HYDROGEOLOGICAL INVESTIGATION
PROPOSED COMMERCIAL/INDUSTRIAL DEVELOPMENT
13846 & 13940 AIRPORT ROAD, CALEDON, ON

Prepared for:

Airport Caledon Inc.
c/o RG CONSULTING INC.
2201 Finch Avenue West – Suite 27

Toronto, ON M9M 2Y9

Prepared by:

HLV2K ENGINEERING LIMITED

Project No. 1900193BH

March 15, 2022

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Airport Caledon Inc.
c/o RG Consulting Inc.
2201 Finch Avenue West - Suite 27
Toronto, Ontario M9M.2Y9

Attention: Mr. Ralph P. Grittani
Email: ralph@rgcdesigngroup.com

Dear Mr. Grittani,

RE: Hydrogeological Investigation – Proposed Commercial/Industrial Development
13846 & 13940 Airport Road, Caledon, ON

HLV2K Engineering Limited (HLV2K) is pleased to provide the Hydrogeological Investigation Report for the above-mentioned project. The report presents HLV2K's understanding of the hydrogeological setting of the study area based on exploratory drilling, data collection, analyses, and review.

We trust that this information meets your present requirements. If we can be of additional assistance in this regard, please contact this office.

For and on behalf of HLV2K Engineering Limited,

k. Mohamadi

Kourosh Mohammadi, Ph.D., P.Eng.

President and Principal

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LIST OF ACRONYMS AND DEFINITIONS

BH	Borehole
EASR	Environmental Activity and Sector Registry
K	Hydraulic Conductivity
GPM	Gallon per Minute
mbgs	Metres Below Ground Surface
MECP	Ministry of Environment, Conservation and Parks
O.Reg.903	Ontario's Wells Regulation
OWRA	Ontario Water Resources Act
PTTW	Permit To Take Water
PHCs	Petroleum Hydrocarbons
VOCs	Volatile Organic Compounds
PAHs	Polycyclic Aromatic Hydrocarbons
WWIS	Water Well Information System
WWR	Water Well Record

1 INTRODUCTION

1.1 General

HLV2K Engineering Limited (HLV2K) was retained by Airport Caledon Inc. c/o RG Consulting Inc. (the Client) to complete a hydrogeological investigation to evaluate the site conditions for proposed development for 13846 & 13940 Airport Road, Caledon, Ontario (the Site). It is our understanding that proposed development will consist of single storey slab on grade commercial/industrial building with parking area and without basement. The Site is located in an agricultural area and is bounded to Airport Road to the east, King Street to the north and agricultural lands to the south and west. There are commercial properties at north, south and across the Airport Road at the east of the Site. The Site location is shown on **Figure 1**.

HLV2K has also conducted a geotechnical investigation for this Site and report was issued with the reference number 19000193AG.

1.2 Purpose

The purpose of the hydrogeological investigation was to characterize the existing hydrogeological conditions at and in the vicinity of the Site, assess the need for, and options for, groundwater control in association with the proposed construction, evaluate potential impacts to the local groundwater regime resulting from the proposed construction, and identify appropriate mitigative measures, as warranted.

This hydrogeological study may be utilized in support for an application for a Permit to Take Water (PTTW) for dewatering purposes during construction or registering in Environmental Activity and Sector Registry (EASR), if necessary. The purpose of completing the PTTW / EASR is to conduct the work in compliance with Ontario Regulation 387/04 (as amended) and the Ontario Water Resources Act (OWRA). The water taking EASR is for construction dewatering projects that require more than 50,000 liters per day (L/day) of water and less than 400,000 L/day under normal conditions. A PTTW is required for any groundwater taking during the construction in excess of 400 cubic metres per day (m^3/day).

2 METHOD OF INVESTIGATION

2.1 General

This hydrogeological investigation was based on review of previously completed geotechnical and hydrogeological reports and published information for the study area, including previously published regional physiographic and geologic mapping and watershed planning reports. Many of these documents are referred to throughout various sections of this report and the relevant details can be found in the References section following the text of the report.

In particular, the work completed in association with this hydrogeological study consisted of the following tasks:

- Reviewing and interpreting available reports and published data;
- Developing Health & Safety and Sampling and Analysis Plans for work at the Site;
- Assessing the current Site conditions and areas of interest;
- Obtaining clearance of all public and private underground utility services (i.e. Bell, Hydro, Gas, TTC, Cable and sewer/water);
- Drilling three (3) boreholes and installing three monitoring wells;
- Developing the groundwater monitoring wells installed on the Site by removing at least three well volumes of groundwater;
- Reviewing water well records available from the Ministry of Environment, Conservation and Parks (MECP);
- Measuring groundwater levels in each of the monitoring wells located at the Site;
- Evaluating proposed construction dewatering requirements;
- Estimation of the underfloor and perimeter drainage flow for permanent dewatering; and,
- Prepare a final report on the findings of this investigation.

2.2 Boreholes and Monitoring Wells

As part of geotechnical investigation for this Site (HLV2K, 2019), thirteen boreholes (BH1 to BH13) were drilled to a depth of 5.2m on September 16 and 17, 2019. The boreholes were advanced by a drilling sub-contractor Drilltech Drilling Limited located at 120 Knapton Dr. Newmarket, ON, under the supervision of HLV2K personnel. The boreholes were advanced by utilizing continuous flight solid stem augers. Three additional boreholes were drilled on March 11, 2020 by Drilltech Drilling Limited and three monitoring wells were installed in those boreholes. Well construction details and borehole logs are presented in **Appendix A**.

The well survey was conducted using a GPS to measure elevations. The approximate borehole locations are shown in **Figure 2**.

It should be noted that the ground surface elevations noted on the appended borehole logs are approximate and were used for the purpose of relating borehole soil stratigraphy and should not be used or relied on for other purposes. Details of monitoring well construction are summarized in **Table 1** below.

TABLE 1: INFORMATION ON GROUNDWATER MONITORING WELLS

MW ID	Estimated Ground Surface Elevation (m)	Borehole Bottom		Well Screen Interval Depth (mbgs)		Well Screen Interval Elevation (m)	
		Depth (mbgs)	Elevation (m)	from	to	from	To
BH201	273.2	6.1	267.1	2.7	5.7	270.5	267.5
BH202	272.6	6.1	266.5	2.7	5.7	269.9	266.9
BH203	270.2	6.1	264.1	2.7	5.7	267.5	264.5

2.3 Groundwater Monitoring and Sampling

As part of this investigation, on March 31, 2020, HLV2K collected samples from one (1) groundwater monitoring well BH202. The sample was analyzed and the analytical results were compared to the limits set in the Region of Peel Sewer Discharge By-law.

Prior to sampling, the wells were developed. The development of the monitoring well was conducted by purging and surging the well water to stress the formation around the well screen so that mobile particulates were removed. The purpose of the well development is to improve the hydraulic connection between the well and the geologic materials in the vicinity of the well, and to subsequently obtain a groundwater sample representative of the in-situ conditions. The groundwater level was measured in the monitoring wells and wells were developed by purging to dry, twice.

The collected samples were submitted to ALS Environmental Laboratories in Mississauga, a member of the Canadian Association for Laboratory Accreditation (CALA), for chemical analysis. Copies of the laboratory certificates of analysis are provided in **Appendix B**.

2.4 In-Situ Hydraulic Conductivity Testing

Rising and falling head hydraulic conductivity test (slug test) was conducted on all groundwater monitoring wells to assess the subsurface hydraulic conductivity conditions.

A summary of the hydraulic conductivity test (slug test) methodology is as follows:

- The static groundwater level in each monitoring well was initially measured and recorded;
- The rising/falling water level in each well was measured and recorded at regular time intervals until the water level had recovered to a level close to the static water level measured before the start of the test;
- In the case of the slug tests, the slug was rapidly removed from the monitoring well to create a sudden drop in the water level and recovery (rising) of the water level was recorded at regular intervals using a data logger;
- The water level in each well was then measured and recorded at regular time intervals using datalogger until the water level had recovered to a level close to the static water level measured before the start of the test;

The water level data from the monitoring wells were analysed by HLV2K using AQTESOLV Professional V4.5 and the Bouwer-Rice equation to estimate the hydraulic conductivity (K) of the soil adjacent to the screened portion of the well.

3 SITE CONDITIONS

3.1 Physical Setting

The Site is located in an agricultural area and is bounded to Airport Road to the East and agricultural lands to the South and west. There are commercial/residential areas at Northwest and East of the Site. Tributaries of Humber River are at the east and west sides of the Site with approximate distance of 500 m to West Humber River to the northeast and 400 m to Salt Creek to the west. According to the Oak Ridges Moraine (ORM) Atlas which is available online at (http://www.mah.gov.on.ca/page334.aspx) and the Niagara Escarpment Plan (NEP) Maps available online at (http://www.escarpment.org/landplanning), the Site is not located within an area where either the Oak Ridges Moraine Conservation Plan or the Niagara Escarpment Plan would be applicable.

3.2 Climatic Conditions

Average monthly climate data from an Environment Canada climate station located at the Woodbridge (Station ID 6159575), approximately 17.6 km southeast of the Site, for the period between 1981 and 2010 is provided in **Table 2**, below (Environment Canada, 2022). The data indicates that the climate in the study area is typical continental with cold winters and warm summers and precipitation records showing local seasonal variation. As shown in **Table 2** below, the mean annual precipitation is 799.8 mm/year, with annual mean rainfall of 697.0 mm/year (87.1% of total precipitation). Average monthly precipitation ranged from 44.2 mm in February to 80.4 mm in August. The mean annual daily temperature is 7.6 degrees Celsius (°C), ranging from -6.6 °C in January to 20.8 °C in July.

TABLE 2: CLIMATE DATA SUMMARY (1981 – 2010) – WOODBRIDGE (ID 6159575)

MONTH	Daily Average Temperature (°C)	Average Rainfall (mm)	Average Snow (cm)	Average Precipitation (mm)
January	-6.6	20.4	29.9	50.3
February	-4.8	23.2	21.1	44.2
March	-0.4	31.4	17.8	49.2
April	6.6	59.6	3.7	63.3
May	12.9	79.1	0.0	79.1
June	18.1	76.3	0.0	76.3
July	20.8	70.4	0.0	70.4
August	19.6	80.4	0.0	80.4
September	15.4	84.6	0.0	84.6
October	9.0	66.0	0.5	66.5
November	3.1	71.1	7.2	78.3
December	-2.8	34.6	22.8	57.4
Year	**7.6**	**697.0**	**102.8**	**799.8**

NOTE: Data was obtained from Environment Canada website (Environment Canada 2022).

3.3 Physiography and Drainage

A review of the topographic map provided online by Natural Resources Canada (Toporama) depicts the Site located within an area that is generally at an approximate elevation of 270 m to 275 m.

The Site is located in the West Humber subwatershed (a tributary to Humber River Watershed) within the Toronto and Region Conservation Authority (TRCA) jurisdiction. The watershed drains southward from the height of land along the Oak Ridges Moraine (ORM) in the north towards the Lake Ontario in the south (TRCA, 2008).

The physiographic region of the Site is South Slope (Chapman and Putnam, 1984). The South Slope physiographic region is defined as the area along the southern slope of the Oak Ridges Moraine and extends along the moraine between Durham Region in the east and the Niagara Escarpment in the west. The South Slope is characterized by topography that gently slopes southward towards Lake Ontario and consists of smooth, faintly drumlinized, clay till plain that contains deeply incised stream valleys (TRCA, 2008).

3.4 Geological Mapping

A regional description of the Quaternary geology of the project area can be found in the Surficial Geology Map of Ontario, Map number: Bolton M2275 (White and Karrow, 1973). A section of this map showing surficial geology of the Site and the surrounding areas is presented in **Figure 3**.

As shown in **Figure 3**, the surficial geology of the Site is mainly Halton/Wildfield Till Formation dominated by low permeability dark grey silty clay loam, clay loam, silty clay or clay till. The Site is located within a glacial till plain that was deposited by the Late Wisconsinan glacier consisting of glaciolacustrine deposits, silty loam, silty clay loam or clay deposits (TRCA, 2008).

None of the boreholes encountered bedrock down to explored depths. However, in most of the Humber River watershed, the bedrock consists of Georgian Bay Formation.

3.5 Subsurface Soil Conditions

The subsurface soil conditions encountered during boreholes advanced at the Site are shown on the borehole logs in **Appendix A**. A summary of the soil conditions is provided below. Reference should be made to the geotechnical report (HLV2K, 2018) for a detailed description of the soil conditions at the Site.

Most of the Site was covered with topsoil and it was encountered during drilling at all the boreholes. Underneath the topsoil, fill/disturbed native material was encountered in all boreholes. The depth of fill in the boreholes (BH1 to BH13) ranged from 0.3 to 0.6 m below the existing ground surface. The explored fill/disturbed native at borehole locations (i.e. BH1 to BH13) generally consisted of silty clay to clayey silt, trace gravel and rootlets mixed with topsoil and was typically in loose to compact state. An organic layer mostly consisting of peat mass, rootlets was found in the fill/disturbed native layer at borehole location (BH4).

Native materials were encountered underlying the fill/disturbed native material in all the boreholes. The native materials encountered at boreholes were quite consistent and were generally cohesive in nature (i.e. firm to hard silty clay till to clayey silt till) extending to maximum explored depth of 5.2m below the existing ground surface or to elevations from 265.4m to 270.3m. A native layer of clayey silty sand till was found at 1.4m in BH1. A 300mm thick layer of gravelly sand was found at a depth of 3.4m in BH3. Silty sand was found at 4.6m, 2.1m and 1.9m in BH10, BH11 and BH12, respectively.

4 GROUNDWATER CONDITIONS

4.1 Regional Groundwater Recharge

Recharge is the process by which groundwater is replenished and involves the vertical infiltration of water through the subsoil deposits and geologic materials to the saturated zone. The major sources of recharge in the study area are as result of precipitation and freshet. The amount of groundwater recharge in a particular area depends on surficial geology, topography, and the extent of land development in that area. Generally, regional groundwater recharge is irregularly distributed temporally and spatially as interpreted from specific climatic conditions, local geology, and land development status.

The Site is vacant and never developed before. Therefore, the groundwater recharge occurs under natural condition. The native soil in the area is dense with low hydraulic conductivity and the infiltration is expected to be low. However, a water balance analysis is recommended for the site to estimate the change in water recharge for pre and post development.

4.2 Groundwater Level Fluctuations

The groundwater level data collected from the monitoring wells are provided in **Table 4**, below. The screen elevations of these monitoring wells are shown in **Table 1** and on the borehole logs provided in **Appendix A**.

A number of groundwater level monitoring rounds were completed in March 2020. As shown in **Table 3** below, the groundwater levels in monitoring wells were measured at approximate depth of -0.85 to 0.33 m below the existing ground surface (mbgs), when the water levels were stabilized in monitoring wells. The corresponding elevations for groundwater were from 271.03 m to 273.35 m. Given that the depth to water in the monitoring wells is higher than the ground level, those are drilled in a confined (pressurized) aquifer.

It should be noted that groundwater conditions vary depending on factors such as temperature, season, precipitation, construction activity and other situations, which may be different from those encountered at the time of the monitoring. The possibility of groundwater level fluctuations at the Site should be considered when designing and developing the construction plans for the project.

Regional groundwater flow in the area typically reflects the local topography and generally occurs from topographic highs to topographic lows. Based on the topography, the local groundwater flow direction was inferred to be from east to west toward Salt Creek. The regional groundwater flow direction in the watershed is from north to south and discharges into Lake Ontario.

