
 3 day (P3) if received by 3pm M-F - 25% rush surcharge minimum
 2 day (P2) if received by 3pm M-F - 50% rush surcharge minimum
 1 day (E) if received by 3pm M-F - 100% rush surcharge minimum
Same day (E2) if received by 10am M-S - 200% rush surcharge. Additional may apply to rush requests on weekends, statutory holidays and non-rat

DATE AND TIME REQUIRED FOR ALL EAP TATS:
For all tests with rush TATS requested, please indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP)

WHITE - LABORATORY COPY
YELLOW - CLIENT COPY
COOLING METHOD: NONE ICE ICE PACKS FROZEN COOLING INITIATED
Submission Comments Identified on Sample Receipt Notification: YES NO
Cooler Custody Seals Intact: YES N/A Sample Custody Seals Intact: YES N/A
INITIAL COOLER TEMPERATURES °C: **15.1** **14.6**
FINAL COOLER TEMPERATURES °C:
FINAL SHIPMENT RECEPTION (ALS use only)
Time: Received by: Date: **8/22** Time:



Environmental Division
Waterloo
Work Order Reference
WT2224508

Telephone: +1 519 886 8910

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.
1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 21

Page

Environmental Division
Waterloo
Work Order Reference
WT2224508



Telephone: +1 519 886 6910

Contact and company name below will appear on the final report

Reports / Recipients

Turnaround Time (TAT) Requested

Company: **McGlynn & Rak**
 Contact: **Rickard Sukhrie**
 Phone: **875-0180**
 Company address below will appear on the final report

Select Report Format: PDF EXCEL ESD (DIGITAL)
 Merge COC/COI Reports with COA YES NO N/A
 Complete Results to Criteria on Report - provide details below if box checked
 Selected Distribution: EMAIL MAIL FAX
 Email 1 or Fax: **rsukhrie@mcgrak.com**
 Email 2
 Email 3

Street: **ZENNAR**
 City/Province: **VAUGHAN**

Select Invoice Distribution: EMAIL MAIL FAX
 Invoice Recipients

Postal Code: **Same as Report To**
 Invoice To: YES NO
 Copy of Invoice with Report: YES NO

Select Invoice Distribution: EMAIL MAIL FAX
 Email 1 or Fax

Company: **Project Information**

ALS Account # / Quote #: **5820**
 Job #: **5820**
 PO / A/E:
 Location:

ALS Lab Work Order # (ALS use only):

ALS Contact:

Sample Identification and/or Coordinates (This description will appear on the report)

Date (dd-mm-yy) Time (hh:mm) Sample Type

ALS Sample # (ALS use only): **BYRD**

ALS Lab Work Order # (ALS use only):

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Received by: **WT2224508**

Released by: **SHIPMENT RELEASE (client use)**

Initial Shipment Reception (ALS use only)

Released by: **Date:**

Received by: **Date:**

Released by: **Date:**

Received by: **Date:**

Released by: **Date:**

Received by: **Date:**

Released by: **Date:**

Received by: **Date:**

Released by: **Date:**

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Released by: **Date:**

Received by: **Date:**

Released by: **Date:**

Received by: **Date:**

Released by: **Date:**

Received by: **Date:**

Released by: **Date:**

Received by: **Date:**

For all tests with rush TATs requested, please contact your A/E to confirm availability.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below

| NUMBER OF CONTAINERS | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 | Sample 6 | Sample 7 | Sample 8 | Sample 9 | Sample 10 |
|----------------------|------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| 1 | X | | | | | | | | | |
| | Hg | | | | | | | | | |
| | HALTON/MILTON | | | | | | | | | |
| | STORM + SANITARY | | | | | | | | | |
| | SEWER CODE | | | | | | | | | |

SAMPLES ON HOLD

EXTENDED STORAGE REQUIRED

SUSPECTED HAZARD (see notes)

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

MM-540



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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 887691

Page 1 of 1

Contact and company name below will appear on the final report

Reports / Recipients

Turnaround Time (TAT) Requested

Environmental Division
Waterloo
Work Order Reference
WT2224508

Company: **McGOWAN & PAE ENGINEERS**
Contact: **RICHARD SUREHA**
Phone: _____
Company address below will appear on the final report

Select Report Format: PDF EXCEL BDD (DIGITAL)
Merge QC/QCI Reports with COA YES NO N/A
Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: EMAIL MAIL FAX

Routine (R) if received by 3pm M-F - no surcharges apply
 4 day (P4) if received by 3pm M-F - 20% rush surcharge minimum
 3 day (P3) if received by 3pm M-F - 25% rush surcharge minimum
 2 day (P2) if received by 3pm M-F - 50% rush surcharge minimum
 1 day (E) if received by 3pm M-F - 100% rush surcharge minimum
Same day (E2) if received by 3pm M-F - 200% rush surcharge. Additional may apply to rush requests on weekends, statutory holidays and non-routine

Street: **11 ZERUWAY BUD**
City/Province: **VANUGHAN / ON**

Email 1 or Fax: **rsureha@mcgrak.com**
Email 2
Email 3

Date and Time Required for all E2/E1/E3 TATs: _____
For all tests with rush TATs requested, please contact
Indicate Filtered (F), Preserved (P) or Filtered and P
Analyst's Requ

Postal Code: _____
Invoice To: Same as Report To YES NO
Copy of Invoice with Report: YES NO

Select Invoice Distribution: EMAIL MAIL FAX
Invoice Recipients

Project Information

Company: _____
Contract: _____

ALS Account # / Quote #: _____
Job #: **5520**
PO / A/E: _____
LSD: _____

Oil and Gas Required Fields (client use)
AFE/Coast Center: _____ PO#: _____
Major/Minor Code: _____ Routing Code: _____
Requisitioner: _____
Location: _____

ALS Lab Work Order # (ALS use only): _____

ALS Contact: _____

NUMBER OF CONTAINERS: **2**
Halton Region
Storm + Sanitary
Gener
***Naphthalene**

ALS Sample # (ALS use only): **RH10**
Sample Identification and/or Coordinates (This description will appear on the report)

Date: **07-MAR-23** Time: **8:00** Sample Type: **GRU**

SAMPLES ON HOLIDAY
EXTENDED STORAGE RISK
SUSPECTED HAZARD (S)

Drinking Water (DW) Samples (client use)
 YES NO
Are samples taken from a Regulated DW System?
Are samples for human consumption/use?
 YES NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Reference WT2224508

Cooling Method: NONE ICE ICE BAGS FROZEN COOLING INITIALIZED
Subsidence Containers identified on Sample Receipt Notification: YES NO
Cooler Custody Seal Intact: YES NO
INITIAL COOLER TEMPERATURES: _____
FINAL COOLER TEMPERATURES: _____

Released by: **MCD** Date: **3/9/23** Time: _____
Received by: _____ Date: _____ Time: _____
SHIPMENT RELEASE (client use)
INITIAL SHIPMENT RECEIPTON (ALS use only)

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.
1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form

WHITE - LABORATORY COPY
YELLOW - CLIENT COPY

DATE RECEIVED DETAIL (ALS use only)
Cooling Method: NONE ICE ICE BAGS FROZEN COOLING INITIALIZED
Subsidence Containers identified on Sample Receipt Notification: YES NO
Cooler Custody Seal Intact: YES NO
INITIAL COOLER TEMPERATURES: _____
FINAL COOLER TEMPERATURES: _____

Released by: **MCD** Date: **3/9/23** Time: _____
Received by: **FA** Date: **2023-03-09** Time: **5:15 PM**
SHIPMENT RELEASE (client use)
INITIAL SHIPMENT RECEIPTON (ALS use only)



Telephone: - 1 519 886 6910

OL-359

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

| | |
|--|---|
| Work Order : WT2224510 | Page : 1 of 5 |
| Amendment : 1 | |
| Client : McClymont & Rak Engineers Inc. | Laboratory : Waterloo - Environmental |
| Contact : Richard Sukhu | Account Manager : Emily Smith |
| Address : 111 Zenway Blvd. Unit 4 Vaughan ON Canada L4H 3H9 | Address : 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8 |
| Telephone : 416 675 0160 | Telephone : +1 519 886 6910 |
| Project : 5820 | Date Samples Received : 08-Dec-2022 13:54 |
| PO : ---- | Date Analysis Commenced : 08-Dec-2022 |
| C-O-C number : 20-1000499 | Issue Date : 15-Mar-2023 15:19 |
| Sampler : CLIENT | |
| Site : ---- | |
| Quote number : 2022 Price List | |
| No. of samples received : 2 | |
| No. of samples analysed : 2 | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| <i>Signatories</i> | <i>Position</i> | <i>Laboratory Department</i> |
|--------------------|---|---------------------------------|
| Jeremy Gingras | Team Leader - Semi-Volatile Instrumentation | Organics, Waterloo, Ontario |
| Jocelyn Kennedy | Department Manager - Semi-Volatile Organics | Organics, Waterloo, Ontario |
| Jon Fisher | Department Manager - Inorganics | Inorganics, Waterloo, Ontario |
| Jon Fisher | Department Manager - Inorganics | Metals, Waterloo, Ontario |
| Manuel Tavaratello | Supervisor - Semi-Volatile Extractions | Organics, Waterloo, Ontario |
| Ruby Sujeepan | | Microbiology, Waterloo, Ontario |
| Sarah Birch | VOC Section Supervisor | Organics, Waterloo, Ontario |

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

| <i>Unit</i> | <i>Description</i> |
|-------------|--|
| µg/L | micrograms per litre |
| CFU/100mL | colony forming units per hundred millilitres |
| mg/L | milligrams per litre |
| pH units | pH units |

>: greater than.

