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G5820

JULY 2023

**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'). McClymont & Rak Engineers Inc. (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 thirteen [13] storey building (Building 5), a twelve [12] storey building (Building 6), and a fifteen [15] storey building (Building 7) over two [2] levels of underground parking.
- **South Block:** A fifteen [15] storey building (Building 1), a fourteen [14] storey building (Building 2), a thirteen [13] storey building (Building 3), and a fifteen [15] storey building (Building 4) over two [2] levels of underground parking.

The finished floor elevation (FFE) at ground level is expected to be at an elevation of 188.15 to 188.25 meters above sea level (masl) for the North Block and 184.50 to 186.95 masl for the South Block.

The P2 FFE will be at an approximate elevation of 180.70 to 180.80 masl for the North Block and 177.05 to 179.0 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:** 230 m by 84 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 Homes Canada, dated July 2023.

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 179.20 masl for the North Block and 175.55 for the South Block. Therefore, groundwater will need to be lowered to an elevation of 178.20 for the North Block and 174.55 masl for the South Block.

The average ground water level recorded in the monitoring wells is at an elevation of 182.26 masl (Table 3), representing an approximate 7 – 8 m hydrostatic head requiring dewatering. The size of the shoring plan layout was assumed to cover approximately 165 m by 80 m and 230 m by 84 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:

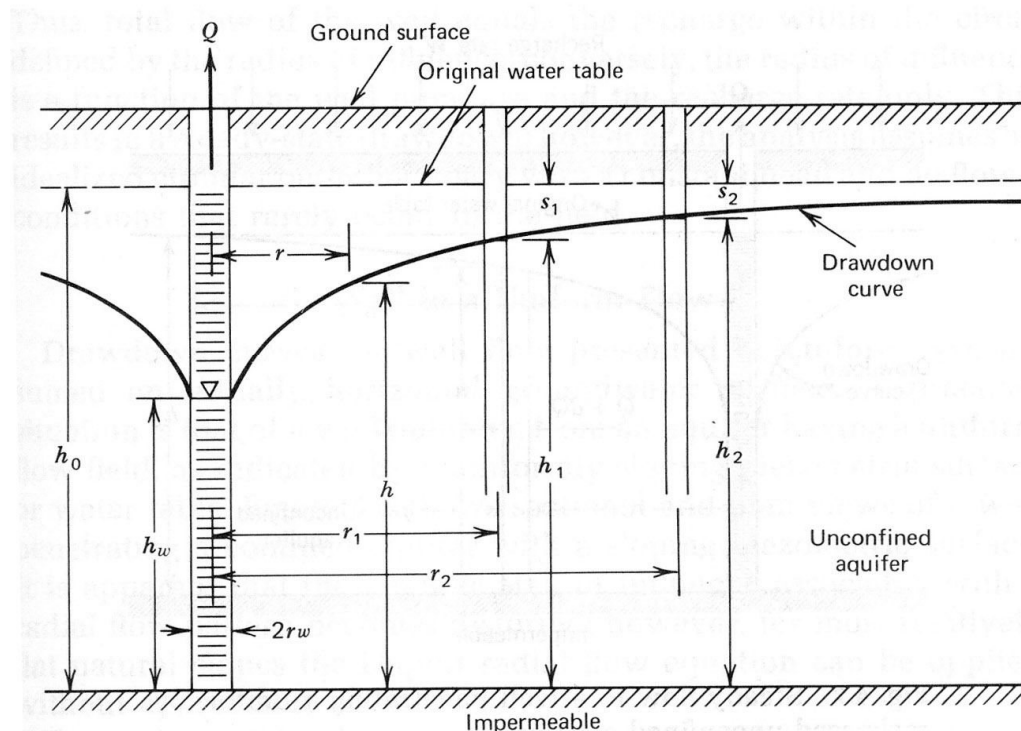
h [m] is the height of the water table above an impervious base

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	182
South	331



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 184.50 to 188.25 meters above sea level (masl). The P2 floor slab elevation is expected to range from elevations of 177.05 to 180.80 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 176.55 to 180.30 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	84
South	205



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 temporary dewatering discharge rate was calculated at 182 m³/day and 331 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 flow rate from the PWDS was calculated at 84 m³/day and 205 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 8 – 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

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

The finished floor elevation (FFE) at ground level is expected to be at an elevation of 188.15 to 188.25 meters above sea level (masl) for the North Block and 184.50 to 186.95 masl for the South Block.

The P2 FFE will be at an approximate elevation of 180.70 to 180.80 masl for the North Block and 177.05 to 179.0 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:** 230 m by 84 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 179.20 masl for the North Block and 175.55 for the South Block. Therefore, groundwater will need to be lowered to an elevation of 178.20 for the North Block and 174.55 masl for the South Block.

The average ground water level recorded in the monitoring wells is at an elevation of 182.26 masl (Table 3), representing an approximate 7 – 8 m hydrostatic head requiring dewatering.

The steady-state discharge rate for temporary construction dewatering was calculated at 182 m³/day (33 USG/min) and 331 m³/day (61 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 will be required from the MECP 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 84 m³/day (15 USG/min) and 205 m³/day (38 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 will 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 26 to 50 m. The ZOI for permanent drainage ranges from 13 to 37 m. As the ZOI for construction dewatering and permanent drainage 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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5. L.W. Mays, *Water Resources Engineering*, 1st Edition, John Wiley & Sons, New York, 2001.
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 Homes Canada, dated July 2023.

8.0 STATEMENT OF LIMITATIONS

McClymont & Rak Engineers, Inc. (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 verifies 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, McClymont and Rak Engineers Inc. 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 McClymont & Rak Engineers, Inc. for this project.

Respectfully,
McCLYMONT & RAK ENGINEERS INC.



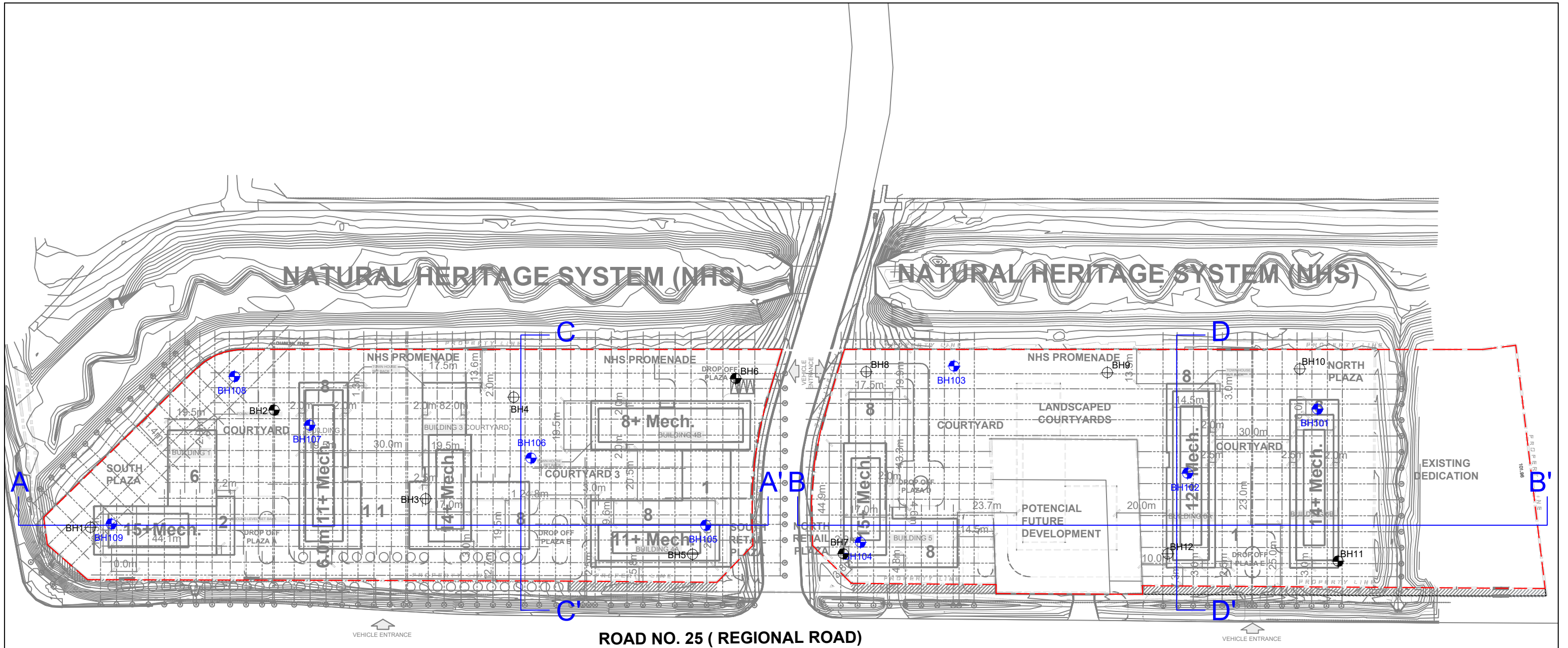
Prepared By:
Richard Sukhu, P.Eng., B.Eng.



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

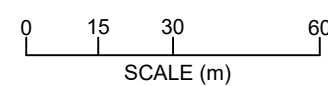
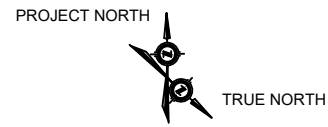
Date of Issue: July 18, 2023

FIGURES



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

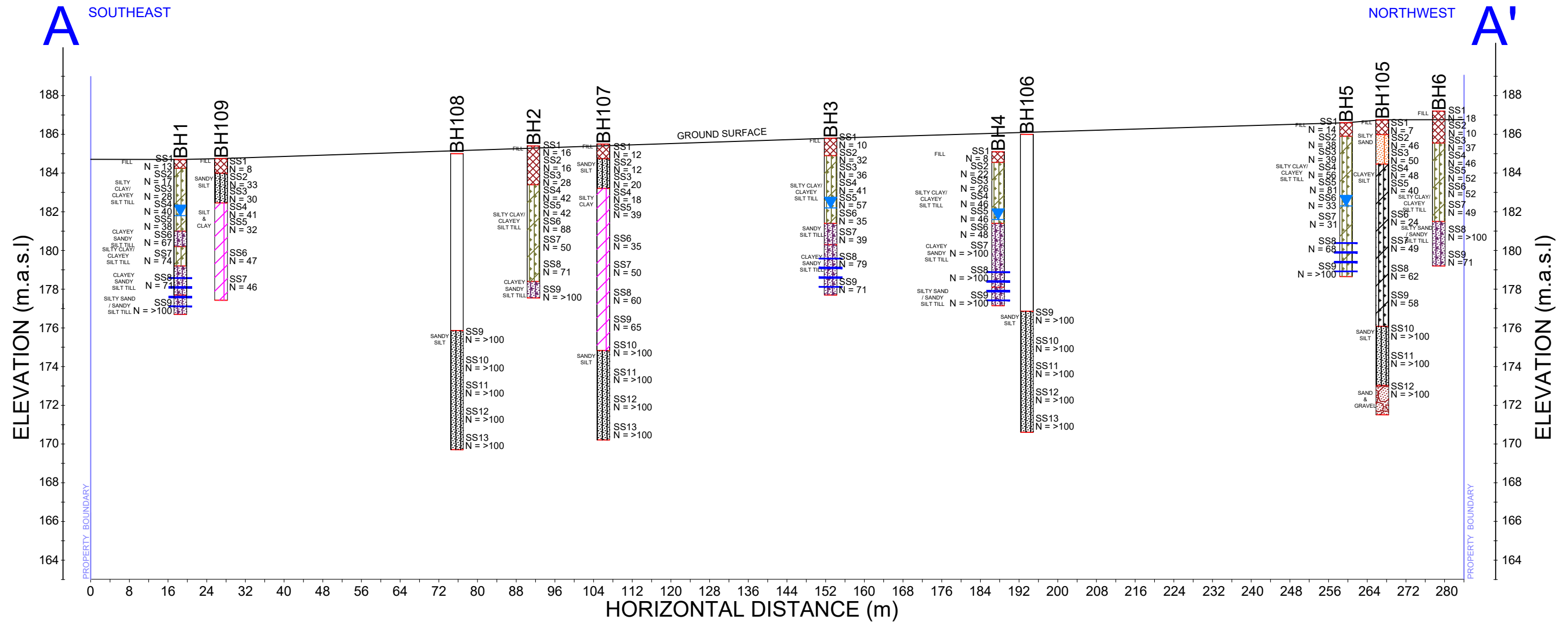
Drawing Notes: Image drafted from property survey, Toronto Maps, Google Maps, and site inspections. Not for construction purposes.