TABLE 3: SUMMARY OF GROUNDWATER LEVEL OBSERVATIONS IN MONITORING WELLS

MW ID	Ground Surface Elevation (m)	Groundwater Level Observations			
		23-MAR-20		31-MAR-20	
		Depth (mbgs)	Elevation (m)	Depth (mbgs)	Elevation (m)
BH201	273.2	0.33	272.87	-0.15	273.35
BH202	272.6	0.05	272.55	-0.02	272.62
BH203	270.2	-0.85	271.05	-0.83	271.03

4.3 Inferred Hydrostratigraphy

The subsurface investigations revealed that beneath the surficial materials, the subsurface conditions encountered in the boreholes consisted of disturbed materials overlaying the native soil, silty clay to clayey silt, trace gravel and rootlets mixed with topsoil and was typically in loose to compact and below that firm to hard silty clay till to clayey silt till. The bedrock was not encountered in any of the boreholes where groundwater was found to be within the native soil.

Conditions encountered in the monitoring wells indicated that the groundwater within is likely in silty sand till and can be considered confined aquifer. Groundwater in the upper layer could be encountered which can be considered perch water or local aquifers. In addition, sand seems were observed in the silty clay till and these sand seams may transfer water from adjacent aquifers to the Site.

4.4 Results of In-Situ Hydraulic Conductivity Tests

Table 4 below summarizes the results of the hydraulic conductivity testing in the monitoring wells and the hydrostratigraphic units in which these monitoring wells were screened. The hydraulic conductivity slug tests and analysis data sheets are presented in **Appendix C**. Where more than one test was conducted at a single location, the value presented in **Table 4** is an average of the results.

The lowest hydraulic conductivity value of approximately 4.5×10^{-6} cm/sec was estimated from the slug test in BH201. The screened portion of that monitoring well was completed in the silty sand till. At BH202, which was screened primarily in the Silty clay to Clayey silt, a somewhat higher hydraulic conductivity of approximately 3.3×10^{-3} cm/sec was estimated. The hydraulic conductivity of 2.5×10^{-5} cm/sec that was estimated for BH203.

TABLE 4: SUMMARY OF IN-SITU HYDRAULIC CONDUCTIVITY TEST RESULTS

MW ID	Hydraulic Conductivity (cm/s)	Hydraulic Conductivity (m/day)	Stratigraphic Unit
BH201	4.5×10^{-6}	3.9×10^{-3}	Silty sand glacial till
BH202	3.3×10^{-3}	2.9	Silty clay to Clayey silt with 0.3 m of gravel layer
BH203	2.2×10^{-5}	1.9×10^{-2}	Clayey silt glacial till

The high hydraulic conductivity in BH202 is likely due to the gravel seem encountered at the depth of 4.4 to 4.7 mbgs. This gravelly layer was observed in some other boreholes including BH3, BH6, BH8, BH10, BH11, BH12 at depth ranging from 1.9 to 5.0 mbgs.

4.5 Groundwater Use in the Study Area

As part of this hydrogeological study, HLV2K searched the MECP Water Well Information System (WWIS) database to identify active wells near the Site. The database search was conducted for the area located within 500 m from the Site boundary. The database search identified records for 54 wells.

Figure 4 presents the locations of the identified wells as well as the associated water use categories within 500 m around the Site. A detailed table showing water well record (WRR) information for these wells is provided in **Appendix D**. The classification of these wells is as follows:

- 28 wells stated as water supply;
- 8 well stated as abandoned;
- 15 well stated as monitoring and test hole; and
- 3 not stated.

The observation wells identified in the database search are considered most likely to be associated with recent construction activities and/or infrastructure upgrades in the area and normally no water would be obtained or used from these boreholes. The search revealed the presence of 28 water supply wells completed between 1958 to 2009. If dewatering is required for the Site, the existence of these wells should be investigated and water well survey is recommended.

4.6 Groundwater Quality for Temporary Dewatering

HLV2K understands that during construction, the groundwater pumped in conjunction with excavation dewatering (where required) may be discharged into the storm or sanitary sewer systems or nearby surface water bodies. In this case, the discharge water quality will have to conform to the discharge limits identified in the Peel Region's Sewer Discharge By-law (53-2010).

The analytical results for the groundwater sample taken from BH2 were compared to the parameters listed in the Peel Region's Sewer Discharge By-law (53-2010). Based on these results, it is anticipated that groundwater removed for dewatering purposes during excavation can be discharged into the municipal sanitary sewer system, provided that a discharge permit is obtained from the Peel Region. Care should be taken to prevent the movement of sediment with the groundwater and if required, a proper filtration or sediment settlement tank should be used.

If discharge to the storm sewer is required, the analytical results suggests that the total suspended solids, total phosphorus, total zinc, and total manganese in water bearing layer cannot meet the Peel Region storm sewer discharge criteria.

Based on these results, it is anticipated that groundwater removed for dewatering purposes during excavation can only be discharged into the sanitary sewer system, provided that a discharge permit is obtained from the Town of Caledon and/or Regional Municipality of Peel.

5 PERCOLATION TESTS

Due to high water table, field percolation test was not conducted. The gradation results provided in **Appendix E** was used to estimate the percolation time. Using "Supplementary Standard SB-6 for Percolation Time and Soil Descriptions in Building Code (September 14, 2012)", the soil falls in the soil category of SC which is clayey sand with a percolation time of 20 – 50 min/cm and a permeability of 10^{-4} to 10^{-6} cm/sec.

6 GROUNDWATER DEWATERING ESTIMATES

6.1 Introduction

It is our understanding that no basement has been considered for this development. Therefore, the excavation for installation of the underground utilities such as sanitary sewers and excavation for the basement were considered in the dewatering estimation. The depth of the utilities for this Site was not know at this stage. It is assumed that the depth of the excavation would be approximately 3 mbgs or elevation of 270 m±.

The highest stabilized groundwater elevation measured in the monitoring wells installed at the Site was at about 273.4 m measured in BH201. Therefore, dewatering is anticipated to be necessary during construction.

As discussed in section 4.4, hydraulic conductivity is varied from 4.5×10^{-6} to 3.3×10^{-3} cm/s. The average estimated hydraulic conductivity or 1.1×10^{-3} cm/s was used in dewatering estimation.

6.1 Dewatering Estimation

The excavation for utility services including sanitary sewer with approximate depth of up to 3 m below grade is required. Approximate ground elevation is 273 m±.

Assuming that the groundwater level should be reduced at least one me below the base of the excavation, the approximate groundwater elevation during the construction should be 269 m or less and the excavation and installation of the sewer line will be carried out in stages not exceeding more than 20 m at a time. For the purpose of calculations to estimate the potential dewatering rate, the excavation was considered as an open excavation. Uniform aquifer thicknesses were assumed for the layer. It was also assumed that the width of the excavation is 2 m.

The referred equation considers a total groundwater inflow rate (Q_T) to an excavation trench consisting of two (2) components, Q_M and Q_R, as follows:

$$Q_T = 2Q_M + Q_R$$

Where

Q_M: Linear flow rate for the trench section (from one side);

Q_R: Radial flow through the two ends of the excavated trench

Using this equation and considering the proposed excavation area, and based on the hydrogeological parameters of the formation expected to be encountered as well as the drawdown needed (sump pump inside the trench will be used), the estimated daily pumping rate to achieve the required drawdown was calculated as follows:

- The linear flow component Q_M [m^3/d], represents groundwater inflow portion to the trench through the excavation length. The linear flow rate depends on the aquifer properties such as hydraulic conductivity, thickness, and static water level as well as excavation length and depth, and the zone of influence. The linear flow rate calculation equation for one side is as follows:

$$Q_M = \frac{xK(H^2 - h^2)}{2L_0}$$

Where:

x – Length of the trench = 30 m;

K – Hydraulic conductivity =0.96 m/d;

H – Distance from static water level to bottom of the aquifer = 8.6 m;

h – Distance from lowered water level to bottom of the aquifer = 4.6 m, and;

L_o – Distance from a point of greatest drawdown to a point where there is no drawdown (zone of influence) [m]. It was estimated approximately using the following empirical relationship developed by Sichart:

$L_0 = 3000(H - h)\sqrt{K}$ (K in m/s) (Powers et al., 2007).

- The radial flow component, Q_R [m^3/d], represents groundwater inflow portion to the trench through the two ends of the excavated trench. The radial flow rate depends on aquifer properties such as hydraulic conductivity, thickness and static water level, as well as the excavation length, width, and depth, and the zone of influence. The radial flow rate calculation equation is as follows:

$$Q_R = \frac{\pi K(H^2 - h^2)}{\ln\left(\frac{R}{r_e}\right)}$$

Where:

K – Hydraulic conductivity = 0.96 m/d;

H – Distance from static water level to bottom of the aquifer = 8.6 m;

h – Distance from lowered water level to bottom of the aquifer = 4.6 m;

R = Radius of the cone of depression (zone of influence) [m], estimated approximately using the following empirical relationship developed by Sichart

$R = r_e + 3000(H - h)\sqrt{K}$, (K in m/s); and

r_e – equivalent radius, estimated to be equal to half the width of the trench (Cashman and Preene, 2001)

To lower the water table to the bottom of the excavation, it is estimated that the total dewatering rate to be approximately 67 m^3/day at maximum. The total flow at any time will depend on the length of excavation that needs dewatering and the expected rate of progress. Allowing a 100% contingency for the variability in hydraulic conductivity that could be experienced and provided the flexibility to address the additional drainage needed as a result of precipitation events, the expected pumping rate needed for the site is about **134 m^3/day**.

The zone of influence (R) is estimated to be maximum 40 m from the edge of the trench. This estimated rate is above the MECP threshold of 50 m^3/day and EASR registration is required before commencing the excavation and dewatering.

6.2 Estimating Long-Term Drainage Requirement

Long-term perimeter foundation and underfloor drainage system are not expected for the building without basement, assuming the floor slab of the proposed construction is at least 200 mm higher than the exterior grade and the ground slopes away from the building. If the proposed floor slab is less than 200 mm higher than the exterior grade, the foundation drain is required. In case that the proposed floor slab is below the exterior grade, both perimeter foundation and underfloor drainage system are required.

7 PREDICTED EFFECTS

Based on the hydrogeological information and data analysis in this report, the potential impacts to surface water and groundwater resources in the vicinity of the Site due to excavation dewatering for construction of the proposed development will be negligible in all aspects.

7.1 Groundwater Use

As indicated in Section 4.5, the search of the MECP water well records indicated 28 water supply wells within approximately 500 m of the Site. Considering the volume and short duration of excavation for utility installation, interference with off-site groundwater use due to construction-related dewatering for this project is not anticipated. A water well survey before commencing the construction activity is recommended.

7.2 Discharge to Municipal Sewer System

Temporary Dewatering Groundwater Quality: Based on the results provided in the certificate of analysis, there are parameters above the limits identified in Region of Peel storm sewer discharge by-law which in turn is also above Provincial Water Quality Objectives (PWQOs). However, the discharge water is expected to meet the limits of the sanitary sewer discharge by-law.

Long-Term Foundation Drain Water Quality: No long-term groundwater discharge is expected for this development.

7.3 Potential for Dewatering-Related Consolidation Settlement

The Site is surrounded by agricultural lands and the ground settlement due to the dewatering activity on Site is unlikely and not expected. The estimated zone of influence is expected to be within the development boundaries and no impact on the adjacent building is expected.

8 DEWATERING MONITORING AND MITIGATION PLAN

The dewatering, if required, may be variable depending on the size of the excavation (length, width and depth), aquifer properties and construction methods. Suitable dewatering method(s) and volume of discharge need to be identified by the contractor using technical evaluation reports and proposed dewatering plan(s). Prior to construction, and where required, discharge permits and EASR registration should be in place for discharging water into local sanitary sewers.

Discharge locations should be monitored on a daily basis. Discharge volume should be measured by using a digital flow meter (in-line flow meter) acceptable to the Region.

9 SUMMARY AND CONCLUSION

Based on the results of the subsurface investigation, hydrogeological assessment, and analysis of hydraulic conductivity testing and groundwater level monitoring data, the following summary of conclusions and recommendations is provided:

- The estimated daily groundwater pumping rate for temporary dewatering is approximately 134 m^3/day and it is higher than the EASR threshold. Therefore, it is anticipated that an EASR registration on MECP online system will be required for the construction dewatering.

- If required, it is recommended that the dewatering system be designed and evaluated by a qualified engineer and performed by a licensed dewatering contractor. The dewatering engineer/contractor should be reminded that during the dewatering activities, care must be taken to prevent the removal of fine soil particles with the pumped water or to use proper filtration prior to discharge to the Region sewer system.

- If required, discharge from temporary dewatering during the construction of the proposed development can potentially be directed into the sanitary sewer system of the Peel Region, provided that a water discharge permit from the Peel Region is obtained and that ongoing monitoring indicates that the discharge quality meets the relevant municipal sewer use standards.

- No surface water is present within the zone of influence.

- Long-term perimeter foundation and underfloor drainage system are not expected for the building without basement, assuming the floor slab of the proposed construction is at least 200 mm higher than the exterior grade and the ground slopes away from the building. If the proposed floor slab is less than 200 mm higher than the exterior grade, the foundation drain is required. In case that the proposed floor slab is below the exterior grade, both perimeter foundation and underfloor drainage system are required.

- The potential for the anticipated construction dewatering to cause significant related consequences is negligible in the light of current information. Should more details become available, the impact must be re-evaluated.

- HLV2K recommends the decommissioning of existing groundwater monitoring wells after completion of the construction of the project. In conformance with Ontario's Wells Regulation (O.Reg.903) of the Ontario Water Resources Act, the installation and eventual decommissioning of groundwater wells must be carried out by a licensed well contractor. If a well will be damaged/destroyed during the construction activities, then the well should be properly decommissioned in advance of that work.

10 STATEMENT OF LIMITATIONS

The contents of this report are subject to the attached '***Statement of Limitation***' sheet. The reader's attention is specifically drawn to these conditions as it is considered essential that they be followed for proper use and interpretation of this report. The Statement of Limitations is not intended to reduce the level of responsibility accepted by HLV2K, but rather to ensure that all parties who have been given reliance for this report are aware of the responsibilities each assumes in so doing.

This report was prepared by HLV2K exclusively for the account of Airport Caledon Inc. c/o RG Consulting Inc. (the CLIENT). Other than by the CLIENT, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of HLV2K. Any use, reliance on or decision made by any person other than CLIENT based on this report is the sole responsibility of such other person. The CLIENT and HLV2K make no representation or warranty to any other person with regard to this report and the work referred to in this report and the CLIENT and HLV2K accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

11 CLOSURE

We trust that this information is satisfactory for your present requirements. Should you have any questions or require additional information, please do not hesitate to contact this office.

For and Behalf of HLV2K Engineering Limited

Ramin Niknam, M.Sc., EIT

Hydrogeologist

Kourosh Mohammadi, PhD., P.Eng.

Principal Hydrogeologist and Groundwater Modeller

REFERENCES

Chapman, L.J., and Putnam, D.F. (1984). The Physiography of Southern Ontario, Third Edition, Ontario Geological Survey, Special Volume 2.

Environment Canada (2022). Canadian National Climate Archive, Canadian Climate Norms and Averages (1981 – 2010), Woodbridge – Station ID 6159575 – Website: http://climate.weather.gc.ca/climate_normals/results_1981_2010_e.html?searchType=stnProx&txtRadius=25&optProxType=city&selCity=43%7C41%7C79%7C45%7CBrampton&selPark=&txtCentralLatDeg=&txtCentralLatMin=0&txtCentralLatSec=0&txtCentralLongDeg=&txtCentralLongMin=0&txtCentralLongSec=0&stnID=5148&dispBack=0

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White, O.L. and Karrow, P.F. (1973). Quaternary geology, Bolton, southern Ontario; Ontario Geological Survey, Scale 1:63,360.