<: less than.

Red shading is applied where the result is greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.

For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit .

Qualifiers

| <i>Qualifier</i> | <i>Description</i> |
|------------------|---|
| BODL | <i>Limit of Reporting for BOD was increased to account for the largest volume of sample tested.</i> |
| DLDS | <i>Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.</i> |
| DLHC | <i>Detection Limit Raised: Dilution required due to high concentration of test analyte(s).</i> |
| DLQ | <i>Detection Limit raised due to co-eluting interference. Mass Spectrometry qualifier ion ratio did not meet acceptance criteria.</i> |



Analytical Results

| Analyte | Method | LOR | Unit | Client sample ID | | | | | | |
|--|----------|-----------|-----------|--------------------|-----------------|--------------------|---------------|----|----|----|
| | | | | BH-1 | | | | | | |
| Sub-Matrix: Groundwater (Matrix: Water) | | | | Sampling date/time | | | | | | |
| | | | | WT2224510-001 | HALSUB SAN | HALSUB STM | | | | |
| Physical Tests | | | | | | | | | | |
| pH | E108 | 0.10 | pH units | 8.22 | 6 - 10 pH units | 6.5 - 8.5 pH units | -- | -- | -- | -- |
| Solids, total suspended [TSS] | E160 | 3.0 | mg/L | 11.8 | 350 mg/L | -- | -- | -- | -- | -- |
| Anions and Nutrients | | | | | | | | | | |
| Fluoride | E235.F | 0.020 | mg/L | 0.182 | DLDS | 10 mg/L | -- | -- | -- | -- |
| Kjeldahl nitrogen, total [TKN] | E318 | 0.050 | mg/L | 0.112 | | 100 mg/L | -- | -- | -- | -- |
| Phosphorus, total | E372-U | 0.0020 | mg/L | 0.0167 | | 10 mg/L | -- | -- | -- | -- |
| Sulfate (as SO4) | E235.SO4 | 0.30 | mg/L | 305 | DLDS | 1500 mg/L | -- | -- | -- | -- |
| Cyanides | | | | | | | | | | |
| Cyanide, strong acid dissociable (Total) | E333 | 0.0020 | mg/L | <0.0020 | | 2 mg/L | -- | -- | -- | -- |
| Microbiological Tests | | | | | | | | | | |
| Coliforms, Escherichia coli [E. coli] | E012A.EC | 1 | CFU/100mL | Not Detected | | -- | 200 CFU/100mL | -- | -- | -- |
| Total Metals | | | | | | | | | | |
| Aluminum, total | E420 | 0.0030 | mg/L | 0.387 | DLHC | 50 mg/L | -- | -- | -- | -- |
| Antimony, total | E420 | 0.00010 | mg/L | <0.00100 | DLHC | 5 mg/L | -- | -- | -- | -- |
| Arsenic, total | E420 | 0.00010 | mg/L | 0.00461 | DLHC | 1 mg/L | -- | -- | -- | -- |
| Beryllium, total | E420 | 0.000020 | mg/L | <0.000200 | DLHC | 5 mg/L | -- | -- | -- | -- |
| Cadmium, total | E420 | 0.0000050 | mg/L | <0.0000500 | DLHC | 1 mg/L | -- | -- | -- | -- |
| Chromium, total | E420 | 0.00050 | mg/L | <0.00500 | DLHC | 3 mg/L | -- | -- | -- | -- |
| Cobalt, total | E420 | 0.00010 | mg/L | 0.00108 | DLHC | 5 mg/L | -- | -- | -- | -- |
| Copper, total | E420 | 0.00050 | mg/L | <0.00500 | DLHC | 3 mg/L | -- | -- | -- | -- |
| Iron, total | E420 | 0.010 | mg/L | 0.777 | DLHC | 50 mg/L | -- | -- | -- | -- |
| Lead, total | E420 | 0.000050 | mg/L | <0.000500 | DLHC | 3 mg/L | -- | -- | -- | -- |
| Manganese, total | E420 | 0.00010 | mg/L | 0.510 | DLHC | 5 mg/L | -- | -- | -- | -- |
| Mercury, total | E508 | 0.0000050 | mg/L | <0.0000050 | | 0.05 mg/L | -- | -- | -- | -- |
| Molybdenum, total | E420 | 0.000050 | mg/L | 0.00532 | DLHC | 5 mg/L | -- | -- | -- | -- |
| Nickel, total | E420 | 0.00050 | mg/L | <0.00500 | DLHC | 3 mg/L | -- | -- | -- | -- |
| Selenium, total | E420 | 0.000050 | mg/L | <0.000500 | DLHC | 5 mg/L | -- | -- | -- | -- |
| Silver, total | E420 | 0.000010 | mg/L | <0.000100 | DLHC | 5 mg/L | -- | -- | -- | -- |
| Tin, total | E420 | 0.00010 | mg/L | 0.00198 | DLHC | 5 mg/L | -- | -- | -- | -- |



| Analyte | Method | LOR | Unit | WT2224510-001 (Continued) | | HALSUB SAN | HALSUB STM | | | | |
|---|-----------|---------|------|------------------------------|------|---------------|---------------|----|----|----|----|
| Total Metals - Continued | | | | | | | | | | | |
| Titanium, total | E420 | 0.00030 | mg/L | 0.00848 | DLHC | 5 mg/L | -- | -- | -- | -- | -- |
| Zinc, total | E420 | 0.0030 | mg/L | <0.0300 | DLHC | 3 mg/L | -- | -- | -- | -- | -- |
| Aggregate Organics | | | | | | | | | | | |
| Biochemical oxygen demand [BOD] | E550 | 2.0 | mg/L | <3.0 | BODL | 300 mg/L | -- | -- | -- | -- | -- |
| Oil & grease (gravimetric) | E567 | 5.0 | mg/L | <5.0 | | -- | -- | -- | -- | -- | -- |
| Oil & grease, animal/vegetable (gravimetric) | EC567A.SG | 5.0 | mg/L | <5.0 | | 150 mg/L | -- | -- | -- | -- | -- |
| Oil & grease, mineral (gravimetric) | E567SG | 5.0 | mg/L | <5.0 | | 15 mg/L | -- | -- | -- | -- | -- |
| Phenols, total (4AAP) | E562 | 0.0010 | mg/L | <0.0010 | | 1 mg/L | -- | -- | -- | -- | -- |
| Volatile Organic Compounds [Drycleaning] | | | | | | | | | | | |
| Dichloromethane | E611F | 1.0 | µg/L | <1.0 | | 2000 µg/L | -- | -- | -- | -- | -- |
| Tetrachloroethylene | E611F | 0.50 | µg/L | <0.50 | | 1000 µg/L | -- | -- | -- | -- | -- |
| Trichloroethylene | E611F | 0.50 | µg/L | <4.00 | DLQ | 400 µg/L | -- | -- | -- | -- | -- |
| Benzene | E611F | 0.50 | µg/L | <0.50 | | 10 µg/L | -- | -- | -- | -- | -- |
| Ethylbenzene | E611F | 0.50 | µg/L | <0.50 | | 160 µg/L | -- | -- | -- | -- | -- |
| Toluene | E611F | 0.50 | µg/L | <0.50 | | 16 µg/L | -- | -- | -- | -- | -- |
| Chloroform | E611F | 0.50 | µg/L | <0.50 | | 40 µg/L | -- | -- | -- | -- | -- |
| Dichlorobenzene, 1,4- | E611F | 0.50 | µg/L | <0.50 | | 80 µg/L | -- | -- | -- | -- | -- |
| Volatile Organic Compounds Surrogates | | | | | | | | | | | |
| Bromofluorobenzene, 4- | E611F | 1.0 | % | 93.2 | | -- | -- | -- | -- | -- | -- |
| Difluorobenzene, 1,4- | E611F | 1.0 | % | 100 | | -- | -- | -- | -- | -- | -- |

Please refer to the General Comments section for an explanation of any qualifiers detected.

No Breaches Found

Key:

HALSUB Ontario Halton Sanitary Sewer By-law No. 02-03 (MAR, 2003)
 SAN Halton Sanitary Sewer By-Law No. 02-03
 STM Halton Storm Sewer By-Law No. 02-03



Analytical Results

| | | | | Client sample ID | | | | | | | |
|---|--------|-------|------|--------------------|----------------------|----|----|----|----|----|--|
| Sub-Matrix: Water | | | | | BH-1 | | | | | | |
| (Matrix: Water) | | | | Sampling date/time | 09-Mar-2023 08:00 | | | | | | |
| Analyte | Method | LOR | Unit | WT2224510-002 | HALSUB SAN | | | | | | |
| Polycyclic Aromatic Hydrocarbons | | | | | | | | | | | |
| Naphthalene | E641A | 0.050 | µg/L | <0.050 | 140 µg/L | -- | -- | -- | -- | -- | |
| Chrysene-d12 | E641A | 0.1 | % | 92.6 | -- | -- | -- | -- | -- | -- | |
| Naphthalene-d8 | E641A | 0.1 | % | 97.4 | -- | -- | -- | -- | -- | -- | |
| Phenanthrene-d10 | E641A | 0.1 | % | 105 | -- | -- | -- | -- | -- | -- | |

Please refer to the General Comments section for an explanation of any qualifiers detected.