MOR **McCLYMONT & RAK**
ENGINEERS, INC.
 GEO-ENVIRONMENTAL CONSULTANTS

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

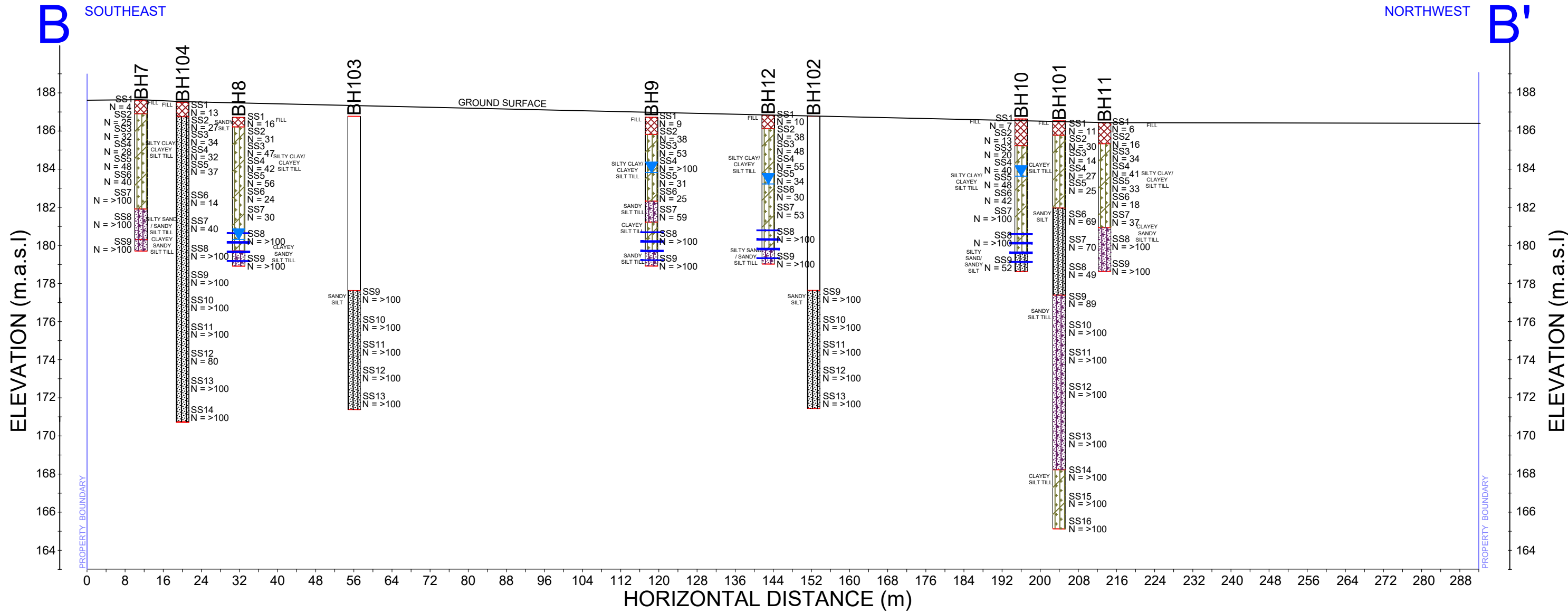
BOREHOLE LOCATION PLAN				
Project No. G5820	Date JANUARY 2023	Drawn by: CM	Checked by: ST	Drawing No. 1



LEGEND:

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

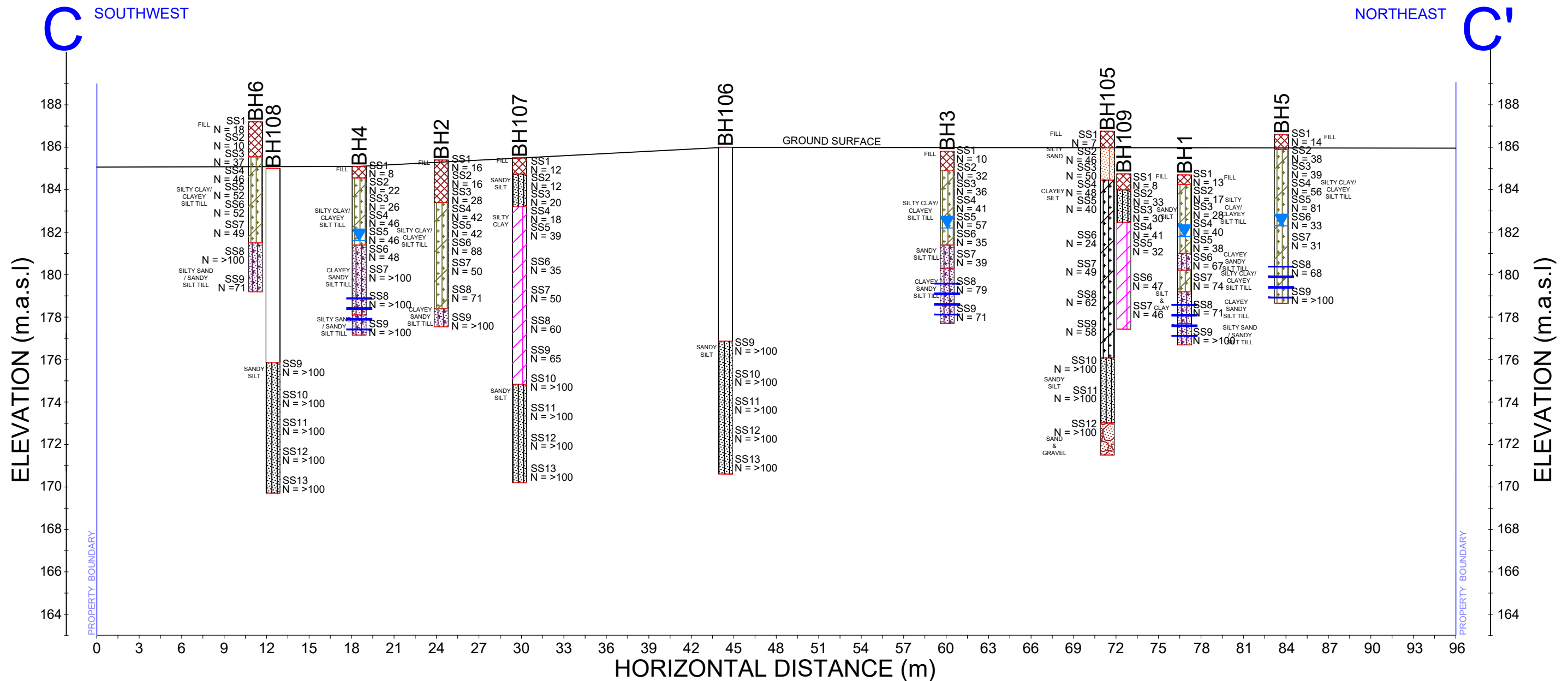
		McCLYMONT & RAK ENGINEERS, INC. GEO-ENVIRONMENTAL CONSULTANTS		
		NORTH-WESTERN CORNER OF REGIONAL ROAD 25 & BRITANNIA ROAD, MILTON, ONTARIO		
CROSS-SECTION A-A'				
Project No. G5820	Date JANUARY 2023	Drawn by: CM	Checked by: ST	Drawing No. 2



LEGEND:

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

		McCLYMONT & RAK ENGINEERS, INC. 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

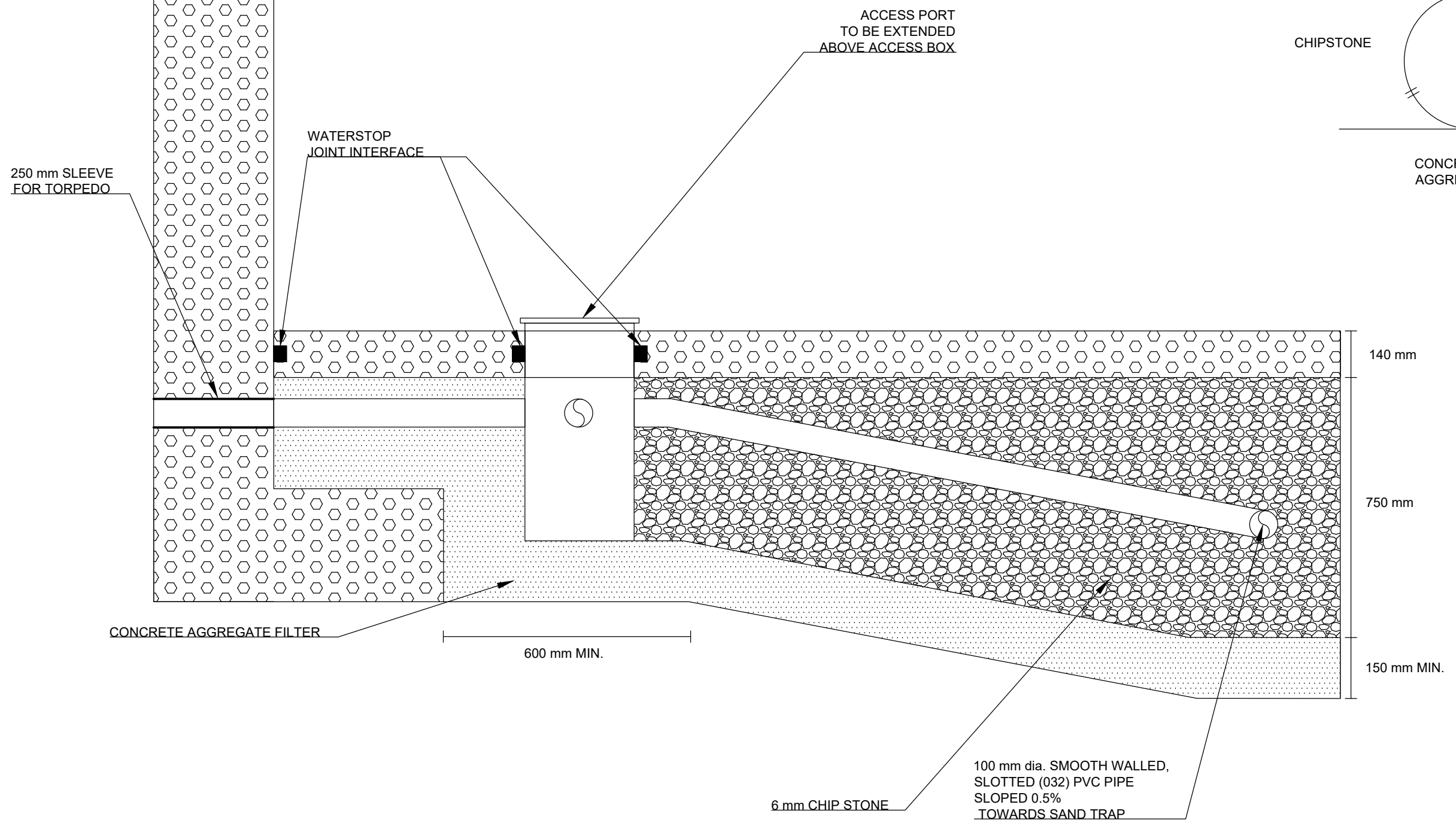
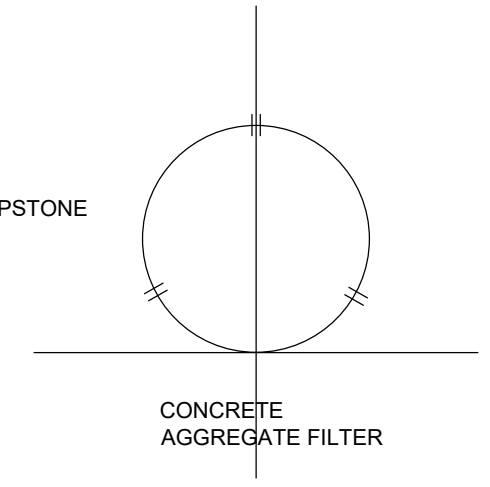