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HLV2K Engineering Limited

STATEMENT OF LIMITATIONS

Your report has been developed based on your unique project specific requirements as understood by HLV2K Engineering Limited (HLV2K) and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking HLV2K to assess how factors that changed subsequent to the date of the report affect the report's recommendations. HLV2K cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions, which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult HLV2K to be advised how time may have impacted on the project.

The findings derived from this investigation were based on information collected and/or provided by the Client. It may become apparent that soil and groundwater conditions differ between and beyond the testing locations examined during future investigations or other work that could not be detected or anticipated at the time of this study. As such, HLV2K cannot be held liable for environmental conditions that were not apparent from the available information. The conclusions presented represent the best judgment of the assessors based on limited investigations.

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature, external data source review, sampling, and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions, which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of HLV2K through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report is based on the assumption that he site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only HLV2K, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and HLV2K cannot be held responsible for such misinterpretation.

To avoid misuse of the information contained in your report it is recommended that you confer with HLV2K before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

HLV2K Engineering Limited

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain HLV2K to work with other project design professionals who are affected by the report. Have HLV2K explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way.

Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment.

Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact HLV2K for information relating to geoenvironmental issues.

HLV2K is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with HLV2K to develop alternative approaches to problems that may be of genuine benefit both in time and in cost.

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from HLV2K to other parties but are included to identify where HLV2K's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from HLV2K closely and do not hesitate to ask any questions you may have.

Third party information reviewed and used to formulate this report is assumed to be complete and correct. HLV2K used this information in good faith and will not accept any responsibility for deficiencies, misinterpretation or incompleteness of the information contained in documents prepared by third parties.

Nothing in this report is intended to constitute or provide a legal opinion.

Should additional information become available, HLV2K requests that this information be brought to our attention so that we may re-assess the conclusions presented herein.

FIGURES

Legend

- Approximate Site Boundary

Drawn:	JD
Approved:	KM
Date:	Apr 21, 2020
Project No:	1900193BH

HLV2K ENGINEERING LIMITED

Title: SITE LOCATION PLAN

Project: HYDROGEOLOGICAL INVESTIGATION FOR PROPOSED COMMERCIAL/INDUSTRIAL DEVELOPMENT AT 13846 & 13940 AIRPORT ROAD, CALEDON, ON

Client: AIRPORT CALEDON INC.

1:17,500

200 100 0 200 400 600

Metres

FIGURE 1

Service Layer Credits: ESRI ArcGIS Base Maps

E:\GIS\HLV2K\1900193_Caledon_13846_13940_AirportRd\1900193BH_HydroG\SiteLocation.mxd

Legend

- Approximate Site Boundary
- Borehole (HLV2K, Apr 2019)
- Monitoring Well (HLV2K, Mar 2020)

Drawn:	JD
Approved:	KM
Date:	Apr 28, 2020
Project No:	1900193BH

Title: **BH/MW LOCATION PLAN**

Project: **HYDROGEOLOGICAL INVESTIGATION FOR PROPOSED COMMERCIAL/INDUSTRIAL DEVELOPMENT AT 13846 & 13940 AIRPORT ROAD, CALEDON, ON**

Client: **AIRPORT CALEDON INC.**

HLV2K ENGINEERING LIMITED

1:2,000

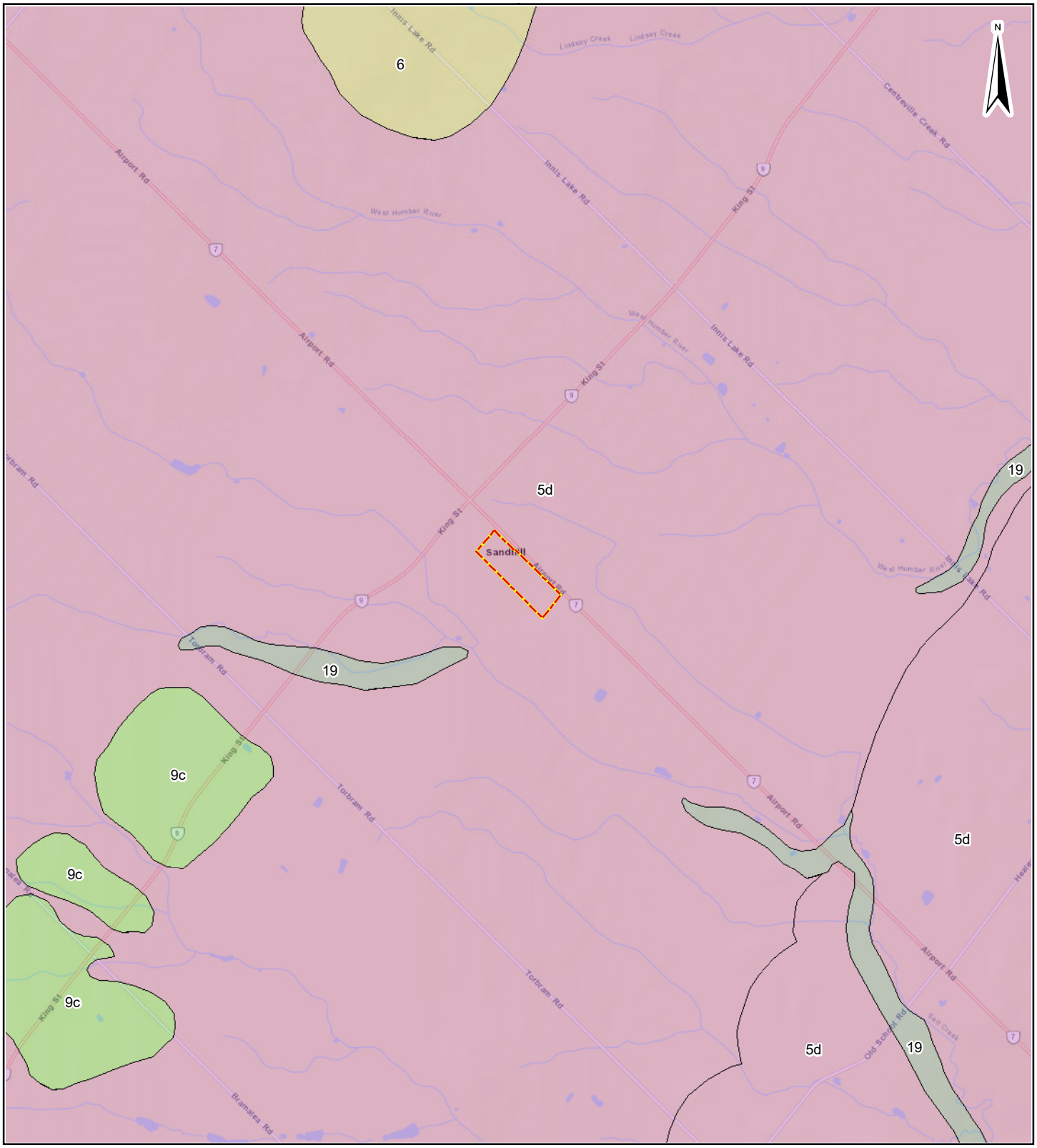
20 10 0 20 40 60 80

Metres

FIGURE 2

Service Layer Credits: Town of Caledon, 2019 Airphoto

E:\GIS\HLV2K\1900193_Caledon_13846_13940_AirportRd\1900193BH_HydroG\SitePlan.mxd



Legend

- Approximate Site Boundary
- 19 - Fluvial/Modern Alluvium; (Silt, sand, gravel)
- 9c - Glaciolacustrine; Deltaic and Lacustrine Sand, Sand, some silt and gravel)
- 6 - Glaciofluvial, Ice-contact stratified drift; (Sand, gravel and (locally) silt, outwash and collapse origin)
- 5d - Glacial, Halton/Wildfield Till (Dark grey silty clay loam, clay loam, silty clay or clay till)

Drawn:	JD
Approved:	KM
Date:	Apr 21, 2020
Project No:	1900193BH

HLV2K ENGINEERING LIMITED

Title: **SITE GEOLOGY**

Project: **HYDROGEOLOGICAL INVESTIGATION FOR PROPOSED COMMERCIAL/INDUSTRIAL DEVELOPMENT AT 13846 & 13940 AIRPORT ROAD, CALEDON, ON**

Client: **AIRPORT CALEDON INC.**

1:25,000

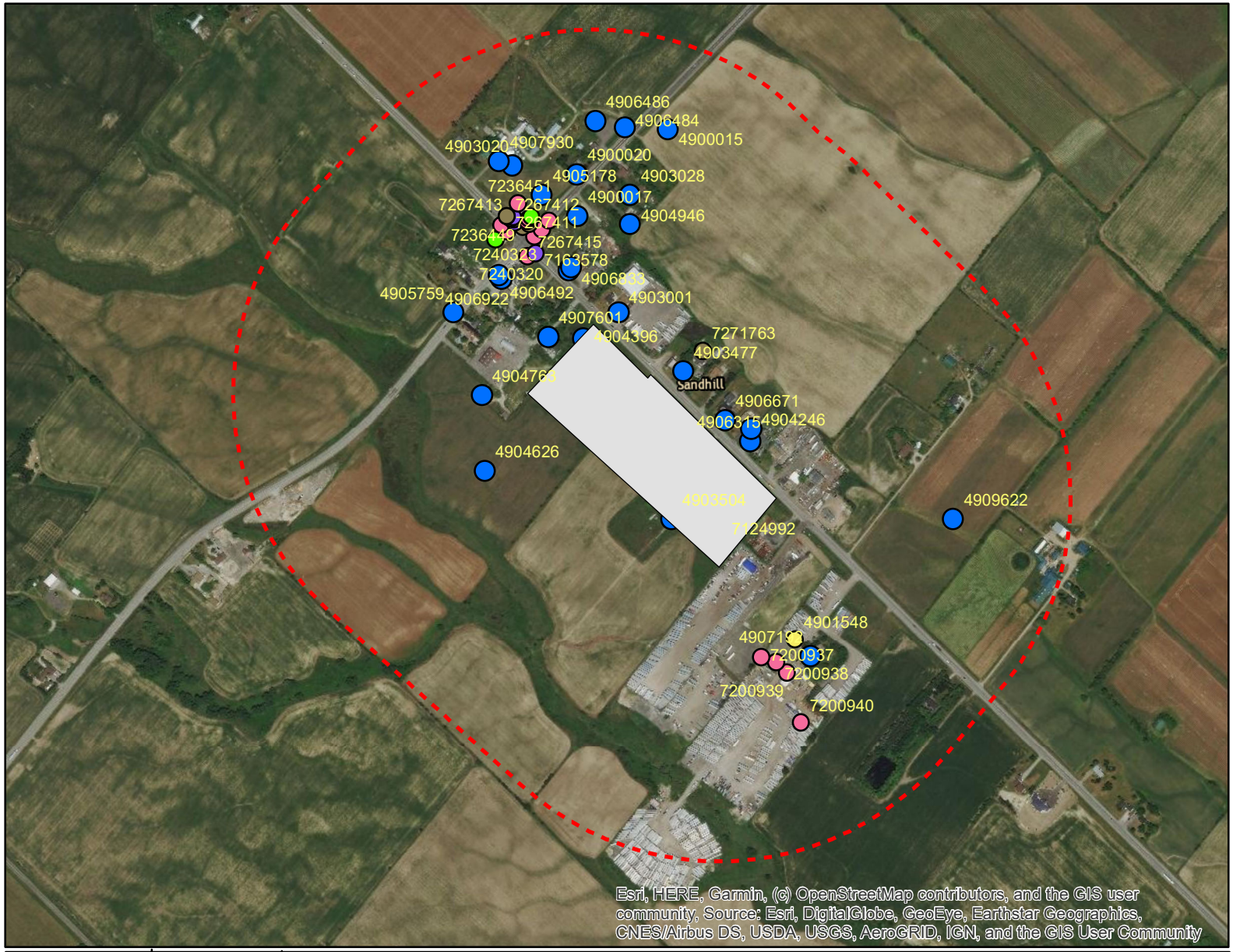
200 100 0 200 400 600 800 1,000

Metres

FIGURE 3

Reference: 1:63,600 Surfacial Geology Map of Ontario, Map numbers: Bolton M2275

E:\GIS\HLV2K\1900193_Caledon_13846_13940_AirportRd\1900193BH_HydroG\SiteGeology.mxd



N

500m Buffer

Apprx. Site Boundary

Final Status

- Abandoned-Other
- Abandoned-Supply
- Monitoring and Test Hole
- Not Stated
- Test Hole
- Water Supply

150 75 0 150 Meters

Drawn	MK	Client:	**AIRPORT CALEDON INC.**
Approved	K.M.	Project:	**HYDROGEOLOGICAL INVESTIGATION PROPOSED COMMERCIAL/INDUSTRIAL DEVELOPMENT 13846 & 13940 AIRPORT ROAD, CALEDON, ON**
Date	APR. 2020	Title:	**WATER WELL MAP**
Scale	As Shown	Project No.:	**19000193BH**
Originial Size	Letter Size	Figure No.:	**4**

HLV2K ENGINEERING LIMITED

APPENDIX A

Borehole Logs

HLV2K ENGINEERING LIMITED

LOG OF BOREHOLE BH201

PROJECT: Proposed Commercial/Industrial Development

CLIENT: RG Consulting Inc.

PROJECT LOCATION: 13846 & 13940 Airport Road, Caledon, ON

DATUM: Geodetic

BH LOCATION: See Borehole Location Plan N 4853565.459 E 595503.327

DRILLING DATA

Method: Hollow Stem Auger

Diameter: 150mm

Date: Mar-11-2020

REF. NO.: 1900193BH

DRAWING NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
273.2												
0.0 / 273.0	**Topsoil:** 200mm						273					
0.2 / 272.7	**Disturbed Native/Fill:** silty clay to clayey silt, trace gravel, brown, loose		1	SS								
0.5	**Clayey Silt Glacial Till:** some sand, trace gravel, oxidized, brown, stiff to very stiff		2	SS			272					1 17 45 37
271.8												
1.4	**Silty Sand Glacial Till:** some sand and gravel, grey, compact to dense		3	SS			271					
			4	SS			270					11 49 26 14
			5	SS			269					
			6	SS			268					
267.1												
6.1	**End of Borehole:** borehole terminated at 6.1m Upon Completion i) Open ii) Water at 4.0m											

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε_f=3% Strain at Failure

HLV2K ENGINEERING LIMITED

LOG OF BOREHOLE BH202

PROJECT: Proposed Commercial/Industrial Development

CLIENT: RG Consulting Inc.

PROJECT LOCATION: 13846 & 13940 Airport Road, Caledon, ON

DATUM: Geodetic

BH LOCATION: See Borehole Location Plan N 4853406.754 E 595585.752

DRILLING DATA

Method: Hollow Stem Auger

Diameter: 150mm

Date: Mar-11-2020

REF. NO.: 1900193BH

DRAWING NO.: 3

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
272.6												
272.5 / 0.1	**Topsoil:** 50mm											
	Disturbed Native/Fill: silty sand till to sandy silt till, some gravel, brown, oxidized, compact		1	SS								
272.0							272					
0.6	**Silty Sand Glacial Till:** some gravel, brown, oxidized, compact		2	SS								
1							271					
			3	SS								
2												
			4	SS			270					
	grey below 2.7m											
269.5 / 3												
3.1	**Silty Clay to Clay Silt:** some sand, oxidized, stiff to very stiff		5	SS			269					
4												
	a layer of gravel from 4.4 to 4.7m						268					
			6	SS								
5							267					
266.5 / 6												
6.1	**End of Borehole:** borehole terminated at 6.1m											
	Upon Completion											
	i) Open ii) Water at 2.1m											

GROUNDWATER ELEVATIONS

Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ $^{\varepsilon}$=3% Strain at Failure

HLV2K ENGINEERING LIMITED

LOG OF BOREHOLE BH203

PROJECT: Proposed Commercial/Industrial Development

CLIENT: RG Consulting Inc.