No Breaches Found

Key:

HALSUB Ontario Halton Sanitary Sewer By-law No. 02-03 (MAR, 2003)
 SAN Halton Sanitary Sewer By-Law No. 02-03

QUALITY CONTROL INTERPRETIVE REPORT

| | |
|---|--|
| <p>Work Order : WT2224510</p> <p>Amendment : 1</p> <p>Client : McClymont & Rak Engineers Inc.</p> <p>Contact : Richard Sukhu</p> <p>Address : 111 Zenway Blvd. Unit 4 Vaughan ON Canada L4H 3H9</p> <p>Telephone : 416 675 0160</p> <p>Project : 5820</p> <p>PO : ----</p> <p>C-O-C number : 20-1000499</p> <p>Sampler : CLIENT</p> <p>Site : ----</p> <p>Quote number : 2022 Price List</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p> | <p>Page : 1 of 10</p> <p>Laboratory : Waterloo - Environmental</p> <p>Account Manager : Emily Smith</p> <p>Address : 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8</p> <p>Telephone : +1 519 886 6910</p> <p>Date Samples Received : 08-Dec-2022 13:54</p> <p>Issue Date : 15-Mar-2023 16:17</p> |
|---|--|

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|----------|---------------|--------------------------|---------------|--------|------|---------------|---------------|--------|------|
| | | | Preparation Date | Holding Times | | Eval | Analysis Date | Holding Times | | Eval |
| | | | | Rec | Actual | | | Rec | Actual | |
| Aggregate Organics : Biochemical Oxygen Demand - 5 day | | | | | | | | | | |
| HDPE [BOD HT-4d] BH-1 | E550 | 08-Dec-2022 | ---- | ---- | ---- | | 12-Dec-2022 | 4 days | 4 days | ✓ |
| Aggregate Organics : Mineral Oil & Grease by Gravimetry | | | | | | | | | | |
| Amber glass (hydrochloric acid) BH-1 | E567SG | 08-Dec-2022 | 15-Dec-2022 | 28 days | 7 days | ✓ | 15-Dec-2022 | 40 days | 0 days | ✓ |
| Aggregate Organics : Oil & Grease by Gravimetry | | | | | | | | | | |
| Amber glass (hydrochloric acid) BH-1 | E567 | 08-Dec-2022 | 15-Dec-2022 | 28 days | 7 days | ✓ | 15-Dec-2022 | 40 days | 0 days | ✓ |
| Aggregate Organics : Phenols (4AAP) in Water by Colorimetry | | | | | | | | | | |
| Amber glass total (sulfuric acid) [ON MECP] BH-1 | E562 | 08-Dec-2022 | 14-Dec-2022 | ---- | ---- | | 15-Dec-2022 | 28 days | 7 days | ✓ |
| Anions and Nutrients : Fluoride in Water by IC | | | | | | | | | | |
| HDPE [ON MECP] BH-1 | E235.F | 08-Dec-2022 | 13-Dec-2022 | ---- | ---- | | 13-Dec-2022 | 28 days | 5 days | ✓ |
| Anions and Nutrients : Sulfate in Water by IC | | | | | | | | | | |
| HDPE [ON MECP] BH-1 | E235.SO4 | 08-Dec-2022 | 13-Dec-2022 | ---- | ---- | | 13-Dec-2022 | 28 days | 5 days | ✓ |
| Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level) | | | | | | | | | | |
| Amber glass total (sulfuric acid) [ON MECP] BH-1 | E318 | 08-Dec-2022 | 15-Dec-2022 | ---- | ---- | | 16-Dec-2022 | 28 days | 8 days | ✓ |



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

| Analyte Group Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|----------|---------------|--------------------------|---------------|---------|------|---------------|---------------|--------|------|
| | | | Preparation Date | Holding Times | | Eval | Analysis Date | Holding Times | | Eval |
| | | | | Rec | Actual | | | Rec | Actual | |
| Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L) | | | | | | | | | | |
| Amber glass total (sulfuric acid) [ON MECP] BH-1 | E372-U | 08-Dec-2022 | 15-Dec-2022 | ---- | ---- | | 16-Dec-2022 | 28 days | 8 days | ✔ |
| Cyanides : Total Cyanide | | | | | | | | | | |
| UV-inhibited HDPE - total (sodium hydroxide) BH-1 | E333 | 08-Dec-2022 | 09-Dec-2022 | ---- | ---- | | 09-Dec-2022 | 14 days | 1 days | ✔ |
| Microbiological Tests : E. coli (MF-mFC-BCIG) | | | | | | | | | | |
| Sterile HDPE (Sodium thiosulphate) [ON MECP] BH-1 | E012A.EC | 08-Dec-2022 | ---- | ---- | ---- | | 10-Dec-2022 | 48 hrs | 47 hrs | ✔ |
| Physical Tests : pH by Meter | | | | | | | | | | |
| HDPE [ON MECP] BH-1 | E108 | 08-Dec-2022 | 13-Dec-2022 | ---- | ---- | | 14-Dec-2022 | 14 days | 6 days | ✔ |
| Physical Tests : TSS by Gravimetry | | | | | | | | | | |
| HDPE [ON MECP] BH-1 | E160 | 08-Dec-2022 | ---- | ---- | ---- | | 13-Dec-2022 | 7 days | 5 days | ✔ |
| Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS | | | | | | | | | | |
| Amber glass/Teflon lined cap (sodium bisulfate) BH-1 | E641A | 09-Mar-2023 | 10-Mar-2023 | 105 days | 92 days | ✔ | 13-Mar-2023 | 40 days | 3 days | ✔ |
| Total Metals : Total Mercury in Water by CVAAS | | | | | | | | | | |
| Glass vial total (hydrochloric acid) BH-1 | E508 | 08-Dec-2022 | 09-Dec-2022 | ---- | ---- | | 09-Dec-2022 | 28 days | 1 days | ✔ |
| Total Metals : Total metals in Water by CRC ICPMS | | | | | | | | | | |
| HDPE total (nitric acid) BH-1 | E420 | 08-Dec-2022 | 08-Dec-2022 | ---- | ---- | | 09-Dec-2022 | 180 days | 1 days | ✔ |
| Volatile Organic Compounds : VOCs (Full List) by Headspace GC-MS | | | | | | | | | | |
| Glass vial (sodium bisulfate) BH-1 | E611F | 08-Dec-2022 | 13-Dec-2022 | ---- | ---- | | 13-Dec-2022 | 14 days | 5 days | ✔ |



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

| Analyte Group Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|--------|---------------|--------------------------|---------------|--------|------|---------------|---------------|--------|------|
| | | | Preparation Date | Holding Times | | Eval | Analysis Date | Holding Times | | Eval |
| | | | | Rec | Actual | | | Rec | Actual | |
| Volatile Organic Compounds [Drycleaning] : VOCs (Full List) by Headspace GC-MS | | | | | | | | | | |
| Glass vial (sodium bisulfate) BH-1 | E611F | 08-Dec-2022 | 13-Dec-2022 | ---- | ---- | | 13-Dec-2022 | 14 days | 5 days | ✔ |
| Volatile Organic Compounds [Fuels] : VOCs (Full List) by Headspace GC-MS | | | | | | | | | | |
| Glass vial (sodium bisulfate) BH-1 | E611F | 08-Dec-2022 | 13-Dec-2022 | ---- | ---- | | 13-Dec-2022 | 14 days | 5 days | ✔ |
| Volatile Organic Compounds [THMs] : VOCs (Full List) by Headspace GC-MS | | | | | | | | | | |
| Glass vial (sodium bisulfate) BH-1 | E611F | 08-Dec-2022 | 13-Dec-2022 | ---- | ---- | | 13-Dec-2022 | 14 days | 5 days | ✔ |