LEGEND:

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

		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

CROSS SECTION:
100 mm dia.
SMOOTH PVC PIPE



PRIVATE WATER
DRAINAGE SYSTEM

TABLES

McCLYMONT AND RAK ENGINEERS INC.
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					
		2.76	181.92	2/8/2023					
		2.62	182.06	3/8/2023					
				4/2023					
				5/2023					
				6/2023					
				7/2023					
				8/2023					
		9/2023							
		10/2023							
		11/2023							
BH 3	185.80	3.70	182.10	3/9/2018	7.70	5.70	3.05	50	STICK-UP
		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					
				4/2023					
				5/2023					
				6/2023					
				7/2023					
				8/2023					
		9/2023							
		10/2023							
		11/2023							
BH 4	185.10	3.60	181.50	3/9/2018	7.70	5.70	3.05	50	STICK-UP
		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					
				4/2023					
				5/2023					
				6/2023					
				7/2023					
				8/2023					
		9/2023							
		10/2023							
		11/2023							
BH 5	186.60	4.20	182.40	3/9/2018	7.70	5.70	3.05	50	STICK-UP
		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					
				4/2023					
				5/2023					
				6/2023					
				7/2023					
				8/2023					
		9/2023							
		10/2023							
		11/2023							
BH 8	186.70	DRY	-	3/9/2018	7.70	5.70	3.05	50	STICK-UP
		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					
				4/2023					
				5/2023					
				6/2023					
				7/2023					
				8/2023					
		9/2023							
		10/2023							
		11/2023							
BH 10	186.60	2.90	183.70	3/9/2018	7.70	5.70	3.05	50	STICK-UP
		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					
				4/2023					
				5/2023					
				6/2023					
				7/2023					
				8/2023					
		9/2023							
		10/2023							
		11/2023							
BH 12	186.80	3.60	183.20	3/9/2018	7.70	5.70	3.05	50	STICK-UP
		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					
				4/2023					
				5/2023					
				6/2023					
				7/2023					
				8/2023					
		9/2023							
		10/2023							
		11/2023							
Min	184.70	0.74	180.30	-	7.70	-	-	-	-
Max	186.80	6.40	185.86	-	7.70	-	-	-	-
Average	186.13	3.25	182.61	-	7.70	-	-	-	-

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

McCLYMONT AND RAK ENGINEERS INC.
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

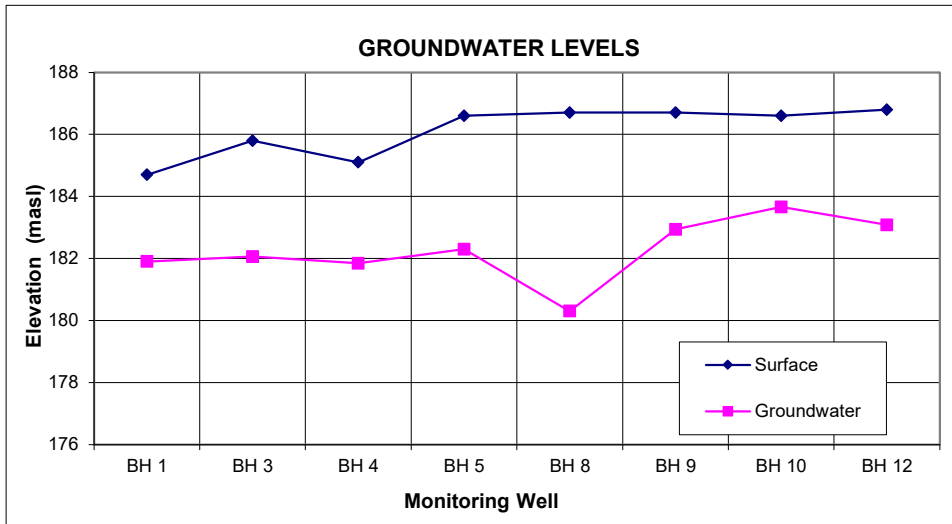
Note:

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

Project: Proposed Residential Development
Location: Northwest corner of Regional Road 25 & Britannia Road, Toronto, ON
Date: July-23
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	2.80	181.90	1/6/2023	
BH 3	185.80	3.74	182.06	1/6/2023	
BH 4	185.10	3.26	181.84	1/6/2023	
BH 5	186.60	4.30	182.30	3/16/2018	
BH 8	186.70	6.40	180.30	3/16/2018	
BH 9	186.70	3.76	182.94	1/6/2023	
BH 10	186.60	2.94	183.66	1/6/2023	
BH 12	186.80	3.72	183.08	1/6/2023	
Average	186.13	3.87	182.26		
Max			183.66		



MCR	McCLYMONT & RAK ENGINEERS, INC.	GROUNDWATER
	GEO-ENVIRONMENTAL CONSULTANTS	

Project: Proposed Residential Development
 Location: Northwest corner of Regional Road 25 & Britannia Road, Toronto, ON
 Date: July-23
 Project #: G5820

**TABLE 4
DISCHARGE ESTIMATION OF CONSTRUCTION DEWATERING**

Site Parameters	North Block	South Block	Units
Initial Water Level before Dewatering	182.26	182.26	(m)
Lowest Water Level during Construction Dewatering	178.20	174.55	(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	176.20	172.55	(m)
Applied Radius of Influence (Ro)	26.21	49.77	(m)
Height btw Initial Water Level and Aquifer Bottom (H)	6.06	9.71	(m)
Height btw Lowest Water Level and Aquifer Bottom (h_w)	2.00	2.00	(m)
Radius of Influence (R)	91.03	123.80	(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	182	331 (m ³ /day)
	33	61 (USG/min)

MCR	McCLYMONT & RAK ENGINEERS, INC.	GROUNDWATER
	GEO-ENVIRONMENTAL CONSULTANTS	

Project: Proposed Residential Development
 Location: Northwest corner of Regional Road 25 & Britannia Road, Toronto, ON
 Date: July-23
 Project #: G5820

**TABLE 5
DISCHARGE ESTIMATION OF PERMANENT DRAINAGE SYSTEM**

Site Parameters	North Block	South Block	Units
Initial Water Level before Dewatering	182.26	182.26	(m)
Lowest Water Level under PDS conditions	180.20	176.55	(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	179.20	175.55	(m)
Applied Radius of Influence (Ro)	13.30	36.86	(m)
Height btw Initial Water Level and Aquifer Bottom (H)	3.06	6.71	(m)
Height btw Lowest Water Level and Aquifer Bottom (h_w)	1.00	1.00	(m)
Radius of Influence (R)	78.12	110.89	(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	84	205 (m ³ /day)
	15	38 (USG/min)

APPENDIX A

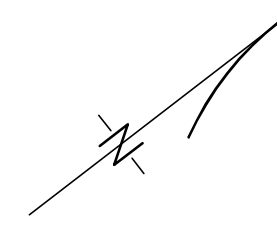
PLAN OF TOPOGRAPHY

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.