PROJECT LOCATION: 13846 & 13940 Airport Road, Caledon, ON

DATUM: Geodetic

BH LOCATION: See Borehole Location Plan N 4853350.221 E 595735.846

DRILLING DATA

Method: Hollow Stem Auger

Diameter: 150mm

Date: Mar-11-2020

REF. NO.: 1900193BH

DRAWING NO.: 4

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
270.2 / 0.0	**Topsoil:** 150mm						270
270.1 / 0.2	**Disturbed Native/Fill:** silty clay to clayey silt, brown, loose		1	SS			
269.6 / 0.6	**Clayey Silt Glacial Till:** some sand, trace gravel, brownish grey, oxidized, stiff to very stiff		2	SS			269
			3	SS			
			4	SS			268
	grey below 2.9m		5	SS			267
			6	SS			266
264.1 / 6.1	**End of Borehole:** borehole terminated at 6.1m Upon Completion i) Open & Dry						265

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L

WATER CONTENT (%): 10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

REMARKS AND GRAIN SIZE DISTRIBUTION (%): GR SA SI CL

GROUNDWATER ELEVATIONS

Measurement: 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

APPENDIX B

Water Quality Certificates of Analysis

HLV2K Engineering Limited (Brampton)
ATTN: Kourosh Mohammadi
2179 Dunwin Drive
Unit 4
Mississauga ON L5L 1X2

Date Received: 01-APR-20
Report Date: 08-APR-20 13:16 (MT)
Version: FINAL

Client Phone: 437-370-0317

Certificate of Analysis

Lab Work Order #: L2433489

Project P.O. #: NOT SUBMITTED
Job Reference: 1900193BH
C of C Numbers: 17-796062
Legal Site Desc:

Amanda Overholster
Account Manager

Summary of Guideline Exceedances

Guideline ALS ID	Client ID	Grouping	Analyte	Result	Guideline Limit	Unit
Ontario Reg. Mun. of Peel Sanitary Bylaw #53-2010 (APR. 2011) - Reg. Mun. of Peel Sanitary by-law #53-2010						
(No parameter exceedances)						
Ontario Reg. Mun. of Peel Sanitary Bylaw #53-2010 (APR. 2011) - Peel Storm Sewer By-Law #53-201- (APR. 2011)						
L2433489-1	MW2	Physical Tests	Total Suspended Solids	30.0	15	mg/L
		Anions and Nutrients	Phosphorus, Total	0.533	0.4	mg/L
		Bacteriological Tests	Fecal Coliforms	<2	0	CFU/100mL
		Total Metals	Manganese (Mn)-Total	0.779	0.05	mg/L
			Zinc (Zn)-Total	0.073	0.04	mg/L

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Physical Tests - WATER

Analyte	Unit	Guide Limits #1	Guide Limits #2	Lab ID: L2433489-1 Sample Date: 31-MAR-20 Sample ID: MW2
pH	pH units	5.5-10	6-9	7.98
Total Suspended Solids	mg/L	350	15	30.0

Guide Limit #1: Reg. Mun. of Peel Sanitary by-law #53-2010
Guide Limit #2: Peel Storm Sewer By-Law #53-201- (APR. 2011)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Anions and Nutrients - WATER

			Lab ID	L2433489-1
			Sample Date	31-MAR-20
			Sample ID	MW2
		Guide Limits		
Analyte	Unit	#1	#2	
Fluoride (F)	mg/L	10	-	0.113
Total Kjeldahl Nitrogen	mg/L	100	1	0.51
Phosphorus, Total	mg/L	10	0.4	0.533
Sulfate (SO4)	mg/L	1500	-	58.0

Guide Limit #1: Reg. Mun. of Peel Sanitary by-law #53-2010
Guide Limit #2: Peel Storm Sewer By-Law #53-201- (APR. 2011)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Cyanides - WATER

		Lab ID	L2433489-1
		Sample Date	31-MAR-20
		Sample ID	MW2
Analyte	Unit	Guide Limits #1	#2
Cyanide, Total	mg/L	2	0.02	<0.0020

Guide Limit #1: Reg. Mun. of Peel Sanitary by-law #53-2010
Guide Limit #2: Peel Storm Sewer By-Law #53-201- (APR. 2011)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Bacteriological Tests - WATER

				Lab ID	Sample Date	Sample ID
		Guide Limits				
Analyte	Unit	#1	#2			
E. Coli	CFU/100mL	-	200	10 DLM		
Fecal Coliforms	CFU/100mL	-	0	<2 DLM		

Guide Limit #1: Reg. Mun. of Peel Sanitary by-law #53-2010
Guide Limit #2: Peel Storm Sewer By-Law #53-201- (APR. 2011)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Total Metals - WATER

Analyte	Unit	Guide Limits #1	Guide Limits #2	Lab ID: L2433489-1 Sample Date: 31-MAR-20 Sample ID: MW2
Aluminum (Al)-Total	mg/L	50	-	18.2 DLHC
Antimony (Sb)-Total	mg/L	5	-	<0.0010 DLHC
Arsenic (As)-Total	mg/L	1	0.02	0.0090 DLHC
Cadmium (Cd)-Total	mg/L	0.7	0.008	0.000089 DLHC
Chromium (Cr)-Total	mg/L	5	0.08	0.0271 DLHC
Cobalt (Co)-Total	mg/L	5	-	0.0139 DLHC
Copper (Cu)-Total	mg/L	3	0.05	0.0259 DLHC
Lead (Pb)-Total	mg/L	3	0.120	0.0127 DLHC
Manganese (Mn)-Total	mg/L	5	0.05	0.779 DLHC
Mercury (Hg)-Total	mg/L	0.01	0.0004	0.0000111
Molybdenum (Mo)-Total	mg/L	5	-	0.00145 DLHC
Nickel (Ni)-Total	mg/L	3	0.08	0.0308 DLHC
Selenium (Se)-Total	mg/L	1	0.02	<0.00050 DLHC
Silver (Ag)-Total	mg/L	5	0.12	<0.00050 DLHC
Tin (Sn)-Total	mg/L	5	-	<0.0010 DLHC
Titanium (Ti)-Total	mg/L	5	-	0.229 DLHC
Zinc (Zn)-Total	mg/L	3	0.04	0.073 DLHC

Guide Limit #1: Reg. Mun. of Peel Sanitary by-law #53-2010
Guide Limit #2: Peel Storm Sewer By-Law #53-201- (APR. 2011)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Aggregate Organics - WATER

			Lab ID	L2433489-1
			Sample Date	31-MAR-20
			Sample ID	MW2
Analyte	**Unit**	**Guide Limits #1**	**#2**	
BOD Carbonaceous	mg/L	300	15	<3.0 BODL
Oil and Grease, Total	mg/L	-	-	<5.0
Animal/Veg Oil & Grease	mg/L	150	-	<5.0
Mineral Oil and Grease	mg/L	15	-	<2.5
Phenols (4AAP)	mg/L	1	0.008	<0.0010

Guide Limit #1: Reg. Mun. of Peel Sanitary by-law #53-2010
Guide Limit #2: Peel Storm Sewer By-Law #53-201- (APR. 2011)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

Volatile Organic Compounds - WATER

				Lab ID	L2433489-1
				Sample Date	31-MAR-20
				Sample ID	MW2
		Guide Limits			
Analyte	Unit	#1	#2		
Acetone	ug/L	-	-	<20	
Benzene	ug/L	10	2	<0.50	
Bromodichloromethane	ug/L	-	-	<0.50	
Bromoform	ug/L	-	-	<1.0	
Bromomethane	ug/L	-	-	<0.50	
Carbon Disulfide	ug/L	-	-	<1.0	
Carbon tetrachloride	ug/L	-	-	<0.20	
Chlorobenzene	ug/L	-	-	<0.50	
Dibromochloromethane	ug/L	-	-	<0.50	
Chloroethane	ug/L	-	-	<1.0	
Chloroform	ug/L	40	2	<1.0	
Chloromethane	ug/L	-	-	<1.0	
1,2-Dibromoethane	ug/L	-	-	<0.20	
1,2-Dichlorobenzene	ug/L	50	5.6	<0.50	
1,3-Dichlorobenzene	ug/L	-	-	<0.50	
1,4-Dichlorobenzene	ug/L	80	6.8	<0.50	
Dichlorodifluoromethane	ug/L	-	-	<1.0	
1,1-Dichloroethane	ug/L	-	-	<0.50	
1,2-Dichloroethane	ug/L	-	-	<0.50	
1,1-Dichloroethylene	ug/L	-	-	<0.50	
cis-1,2-Dichloroethylene	ug/L	4000	5.6	<0.50	
trans-1,2-Dichloroethylene	ug/L	-	-	<0.50	
Dichloromethane	ug/L	2000	5.2	<2.0	
1,2-Dichloropropane	ug/L	-	-	<0.50	
cis-1,3-Dichloropropene	ug/L	-	-	<0.30	
trans-1,3-Dichloropropene	ug/L	140	5.6	<0.30	
Ethylbenzene	ug/L	160	2	<0.50	
n-Hexane	ug/L	-	-	<0.50	
2-Hexanone	ug/L	-	-	<20	
Methyl Ethyl Ketone	ug/L	8000	-	<20	

Guide Limit #1: Reg. Mun. of Peel Sanitary by-law #53-2010
Guide Limit #2: Peel Storm Sewer By-Law #53-201- (APR. 2011)

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Volatile Organic Compounds - WATER

			Lab ID	L2433489-1
			Sample Date	31-MAR-20
			Sample ID	MW2
		Guide Limits		
Analyte	Unit	#1	#2	
Methyl Isobutyl Ketone	ug/L	-	-	<20
MTBE	ug/L	-	-	<0.50
Styrene	ug/L	200	-	<0.50
1,1,1,2-Tetrachloroethane	ug/L	-	-	<0.50
1,1,2,2-Tetrachloroethane	ug/L	1400	17	<0.50
Tetrachloroethylene	ug/L	1000	4.4	<0.50
Toluene	ug/L	270	2	<0.50
1,1,1-Trichloroethane	ug/L	-	-	<0.50
1,1,2-Trichloroethane	ug/L	-	-	<0.50
Trichloroethylene	ug/L	400	8	<0.50
Trichlorofluoromethane	ug/L	-	-	<1.0
Vinyl chloride	ug/L	-	-	<0.50
o-Xylene	ug/L	-	-	<0.30
m+p-Xylenes	ug/L	-	-	<0.40
Xylenes (Total)	ug/L	1400	4.4	<0.50
Surrogate: 4-Bromofluorobenzene	%	-	-	99.9
Surrogate: 1,4-Difluorobenzene	%	-	-	100.7

Guide Limit #1: Reg. Mun. of Peel Sanitary by-law #53-2010
Guide Limit #2: Peel Storm Sewer By-Law #53-201- (APR. 2011)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Phthalate Esters - WATER

			Lab ID	L2433489-1
			Sample Date	31-MAR-20
			Sample ID	MW2
		Guide Limits		
Analyte	Unit	#1	#2	
Bis(2-ethylhexyl)phthalate	ug/L	12	8.8	<2.0
Surrogate: 2-fluorobiphenyl	%	-	-	76.4
Surrogate: p-Terphenyl d14	%	-	-	71.5

Guide Limit #1: Reg. Mun. of Peel Sanitary by-law #53-2010
Guide Limit #2: Peel Storm Sewer By-Law #53-201- (APR. 2011)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Semi-Volatile Organics - WATER

			Lab ID	L2433489-1
			Sample Date	31-MAR-20
			Sample ID	MW2
		Guide Limits		
Analyte	Unit	#1	#2	
Di-n-butylphthalate	ug/L	80	15	<1.0
Surrogate: 2-Fluorobiphenyl	%	-	-	76.4
Surrogate: p-Terphenyl d14	%	-	-	71.5

Guide Limit #1: Reg. Mun. of Peel Sanitary by-law #53-2010
Guide Limit #2: Peel Storm Sewer By-Law #53-201- (APR. 2011)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Polychlorinated Biphenyls - WATER

			Lab ID	L2433489-1
			Sample Date	31-MAR-20
			Sample ID	MW2
		Guide Limits		
Analyte	Unit	#1	#2	
Aroclor 1242	ug/L	-	-	<0.020
Aroclor 1248	ug/L	-	-	<0.020
Aroclor 1254	ug/L	-	-	<0.020
Aroclor 1260	ug/L	-	-	<0.020
Surrogate: Decachlorobiphenyl	%	-	-	64.9
Total PCBs	ug/L	1	0.4	<0.040
Surrogate: Tetrachloro-m-xylene	%	-	-	83.4

Guide Limit #1: Reg. Mun. of Peel Sanitary by-law #53-2010
Guide Limit #2: Peel Storm Sewer By-Law #53-201- (APR. 2011)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Organic Parameters - WATER

			Lab ID	L2433489-1
			Sample Date	31-MAR-20
			Sample ID	MW2
Analyte	**Unit**	**Guide Limits #1**	**#2**	
Nonylphenol	ug/L	20	-	<1.0
Nonylphenol Diethoxylates	ug/L	-	-	<0.10
Total Nonylphenol Ethoxylates	ug/L	200	-	<2.0
Nonylphenol Monoethoxylates	ug/L	-	-	<2.0

Guide Limit #1: Reg. Mun. of Peel Sanitary by-law #53-2010
Guide Limit #2: Peel Storm Sewer By-Law #53-201- (APR. 2011)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
BODL	Limit of Reporting for BOD was increased to account for the largest volume of sample tested.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
625-BIS-2-PHTH-WT	Water	Bis(2-ethylhexyl)phthalate	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD.			
625-DNB-PHTH-WT	Water	Di-n-Butyl Phthalate	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD.			
BOD-C-WT	Water	BOD Carbonaceous	APHA 5210 B (CBOD)
This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.			
CN-TOT-WT	Water	Cyanide, Total	ISO 14403-2
Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex. When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference			
EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
EC-WW-MF-WT	Water	E. Coli	SM 9222D
A 100 mL volume of sample is filtered through a membrane, the membrane is placed on mFC-BCIG agar and incubated at 44.5 –0 .2 °C for 24 – 2 h. Method ID: WT-TM-1200			
F-IC-N-WT	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
FC-WW-MF-WT	Water	Fecal Coliforms	APHA 9223B
FC-WW-MF-WT	Water	Fecal Coliforms	SM 9222D
HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

NP,NPE-LCMS-WT	Water	Nonylphenols and Ethoxylates by LC/MS-MS	J. Chrom A849 (1999) p.467-482

Water samples are filtered and analyzed on LCMS/MS by direct injection.

OGG-SPEC-CALC-WT	Water	Speciated Oil and Grease A/V Calc	CALCULATION

Sample is extracted with hexane, sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.

OGG-SPEC-WT	Water	Speciated Oil and Grease-Gravimetric	APHA 5520 B

The procedure involves an extraction of the entire water sample with hexane. Sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.

P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is deteremined colourimetrically after persulphate digestion of the sample.

PCB-WT	Water	Polychlorinated Biphenyls	EPA 8082

PCBs are extracted from an aqueous sample at neutral pH with aliquots of dichloromethane using a modified separatory funnel technique. The extracts are analyzed by GC/MSD.

PH-WT	Water	pH	APHA 4500 H-Electrode

Water samples are analyzed directly by a calibrated pH meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric

A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1°C for a minimum of four hours or until a constant weight is achieved.

TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.

VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**

Aqueous samples are analyzed by headspace-GC/MS.

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

17-796062

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

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. Guideline limits 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.