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

| Quality Control Sample Type | Method | QC Lot # | Count | | Frequency (%) | | |
|---|----------|----------|-------|---------|---------------|----------|------------|
| | | | QC | Regular | Actual | Expected | Evaluation |
| Analytical Methods | | | | | | | |
| Laboratory Duplicates (DUP) | | | | | | | |
| Biochemical Oxygen Demand - 5 day | E550 | 775463 | 1 | 16 | 6.2 | 5.0 | ✓ |
| E. coli (MF-mFC-BCIG) | E012A.EC | 774372 | 1 | 10 | 10.0 | 5.0 | ✓ |
| Fluoride in Water by IC | E235.F | 776533 | 1 | 10 | 10.0 | 5.0 | ✓ |
| pH by Meter | E108 | 776528 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Phenols (4AAP) in Water by Colorimetry | E562 | 778198 | 1 | 19 | 5.2 | 5.0 | ✓ |
| Sulfate in Water by IC | E235.SO4 | 776531 | 1 | 11 | 9.0 | 5.0 | ✓ |
| Total Cyanide | E333 | 773103 | 1 | 8 | 12.5 | 5.0 | ✓ |
| Total Kjeldahl Nitrogen by Fluorescence (Low Level) | E318 | 778196 | 1 | 16 | 6.2 | 5.0 | ✓ |
| Total Mercury in Water by CVAAS | E508 | 773013 | 1 | 5 | 20.0 | 5.0 | ✓ |
| Total metals in Water by CRC ICPMS | E420 | 772785 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Total Phosphorus by Colourimetry (0.002 mg/L) | E372-U | 778197 | 1 | 20 | 5.0 | 5.0 | ✓ |
| TSS by Gravimetry | E160 | 775520 | 1 | 18 | 5.5 | 4.7 | ✓ |
| VOCs (Full List) by Headspace GC-MS | E611F | 776870 | 1 | 3 | 33.3 | 5.0 | ✓ |
| Laboratory Control Samples (LCS) | | | | | | | |
| Biochemical Oxygen Demand - 5 day | E550 | 775463 | 1 | 16 | 6.2 | 5.0 | ✓ |
| Fluoride in Water by IC | E235.F | 776533 | 1 | 10 | 10.0 | 5.0 | ✓ |
| Mineral Oil & Grease by Gravimetry | E567SG | 772961 | 1 | 11 | 9.0 | 5.0 | ✓ |
| Oil & Grease by Gravimetry | E567 | 772960 | 1 | 13 | 7.6 | 5.0 | ✓ |
| PAHs by Hexane LVI GC-MS | E641A | 859428 | 1 | 11 | 9.0 | 5.0 | ✓ |
| pH by Meter | E108 | 776528 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Phenols (4AAP) in Water by Colorimetry | E562 | 778198 | 1 | 19 | 5.2 | 5.0 | ✓ |
| Sulfate in Water by IC | E235.SO4 | 776531 | 1 | 11 | 9.0 | 5.0 | ✓ |
| Total Cyanide | E333 | 773103 | 1 | 8 | 12.5 | 5.0 | ✓ |
| Total Kjeldahl Nitrogen by Fluorescence (Low Level) | E318 | 778196 | 1 | 16 | 6.2 | 5.0 | ✓ |
| Total Mercury in Water by CVAAS | E508 | 773013 | 1 | 5 | 20.0 | 5.0 | ✓ |
| Total metals in Water by CRC ICPMS | E420 | 772785 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Total Phosphorus by Colourimetry (0.002 mg/L) | E372-U | 778197 | 1 | 20 | 5.0 | 5.0 | ✓ |
| TSS by Gravimetry | E160 | 775520 | 1 | 18 | 5.5 | 4.7 | ✓ |
| VOCs (Full List) by Headspace GC-MS | E611F | 776870 | 1 | 3 | 33.3 | 5.0 | ✓ |
| Method Blanks (MB) | | | | | | | |
| Biochemical Oxygen Demand - 5 day | E550 | 775463 | 1 | 16 | 6.2 | 5.0 | ✓ |
| E. coli (MF-mFC-BCIG) | E012A.EC | 774372 | 1 | 10 | 10.0 | 5.0 | ✓ |
| Fluoride in Water by IC | E235.F | 776533 | 1 | 10 | 10.0 | 5.0 | ✓ |
| Mineral Oil & Grease by Gravimetry | E567SG | 772961 | 1 | 11 | 9.0 | 5.0 | ✓ |
| Oil & Grease by Gravimetry | E567 | 772960 | 1 | 13 | 7.6 | 5.0 | ✓ |



Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

| Quality Control Sample Type | Method | QC Lot # | Count | | Frequency (%) | | |
|---|----------|----------|-------|---------|---------------|----------|------------|
| | | | QC | Regular | Actual | Expected | Evaluation |
| <i>Analytical Methods</i> | | | | | | | |
| Method Blanks (MB) - Continued | | | | | | | |
| PAHs by Hexane LVI GC-MS | E641A | 859428 | 1 | 11 | 9.0 | 5.0 | ✔ |
| Phenols (4AAP) in Water by Colorimetry | E562 | 778198 | 1 | 19 | 5.2 | 5.0 | ✔ |
| Sulfate in Water by IC | E235.SO4 | 776531 | 1 | 11 | 9.0 | 5.0 | ✔ |
| Total Cyanide | E333 | 773103 | 1 | 8 | 12.5 | 5.0 | ✔ |
| Total Kjeldahl Nitrogen by Fluorescence (Low Level) | E318 | 778196 | 1 | 16 | 6.2 | 5.0 | ✔ |
| Total Mercury in Water by CVAAS | E508 | 773013 | 1 | 5 | 20.0 | 5.0 | ✔ |
| Total metals in Water by CRC ICPMS | E420 | 772785 | 1 | 20 | 5.0 | 5.0 | ✔ |
| Total Phosphorus by Colourimetry (0.002 mg/L) | E372-U | 778197 | 1 | 20 | 5.0 | 5.0 | ✔ |
| TSS by Gravimetry | E160 | 775520 | 1 | 18 | 5.5 | 4.7 | ✔ |
| VOCs (Full List) by Headspace GC-MS | E611F | 776870 | 1 | 3 | 33.3 | 5.0 | ✔ |
| Matrix Spikes (MS) | | | | | | | |
| Fluoride in Water by IC | E235.F | 776533 | 1 | 10 | 10.0 | 5.0 | ✔ |
| Phenols (4AAP) in Water by Colorimetry | E562 | 778198 | 1 | 19 | 5.2 | 5.0 | ✔ |
| Sulfate in Water by IC | E235.SO4 | 776531 | 1 | 11 | 9.0 | 5.0 | ✔ |
| Total Cyanide | E333 | 773103 | 1 | 8 | 12.5 | 5.0 | ✔ |
| Total Kjeldahl Nitrogen by Fluorescence (Low Level) | E318 | 778196 | 1 | 16 | 6.2 | 5.0 | ✔ |
| Total Mercury in Water by CVAAS | E508 | 773013 | 1 | 5 | 20.0 | 5.0 | ✔ |
| Total metals in Water by CRC ICPMS | E420 | 772785 | 1 | 20 | 5.0 | 5.0 | ✔ |
| Total Phosphorus by Colourimetry (0.002 mg/L) | E372-U | 778197 | 1 | 20 | 5.0 | 5.0 | ✔ |
| VOCs (Full List) by Headspace GC-MS | E611F | 776870 | 1 | 3 | 33.3 | 5.0 | ✔ |



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

| Analytical Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|--------------------------------------|--------|-------------------------|--|
| E. coli (MF-mFC-BCIG) | E012A.EC Waterloo - Environmental | Water | ON E3433 (mod) | Following filtration (0.45 µm), and incubation at 44.5±0.2°C for 24 hours, colonies exhibiting characteristic morphology of the target organism are enumerated. |
| pH by Meter | E108 Waterloo - Environmental | Water | APHA 4500-H (mod) | pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time. |
| TSS by Gravimetry | E160 Waterloo - Environmental | Water | APHA 2540 D (mod) | Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples. |
| Fluoride in Water by IC | E235.F Waterloo - Environmental | Water | EPA 300.1 (mod) | Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. |
| Sulfate in Water by IC | E235.SO4 Waterloo - Environmental | Water | EPA 300.1 (mod) | Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. |
| Total Kjeldahl Nitrogen by Fluorescence (Low Level) | E318 Waterloo - Environmental | Water | Method Fialab 100, 2018 | TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021). |
| Total Cyanide | E333 Waterloo - Environmental | Water | ISO 14403 (mod) | Total or Strong Acid Dissociable (SAD) Cyanide is determined by Continuous Flow Analyzer (CFA) with in-line UV digestion followed by colourmetric analysis. Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration). |
| Total Phosphorus by Colourimetry (0.002 mg/L) | E372-U Waterloo - Environmental | Water | APHA 4500-P E (mod). | Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample. |
| Total metals in Water by CRC ICPMS | E420 Waterloo - Environmental | Water | EPA 200.2/6020B (mod) | Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method. |



| Analytical Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---------------------------------------|--------|--|---|
| Total Mercury in Water by CVAAS | E508 Waterloo - Environmental | Water | EPA 1631E (mod) | Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS |
| Biochemical Oxygen Demand - 5 day | E550 Waterloo - Environmental | Water | APHA 5210 B (mod) | Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples. |
| Phenols (4AAP) in Water by Colorimetry | E562 Waterloo - Environmental | Water | EPA 9066 | This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K ₃ Fe(CN) ₆) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically. |
| Oil & Grease by Gravimetry | E567 Waterloo - Environmental | Water | BC MOE Lab Manual (Oil & Grease) (mod) | The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease. |
| Mineral Oil & Grease by Gravimetry | E567SG Waterloo - Environmental | Water | BC MOE Lab Manual (Oil & Grease) (mod) | The entire water sample is extracted with hexane, followed by silica gel treatment after which the extract is evaporated to dryness. The residue is then weighed to determine Mineral Oil and Grease. |
| VOCs (Full List) by Headspace GC-MS | E611F Waterloo - Environmental | Water | EPA 8260D (mod) | Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law. |
| PAHs by Hexane LVI GC-MS | E641A Waterloo - Environmental | Water | EPA 8270E (mod) | Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS. |
| Animal & Vegetable Oil & Grease by Gravimetry | EC567A.SG Waterloo - Environmental | Water | APHA 5520 (mod) | Animal & vegetable oil and grease is calculated as follows: Oil & Grease (gravimetric) minus Mineral Oil & Grease (gravimetric) |

| Preparation Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|-----------------------------------|--------|------------------------|---|
| Digestion for TKN in water | EP318 Waterloo - Environmental | Water | APHA 4500-Norg D (mod) | Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low. |
| Digestion for Total Phosphorus in water | EP372 Waterloo - Environmental | Water | APHA 4500-P E (mod). | Samples are heated with a persulfate digestion reagent. |



| <i>Preparation Methods</i> | <i>Method / Lab</i> | <i>Matrix</i> | <i>Method Reference</i> | <i>Method Descriptions</i> |
|---|--|---------------|---|---|
| Oil & Grease Extraction for Gravimetry | EP567 Waterloo - Environmental | Water | BC MOE Lab Manual (Oil & Grease) (mod) | The entire water sample is extracted with hexane by liquid-liquid extraction. |
| VOCs Preparation for Headspace Analysis | EP581 Waterloo - Environmental | Water | EPA 5021A (mod) | Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system. |
| PHCs and PAHs Hexane Extraction | EP601 Waterloo - Environmental | Water | EPA 3511 (mod) | Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction. |