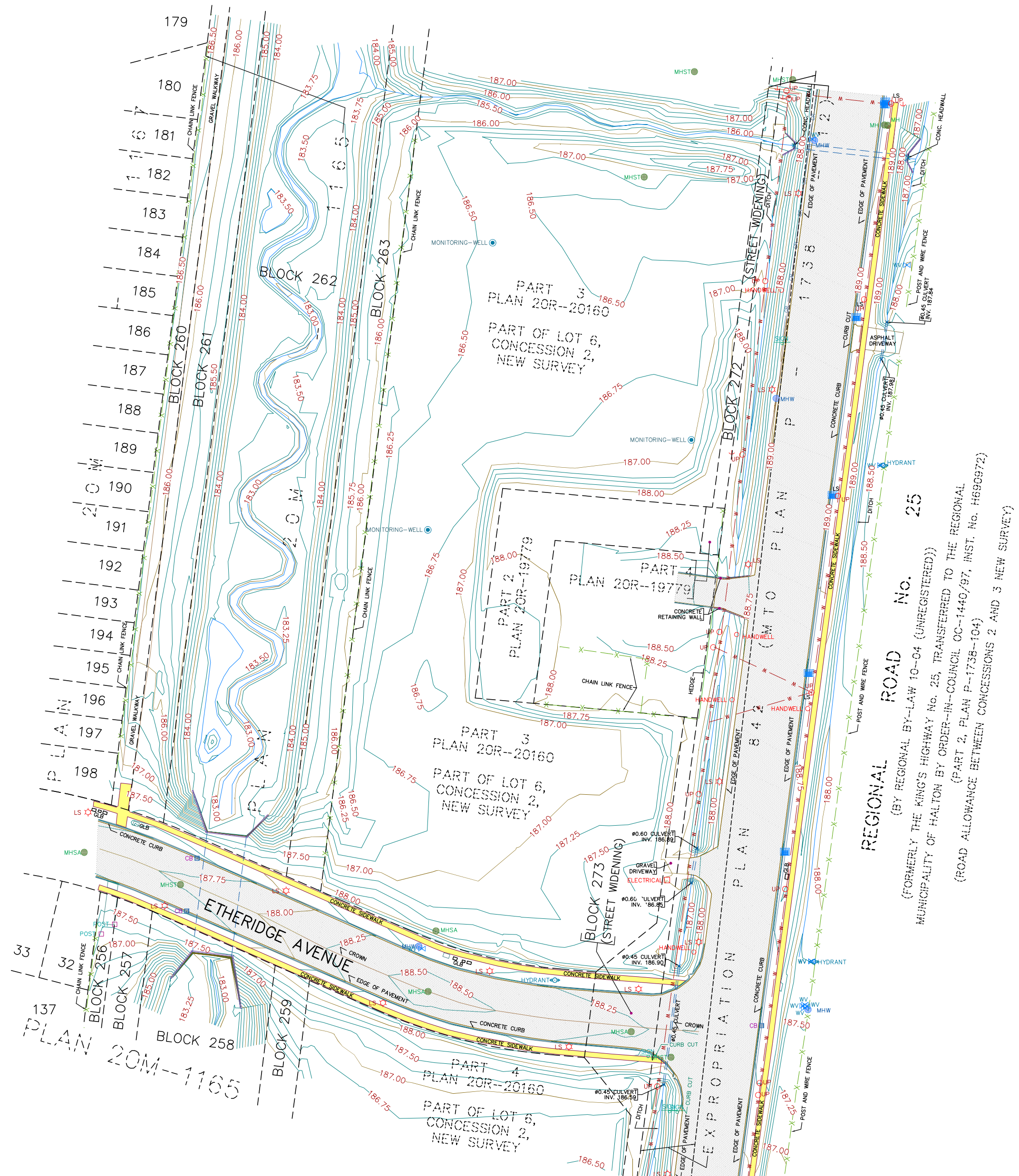
FIELD OBSERVATIONS

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



RADY-PENTEK & EDWARD SURVEYING LTD.
 ONTARIO LAND SURVEYORS
 643 CHRISLEA ROAD, SUITE 7,
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 Tel. (416) 635-5000 Fax (416) 635-5001
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 Website: www.r-pe.ca
 DRAWN: S.G.
 JOB No. 14-014 CAD FILE 14014tp22a



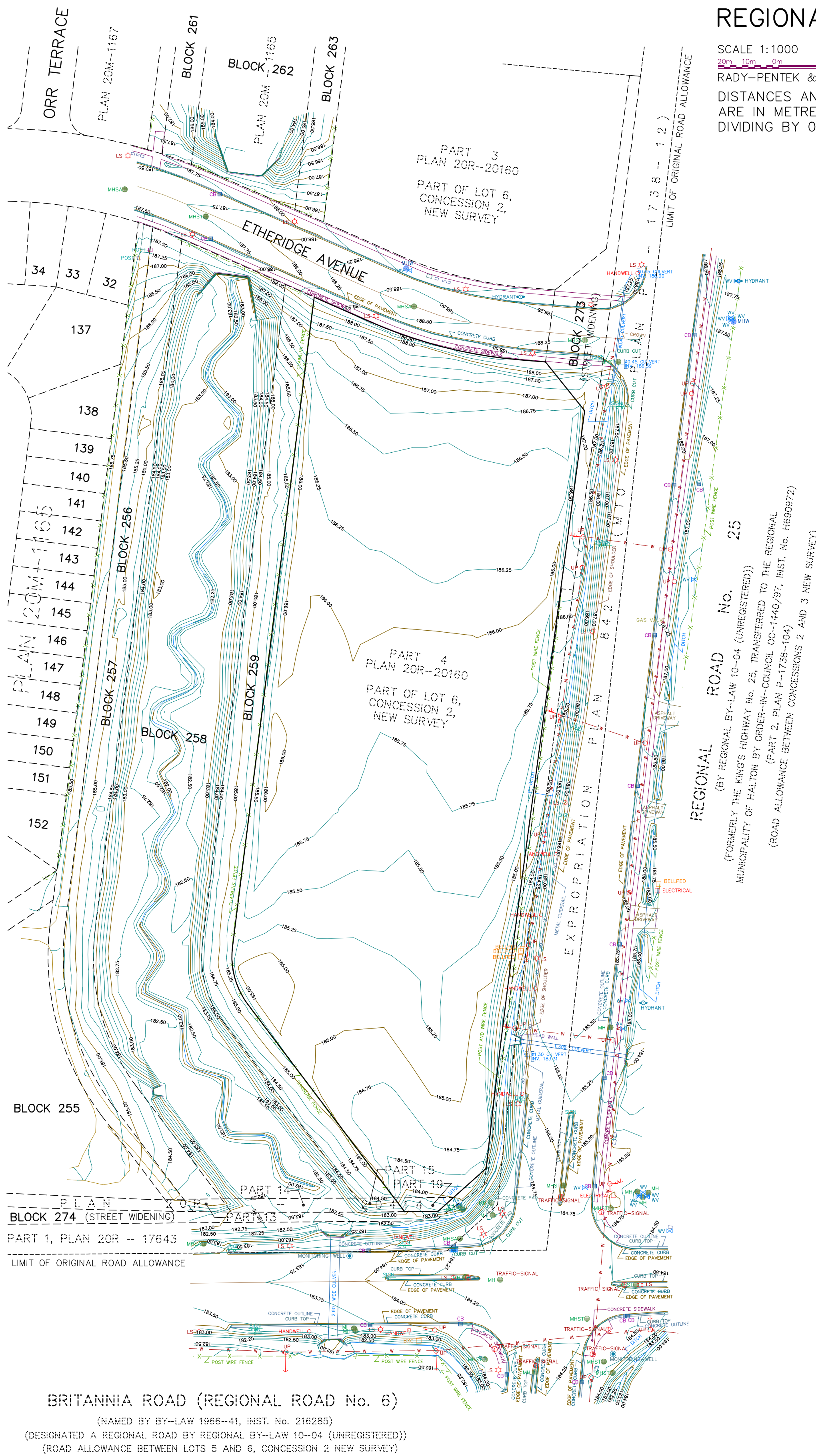
SKETCH SHOWING ELEVATIONS OF PART OF LOT 5, CONCESSION 2, NEW SURVEY (GEOGRAPHIC TOWNSHIP OF TRAFALGAR) AND PART OF PLAN 20M-1165 TOWN OF MILTON REGIONAL MUNICIPALITY OF HALTON

SCALE 1:1000

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

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
- 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



RADY-PENTEK & EDWARD SURVEYING LTD.
ONTARIO LAND SURVEYORS
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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

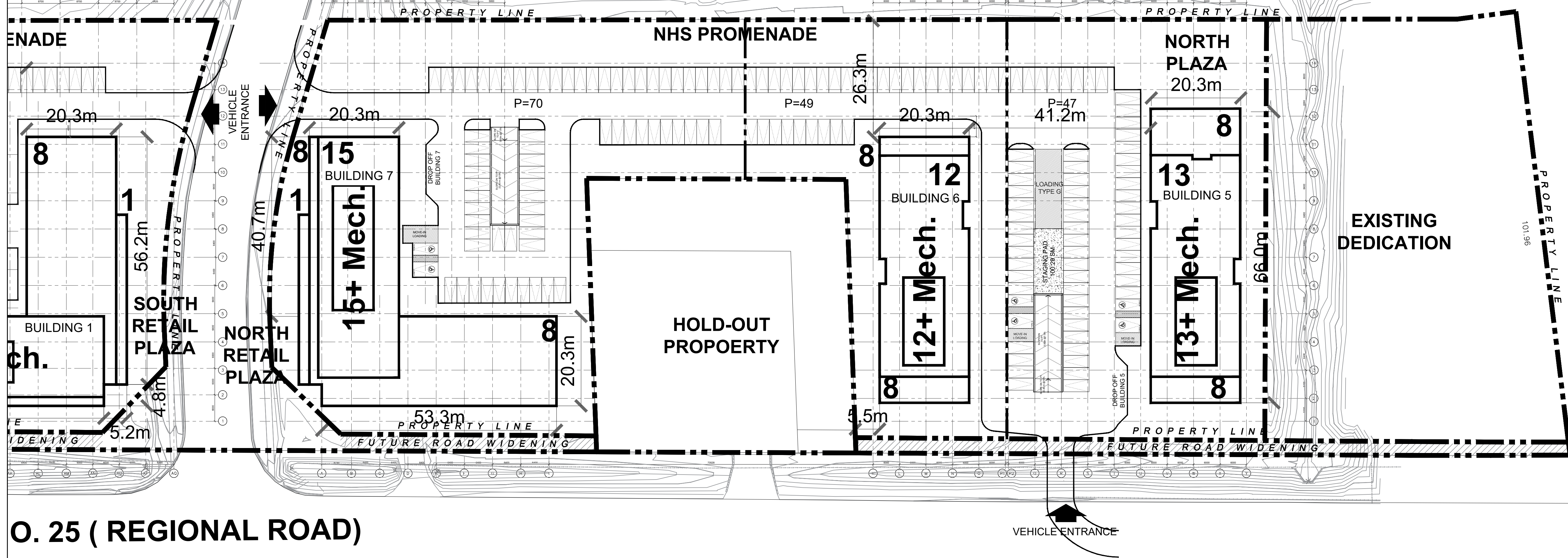
BOUNDARY NOTE

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

(NHS)

NATURAL HERITAGE SYSTEM (NHS)



O. 25 (REGIONAL ROAD)

No. Revisions Date

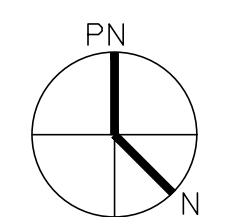
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FRAMGARD MATTAMY