Quality Control Report

Workorder: L2433489 Report Date: 08-APR-20

Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2
Contact: Kourosh Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-BIS-2-PHTH-WT	**Water**							
Batch R5049446								
WG3302393-2 LCS								
Bis(2-ethylhexyl)phthalate			114.4		%		50-140	02-APR-20
WG3302393-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	02-APR-20
Surrogate: 2-fluorobiphenyl			87.2		%		40-130	02-APR-20
Surrogate: p-Terphenyl d14			122.2		%		40-130	02-APR-20
625-DNB-PHTH-WT	**Water**							
Batch R5049446								
WG3302393-2 LCS								
Di-n-butylphthalate			112.6		%		50-150	02-APR-20
WG3302393-1 MB								
Di-n-butylphthalate			<1.0		ug/L		1	02-APR-20
Surrogate: 2-Fluorobiphenyl			87.2		%		40-130	02-APR-20
Surrogate: p-Terphenyl d14			122.2		%		40-130	02-APR-20
BOD-C-WT	**Water**							
Batch R5051729								
WG3303168-2 DUP		**L2433290-1**						
BOD Carbonaceous		<3.0	<3.0	RPD-NA	mg/L	N/A	20	07-APR-20
WG3303168-3 LCS								
BOD Carbonaceous			86.4		%		85-115	07-APR-20
WG3303168-1 MB								
BOD Carbonaceous			<2.0		mg/L		2	07-APR-20
CN-TOT-WT	**Water**							
Batch R5050402								
WG3302826-3 DUP		**L2433290-1**						
Cyanide, Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	02-APR-20
WG3302826-2 LCS								
Cyanide, Total			111.1		%		80-120	02-APR-20
WG3302826-1 MB								
Cyanide, Total			<0.0020		mg/L		0.002	02-APR-20
WG3302826-4 MS		**L2433290-1**						
Cyanide, Total			108.9		%		70-130	02-APR-20
EC-WW-MF-WT	**Water**							
Batch R5050429								
WG3302782-3 DUP		**L2433489-1**						
E. Coli		10	<2	DUP-H	CFU/100mL	N/A	65	02-APR-20
WG3302782-1 MB								

Quality Control Report

Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2
Contact: Kourosh Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
EC-WW-MF-WT	**Water**							
Batch R5050429								
WG3302782-1 MB								
E. Coli			0		CFU/100mL		1	02-APR-20
F-IC-N-WT	**Water**							
Batch R5050662								
WG3302897-15 DUP		**WG3302897-13**						
Fluoride (F)		0.072	0.073		mg/L	0.7	20	02-APR-20
WG3302897-12 LCS								
Fluoride (F)			102.2		%		90-110	02-APR-20
WG3302897-11 MB								
Fluoride (F)			<0.020		mg/L		0.02	02-APR-20
WG3302897-14 MS		**WG3302897-13**						
Fluoride (F)			100.5		%		75-125	02-APR-20
FC-WW-MF-WT	**Water**							
Batch R5050428								
WG3302776-1 MB								
Fecal Coliforms			0		CFU/100mL		1	02-APR-20
HG-T-CVAA-WT	**Water**							
Batch R5050216								
WG3302611-3 DUP		**L2433290-1**						
Mercury (Hg)-Total		0.0000131	0.0000150		mg/L	14	20	02-APR-20
WG3302611-2 LCS								
Mercury (Hg)-Total			111.0		%		80-120	02-APR-20
WG3302611-1 MB								
Mercury (Hg)-Total			<0.000005(		mg/L		0.000005	02-APR-20
WG3302611-4 MS		**L2433290-2**						
Mercury (Hg)-Total			105.4		%		70-130	02-APR-20
MET-T-CCMS-WT	**Water**							
Batch R5049855								
WG3302668-4 DUP		**WG3302668-3**						
Aluminum (Al)-Total		0.355	0.361		mg/L	1.6	20	02-APR-20
Antimony (Sb)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-APR-20
Arsenic (As)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-APR-20
Cadmium (Cd)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	02-APR-20
Chromium (Cr)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	02-APR-20
Cobalt (Co)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-APR-20

Quality Control Report

Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2
Contact: Kourosh Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT	**Water**							
Batch R5049855								
WG3302668-4 DUP		**WG3302668-3**						
Copper (Cu)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	02-APR-20
Lead (Pb)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-APR-20
Manganese (Mn)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	02-APR-20
Molybdenum (Mo)-Total		0.0155	0.0150		mg/L	3.2	20	02-APR-20
Nickel (Ni)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	02-APR-20
Selenium (Se)-Total		0.00079	0.00105	J	mg/L	0.00026	0.001	02-APR-20
Silver (Ag)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-APR-20
Tin (Sn)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-APR-20
Titanium (Ti)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	02-APR-20
Zinc (Zn)-Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	02-APR-20
WG3302668-2 LCS								
Aluminum (Al)-Total			107.6		%		80-120	02-APR-20
Antimony (Sb)-Total			107.3		%		80-120	02-APR-20
Arsenic (As)-Total			105.6		%		80-120	02-APR-20
Cadmium (Cd)-Total			104.9		%		80-120	02-APR-20
Chromium (Cr)-Total			104.7		%		80-120	02-APR-20
Cobalt (Co)-Total			102.7		%		80-120	02-APR-20
Copper (Cu)-Total			102.9		%		80-120	02-APR-20
Lead (Pb)-Total			104.5		%		80-120	02-APR-20
Manganese (Mn)-Total			107.0		%		80-120	02-APR-20
Molybdenum (Mo)-Total			103.4		%		80-120	02-APR-20
Nickel (Ni)-Total			102.3		%		80-120	02-APR-20
Selenium (Se)-Total			105.8		%		80-120	02-APR-20
Silver (Ag)-Total			105.6		%		80-120	02-APR-20
Tin (Sn)-Total			104.4		%		80-120	02-APR-20
Titanium (Ti)-Total			101.9		%		80-120	02-APR-20
Zinc (Zn)-Total			104.8		%		80-120	02-APR-20
WG3302668-1 MB								
Aluminum (Al)-Total			<0.0050		mg/L		0.005	02-APR-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	02-APR-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	02-APR-20
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	02-APR-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	02-APR-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	02-APR-20

Quality Control Report

Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2
Contact: Kourosh Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT	**Water**							
Batch R5049855								
WG3302668-1 MB								
Copper (Cu)-Total			<0.00050		mg/L		0.0005	02-APR-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	02-APR-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	02-APR-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	02-APR-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	02-APR-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	02-APR-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	02-APR-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	02-APR-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	02-APR-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	02-APR-20
WG3302668-5 MS		**WG3302668-6**						
Aluminum (Al)-Total			N/A	MS-B	%		-	02-APR-20
Antimony (Sb)-Total			102.0		%		70-130	02-APR-20
Arsenic (As)-Total			103.5		%		70-130	02-APR-20
Cadmium (Cd)-Total			98.6		%		70-130	02-APR-20
Chromium (Cr)-Total			100.5		%		70-130	02-APR-20
Cobalt (Co)-Total			98.7		%		70-130	02-APR-20
Copper (Cu)-Total			N/A	MS-B	%		-	02-APR-20
Lead (Pb)-Total			95.0		%		70-130	02-APR-20
Manganese (Mn)-Total			104.1		%		70-130	02-APR-20
Molybdenum (Mo)-Total			N/A	MS-B	%		-	02-APR-20
Nickel (Ni)-Total			98.1		%		70-130	02-APR-20
Selenium (Se)-Total			104.5		%		70-130	02-APR-20
Silver (Ag)-Total			95.0		%		70-130	02-APR-20
Tin (Sn)-Total			97.4		%		70-130	02-APR-20
Titanium (Ti)-Total			94.8		%		70-130	02-APR-20
Zinc (Zn)-Total			102.2		%		70-130	02-APR-20
NP,NPE-LCMS-WT	**Water**							
Batch R5049402								
WG3302186-3 DUP		**L2432784-1**						
Nonylphenol		<1.0	<1.0	RPD-NA	ug/L	N/A	30	01-APR-20
Nonylphenol Monoethoxylates		<2.0	<2.0	RPD-NA	ug/L	N/A	30	01-APR-20
Nonylphenol Diethoxylates		<0.10	<0.10	RPD-NA	ug/L	N/A	30	01-APR-20
WG3302186-2 LCS								

Quality Control Report

Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2
Contact: Kourosh Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NP,NPE-LCMS-WT	**Water**							
Batch R5049402								
WG3302186-2 LCS								
Nonylphenol			79.1		%		75-125	01-APR-20
Nonylphenol Monoethoxylates			105.0		%		75-125	01-APR-20
Nonylphenol Diethoxylates			92.5		%		75-125	01-APR-20
WG3302186-1 MB								
Nonylphenol			<1.0		ug/L		1	01-APR-20
Nonylphenol Monoethoxylates			<2.0		ug/L		2	01-APR-20
Nonylphenol Diethoxylates			<0.10		ug/L		0.1	01-APR-20
WG3302186-4 MS		**L2432784-1**						
Nonylphenol			87.4		%		50-150	01-APR-20
Nonylphenol Monoethoxylates			125.8		%		50-150	01-APR-20
Nonylphenol Diethoxylates			86.7		%		50-150	01-APR-20
OGG-SPEC-WT	**Water**							
Batch R5050872								
WG3303364-2 LCS								
Oil and Grease, Total			100.4		%		70-130	03-APR-20
Mineral Oil and Grease			101.9		%		70-130	03-APR-20
WG3303364-1 MB								
Oil and Grease, Total			<5.0		mg/L		5	03-APR-20
Mineral Oil and Grease			<2.5		mg/L		2.5	03-APR-20
P-T-COL-WT	**Water**							
Batch R5050366								
WG3302734-3 DUP		**L2433470-1**						
Phosphorus, Total		0.142	0.135		mg/L	4.8	20	03-APR-20
WG3302734-2 LCS								
Phosphorus, Total			102.0		%		80-120	03-APR-20
WG3302734-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	03-APR-20
WG3302734-4 MS		**L2433470-1**						
Phosphorus, Total			N/A	MS-B	%		-	03-APR-20
PCB-WT	**Water**							
Batch R5050780								
WG3302711-2 LCS								
Aroclor 1242			124.1		%		65-130	03-APR-20
Aroclor 1248			111.9		%		65-130	03-APR-20
Aroclor 1254			109.6		%		65-130	03-APR-20

Quality Control Report

Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2
Contact: Kourosh Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-WT	**Water**							
Batch R5050780								
WG3302711-2 LCS								
Aroclor 1260			98.9		%		65-130	03-APR-20
WG3302711-1 MB								
Aroclor 1242			<0.020		ug/L		0.02	03-APR-20
Aroclor 1248			<0.020		ug/L		0.02	03-APR-20
Aroclor 1254			<0.020		ug/L		0.02	03-APR-20
Aroclor 1260			<0.020		ug/L		0.02	03-APR-20
Surrogate: Decachlorobiphenyl			88.3		%		50-150	03-APR-20
Surrogate: Tetrachloro-m-xylene			73.9		%		50-150	03-APR-20
PH-WT	**Water**							
Batch R5050441								
WG3303456-4 DUP		**WG3303456-3**						
pH		8.13	8.12	J	pH units	0.01	0.2	03-APR-20
WG3303456-2 LCS								
pH			7.00		pH units		6.9-7.1	03-APR-20
PHENOLS-4AAP-WT	**Water**							
Batch R5050588								
WG3302727-3 DUP		**L2433456-1**						
Phenols (4AAP)		0.0015	0.0016		mg/L	6.9	20	02-APR-20
WG3302727-2 LCS								
Phenols (4AAP)			102.7		%		85-115	02-APR-20
WG3302727-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	02-APR-20
WG3302727-4 MS		**L2433456-1**						
Phenols (4AAP)			102.7		%		75-125	02-APR-20
SO4-IC-N-WT	**Water**							
Batch R5050662								
WG3302897-15 DUP		**WG3302897-13**						
Sulfate (SO4)		10.3	10.2		mg/L	0.2	20	02-APR-20
WG3302897-12 LCS								
Sulfate (SO4)			101.9		%		90-110	02-APR-20
WG3302897-11 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	02-APR-20
WG3302897-14 MS		**WG3302897-13**						
Sulfate (SO4)			101.7		%		75-125	02-APR-20
SOLIDS-TSS-WT	**Water**							

Quality Control Report

Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2
Contact: Kourosh Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TSS-WT	**Water**							
Batch R5051144								
WG3303412-3 DUP		**L2432566-1**						
Total Suspended Solids		1580	1590		mg/L	0.6	20	06-APR-20
WG3303412-2 LCS								
Total Suspended Solids			101.5		%		85-115	06-APR-20
WG3303412-1 MB								
Total Suspended Solids			<2.0		mg/L		2	06-APR-20
TKN-WT	**Water**							
Batch R5050726								
WG3302732-3 DUP		**L2433290-2**						
Total Kjeldahl Nitrogen		0.37	0.35		mg/L	5.8	20	03-APR-20
WG3302732-2 LCS								
Total Kjeldahl Nitrogen			103.4		%		75-125	03-APR-20
WG3302732-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	03-APR-20
WG3302732-4 MS		**L2433290-2**						
Total Kjeldahl Nitrogen			80.7		%		70-130	03-APR-20
VOC-ROU-HS-WT	**Water**							
Batch R5049578								
WG3302200-4 DUP		**WG3302200-3**						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	02-APR-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
2-Hexanone		<20	<20	RPD-NA	ug/L	N/A	30	02-APR-20
Acetone		26	24		ug/L	9.0	30	02-APR-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
Bromodichloromethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20

Quality Control Report

Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2
Contact: Kourosh Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	**Water**							
Batch R5049578								
WG3302200-4 DUP		**WG3302200-3**						
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	02-APR-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
Carbon Disulfide		<1.0	<1.0	RPD-NA	ug/L	N/A	30	02-APR-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	02-APR-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	02-APR-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	02-APR-20
Chloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	02-APR-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	02-APR-20
Dibromochloromethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	02-APR-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	02-APR-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
m+p-Xylenes		<1.0	<0.40	RPD-NA	ug/L	N/A	30	02-APR-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	02-APR-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	02-APR-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
o-Xylene		<0.50	<0.30	RPD-NA	ug/L	N/A	30	02-APR-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
trans-1,3-Dichloropropene		<0.50	<0.30	RPD-NA	ug/L	N/A	30	02-APR-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	02-APR-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	02-APR-20
WG3302200-1 LCS								
1,1,1,2-Tetrachloroethane			96.3		%		70-130	02-APR-20
1,1,2,2-Tetrachloroethane			92.1		%		70-130	02-APR-20
1,1,1-Trichloroethane			94.3		%		70-130	02-APR-20
1,1,2-Trichloroethane			96.5		%		70-130	02-APR-20

Quality Control Report

Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2
Contact: Kourosh Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	**Water**							
Batch R5049578								
WG3302200-1 LCS								
1,2-Dibromoethane			96.1		%		70-130	02-APR-20
1,1-Dichloroethane			94.1		%		70-130	02-APR-20
1,1-Dichloroethylene			88.2		%		70-130	02-APR-20
1,2-Dichlorobenzene			97.1		%		70-130	02-APR-20
1,2-Dichloroethane			94.8		%		70-130	02-APR-20
1,2-Dichloropropane			95.0		%		70-130	02-APR-20
1,3-Dichlorobenzene			92.5		%		70-130	02-APR-20
1,4-Dichlorobenzene			92.5		%		70-130	02-APR-20
2-Hexanone			92.7		%		60-140	02-APR-20
Acetone			104.1		%		60-140	02-APR-20
Benzene			94.5		%		70-130	02-APR-20
Bromodichloromethane			96.5		%		70-130	02-APR-20
Bromoform			92.7		%		70-130	02-APR-20
Bromomethane			79.7		%		60-140	02-APR-20
Carbon Disulfide			88.6		%		70-130	02-APR-20
Carbon tetrachloride			95.2		%		70-130	02-APR-20
Chlorobenzene			94.6		%		70-130	02-APR-20
Chloroethane			101.6		%		70-130	02-APR-20
Chloroform			96.1		%		70-130	02-APR-20
Chloromethane			101.3		%		60-140	02-APR-20
cis-1,2-Dichloroethylene			92.6		%		70-130	02-APR-20
cis-1,3-Dichloropropene			86.4		%		70-130	02-APR-20
Dibromochloromethane			93.5		%		70-130	02-APR-20
Dichlorodifluoromethane			91.2		%		50-140	02-APR-20
Dichloromethane			95.6		%		70-130	02-APR-20
Ethylbenzene			93.9		%		70-130	02-APR-20
m+p-Xylenes			93.5		%		70-130	02-APR-20
Methyl Ethyl Ketone			88.4		%		60-140	02-APR-20
Methyl Isobutyl Ketone			91.7		%		50-150	02-APR-20
n-Hexane			87.4		%		70-130	02-APR-20
MTBE			92.2		%		70-130	02-APR-20
o-Xylene			102.5		%		70-130	02-APR-20
Styrene			90.5		%		70-130	02-APR-20