QUALITY CONTROL REPORT

| | | | |
|--------------------------------|--|--------------------------------|---|
| Work Order | : WT2224510 | Page | : 1 of 10 |
| Amendment | : 1 | | |
| Client | : McClymont & Rak Engineers Inc. | Laboratory | : Waterloo - Environmental |
| Contact | : Richard Sukhu | Account Manager | : Emily Smith |
| Address | : 111 Zenway Blvd. Unit 4 Vaughan ON Canada L4H 3H9 | Address | : 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8 |
| Telephone | : | Telephone | : +1 519 886 6910 |
| Project | : 5820 | Date Samples Received | : 08-Dec-2022 13:54 |
| PO | : ---- | Date Analysis Commenced | : 08-Dec-2022 |
| C-O-C number | : 20-1000499 | Issue Date | : 15-Mar-2023 15:42 |
| Sampler | : CLIENT 416 675 0160 | | |
| Site | : ---- | | |
| Quote number | : 2022 Price List | | |
| No. of samples received | : 2 | | |
| No. of samples analysed | : 2 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| <i>Signatories</i> | <i>Position</i> | <i>Laboratory Department</i> |
|--------------------|---|--|
| Jeremy Gingras | Team Leader - Semi-Volatile Instrumentation | Waterloo Organics, Waterloo, Ontario |
| Jocelyn Kennedy | Department Manager - Semi-Volatile Organics | Waterloo Organics, Waterloo, Ontario |
| Jon Fisher | Department Manager - Inorganics | Waterloo Inorganics, Waterloo, Ontario |
| Jon Fisher | Department Manager - Inorganics | Waterloo Metals, Waterloo, Ontario |
| Manuel Tavarato | Supervisor - Semi-Volatile Extractions | Waterloo Organics, Waterloo, Ontario |
| Ruby Sujeepan | | Waterloo Microbiology, Waterloo, Ontario |
| Sarah Birch | VOC Section Supervisor | Waterloo Organics, Waterloo, Ontario |

Page : 2 of 10
Work Order : WT2224510 Amendment 1
Client : McClymont & Rak Engineers Inc.
Project : 5820



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

| Sub-Matrix: Water | | | | | Laboratory Duplicate (DUP) Report | | | | | | |
|---|------------------|--|------------|----------|-----------------------------------|-----------|-----------------|------------------|----------------------|------------------|-----------|
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | LOR | Unit | Original Result | Duplicate Result | RPD(%) or Difference | Duplicate Limits | Qualifier |
| Physical Tests (QC Lot: 775520) | | | | | | | | | | | |
| WT2224429-001 | Anonymous | Solids, total suspended [TSS] | ---- | E160 | 5.0 | mg/L | 218 | 234 | 7.09% | 20% | ---- |
| Physical Tests (QC Lot: 776528) | | | | | | | | | | | |
| WT2224728-001 | Anonymous | pH | ---- | E108 | 0.10 | pH units | 8.00 | 7.99 | 0.125% | 4% | ---- |
| Anions and Nutrients (QC Lot: 776531) | | | | | | | | | | | |
| WT2224766-002 | Anonymous | Sulfate (as SO ₄) | 14808-79-8 | E235.SO4 | 0.30 | mg/L | 31.3 | 31.1 | 0.474% | 20% | ---- |
| Anions and Nutrients (QC Lot: 776533) | | | | | | | | | | | |
| WT2224766-002 | Anonymous | Fluoride | 16984-48-8 | E235.F | 0.020 | mg/L | 0.051 | 0.051 | 0.00003 | Diff <2x LOR | ---- |
| Anions and Nutrients (QC Lot: 778196) | | | | | | | | | | | |
| WT2224280-002 | Anonymous | Kjeldahl nitrogen, total [TKN] | ---- | E318 | 2.50 | mg/L | 68.6 | 70.7 | 3.04% | 20% | ---- |
| Anions and Nutrients (QC Lot: 778197) | | | | | | | | | | | |
| WT2224280-002 | Anonymous | Phosphorus, total | 7723-14-0 | E372-U | 0.0200 | mg/L | 5.35 | 5.37 | 0.359% | 20% | ---- |
| Cyanides (QC Lot: 773103) | | | | | | | | | | | |
| WT2224459-002 | Anonymous | Cyanide, strong acid dissociable (Total) | ---- | E333 | 0.0020 | mg/L | <0.0020 | <0.0020 | 0 | Diff <2x LOR | ---- |
| Microbiological Tests (QC Lot: 774372) | | | | | | | | | | | |
| WT2224517-001 | Anonymous | Coliforms, Escherichia coli [E. coli] | ---- | E012A.EC | 1 | CFU/100mL | <1 | <1 | 0 | Diff <2x LOR | ---- |
| Total Metals (QC Lot: 772785) | | | | | | | | | | | |
| WT2224434-001 | Anonymous | Aluminum, total | 7429-90-5 | E420 | 0.0030 | mg/L | <0.0030 | <0.0030 | 0 | Diff <2x LOR | ---- |
| | | Antimony, total | 7440-36-0 | E420 | 0.00010 | mg/L | <0.00010 | <0.00010 | 0 | Diff <2x LOR | ---- |
| | | Arsenic, total | 7440-38-2 | E420 | 0.00010 | mg/L | 0.00406 | 0.00416 | 2.46% | 20% | ---- |
| | | Beryllium, total | 7440-41-7 | E420 | 0.000020 | mg/L | <0.000020 | <0.000020 | 0 | Diff <2x LOR | ---- |
| | | Cadmium, total | 7440-43-9 | E420 | 0.0000050 | mg/L | 0.0000081 | 0.0000065 | 0.0000016 | Diff <2x LOR | ---- |
| | | Chromium, total | 7440-47-3 | E420 | 0.00050 | mg/L | <0.00050 | <0.00050 | 0 | Diff <2x LOR | ---- |
| | | Cobalt, total | 7440-48-4 | E420 | 0.00010 | mg/L | 0.00013 | 0.00012 | 0.0000008 | Diff <2x LOR | ---- |
| | | Copper, total | 7440-50-8 | E420 | 0.00050 | mg/L | <0.00050 | <0.00050 | 0 | Diff <2x LOR | ---- |
| | | Iron, total | 7439-89-6 | E420 | 0.010 | mg/L | 0.571 | 0.581 | 1.67% | 20% | ---- |
| | | Lead, total | 7439-92-1 | E420 | 0.000050 | mg/L | 0.000132 | 0.000135 | 0.000003 | Diff <2x LOR | ---- |
| | | Manganese, total | 7439-96-5 | E420 | 0.00010 | mg/L | 0.0672 | 0.0690 | 2.67% | 20% | ---- |
| | | Molybdenum, total | 7439-98-7 | E420 | 0.000050 | mg/L | 0.00240 | 0.00249 | 3.61% | 20% | ---- |
| | | Nickel, total | 7440-02-0 | E420 | 0.00050 | mg/L | <0.00050 | <0.00050 | 0 | Diff <2x LOR | ---- |



| Sub-Matrix: Water | | | | | Laboratory Duplicate (DUP) Report | | | | | | |
|--|------------------|---------------------------------|------------|--------|-----------------------------------|-------|-----------------|------------------|----------------------|------------------|-----------|
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | LOR | Unit | Original Result | Duplicate Result | RPD(%) or Difference | Duplicate Limits | Qualifier |
| Total Metals (QC Lot: 772785) - continued | | | | | | | | | | | |
| WT2224434-001 | Anonymous | Selenium, total | 7782-49-2 | E420 | 0.000050 | mg/L | <0.000050 | <0.000050 | 0 | Diff <2x LOR | ---- |
| | | Silver, total | 7440-22-4 | E420 | 0.000010 | mg/L | <0.000010 | <0.000010 | 0 | Diff <2x LOR | ---- |
| | | Tin, total | 7440-31-5 | E420 | 0.00010 | mg/L | <0.00010 | <0.00010 | 0 | Diff <2x LOR | ---- |
| | | Titanium, total | 7440-32-6 | E420 | 0.00030 | mg/L | <0.00030 | <0.00030 | 0 | Diff <2x LOR | ---- |
| | | Zinc, total | 7440-66-6 | E420 | 0.0030 | mg/L | <0.0030 | <0.0030 | 0 | Diff <2x LOR | ---- |
| Total Metals (QC Lot: 773013) | | | | | | | | | | | |
| WT2224505-001 | Anonymous | Mercury, total | 7439-97-6 | E508 | 0.0000050 | mg/L | <0.0000050 | <0.0000050 | 0 | Diff <2x LOR | ---- |
| Aggregate Organics (QC Lot: 775463) | | | | | | | | | | | |
| WT2224508-001 | Anonymous | Biochemical oxygen demand [BOD] | ---- | E550 | 3.0 | mg/L | 3.4 | <3.0 | 12.8% | 30% | ---- |
| Aggregate Organics (QC Lot: 778198) | | | | | | | | | | | |
| WT2224462-001 | Anonymous | Phenols, total (4AAP) | ---- | E562 | 0.0010 | mg/L | 0.0015 | <0.0010 | 0.0005 | Diff <2x LOR | ---- |
| Volatile Organic Compounds (QC Lot: 776870) | | | | | | | | | | | |
| WT2224508-001 | Anonymous | Benzene | 71-43-2 | E611F | 0.50 | µg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| | | Chloroform | 67-66-3 | E611F | 0.50 | µg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| | | Dichlorobenzene, 1,4- | 106-46-7 | E611F | 0.50 | µg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| | | Dichloromethane | 75-09-2 | E611F | 1.0 | µg/L | <1.0 | <1.0 | 0 | Diff <2x LOR | ---- |
| | | Ethylbenzene | 100-41-4 | E611F | 0.50 | µg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| | | Tetrachloroethylene | 127-18-4 | E611F | 0.50 | µg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| | | Toluene | 108-88-3 | E611F | 0.50 | µg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| Trichloroethylene | 79-01-6 | E611F | 0.50 | µg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- | | |