MILTON WEST, ONTARIO

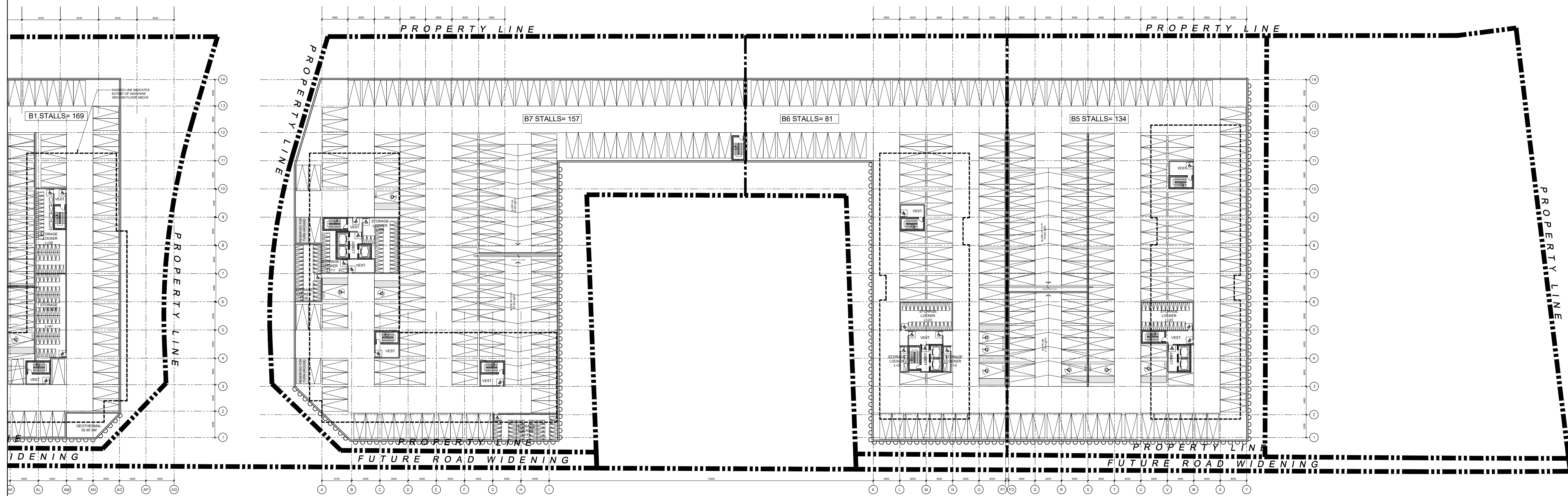


Drawn MK, JA Scale 1:500

Checked BL Date 2023-07-12

Title NORTH BLOCK SITE PLAN

Project No. 22-210 Drawing No. A200



No.	Revisions	Date

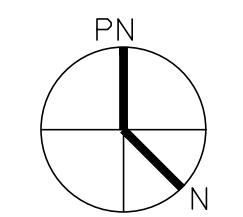
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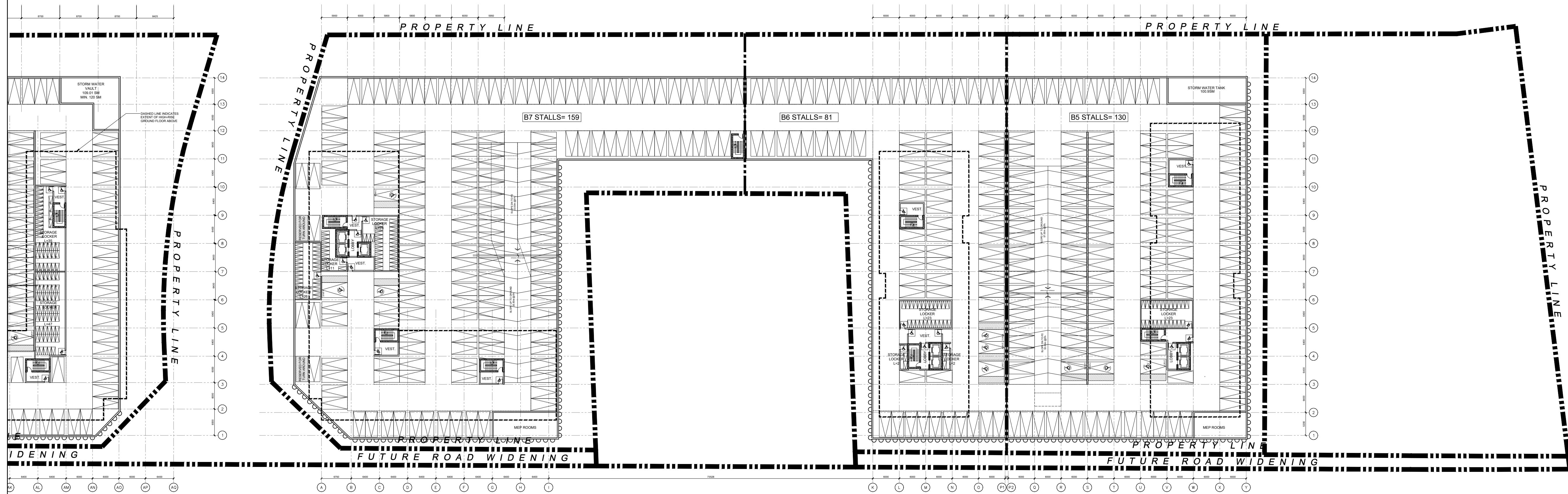


Drawn MK, JA	Scale 1:500
Checked BL	Date 2023-07-12

Title
NORTH BLOCK PARKING LEVEL P2

Project No.
22-210

Drawing No.
A203



No.	Revisions	Date

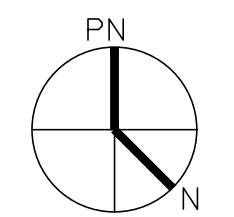
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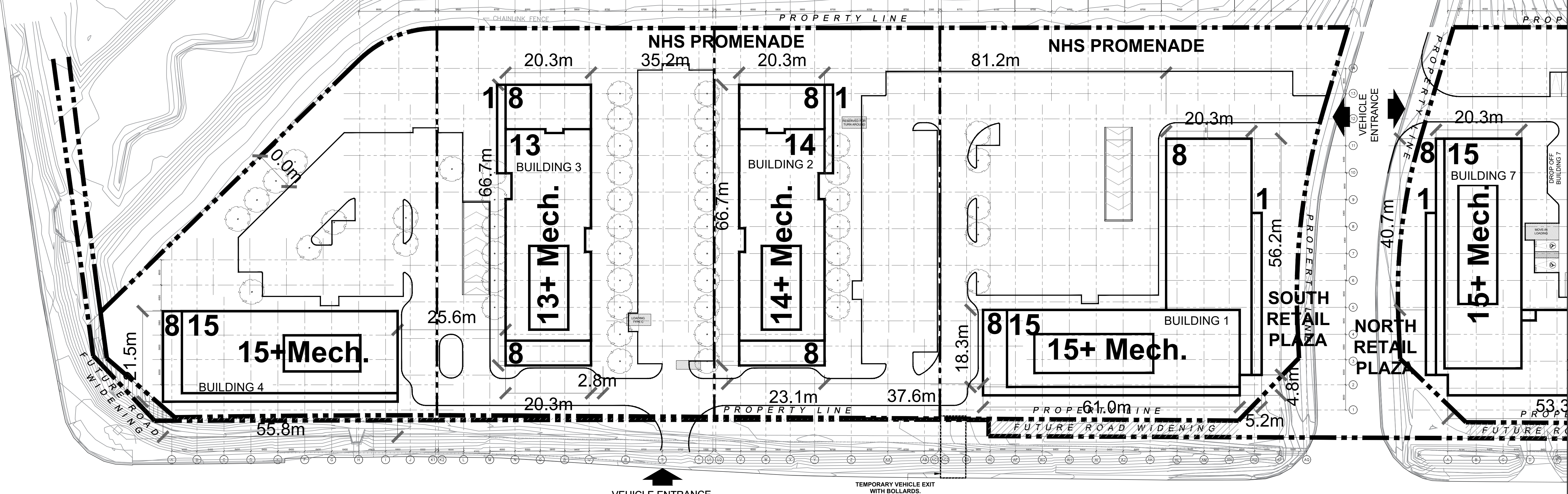
Drawn MK, JA	Scale 1:500
Checked BL	Date 2023-07-12

Title
**NORTH BLOCK
 PARKING LEVEL P1**

Project No.
22-210

Drawing No.
A204

NATURAL HERITAGE SYSTEM (NHS)



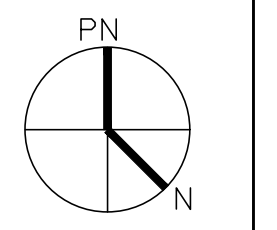
ROAD NO. 25 (REGIONAL ROAD)

No. Revisions Date
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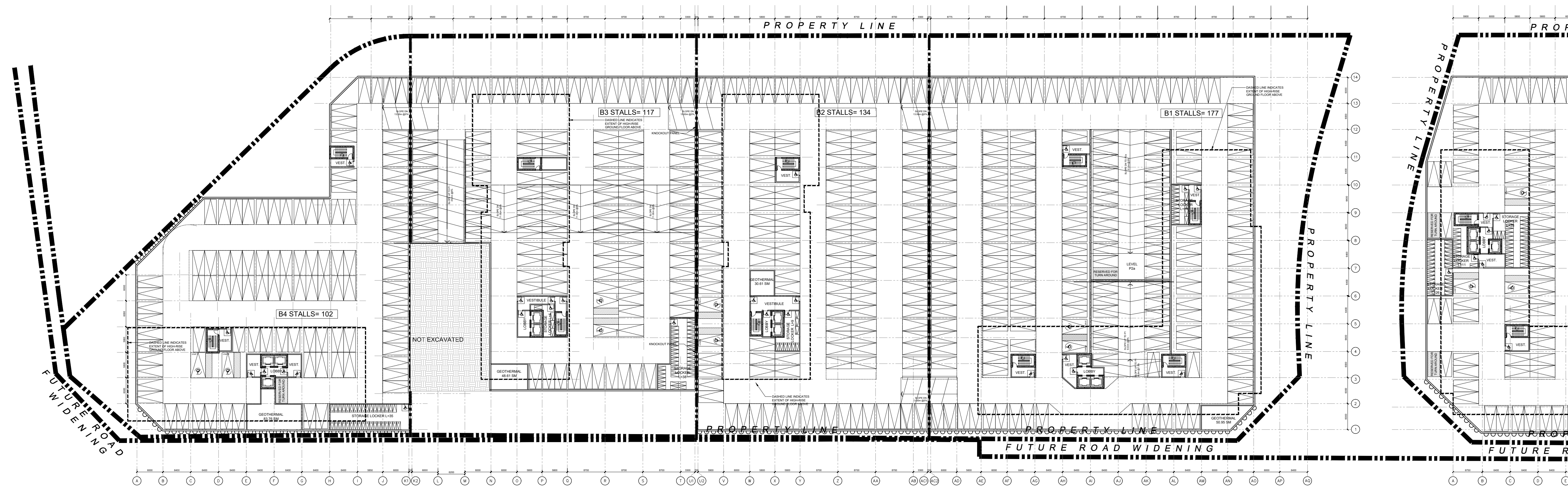
MILTON WEST, ONTARIO



Drawn MK, JA	Scale 1:500
Checked BL	Date 2023-07-14

Title
SOUTH BLOCK SITE PLAN

Project No. 22-210	Drawing No. A212
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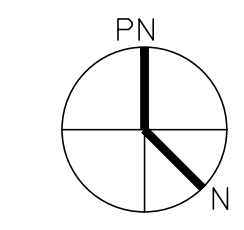


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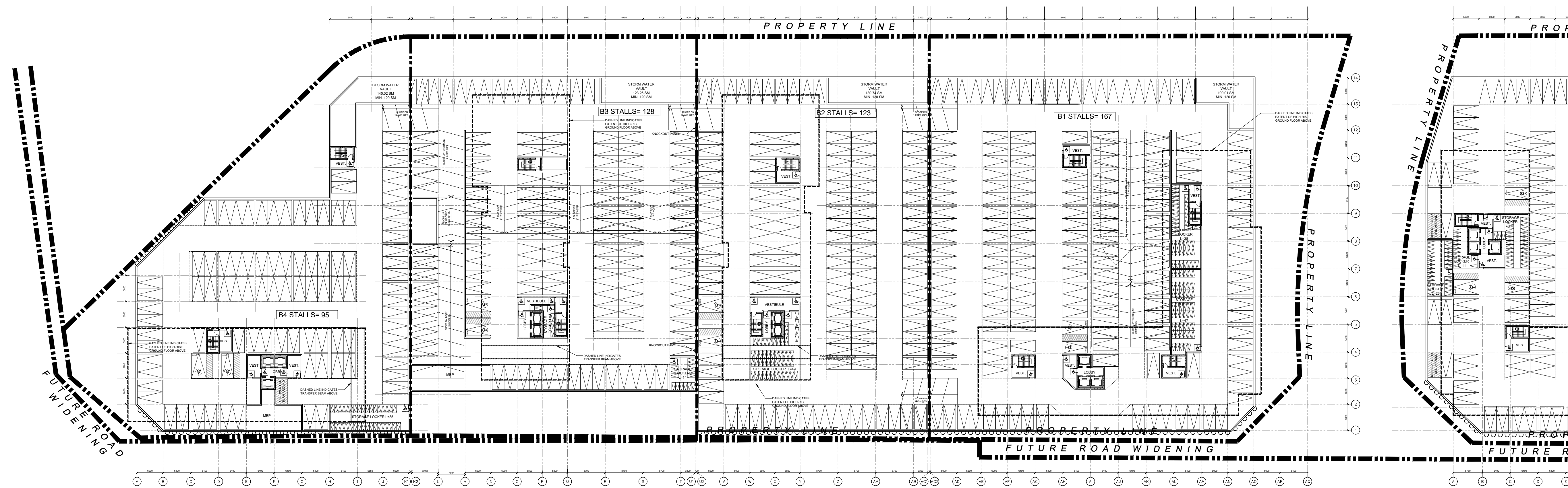
MILTON WEST, ONTARIO