Quality Control Report

Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2
Contact: Kourosh Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	**Water**							
Batch R5049578								
WG3302200-1 LCS								
Tetrachloroethylene			90.0		%		70-130	02-APR-20
Toluene			97.9		%		70-130	02-APR-20
trans-1,2-Dichloroethylene			87.6		%		70-130	02-APR-20
trans-1,3-Dichloropropene			90.5		%		70-130	02-APR-20
Trichloroethylene			93.4		%		70-130	02-APR-20
Trichlorofluoromethane			88.2		%		60-140	02-APR-20
Vinyl chloride			102.4		%		60-140	02-APR-20
WG3302200-2 MB								
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	02-APR-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	02-APR-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	02-APR-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	02-APR-20
1,2-Dibromoethane			<0.20		ug/L		0.2	02-APR-20
1,1-Dichloroethane			<0.50		ug/L		0.5	02-APR-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	02-APR-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	02-APR-20
1,2-Dichloroethane			<0.50		ug/L		0.5	02-APR-20
1,2-Dichloropropane			<0.50		ug/L		0.5	02-APR-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	02-APR-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	02-APR-20
2-Hexanone			<20		ug/L		20	02-APR-20
Acetone			<20		ug/L		20	02-APR-20
Benzene			<0.50		ug/L		0.5	02-APR-20
Bromodichloromethane			<0.50		ug/L		0.5	02-APR-20
Bromoform			<1.0		ug/L		1	02-APR-20
Bromomethane			<0.50		ug/L		0.5	02-APR-20
Carbon Disulfide			<1.0		ug/L		1	02-APR-20
Carbon tetrachloride			<0.20		ug/L		0.2	02-APR-20
Chlorobenzene			<0.50		ug/L		0.5	02-APR-20
Chloroethane			<1.0		ug/L		1	02-APR-20
Chloroform			<1.0		ug/L		1	02-APR-20
Chloromethane			<1.0		ug/L		1	02-APR-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	02-APR-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	02-APR-20

Quality Control Report

Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2
Contact: Kourosh Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	**Water**							
Batch R5049578								
WG3302200-2 MB								
Dibromochloromethane			<0.50		ug/L		0.5	02-APR-20
Dichlorodifluoromethane			<1.0		ug/L		1	02-APR-20
Dichloromethane			<2.0		ug/L		2	02-APR-20
Ethylbenzene			<0.50		ug/L		0.5	02-APR-20
m+p-Xylenes			<0.40		ug/L		0.4	02-APR-20
Methyl Ethyl Ketone			<20		ug/L		20	02-APR-20
Methyl Isobutyl Ketone			<20		ug/L		20	02-APR-20
n-Hexane			<0.50		ug/L		0.5	02-APR-20
MTBE			<0.50		ug/L		0.5	02-APR-20
o-Xylene			<0.30		ug/L		0.3	02-APR-20
Styrene			<0.50		ug/L		0.5	02-APR-20
Tetrachloroethylene			<0.50		ug/L		0.5	02-APR-20
Toluene			<0.50		ug/L		0.5	02-APR-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	02-APR-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	02-APR-20
Trichloroethylene			<0.50		ug/L		0.5	02-APR-20
Trichlorofluoromethane			<1.0		ug/L		1	02-APR-20
Vinyl chloride			<0.50		ug/L		0.5	02-APR-20
Surrogate: 1,4-Difluorobenzene			99.7		%		70-130	02-APR-20
Surrogate: 4-Bromofluorobenzene			99.2		%		70-130	02-APR-20
WG3302200-5 MS		**WG3302200-3**						
1,1,1,2-Tetrachloroethane			96.3		%		50-150	02-APR-20
1,1,2,2-Tetrachloroethane			90.9		%		50-150	02-APR-20
1,1,1-Trichloroethane			95.2		%		50-150	02-APR-20
1,1,2-Trichloroethane			94.0		%		50-150	02-APR-20
1,2-Dibromoethane			92.3		%		50-150	02-APR-20
1,1-Dichloroethane			94.3		%		50-150	02-APR-20
1,1-Dichloroethylene			86.8		%		50-150	02-APR-20
1,2-Dichlorobenzene			98.1		%		50-150	02-APR-20
1,2-Dichloroethane			92.2		%		50-150	02-APR-20
1,2-Dichloropropane			95.1		%		50-150	02-APR-20
1,3-Dichlorobenzene			94.0		%		50-150	02-APR-20
1,4-Dichlorobenzene			93.9		%		50-150	02-APR-20
2-Hexanone			87.8		%		50-150	02-APR-20

Quality Control Report

Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2
Contact: Kourosh Mohammadi

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	**Water**							
Batch R5049578								
WG3302200-5 MS		**WG3302200-3**						
Acetone			96.3		%		50-150	02-APR-20
Benzene			94.9		%		50-150	02-APR-20
Bromodichloromethane			96.4		%		50-150	02-APR-20
Bromoform			90.3		%		50-150	02-APR-20
Bromomethane			73.6		%		50-150	02-APR-20
Carbon Disulfide			86.9		%		50-150	02-APR-20
Carbon tetrachloride			96.5		%		50-150	02-APR-20
Chlorobenzene			95.2		%		50-150	02-APR-20
Chloroethane			98.4		%		50-150	02-APR-20
Chloroform			96.7		%		50-150	02-APR-20
Chloromethane			96.7		%		50-150	02-APR-20
cis-1,2-Dichloroethylene			93.0		%		50-150	02-APR-20
cis-1,3-Dichloropropene			87.9		%		50-150	02-APR-20
Dibromochloromethane			91.1		%		50-150	02-APR-20
Dichlorodifluoromethane			80.9		%		50-150	02-APR-20
Dichloromethane			94.6		%		50-150	02-APR-20
Ethylbenzene			95.0		%		50-150	02-APR-20
m+p-Xylenes			94.5		%		50-150	02-APR-20
Methyl Ethyl Ketone			80.4		%		50-150	02-APR-20
Methyl Isobutyl Ketone			87.4		%		50-150	02-APR-20
n-Hexane			84.4		%		50-150	02-APR-20
MTBE			92.2		%		50-150	02-APR-20
o-Xylene			103.4		%		50-150	02-APR-20
Styrene			90.7		%		50-150	02-APR-20
Tetrachloroethylene			91.7		%		50-150	02-APR-20
Toluene			96.9		%		50-150	02-APR-20
trans-1,2-Dichloroethylene			88.3		%		50-150	02-APR-20
trans-1,3-Dichloropropene			90.4		%		50-150	02-APR-20
Trichloroethylene			95.4		%		50-150	02-APR-20
Trichlorofluoromethane			85.7		%		50-150	02-APR-20
Vinyl chloride			96.7		%		50-150	02-APR-20

Quality Control Report

Workorder: L2433489 Report Date: 08-APR-20

Client: HLV2K Engineering Limited (Brampton)
2179 Dunwin Drive Unit 4
Mississauga ON L5L 1X2
Contact: Kourosh Mohammadi

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2433489-COFC

COC Number: 17 - 796062

Page of

Report To	Contact and company name below will appear on the final report	Report
Company:	HLV2K Engineering	Select Report Format: [X] PDF [ ] EXCEL [ ] EDD (DIGITAL)
Contact:	Kourosh Mohammadi	Quality Control (QC) Report with Report [ ] YES [ ] NO
Phone:	905-569-7765	[X] Compare Results to Criteria on Report - provide details below if box checked
	Company address below will appear on the final report	Select Distribution: [X] EMAIL [ ] MAIL [ ] FAX
Street:		Email 1 or Fax Kourosh.mohammadi@HLV2K.com
City/Province:		Email 2
Postal Code:		Email 3

Invoice To	Same as Report To [ ] YES [ ] NO	Invoice Distribution
	Copy of Invoice with Report [ ] YES [ ] NO	Select Invoice Distribution: [X] EMAIL [ ] MAIL [ ] FAX
Company:		Email 1 or Fax
Contact:		Email 2

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#
Job #:	1900193BH	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L2433489RO

ALS Contact:

Sampler:

Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] [X] Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] [ ] | 3 day [P3-25%] [ ] | 2 day [P2-50%] [ ]

EMERGENCY: 1 Business day [E - 100%] [ ] | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] [ ]

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

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

NUMBER OF CONTAINERS

Peel sanitary/storm sewer

SAMPLES ON HOLD

SUSPECTED HAZARD (see Special Instructions)

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type
	MW2	31-3-20	11:00	GW

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? [ ] YES [X] NO

Are samples for human consumption/ use? [ ] YES [X] NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

Peel sanitary/storm sewer discharge by-law

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen [ ] | SIF Observations Yes [ ] No [ ]

Ice Packs [X] Ice Cubes [ ] | Custody seal intact Yes [ ] No [ ]

Cooling Initiated [ ]

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
				6.2			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Ramin	Date: 31-3-20	Time: 13:00	Received by:	Date:	Time:	Received by:	Date: 4-1-2020	Time: 1430

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2018 FRONT

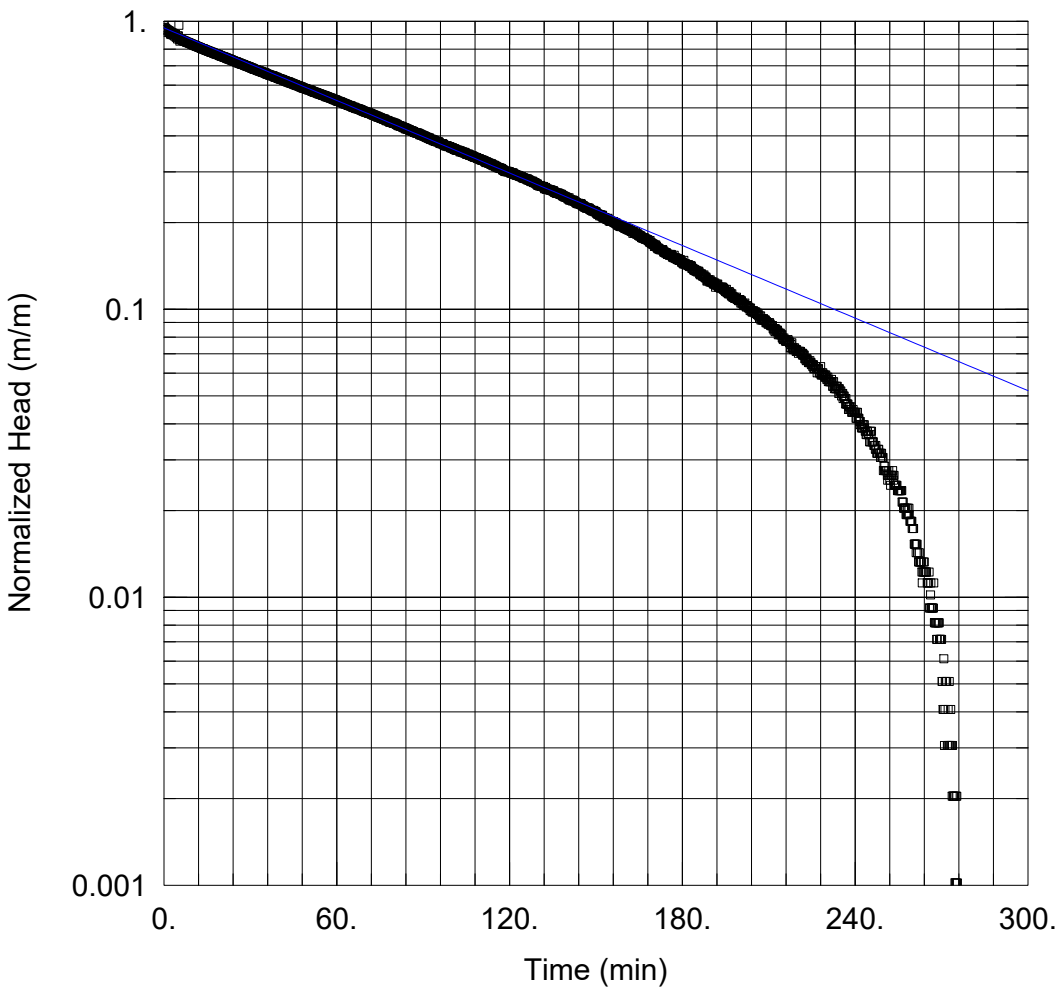
1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

APPENDIX C

In-Situ Hydraulic Conductivity Testing Results

In-Situ Hydraulic Conductivity Test (Rising Head) - BH201

Prepared By:	Prepared For:
HLV2K Engineering	Airport Caledon Inc.
Project:	**Location:**
1900193BH	Caledon, Ontario



SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 4.451E-6 cm/sec y0 = 0.9302 m

AQUIFER DATA

Saturated Thickness: 6.1 m Anisotropy Ratio (Kz/Kr): 1.

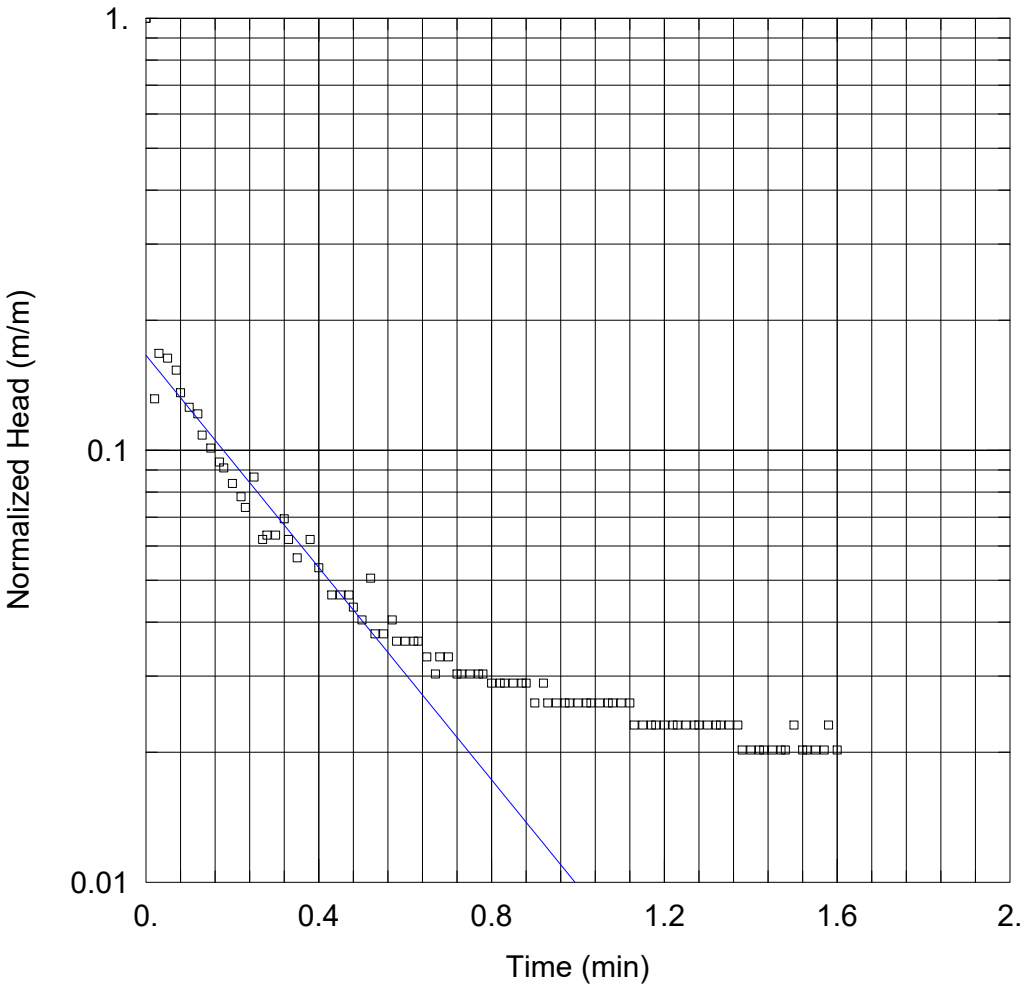
WELL DATA (BH201)

Initial Displacement: 0.981 m
Static Water Column Height: 5.85 m
Total Well Penetration Depth: 5.7 m
Screen Length: 3.05 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

HLV2K ENGINEERING LIMITED

In-Situ Hydraulic Conductivity Test - 1st Trial (Falling Head) - BH202

Prepared By:	Prepared For:
HLV2K Engineering	Airport Caledon Inc.
Project:	**Location:**
1900193BH	Caledon, Ontario



SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.001289 cm/sec y0 = 0.1148 m

AQUIFER DATA

Saturated Thickness: 3. m Anisotropy Ratio (Kz/Kr): 1.