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|--|------------|----------|----------|-----------|------------|-----------|
| Physical Tests (QCLot: 775520) | | | | | | |
| Solids, total suspended [TSS] | --- | E160 | 3 | mg/L | <3.0 | --- |
| Anions and Nutrients (QCLot: 776531) | | | | | | |
| Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.3 | mg/L | <0.30 | --- |
| Anions and Nutrients (QCLot: 776533) | | | | | | |
| Fluoride | 16984-48-8 | E235.F | 0.02 | mg/L | <0.020 | --- |
| Anions and Nutrients (QCLot: 778196) | | | | | | |
| Kjeldahl nitrogen, total [TKN] | --- | E318 | 0.05 | mg/L | <0.050 | --- |
| Anions and Nutrients (QCLot: 778197) | | | | | | |
| Phosphorus, total | 7723-14-0 | E372-U | 0.002 | mg/L | <0.0020 | --- |
| Cyanides (QCLot: 773103) | | | | | | |
| Cyanide, strong acid dissociable (Total) | --- | E333 | 0.002 | mg/L | <0.0020 | --- |
| Microbiological Tests (QCLot: 774372) | | | | | | |
| Coliforms, Escherichia coli [E. coli] | --- | E012A.EC | 1 | CFU/100mL | <1 | --- |
| Total Metals (QCLot: 772785) | | | | | | |
| Aluminum, total | 7429-90-5 | E420 | 0.003 | mg/L | <0.0030 | --- |
| Antimony, total | 7440-36-0 | E420 | 0.0001 | mg/L | <0.00010 | --- |
| Arsenic, total | 7440-38-2 | E420 | 0.0001 | mg/L | <0.00010 | --- |
| Beryllium, total | 7440-41-7 | E420 | 0.00002 | mg/L | <0.000020 | --- |
| Cadmium, total | 7440-43-9 | E420 | 0.000005 | mg/L | <0.0000050 | --- |
| Chromium, total | 7440-47-3 | E420 | 0.0005 | mg/L | <0.00050 | --- |
| Cobalt, total | 7440-48-4 | E420 | 0.0001 | mg/L | <0.00010 | --- |
| Copper, total | 7440-50-8 | E420 | 0.0005 | mg/L | <0.00050 | --- |
| Iron, total | 7439-89-6 | E420 | 0.01 | mg/L | <0.010 | --- |
| Lead, total | 7439-92-1 | E420 | 0.00005 | mg/L | <0.000050 | --- |
| Manganese, total | 7439-96-5 | E420 | 0.0001 | mg/L | <0.00010 | --- |
| Molybdenum, total | 7439-98-7 | E420 | 0.00005 | mg/L | <0.000050 | --- |
| Nickel, total | 7440-02-0 | E420 | 0.0005 | mg/L | <0.00050 | --- |
| Selenium, total | 7782-49-2 | E420 | 0.00005 | mg/L | <0.000050 | --- |
| Silver, total | 7440-22-4 | E420 | 0.00001 | mg/L | <0.000010 | --- |
| Tin, total | 7440-31-5 | E420 | 0.0001 | mg/L | <0.00010 | --- |
| Titanium, total | 7440-32-6 | E420 | 0.0003 | mg/L | <0.00030 | --- |
| Zinc, total | 7440-66-6 | E420 | 0.003 | mg/L | <0.0030 | --- |



Sub-Matrix: **Water**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|------------|--------|----------|------|------------|-----------|
| Total Metals (QCLot: 773013) | | | | | | |
| Mercury, total | 7439-97-6 | E508 | 0.000005 | mg/L | <0.0000050 | ---- |
| Aggregate Organics (QCLot: 772960) | | | | | | |
| Oil & grease (gravimetric) | ---- | E567 | 5 | mg/L | <5.0 | ---- |
| Aggregate Organics (QCLot: 772961) | | | | | | |
| Oil & grease, mineral (gravimetric) | ---- | E567SG | 5 | mg/L | <5.0 | ---- |
| Aggregate Organics (QCLot: 775463) | | | | | | |
| Biochemical oxygen demand [BOD] | ---- | E550 | 2 | mg/L | <2.0 | ---- |
| Aggregate Organics (QCLot: 778198) | | | | | | |
| Phenols, total (4AAP) | ---- | E562 | 0.001 | mg/L | <0.0010 | ---- |
| Volatile Organic Compounds (QCLot: 776870) | | | | | | |
| Benzene | 71-43-2 | E611F | 0.5 | µg/L | <0.50 | ---- |
| Chloroform | 67-66-3 | E611F | 0.5 | µg/L | <0.50 | ---- |
| Dichlorobenzene, 1,4- | 106-46-7 | E611F | 0.5 | µg/L | <0.50 | ---- |
| Dichloromethane | 75-09-2 | E611F | 1 | µg/L | <1.0 | ---- |
| Ethylbenzene | 100-41-4 | E611F | 0.5 | µg/L | <0.50 | ---- |
| Tetrachloroethylene | 127-18-4 | E611F | 0.5 | µg/L | <0.50 | ---- |
| Toluene | 108-88-3 | E611F | 0.5 | µg/L | <0.50 | ---- |
| Trichloroethylene | 79-01-6 | E611F | 0.5 | µg/L | <0.50 | ---- |
| Polycyclic Aromatic Hydrocarbons (QCLot: 859428) | | | | | | |
| Naphthalene | 91-20-3 | E641A | 0.05 | µg/L | <0.050 | ---- |



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

| | | | | | Laboratory Control Sample (LCS) Report | | | | |
|---|------------|----------|----------|----------|--|--------------|---------------------|------|-----------|
| | | | | | Spike | Recovery (%) | Recovery Limits (%) | | |
| Analyte | CAS Number | Method | LOR | Unit | Concentration | LCS | Low | High | Qualifier |
| Physical Tests (QCLot: 775520) | | | | | | | | | |
| Solids, total suspended [TSS] | ---- | E160 | 3 | mg/L | 150 mg/L | 100 | 85.0 | 115 | ---- |
| Physical Tests (QCLot: 776528) | | | | | | | | | |
| pH | ---- | E108 | ---- | pH units | 7 pH units | 101 | 98.0 | 102 | ---- |
| Anions and Nutrients (QCLot: 776531) | | | | | | | | | |
| Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.3 | mg/L | 100 mg/L | 100 | 90.0 | 110 | ---- |
| Anions and Nutrients (QCLot: 776533) | | | | | | | | | |
| Fluoride | 16984-48-8 | E235.F | 0.02 | mg/L | 1 mg/L | 102 | 90.0 | 110 | ---- |
| Anions and Nutrients (QCLot: 778196) | | | | | | | | | |
| Kjeldahl nitrogen, total [TKN] | ---- | E318 | 0.05 | mg/L | 4 mg/L | 110 | 75.0 | 125 | ---- |
| Anions and Nutrients (QCLot: 778197) | | | | | | | | | |
| Phosphorus, total | 7723-14-0 | E372-U | 0.002 | mg/L | 0.845 mg/L | 98.3 | 80.0 | 120 | ---- |
| Cyanides (QCLot: 773103) | | | | | | | | | |
| Cyanide, strong acid dissociable (Total) | ---- | E333 | 0.002 | mg/L | 0.25 mg/L | 91.0 | 80.0 | 120 | ---- |
| Total Metals (QCLot: 772785) | | | | | | | | | |
| Aluminum, total | 7429-90-5 | E420 | 0.003 | mg/L | 0.1 mg/L | 96.7 | 80.0 | 120 | ---- |
| Antimony, total | 7440-36-0 | E420 | 0.0001 | mg/L | 0.05 mg/L | 99.0 | 80.0 | 120 | ---- |
| Arsenic, total | 7440-38-2 | E420 | 0.0001 | mg/L | 0.05 mg/L | 102 | 80.0 | 120 | ---- |
| Beryllium, total | 7440-41-7 | E420 | 0.00002 | mg/L | 0.005 mg/L | 93.7 | 80.0 | 120 | ---- |
| Cadmium, total | 7440-43-9 | E420 | 0.000005 | mg/L | 0.005 mg/L | 97.1 | 80.0 | 120 | ---- |
| Chromium, total | 7440-47-3 | E420 | 0.0005 | mg/L | 0.0125 mg/L | 95.6 | 80.0 | 120 | ---- |
| Cobalt, total | 7440-48-4 | E420 | 0.0001 | mg/L | 0.0125 mg/L | 96.5 | 80.0 | 120 | ---- |
| Copper, total | 7440-50-8 | E420 | 0.0005 | mg/L | 0.0125 mg/L | 95.6 | 80.0 | 120 | ---- |
| Iron, total | 7439-89-6 | E420 | 0.01 | mg/L | 0.05 mg/L | 94.5 | 80.0 | 120 | ---- |
| Lead, total | 7439-92-1 | E420 | 0.00005 | mg/L | 0.025 mg/L | 94.7 | 80.0 | 120 | ---- |
| Manganese, total | 7439-96-5 | E420 | 0.0001 | mg/L | 0.0125 mg/L | 96.7 | 80.0 | 120 | ---- |
| Molybdenum, total | 7439-98-7 | E420 | 0.00005 | mg/L | 0.0125 mg/L | 96.4 | 80.0 | 120 | ---- |
| Nickel, total | 7440-02-0 | E420 | 0.0005 | mg/L | 0.025 mg/L | 95.7 | 80.0 | 120 | ---- |
| Selenium, total | 7782-49-2 | E420 | 0.00005 | mg/L | 0.05 mg/L | 95.6 | 80.0 | 120 | ---- |
| Silver, total | 7440-22-4 | E420 | 0.00001 | mg/L | 0.005 mg/L | 88.7 | 80.0 | 120 | ---- |
| Tin, total | 7440-31-5 | E420 | 0.0001 | mg/L | 0.025 mg/L | 94.9 | 80.0 | 120 | ---- |