Drawn MK, JA	Scale 1:500
Checked BL	Date 2023-07-14

Title
SOUTH BLOCK PARKING LEVEL P2

Project No. 22-210	Drawing No. A214
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No.	Revisions	Date

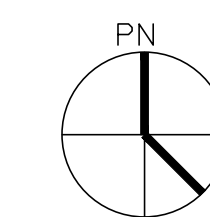
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MILTON WEST, ONTARIO



Drawn MK, JA	Scale 1:500
Checked BL	Date 2023-07-14

Title
**SOUTH BLOCK
PARKING LEVEL P1**

Project No.
22-210

Drawing No.
A215

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								
							20 100 200 300 400				20 40 60 80									
							20 40 60 80				wp ----- w 10 20 30 40									
		GROUND SURFACE		186.50																
	POWER BORING HOLLOW STEM AUGER	FILL: clayey silt, trace of gravel, organics, topsoil inclusions, rootlets, dark brown, moist, stiff.		185.74	1	SS	11										16.9			
				0.76	2	SS	30												14.5	
2		CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, very stiff.			3	SS	14											16.9		
						4	SS	27											12.7	
						5	SS	25											14	
4							6	SS	69										5.4	
						181.93	7	SS	70											5.5
6		SANDY SILT: some clay and gravel, reddish brown, moist to wet, very dense to dense.			8	SS	49											5.9		
						9	SS	89											14.8	
8						177.36	10	SS	>100										6.8	
			- some clayey silt seams at 7.62 m.																9.2	
10		SANDY SILT TILL: trace of gravel, clay, reddish brown, moist to wet, very dense.			11	SS	100												13.6	
						12	SS	>100												8.3
12							13	SS	>100											8.9
					- moist, shale fragments from 10.67 m to 13.72 m.		14	SS	100											
14		CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			15	SS	100												14.1	
					16	SS	100													
16					168.21	17	SS	100												
		- shale fragments at 13.87 m.		18.29	18	SS	100													
18	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			19	SS	100														
					20	SS	100													
20	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			21	SS	100														
					22	SS	100													
22	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			23	SS	100														
					24	SS	100													
24					165.11	25	SS	100												
					21.39	26	SS	100												
26	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			27	SS	100														
					28	SS	100													
28	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			29	SS	100														
					30	SS	100													
30	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			31	SS	100														
					32	SS	100													
32	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			33	SS	100														
					34	SS	100													
34	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			35	SS	100														
					36	SS	100													
36	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			37	SS	100														
					38	SS	100													
38	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			39	SS	100														
					40	SS	100													
40	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			41	SS	100														
					42	SS	100													
42	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			43	SS	100														
					44	SS	100													
44	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			45	SS	100														
					46	SS	100													
46	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			47	SS	100														
					48	SS	100													
48	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			49	SS	100														
					50	SS	100													
50	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			51	SS	100														
					52	SS	100													
52	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			53	SS	100														
					54	SS	100													
54	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			55	SS	100														
					56	SS	100													
56	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			57	SS	100														
					58	SS	100													
58	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			59	SS	100														
					60	SS	100													
60	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			61	SS	100														
					62	SS	100													
62	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			63	SS	100														
					64	SS	100													
64	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			65	SS	100														
					66	SS	100													
66	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			67	SS	100														
					68	SS	100													
68	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			69	SS	100														
					70	SS	100													
70	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			71	SS	100														
					72	SS	100													
72	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			73	SS	100														
					74	SS	100													
74	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			75	SS	100														
					76	SS	100													
76	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			77	SS	100														
					78	SS	100													
78	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			79	SS	100														
					80	SS	100													
80	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			81	SS	100														
					82	SS	100													
82	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			83	SS	100														
					84	SS	100													
84	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			85	SS	100														
					86	SS	100													
86	CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.			87	SS	100														

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	SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense.		177.61 9.14	9	SS	>100					8.5							
4				10	SS	>100				8.2									
6																			
8																			
10																			
12																			
14																			
16																			
18																			
					End of Borehole		171.38 15.37	13	SS	>100					11.1				
					Note:										11				
															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	nat V - ● rem V - ○				Q - ✕ U - ▲						
								% LEL - (hexane) □				WATER CONTENT, PERCENT						
							100	200	300	400	20	40	60	80	wp ----- w 10 20 30 40			
		GROUND SURFACE		187.50														
	POWER BORING SOLID STEM AUGER	FILL: sand and gravel, reddish brown, dry, compact.		186.74	1	SS	13									12.4		
		SANDY SILT: trace of gravel, reddish brown, moist to wet, compact to very dense.		0.76	2	SS	27										13.4	
2					3	SS	34										12.9	
					4	SS	32										11.1	
					5	SS	37										11.7	
4			- trace of clay, compact from 4.57 m to 6.10 m.		6	SS	14										12.8	
					7	SS	40										8.2	
6			- some clay, some gravel, shale fragments from 6.10 m to 16.79 m.		8	SS	>100										9.8	
8					9	SS	>100										8.7	
10					10	SS	>100										7.2	
12					11	SS	>100										10.7	
14					12	SS	80										10.5	
16					13	SS	>100										10.5	
18			End of Borehole		170.71	14	SS	>100									14.2	
		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	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 \ominus wl			
						20	40	60	80					10 20 30 40			
		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	
2					3	SS	50									19.5	
		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	
4					5	SS	40									10.2	
		- hard from 6.10 m to 10.67 m.			6	SS	24									11.4	
6					7	SS	49									7.2	
8					8	SS	62									7.4	
10					9	SS	58									10.3	
		SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense.		176.08 10.67	10	SS	>100									10	
12					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													

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					
								% LEL - (hexane) \square				WATER CONTENT, PERCENT					
		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.		184.76	2	SS	12										
						3	SS	20									
2		SILTY CLAY: reddish brown, moist to wet, very stiff to hard.		183.21	4	SS	18						14.4				
				2.29		5	SS	39					12.8				
4						6	SS	35					12.3				
						7	SS	50					17.4				
6						8	SS	60					11.4				
						9	SS	65					10.7				
8						10	SS	>100					12.7				
10						11	SS	>100					9.9				
12						12	SS	>100					9.1				
14						13	SS	>100					14.8				
16		End of Borehole		170.21													
		Note:		15.29													

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																
4																	
6																	
8																	
10			SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense.	175.86 9.14	9	SS	>100					10.9					
12																	
14												12.7					
16												9.2					
18												9.2					
			End of Borehole	169.71 15.29	13	SS	>100					8.6					
			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	nat V - \otimes rem V - \bullet				Q - \times U - \blacktriangle					
								% LEL - (hexane) \square				WATER CONTENT, PERCENT					
		GROUND SURFACE		184.75													
	POWER BORING HOLLOW STEM AUGER	FILL: sand, trace of gravel, organics, rootlets, brown, moist, loose.			1	SS	8										
		SANDY SILT: trace of clay, reddish brown, moist, dense.		183.99 0.76		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																	
8		End of Borehole Note:		177.43 7.32													

GROUNDWATER ELEVATIONS

∇ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL: m bgs

\blacktriangledown 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.

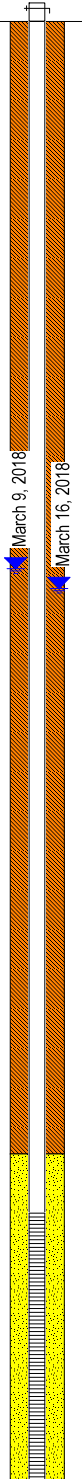


83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

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
 DATE: March 1, 2018
 DATUM: Geodetic

CLIENT: Mattamy Willmott Limited
 LOCATION: Milton, ON
 BOREHOLE TYPE: Solid Stem Augers

ORIGINATED BY: M.Z.
 COMPILED BY: M.Z.
 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	0.5	dark mottled brown Silty Clay/Clayey Silt Fill some topsoil, some organic stains some rootlets, damp		1	SS	33	10			25		
184.9	1.0	mottled reddish brown Compacted Silty Clay/Clayey Silt Fill damp, stiff								14		
	1.5	brown, occ. reddish brown Silty Clay/Clayey Silt Till trace to some sand occ. oxidized fissures damp, hard		2	SS	25	32			13		
	2.0									18		
	2.5											
	3.0											
	3.5											
	4.0	grey								12		
181.4	4.5	grey Sandy Silt Till some clay, occ. oxidized fissures damp, hard		6	SS	38	35			11		
	5.0									13		
	5.5											
180.3	6.0	grey Clayey Sandy Silt Till trace shale fragments damp, hard		7	SS	35	39			9		
	6.5											
	7.0											
	7.5											
	8.0											
	8.5											
	9.0											
	9.5											
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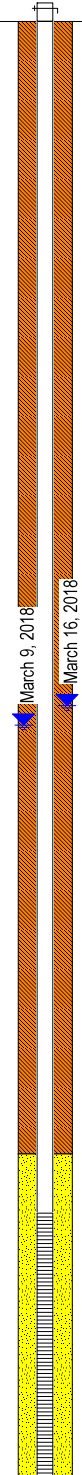
RECORD OF BOREHOLE 4

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 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					
185.1	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					
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																	

Gradation Analysis
S(4):
2 18 47 33

Gradation Analysis
S(8):
12 33 46 9

February 28, 2018

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			7			
	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												

March 16, 2018

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 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)					
178.9		grey Clayey Sandy Silt Till damp, hard		9	SS	10	50/13cm		8 ○		
	8	End of Borehole Cave-in Depth on Completion: 7.0m Groundwater Depth on Completion: Dry Measured Water Level in installed Monitoring Well on: March 9, 2018: Dry March 16, 2018: 6.4m									
	9										
	10										
	11										
	12										
	13										
	14										

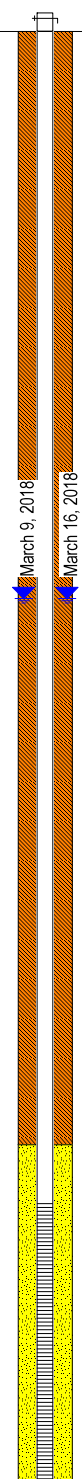
RECORD OF BOREHOLE 9

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												



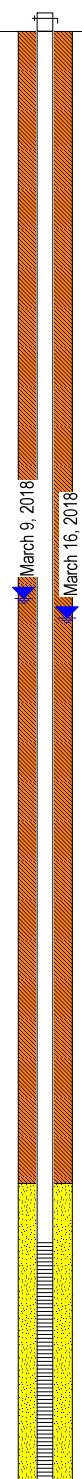
RECORD OF BOREHOLE 10

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 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
186.6	0	Ground Surface										
	0	dark brown Clayey Silt Fill some topsoil, some organic stains, some rootlets, damp to moist		1	SS	30	7					
185.9	1	brown Compacted Silty Clay/Clayey Silt Fill damp, stiff		2	SS	28	13					
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					
	3	hard		4	SS	23	40					
	4			5	SS	30	48					
	5	grey		6	SS	28	42					
	6			7	SS	30	90/28cm					
	7	occ. sandy silt till seams		8	SS	23	50/13cm					
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											

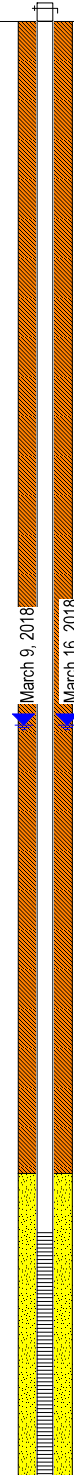
RECORD OF BOREHOLE 12

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.