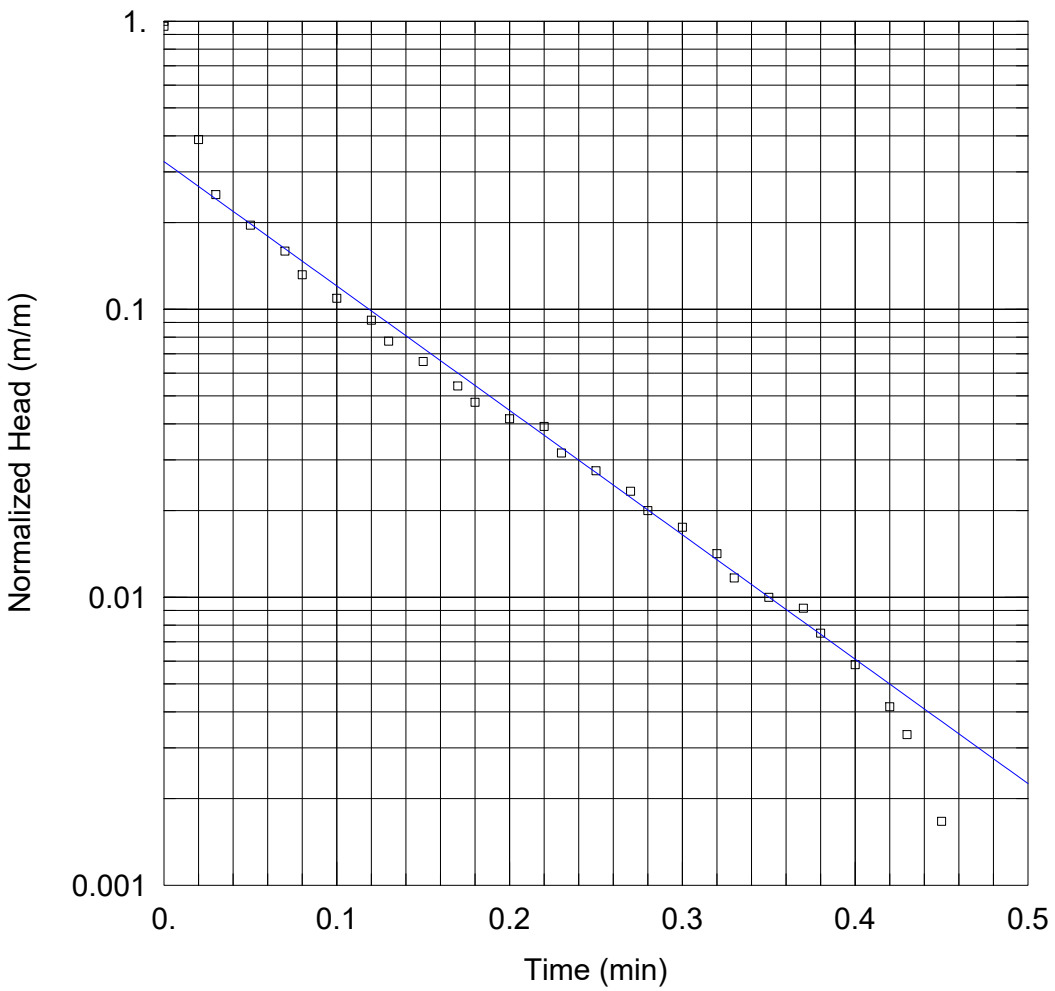
WELL DATA (BH202)

Initial Displacement: 0.692 m
Static Water Column Height: 5.55 m
Total Well Penetration Depth: 2.5 m
Screen Length: 2.5 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

HLV2K ENGINEERING LIMITED

In-Situ Hydraulic Conductivity Test - 1st Trial (Rising Head) - BH202

Prepared By:	Prepared For:
HLV2K Engineering	Airport Caledon Inc.
Project:	**Location:**
1900193BH	Caledon, Ontario



SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.004532 cm/sec y0 = 0.3907 m

AQUIFER DATA

Saturated Thickness: 3. m Anisotropy Ratio (Kz/Kr): 1.

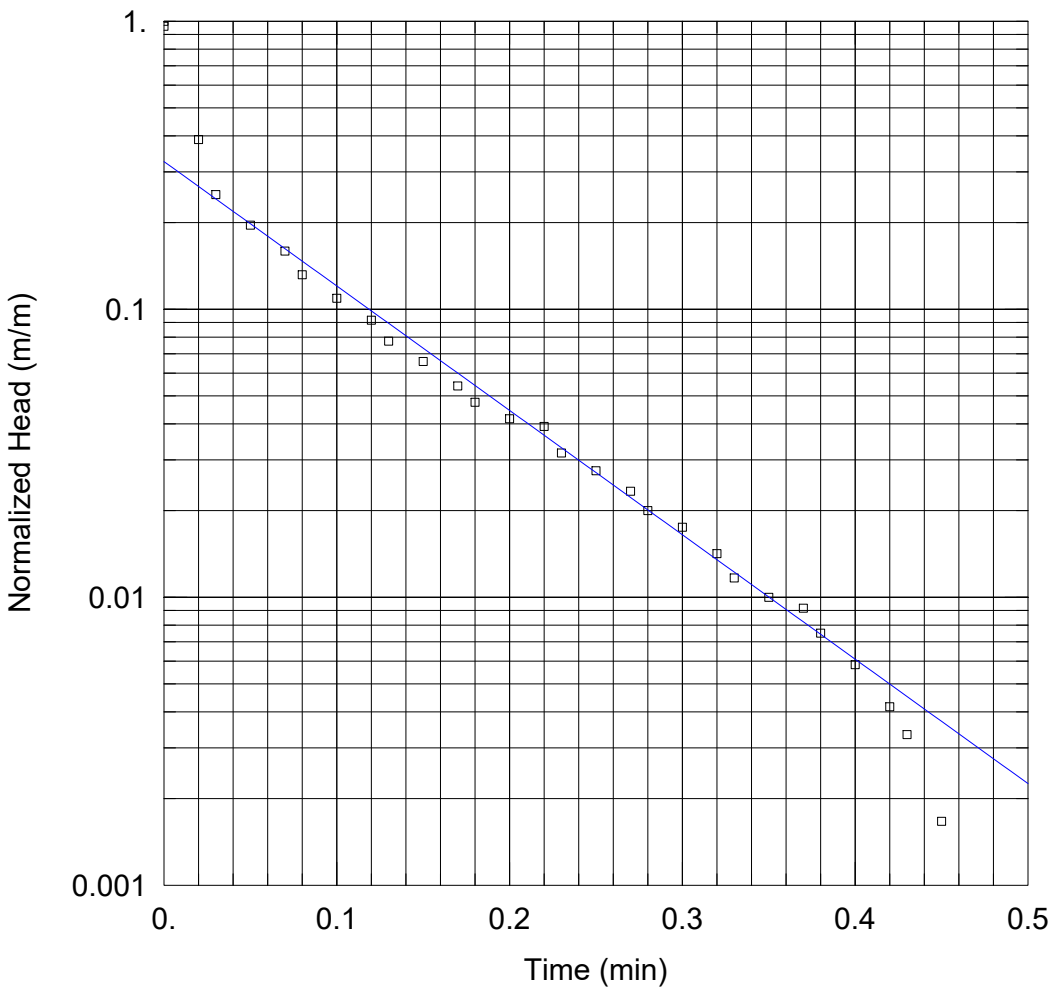
WELL DATA (BH202)

Initial Displacement: 1.2 m
Static Water Column Height: 5.55 m
Total Well Penetration Depth: 2.5 m
Screen Length: 2.5 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

HLV2K ENGINEERING LIMITED

In-Situ Hydraulic Conductivity Test - 1st Trial (Rising Head) - BH202

Prepared By:	Prepared For:
HLV2K Engineering	Airport Caledon Inc.
Project:	**Location:**
1900193BH	Caledon, Ontario



SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.004532 cm/sec y0 = 0.3907 m

AQUIFER DATA

Saturated Thickness: 3. m Anisotropy Ratio (Kz/Kr): 1.

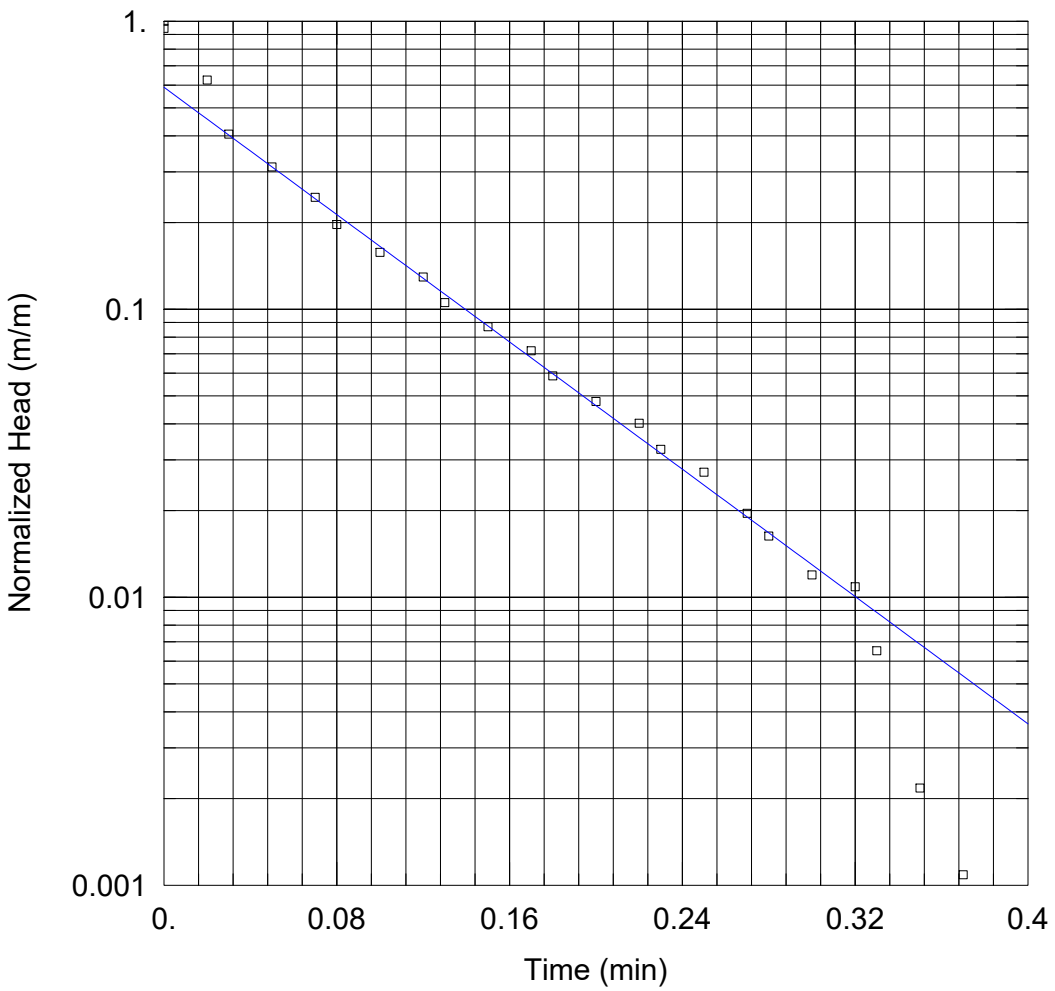
WELL DATA (BH202)

Initial Displacement: 1.2 m
Static Water Column Height: 5.55 m
Total Well Penetration Depth: 2.5 m
Screen Length: 2.5 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

HLV2K ENGINEERING LIMITED

In-Situ Hydraulic Conductivity Test - 2nd Trial (Rising Head) - BH202

Prepared By:	Prepared For:
HLV2K Engineering	Airport Caledon Inc.
Project:	**Location:**
1900193BH	Caledon, Ontario



SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.005798 cm/sec y0 = 0.5424 m

AQUIFER DATA

Saturated Thickness: 3. m Anisotropy Ratio (Kz/Kr): 1.