Sub-Matrix: **Water**

| | | | | | Laboratory Control Sample (LCS) Report | | | | |
|---|------------|--------|----------|------|--|--------------|---------------------|------|-----------|
| | | | | | Spike | Recovery (%) | Recovery Limits (%) | | |
| Analyte | CAS Number | Method | LOR | Unit | Concentration | LCS | Low | High | Qualifier |
| Total Metals (QCLot: 772785) - continued | | | | | | | | | |
| Titanium, total | 7440-32-6 | E420 | 0.0003 | mg/L | 0.0125 mg/L | 90.9 | 80.0 | 120 | ---- |
| Zinc, total | 7440-66-6 | E420 | 0.003 | mg/L | 0.025 mg/L | 97.8 | 80.0 | 120 | ---- |
| Total Metals (QCLot: 773013) | | | | | | | | | |
| Mercury, total | 7439-97-6 | E508 | 0.000005 | mg/L | 0.0001 mg/L | 102 | 80.0 | 120 | ---- |
| Aggregate Organics (QCLot: 772960) | | | | | | | | | |
| Oil & grease (gravimetric) | ---- | E567 | 5 | mg/L | 200 mg/L | 98.0 | 70.0 | 130 | ---- |
| Aggregate Organics (QCLot: 772961) | | | | | | | | | |
| Oil & grease, mineral (gravimetric) | ---- | E567SG | 5 | mg/L | 100 mg/L | 85.7 | 70.0 | 130 | ---- |
| Aggregate Organics (QCLot: 775463) | | | | | | | | | |
| Biochemical oxygen demand [BOD] | ---- | E550 | 2 | mg/L | 198 mg/L | 105 | 85.0 | 115 | ---- |
| Aggregate Organics (QCLot: 778198) | | | | | | | | | |
| Phenols, total (4AAP) | ---- | E562 | 0.001 | mg/L | 0.02 mg/L | 105 | 85.0 | 115 | ---- |
| Volatile Organic Compounds (QCLot: 776870) | | | | | | | | | |
| Benzene | 71-43-2 | E611F | 0.5 | µg/L | 100 µg/L | 95.6 | 70.0 | 130 | ---- |
| Chloroform | 67-66-3 | E611F | 0.5 | µg/L | 100 µg/L | 90.5 | 70.0 | 130 | ---- |
| Dichlorobenzene, 1,4- | 106-46-7 | E611F | 0.5 | µg/L | 100 µg/L | 96.4 | 70.0 | 130 | ---- |
| Dichloromethane | 75-09-2 | E611F | 1 | µg/L | 100 µg/L | 102 | 70.0 | 130 | ---- |
| Ethylbenzene | 100-41-4 | E611F | 0.5 | µg/L | 100 µg/L | 92.6 | 70.0 | 130 | ---- |
| Tetrachloroethylene | 127-18-4 | E611F | 0.5 | µg/L | 100 µg/L | 93.2 | 70.0 | 130 | ---- |
| Toluene | 108-88-3 | E611F | 0.5 | µg/L | 100 µg/L | 99.0 | 70.0 | 130 | ---- |
| Trichloroethylene | 79-01-6 | E611F | 0.5 | µg/L | 100 µg/L | 94.9 | 70.0 | 130 | ---- |
| Polycyclic Aromatic Hydrocarbons (QCLot: 859428) | | | | | | | | | |
| Naphthalene | 91-20-3 | E641A | 0.05 | µg/L | 0.5263 µg/L | 76.1 | 50.0 | 140 | ---- |



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

| | | | | | Matrix Spike (MS) Report | | | | | |
|---|------------------|--|------------|----------|--------------------------|-------------|--------------|---------------------|------|-----------|
| | | | | | Spike | | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | Concentration | Target | MS | Low | High | Qualifier |
| Anions and Nutrients (QCLot: 776531) | | | | | | | | | | |
| WT2224766-002 | Anonymous | Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 96.7 mg/L | 100 mg/L | 96.7 | 75.0 | 125 | ---- |
| Anions and Nutrients (QCLot: 776533) | | | | | | | | | | |
| WT2224766-002 | Anonymous | Fluoride | 16984-48-8 | E235.F | 0.956 mg/L | 1 mg/L | 95.6 | 75.0 | 125 | ---- |
| Anions and Nutrients (QCLot: 778196) | | | | | | | | | | |
| WT2224280-002 | Anonymous | Kjeldahl nitrogen, total [TKN] | ---- | E318 | ND mg/L | 2.5 mg/L | ND | 70.0 | 130 | ---- |
| Anions and Nutrients (QCLot: 778197) | | | | | | | | | | |
| WT2224280-002 | Anonymous | Phosphorus, total | 7723-14-0 | E372-U | ND mg/L | 0.1 mg/L | ND | 70.0 | 130 | ---- |
| Cyanides (QCLot: 773103) | | | | | | | | | | |
| WT2224459-002 | Anonymous | Cyanide, strong acid dissociable (Total) | ---- | E333 | 0.232 mg/L | 0.25 mg/L | 92.6 | 75.0 | 125 | ---- |
| Total Metals (QCLot: 772785) | | | | | | | | | | |
| WT2224480-001 | Anonymous | Aluminum, total | 7429-90-5 | E420 | ND mg/L | 0.1 mg/L | ND | 70.0 | 130 | ---- |
| | | Antimony, total | 7440-36-0 | E420 | 0.0486 mg/L | 0.05 mg/L | 97.2 | 70.0 | 130 | ---- |
| | | Arsenic, total | 7440-38-2 | E420 | 0.0504 mg/L | 0.05 mg/L | 101 | 70.0 | 130 | ---- |
| | | Beryllium, total | 7440-41-7 | E420 | 0.00491 mg/L | 0.005 mg/L | 98.3 | 70.0 | 130 | ---- |
| | | Cadmium, total | 7440-43-9 | E420 | 0.00480 mg/L | 0.005 mg/L | 96.1 | 70.0 | 130 | ---- |
| | | Chromium, total | 7440-47-3 | E420 | 0.0127 mg/L | 0.0125 mg/L | 102 | 70.0 | 130 | ---- |
| | | Cobalt, total | 7440-48-4 | E420 | 0.0120 mg/L | 0.0125 mg/L | 96.1 | 70.0 | 130 | ---- |
| | | Copper, total | 7440-50-8 | E420 | 0.0113 mg/L | 0.0125 mg/L | 90.8 | 70.0 | 130 | ---- |
| | | Iron, total | 7439-89-6 | E420 | ND mg/L | 0.05 mg/L | ND | 70.0 | 130 | ---- |
| | | Lead, total | 7439-92-1 | E420 | 0.0239 mg/L | 0.025 mg/L | 95.7 | 70.0 | 130 | ---- |
| | | Manganese, total | 7439-96-5 | E420 | ND mg/L | 0.0125 mg/L | ND | 70.0 | 130 | ---- |
| | | Molybdenum, total | 7439-98-7 | E420 | 0.0122 mg/L | 0.0125 mg/L | 97.6 | 70.0 | 130 | ---- |
| | | Nickel, total | 7440-02-0 | E420 | 0.0232 mg/L | 0.025 mg/L | 92.8 | 70.0 | 130 | ---- |
| | | Selenium, total | 7782-49-2 | E420 | 0.0494 mg/L | 0.05 mg/L | 98.8 | 70.0 | 130 | ---- |
| | | Silver, total | 7440-22-4 | E420 | 0.00456 mg/L | 0.005 mg/L | 91.1 | 70.0 | 130 | ---- |
| | | Tin, total | 7440-31-5 | E420 | 0.0235 mg/L | 0.025 mg/L | 94.0 | 70.0 | 130 | ---- |
| | | Titanium, total | 7440-32-6 | E420 | ND mg/L | 0.0125 mg/L | ND | 70.0 | 130 | ---- |
| | | Zinc, total | 7440-66-6 | E420 | 0.0228 mg/L | 0.025 mg/L | 91.0 | 70.0 | 130 | ---- |
| Total Metals (QCLot: 773013) | | | | | | | | | | |
| WT2224507-001 | Anonymous | Mercury, total | 7439-97-6 | E508 | 0.0000909 mg/L | 0.0001 mg/L | 90.9 | 70.0 | 130 | ---- |