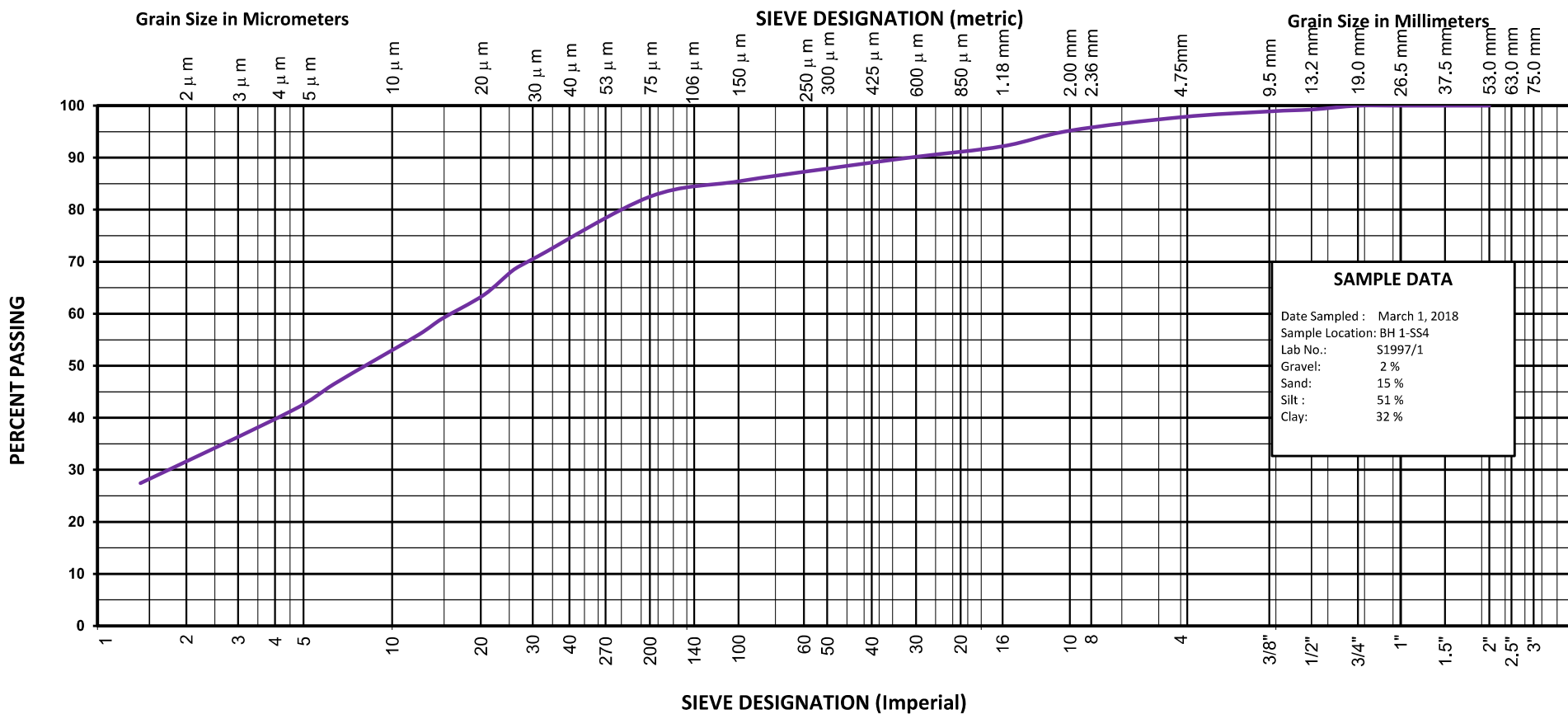


83 Citation Dr, Unit 9,
Vaughan, Ontario, L4K 2Z6

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



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.:

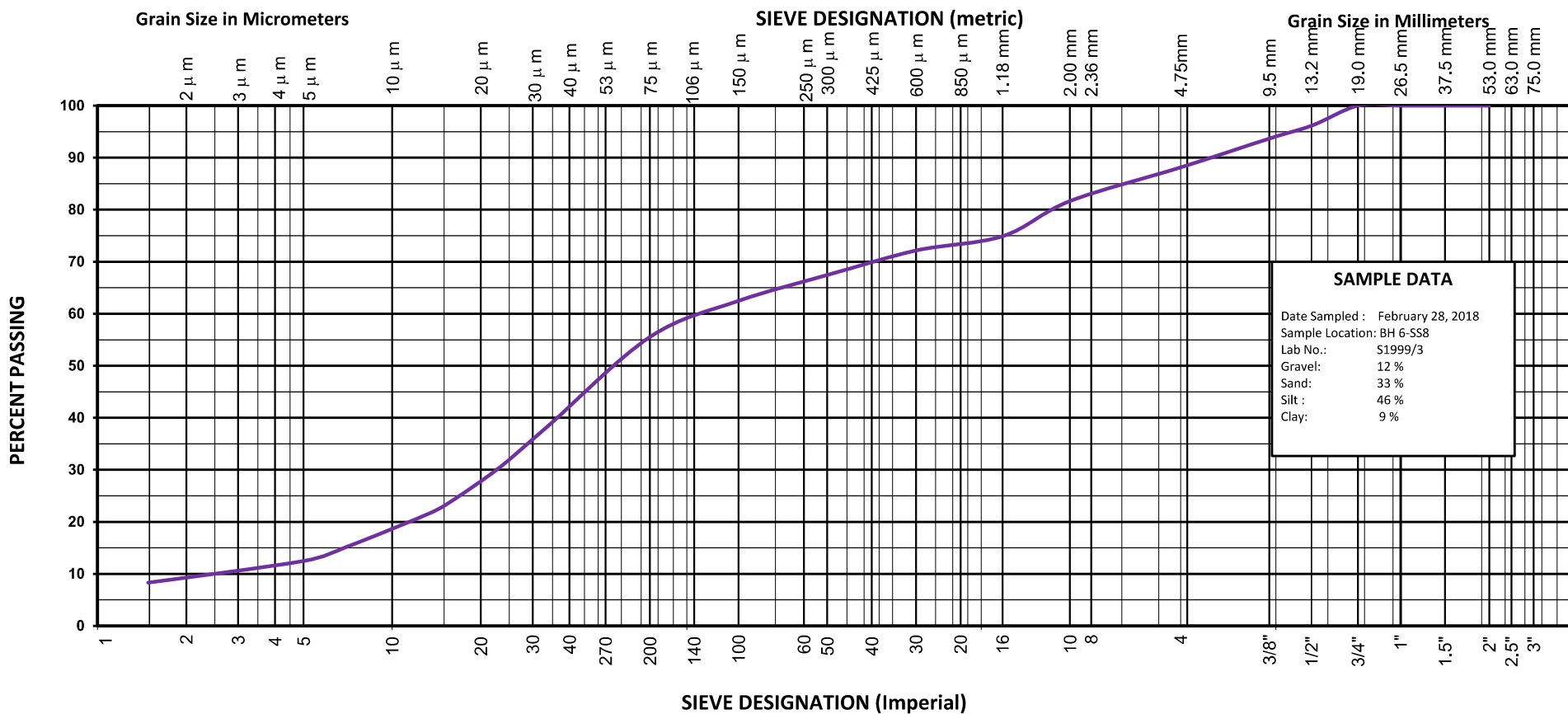
T18721

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.:

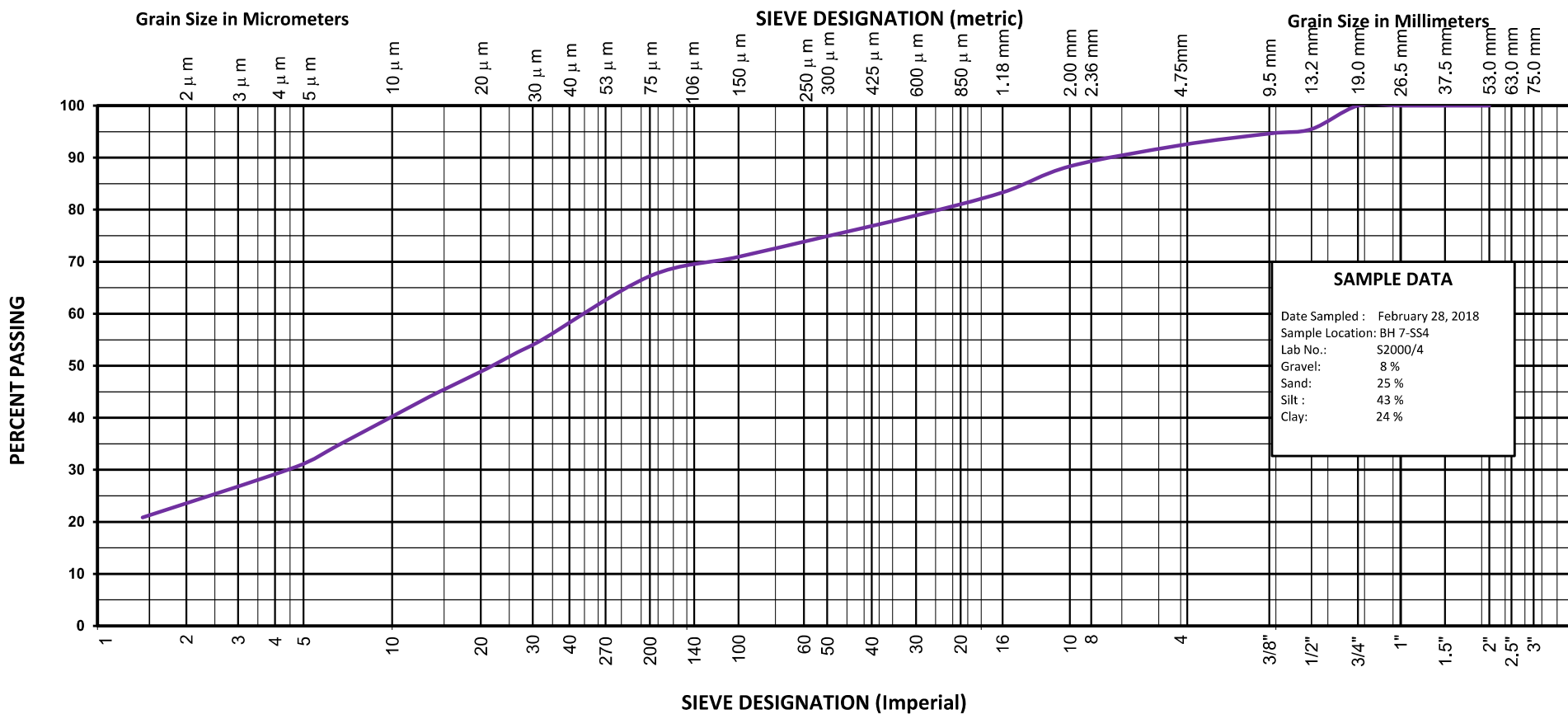
T18721

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 7-SS4
Lab No.:	S2000/4
Gravel:	8 %
Sand:	25 %
Silt :	43 %
Clay:	24 %