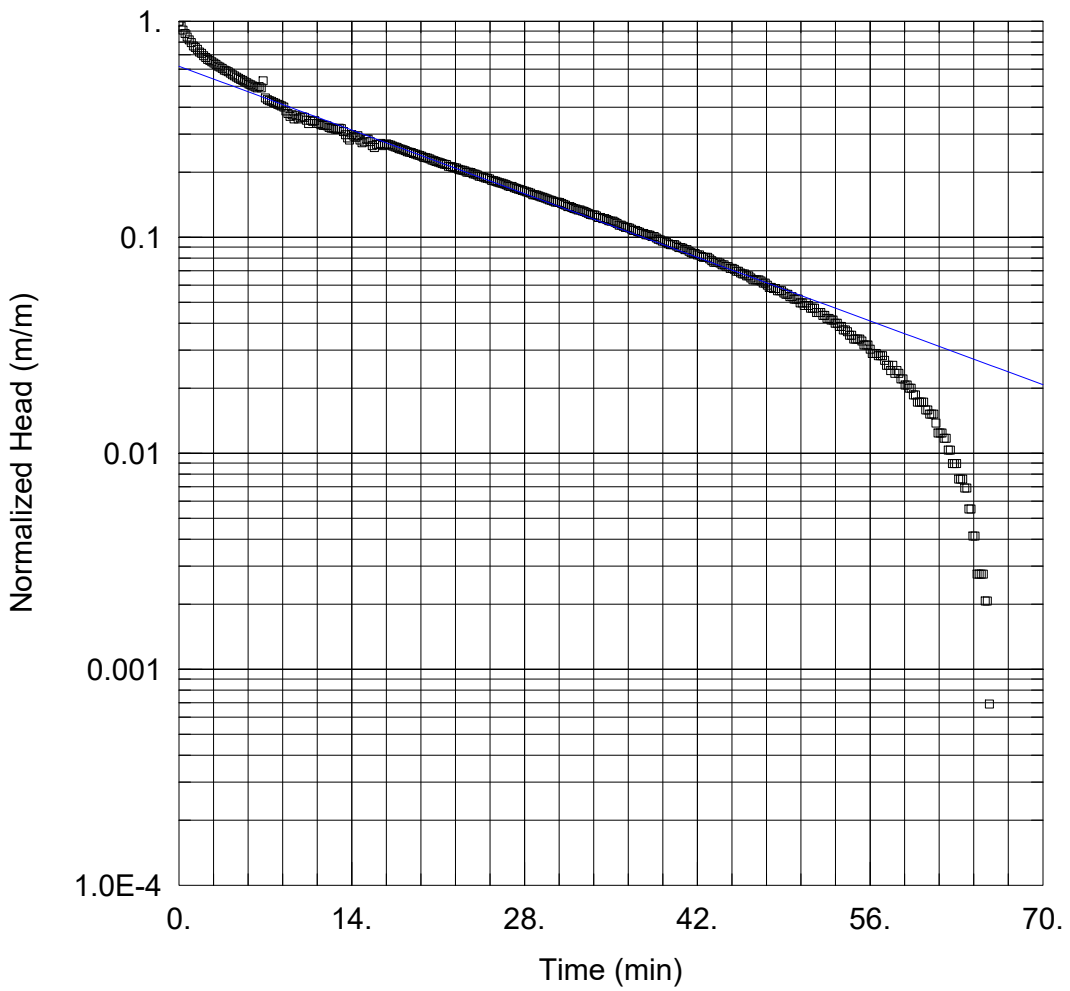
WELL DATA (BH202)

Initial Displacement: 0.92 m
Static Water Column Height: 5.55 m
Total Well Penetration Depth: 2.5 m
Screen Length: 2.5 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

HLV2K ENGINEERING LIMITED

In-Situ Hydraulic Conductivity Test (Rising Head) - BH203

Prepared By:	Prepared For:
HLV2K Engineering	Airport Caledon Inc.
Project:	**Location:**
1900193BH	Caledon, Ontario



SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 2.208E-5 cm/sec y0 = 0.897 m

AQUIFER DATA

Saturated Thickness: 6.1 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH203)

Initial Displacement: 1.45 m
Static Water Column Height: 6.43 m
Total Well Penetration Depth: 5.6 m
Screen Length: 3.05 m
Casing Radius: 0.025 m
Well Radius: 0.1 m

HLV2K ENGINEERING LIMITED

APPENDIX D

Information on Water Well Records

Water Well Record

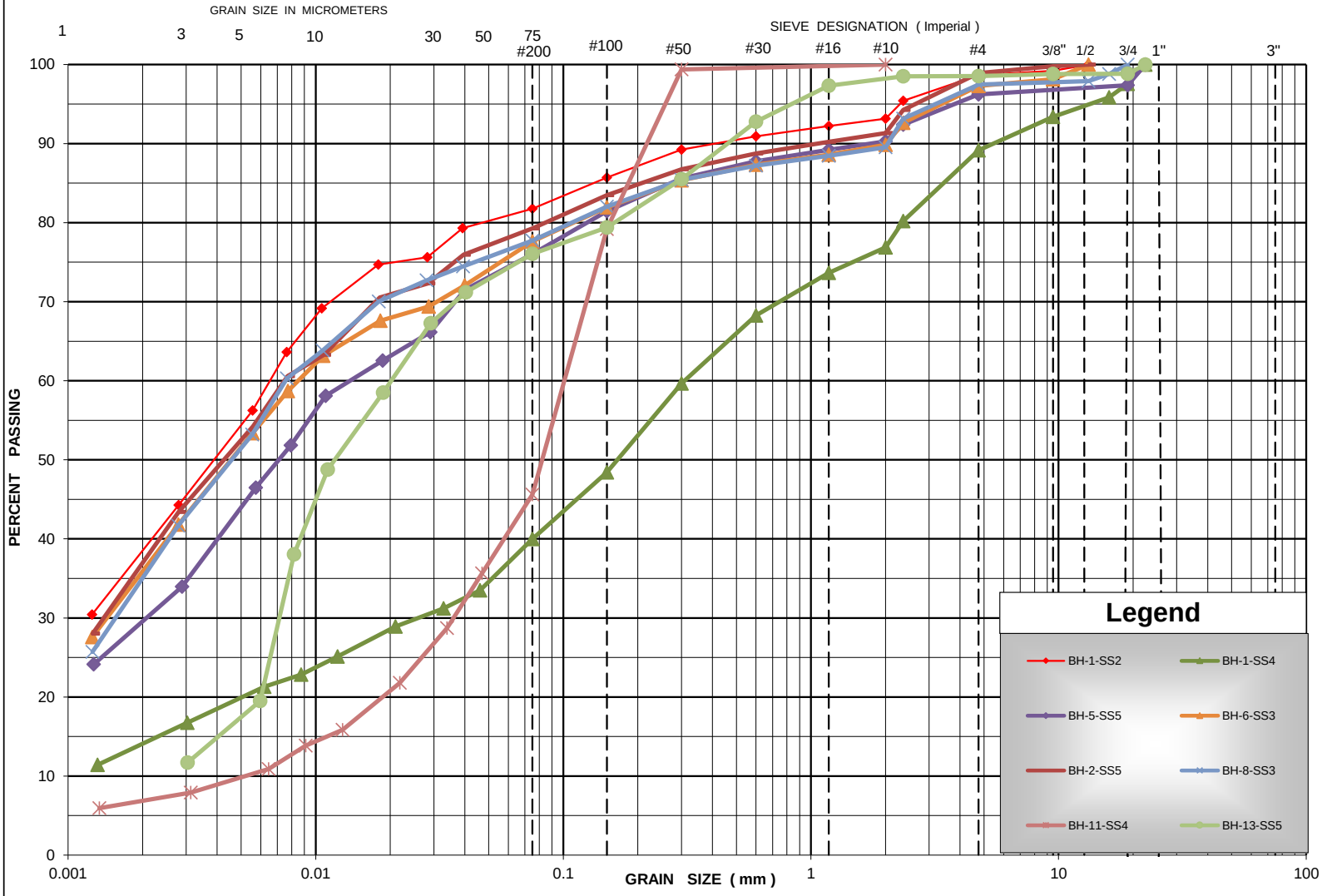
WELL_ID	BOREHOLE ID	Easting	Northing	Well Depth (m)	Well Type	Water Table Depth (m)	Date Completed	Final Status
4900015	10314863	595628.6	4853934	75	Overburden	75.0	1958-04-22	Water Supply
4900017	10314865	595474.6	4853787	9	Overburden	9.0	1961-10-17	Water Supply
4900020	10314868	595473.6	4853858	11	Overburden	6.3	1956-11-14	Water Supply
4901548	10316393	595844.6	4853068	71	Bedrock	6.6	1965-04-15	Abandoned-Supply
4903001	10317842	595544.6	4853623	14	Overburden	13.8	1968-11-21	Water Supply
4903020	10317861	595364.6	4853873	10	Overburden	8.1	1968-07-23	Water Supply
4903028	10317869	595564.6	4853823	8	Overburden	7.5	1968-06-28	Water Supply
4903477	10318311	595654.6	4853523	14	Overburden	14.1	1970-06-16	Water Supply
4903504	10318338	595634.6	4853273	4	Overburden	1.8	1970-11-05	Water Supply
4904246	10319034	595769.6	4853426	12	Overburden	10.5	1973-08-27	Water Supply
4904396	10319181	595484.6	4853579	9	Overburden	9.0	1974-05-21	Water Supply
4904626	10319407	595317.5	4853354	15	Overburden	13.5	1974-12-30	Water Supply
4904763	10319535	595312.5	4853483	15	Overburden	13.8	1975-09-25	Water Supply
4904946	10319712	595564.6	4853773	15	Overburden	14.4	1976-09-03	Water Supply
4905178	10319933	595414.6	4853823	12	Overburden	11.4	1977-06-27	Water Supply
4905759	10320452	595264.6	4853623	14	Overburden	13.5	1980-08-28	Water Supply
4906315	10320881	595768.6	4853405	15	Overburden	5.4	1985-08-20	Water Supply
4906484	10321049	595555.6	4853937	56	Overburden	54.6	1985-09-12	Water Supply
4906486	10321051	595505.6	4853948	55	Overburden	54.6	1985-08-24	Water Supply
4906492	10321057	595341.6	4853687	9	Overburden	8.1	1986-06-06	Water Supply
4906671	10321234	595725.6	4853440	15	Overburden	13.5	1987-08-21	Water Supply
4906833	10321394	595464	4853700	48	Bedrock	48.6	1988-05-07	Water Supply
4906881	10321442	595460	4853695	75	Overburden	71.7	1988-08-13	Water Supply
4906922	10321483	595346	4853681	12	Overburden	5.7	1988-10-05	Water Supply
4907192	10321752	595871	4853040	10	Overburden	3.0	1989-11-08	Water Supply
4907601	10322160	595425	4853582	18	Overburden	17.7	1991-12-10	Water Supply
4907930	10322489	595342	4853880	21	Overburden	18.0	1994-11-24	Water Supply
4909622	11328990	596113	4853273	14	Overburden	7.3	2004-11-08	Water Supply
7124992	1002505281	595719	4853223	10		12.0	2009-06-26	Water Supply
7161918	1003496963	595336	4853747	6			2011-03-09	Test Hole
7163578	1003513628	595404	4853724			0.0	2011-04-06	Not Stated
7200937	1004278843	595787	4853038	1			2013-04-04	Monitoring and Test Hole
7200938	1004278846	595812	4853030	1			2013-04-04	Monitoring and Test Hole
7200939	1004278849	595831	4853012	3			2013-04-04	Monitoring and Test Hole
7200940	1004278852	595855	4852927	2			2013-04-04	Monitoring and Test Hole
7236446	1005294644	595392	4853782	3			2014-12-11	Monitoring and Test Hole
7236447	1005294647	595390	4853778	3			2014-12-12	Monitoring and Test Hole
7236448	1005294650	595397	4853786	3			2014-12-12	Test Hole
7236449	1005294653	595365	4853785	3			2014-12-11	Not Stated
7236450	1005294656	595369	4853776	5			2014-12-11	Not Stated
7236451	1005294659	595374	4853809	3			2014-12-11	Monitoring and Test Hole
7236452	1005294662	595367	4853781				2014-12-11	Abandoned-Other
7240320	1005327735	595390	4853719	3			2015-03-24	Monitoring and Test Hole
7240321	1005327738	595356	4853760	3			2015-03-24	Monitoring and Test Hole
7240322	1005327741	595346	4853771	3			2015-03-24	Monitoring and Test Hole
7240323	1005327744	595402	4853752	3			2015-03-26	Monitoring and Test Hole
7240352	1005327831	595414	4853764	3			2015-03-23	Monitoring and Test Hole
7240353	1005327834	595426	4853779	3			2015-03-23	Monitoring and Test Hole
7267411	1006165706	595355	4853787				2016-06-07	Abandoned-Other
7267412	1006165731	595355	4853787				2016-06-02	Abandoned-Other
7267413	1006165734	595362	4853782				2016-06-02	Abandoned-Other
7267414	1006165745	595382	4853768				2016-06-02	Abandoned-Other
7267415	1006165756	595393	4853773				2016-06-07	Abandoned-Other
7271763	1006248900	595688	4853558	14		2.4	2016-08-25	Abandoned-Other

APPENDIX E

Grain Size Analysis Used for Percolation Estimate

UNIFIED SOIL CLASSIFICATION SYSTEM LS 702/D 422

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse



HLV2K ENGINEERING LIMITED

GRAIN SIZE DISTRIBUTION

Drawing No : 2

PROJECT # : 1900193AG

DATE : October 07, 2019

MMAH Supplementary Standard SB-6

Percolation Time and Soil Descriptions

September 14, 2012

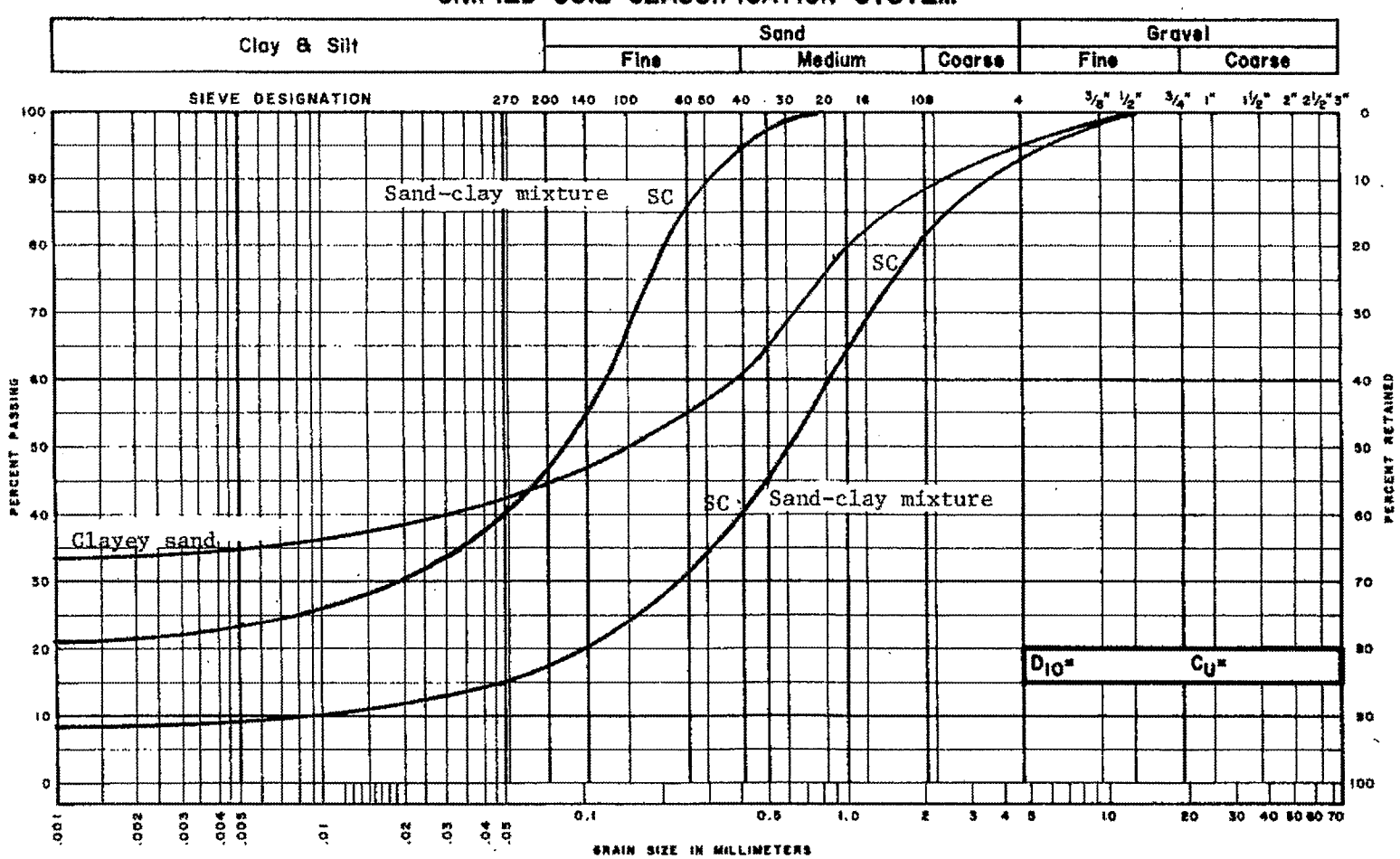


Chart 8 - SC
- Clayey sands, sand-clay mixtures
- More than 12% finer than 0.074 mm
- Plasticity index greater than 7
- Plots above "A" line on plasticity chart