Sub-Matrix: **Water**

| | | | | | Matrix Spike (MS) Report | | | | | |
|---|------------------|-----------------------|------------|--------|--------------------------|-----------|--------------|---------------------|------|-----------|
| | | | | | Spike | | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | Concentration | Target | MS | Low | High | Qualifier |
| Aggregate Organics (QCLot: 778198) | | | | | | | | | | |
| WT2224462-001 | Anonymous | Phenols, total (4AAP) | ---- | E562 | 0.0203 mg/L | 0.02 mg/L | 102 | 75.0 | 125 | ---- |
| Volatile Organic Compounds (QCLot: 776870) | | | | | | | | | | |
| WT2224508-001 | Anonymous | Benzene | 71-43-2 | E611F | 96.8 µg/L | 100 µg/L | 96.8 | 60.0 | 140 | ---- |
| | | Chloroform | 67-66-3 | E611F | 94.8 µg/L | 100 µg/L | 94.8 | 60.0 | 140 | ---- |
| | | Dichlorobenzene, 1,4- | 106-46-7 | E611F | 101 µg/L | 100 µg/L | 101 | 60.0 | 140 | ---- |
| | | Dichloromethane | 75-09-2 | E611F | 105 µg/L | 100 µg/L | 105 | 60.0 | 140 | ---- |
| | | Ethylbenzene | 100-41-4 | E611F | 94.1 µg/L | 100 µg/L | 94.1 | 60.0 | 140 | ---- |
| | | Tetrachloroethylene | 127-18-4 | E611F | 91.2 µg/L | 100 µg/L | 91.2 | 60.0 | 140 | ---- |
| | | Toluene | 108-88-3 | E611F | 101 µg/L | 100 µg/L | 101 | 60.0 | 140 | ---- |
| | | Trichloroethylene | 79-01-6 | E611F | 94.2 µg/L | 100 µg/L | 94.2 | 60.0 | 140 | ---- |



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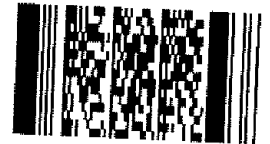
Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 1000499

Page 1 of 1

Environmental Division
Waterloo
Work Order Reference
WT2224510



Telephone : +1 519 886 6910

| | | | | | | | |
|--|---|--|---|---|---|---|-----------|
| Report To Contact and company name below will appear on the final report | | Reports / Recipients | | | Turnaround Time (TAT) Requested | | |
| Company: | Mccormick & Rank of Engrs. | Select Report Format: | <input checked="" type="checkbox"/> PDF <input type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) | <input checked="" type="checkbox"/> Routine [R] if received by 3pm M-F - no surcharges apply <input type="checkbox"/> 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum <input type="checkbox"/> 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum <input type="checkbox"/> 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum <input type="checkbox"/> 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum <input type="checkbox"/> Same day [E2] if received by 10am M-S - 200% rush surcharge. Additl may apply to rush requests on weekends, statutory holidays and non-rou | | | |
| Contact: | Richard Subhu | Merge QC/QCI Reports with COA | <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A | | | | |
| Phone: | 416-561-9264 | <input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked | | | | | |
| Company address below will appear on the final report | | Select Distribution: | <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX | | | | |
| Street: | 111 Zennway Blvd. | Email 1 or Fax: | rsuhhu@mccrack.com | | | | |
| City/Province: | Woodbridge | Email 2: | | | | | |
| Postal Code: | | Email 3: | | | | | |
| Invoice To: | Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | Invoice Recipients | | | Date and Time Required for all E&P TATs: | | |
| | Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | Select Invoice Distribution: | <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX | | | | |
| Company: | | Email 1 or Fax: | rsuhhu@mccrack.com | | | | |
| Contact: | | Email 2: | | | | | |
| Project Information | | Oil and Gas Required Fields (client use) | | | Analysis Re | | |
| ALS Account # / Quote #: | | AFE/Cost Center: | PO# | | | | |
| Job #: | 5820 | Major/Minor Code: | Routing Code: | | | | |
| PO / AFE: | | Requisitioner: | | | | | |
| LSD: | | Location: | | | | | |
| ALS Lab Work Order # (ALS use only): | | ALS Contact: | Sampler: | | | | |
| ALS Sample # (ALS use only) | Sample Identification and/or Coordinates (This description will appear on the report) | Date (dd-mm-yy) | Time (hh:mm) | Sample Type | NUMBER OF CONTAINERS Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) X MELTON STROM AND SANITARY | SAMPLES ON HOLD EXTENDED STORAGE REQ SUSPECTED HAZARD (see | |
| | BH-1 | 8 Dec 2022 | 9:45 | GW | | | |
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| Drinking Water (DW) Samples¹ (client use) | | Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only) | | | SAMPLE RECEIPT DETAILS (ALS use only) | | |
| Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | | Cooling Method: <input checked="" type="checkbox"/> NONE <input type="checkbox"/> ICE <input type="checkbox"/> ICE PACKS <input type="checkbox"/> FROZEN <input type="checkbox"/> COOLING INITIATED | | |
| Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | | | | Submission Comments identified on Sample Receipt Notification: <input type="checkbox"/> YES <input type="checkbox"/> NO | | |
| | | | | | Cooler Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A Sample Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A | | |
| | | | | | INITIAL COOLER TEMPERATURES °C: FINAL COOLER TEMPERATURES °C: 15.1 / 14.6 | | |
| SHIPMENT RELEASE (client use) | | INITIAL SHIPMENT RECEPTION (ALS use only) | | | FINAL SHIPMENT RECEPTION (ALS use only) | | |
| Released by: | Date: | Time: | Received by: | Date: | Time: | Received by: | Date: |
| | | | | | | HD | DEC 8, 22 |

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

N-466; B-338; GC-207; VW-169; OR-136; L-288; M-501; OGG-301.

105-638; CN-470; SC-16;



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Chain of Custody (COC) / Analytical Request Form

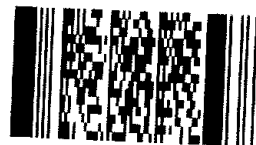
COC Number: 20 - 887463

Canada Toll Free: 1 800 668 9878

Page 1 of 1

| Report To | | Reports / Recipients | | | | Turnaround Time (TAT) Requested | | | | | | |
|---|---|---|------------------|--------------|-------------|--|---|--|--|--|--|--|
| Company: <u>MCCLYMOND & PDE ENGINEERS</u> Contact: <u>RICHARD SUKHA</u> Phone: Company address below will appear on the final report | | Select Report Format: <input checked="" type="checkbox"/> PDF <input type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) Merge QC/QCI Reports with COA <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: <u>r.sukha@mcclay.com</u> Email 2 Email 3 | | | | <input checked="" type="checkbox"/> Routine [R] if received by 3pm M-F - no surcharges at <input type="checkbox"/> 4 day [P4] if received by 3pm M-F - 20% rush surch <input type="checkbox"/> 3 day [P3] if received by 3pm M-F - 25% rush surch <input type="checkbox"/> 2 day [P2] if received by 3pm M-F - 50% rush surch <input type="checkbox"/> 1 day [E] if received by 3pm M-F - 100% rush surch <input type="checkbox"/> Same day [E2] if received by 10am M-S - 200% rush s may apply to rush requests on weekends, statutory holid | | | | | | |
| Invoice To: Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | Invoice Recipients Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax Email 2 | | | | Date and Time Required for all RAP TATs: For all tests with rush TATs req: A | | | | | | |
| Company: Contact: | | Project Information Oil and Gas Required Fields (client use) AFE/Cost Center: Major/Minor Code: Requisitioner: Location: | | | | Indicate Filtered (F), Preserved (P) | | | | | | |
| ALS Account # / Quote #: <u>5820</u> Job #: <u>5820</u> PO / AFE: LSD: | | ALS Lab Work Order # (ALS use only): ALS Contact: Sampler: | | | | NUMBER OF CONTAINERS Hutton Region Sunday + Storm Sewer *Naphthalene | Telephone: - 1 519 886 6910 | | | | | |
| ALS Sample # (ALS use only) | Sample Identification and/or Coordinates (This description will appear on the report) | | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | | SAMPLES ON HAZ EXTENDED STORAGE REQUIRED SUSPECTED HAZARD (see notes) | | | | | |
| | <u>BH 1</u> | | <u>09-MAR-23</u> | <u>8:00</u> | <u>GW</u> | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Drinking Water (DW) Samples ¹ (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only) <u>Reference WT2224510</u> | | | | SAMPLE RECEIPT DETAILS (ALS use only) Cooling Method: <input type="checkbox"/> NONE <input checked="" type="checkbox"/> ICE <input type="checkbox"/> ICE PACKS <input type="checkbox"/> FROZEN <input type="checkbox"/> COOLING INITIATED Submission Comments identified on Sample Receipt Notification: <input type="checkbox"/> YES <input type="checkbox"/> NO Cooler Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A Sample Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A INITIAL COOLER TEMPERATURES °C FINAL COOLER TEMPERATURES °C | | | | | | |
| SHIPMENT RELEASE (client use) Released by: <u>MCR</u> Date: <u>3/9/23</u> Time: | | INITIAL SHIPMENT RECEPTION (ALS use only) Received by: Date: Time: | | | | FINAL SHIPMENT RECEPTION (ALS use only) Received by: <u>AH</u> Date: <u>2023-03-09</u> Time: <u>3:00pm</u> | | | | | | |

Environmental Division
 Waterloo
 Work Order Reference
WT2224510



Telephone: - 1 519 886 6910

SAMPLES ON HAZ
 EXTENDED STORAGE REQUIRED
 SUSPECTED HAZARD (see notes)

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Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.
 1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

OR 359