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GRAIN SIZE ANALYSIS

Project :

Framgard Property- Major Node

Project No.:

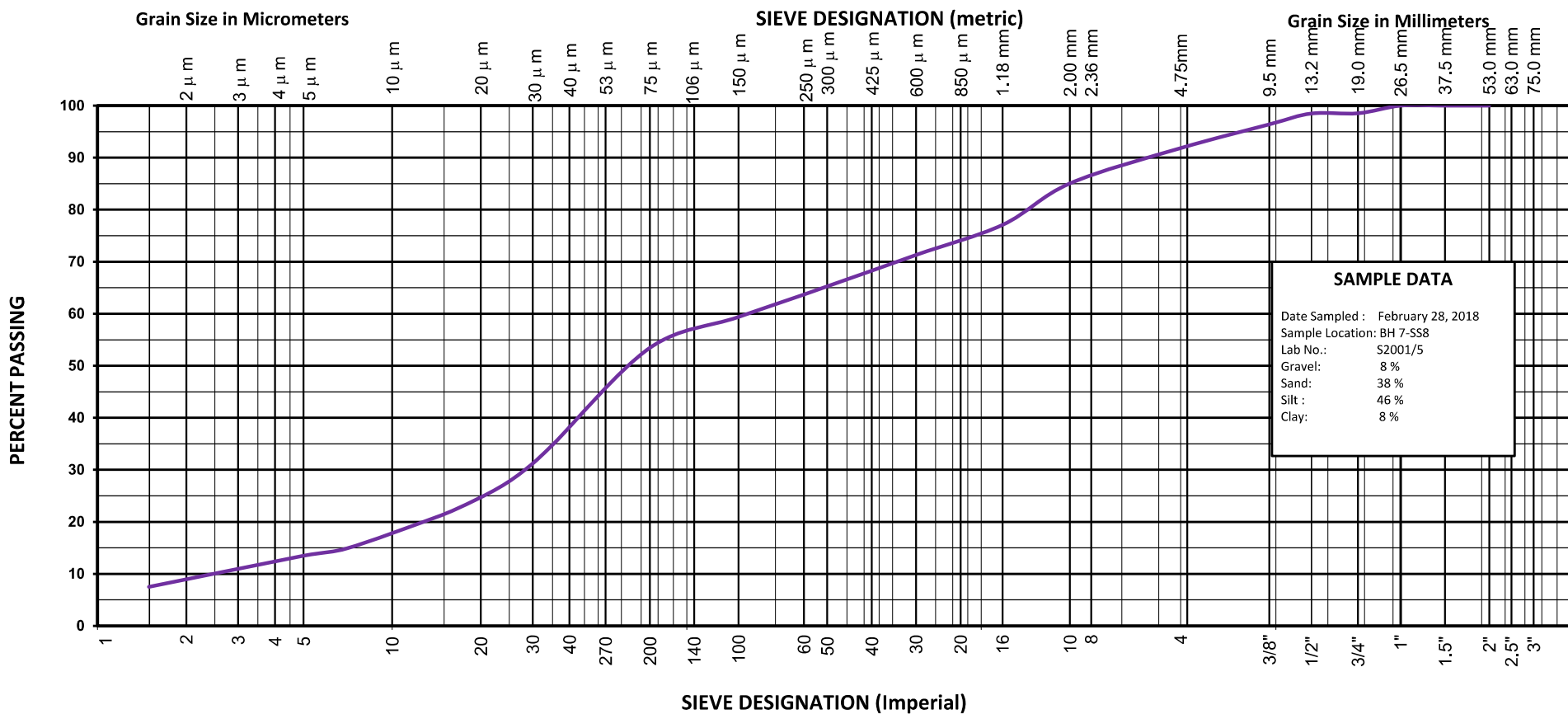
T18721

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-SS8
Lab No.:	S2001/5
Gravel:	8 %
Sand:	38 %
Silt :	46 %
Clay:	8 %

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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



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
Analytical Methods							
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 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 : 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

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. Addition may apply to rush requests on weekends, statutory holidays and non-routine.

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

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

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

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

Company: _____

Project Information

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

ALS Account # / Quote #: _____

AF/Coast Center: _____
Major/Minor Code: _____
Routing Code: _____

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

Job #: **5520**
PO / A/E: _____

Requestioner: _____
Location: _____

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

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

ALS Contact: _____

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

ALS Sample # (ALS use only): **RH10**

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

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

Date: **07-MAR-23**

Time: **8:00**

Sample Type: **GRU**

Sampler: _____

Time: _____

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

Drinking Water (DW) Samples (client use)

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

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

Are samples taken from a Regulated DW System? YES NO

Are samples for human consumption/ use? YES NO

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

Released by: **MCD**

Date: **3/9/23**

Time: _____

SHIPMENT RELEASE (client use)

INITIAL SHIPMENT RECEIPTON (ALS use only)

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

Received by: _____

Date: _____

Time: _____

WHITE - LABORATORY COPY

YELLOW - CLIENT COPY

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

Released by: _____

Date: _____

Time: _____

SHIPMENT RECEIPTON (ALS use only)

INITIAL SHIPMENT RECEIPTON (ALS use only)

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

Received by: _____

Date: **2023-03-09**

Time: **5:15 PM**

Final Receipt Details (ALS use only)

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

Cooling Method: NONE ICE ICE BAGS FROZEN COOLING INITIALIZED

Subsission Containers identified on Sample Receipt Notification: YES NO

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

Cooler Custody Seal Intact: YES NO

Sample Custody Seal Intact: YES NO

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

INITIAL COOLER TEMPERATURES: _____

FINAL COOLER TEMPERATURES: _____

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

Released by: _____

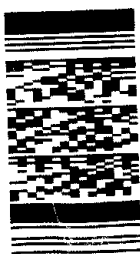
Date: _____

Time: _____

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.



Telephone: - 1 519 886 6910

OR-359



CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

<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 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 15:19</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>
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						
				08-Dec-2022 09:45						
				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

Sub-Matrix: Water (Matrix: Water)		Client sample ID		Sampling date/time						
		BH-1		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>
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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
Analytical Methods							
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
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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



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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
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

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Environmental Division
Waterloo
Work Order Reference
WT2224510

Telephone : + 1 519 886 8910



Report To: Contact and company name below will appear on the final report

Company: Heilmann & Rakey Envs.
Contact: Richard Suban
Phone: 416-561-9264
Street: 11200 Yonge Blvd.
City/Province: Scarborough
Postal Code: M1S 1V7
Invoice To: Same as Report To
Company: Copy of Invoice with Report

Reports / Recipients: Select Report Format: PDF, EXCEL, WORD, DIGITAL
Merge COC/QCI Reports with COA
Compare Results to Criteria on Request - provide details below if box checked
Select Distribution: EMAIL, MAIL, FAX
Email 1 or Fax: rsuban@mcclarr.com
Email 2
Email 3

Turnaround Time (TAT) Requested: Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP)

ALS Account # / Quote #: 5820
Job #: PO / AFE:
LSD:
Project Information: ALS Account # / Quote #, Job #, PO / AFE, LSD

ALS Lab Work Order # (ALS use only):
Sample Identification and/or Coordinates (This description will appear on the report): BH-1
ALS Sample # (ALS use only):
ALS Contact:
Date: 8 Dec 2020
Time: 9:45
Sample Type: GWS

NUMBER OF CONTAINERS table with columns for MELTON STROM AND SANITARY

Drinking Water (DW) Samples (client use):
Are samples taken from a Regulated DW System?
Are samples for human consumption/use?

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

SAMPLE RECEIPT DETAILS (ALS use only):
Cooling Method: NONE, ICE, ICE PACKS, ROZEN
Substitution Comments: Identified on Sample Receipt Notification
Cooler Custody Seals Intact: YES, NO
Final Cooler Temperatures °C: 15.1, 14.6

Released by: Date: Received by: Date: SHIPMENT RELEASE (client use)
INITIAL SHIPMENT RECEPTION (ALS use only)
WHITE - LABORATORY COPY YELLOW - CLIENT COPY
Failure to complete all portions of this form may delay analysis. Please fill in 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; NW-469; OR-436; L-288; M-504; OG6-304



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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 887463

Page 1 of 1

Report To: Contact and company name below will appear on the final report

Company: MCLYMOND & CO. BUSINESS

Contact: RICHARD SUEHIC

Phone: Company address below will appear on the final report

Street: Email 1 or Fax: r.sueh@mclymond.com

City/Province: Email 2

Postal Code: Email 3

Invoice To: Same as Report To YES NO

Copy of Invoice with Report: YES NO

Company: Select Invoice Distribution: EMAIL MAIL FAX

Contact: Email 1 or Fax

ALS Account # / Quote #: Project Information

Job #: 5820 AFE/Cost Center: Major/Minor Code: PO#

PO/AFE: Requisitioner: Routing Code:

LSD: Location:

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

ALS Sample #: Sample Identification and/or Coordinates

(ALS use only) (This description will appear on the report)

31 1 03-MAR-23 8:00 GW

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

Notes / Specify Limits for result evaluation by selecting from drop-down below

(Excel COC only)

Drinking Water (DW) Samples (client use)

Are samples taken from a Regulated DW System? YES NO

Are samples for human consumption / use? YES NO

Released by: MCL Date: 3/9/23 Time:

Received by: INITIAL SHIPMENT RECEPTION (ALS use only)

Date: Time:

Received by: INITIAL SHIPMENT RECEPTION (ALS use only)

Date: Time:

Received by: WHITE - LABORATORY COPY

Date: Time:

Received by: YELLOW - CLIENT COPY

Date: Time:

Received by: FINAL SHIPMENT RECEPTION (ALS use only)

Date: Time: 5:00pm

Shipping Method: None Ice Dry Packs Frozen

Submission Comments identified on Sample Receipt Notification

Cooler Custody Seals Intact: YES NO

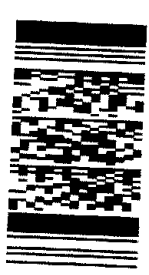
INITIAL COOLER TEMPERATURES: FINAL COOLER TEMPERATURES: C

Shipping Release (client use)

Referance WT22224510

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

Telephone: -1 519 886 8910



Environmental Division
Water/loo
Work Order Reference
WT22224510

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

HERE

OK 359

ALS 2020 FORM