

Phase Two Environmental Site Assessment

2829 Dumauiier Avenue
Ottawa, Ontario

Prepared for:
3223701 Canada Inc.



June 11, 2021

Ref: LOP21-004C

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1. Executive Summary

Lopers & Associates (Lopers) was retained by 3223701 Canada Inc. (Brigil) to complete a Phase Two Environmental Site Assessment (Phase Two ESA) of the commercial property with Civic address No. 2829 Dumaurier Avenue, Ottawa, Ontario ("Phase Two Property", "Property" or "Site").

This Phase Two ESA is being completed as part of due diligence requirements associated with the submission of a Development Application to the City of Ottawa Municipal Planning Department.

Lopers has previously completed a Phase One Environmental Site Assessment (Phase One ESA) (Reference No. LOP20-004A, dated January 8, 2021) for Brigil at the Property. The Phase One ESA identified the presence of one potentially contaminating activity (PCA) at the Property (and adjacent land to the north and east) which was interpreted to represent an area of potential environmental concern (APEC). The presence of a former waste disposal site on the north portion of the Phase One Property (PCA #1) is a significant PCA which represents APEC #1 for the Property. The contaminants of potential concern (CPCs) associated with the former waste disposal site are VOCs (for groundwater only), metals, PAHs and PHCs/BTEXs.

A recent (2019) GHD Phase Two ESA was completed by others (as supervised by Mr. Luke Lopers, author of this report) for Brigil; the subject of which was a larger parcel of land which includes the Phase Two Property as well as the adjacent commercial property to the south, including the entire Dumaurier Plaza. Lopers understands that because of information contained in this report that is not specific to only the Property a revised Phase Two ESA report, which is Site specific is required. This Phase Two ESA report includes reference to all available investigations completed at the Property.

As part of historical investigations, at least seven boreholes were drilled at the Phase Two Property. All seven of these boreholes were instrumented with groundwater monitoring wells with screens installed in either the overburden or bedrock.

As part of historical investigations, at least one soil sample was submitted for laboratory analysis for Polycyclic Aromatic Hydrocarbons (PAHs), metals and inorganics. One sample was also submitted for toxicity leaching characteristic procedure (TCLP) for waste characterization purposes.

Groundwater sampling was completed at the time of the 2019 GHD Phase Two ESA. An additional round of groundwater monitoring and sampling was completed of the viable monitoring wells at the Phase Two Property as part of this investigation in May of 2021. A total of nine groundwater samples, including two duplicate samples and two trip blanks, were

submitted for laboratory analysis for a combination of PHCs, BTEXs, VOCs, PAHs, metals and inorganics.

The applicable site condition standard was determined to be the full depth generic site condition standard, in a non-potable groundwater condition, with coarse textured soil, for residential property use, as specified in Table 3 of the MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

The groundwater sample BH3S, collected in October of 2018 from a screen depth of approximately 2.2-3.7 m BGS, had reported concentrations of PHC F2 range (170 µg/g vs. 150 µg/g) and PHC F3 range (860 µg/g vs. 500 µg/g). All of the other soil and groundwater results for the Phase Two Property are in compliance with the applicable site condition standards. It should be noted that the monitoring well BH3D was installed for vertical delineation purposes for BH3S; BH3D had no detectable PHC concentrations in a sample collected the same date as the aforementioned sample from BH3S. The Phase Two Property is not in compliance with the site condition standards as of the certification date of May 17, 2021.

Historical environmental reports referenced the presence of a layer of buried refuse/waste at the Phase Two Property, however, the specific investigations (including associated borehole logs and laboratory analytical results) referenced were not available as part of this Phase Two ESA. Although there were no observations of refuse/waste or evidence of deleterious fill material identified in any of the boreholes drilled as part of the 2019 GHD Phase Two ESA or the 2019 Paterson Geotechnical Investigation, it is suspected that waste and/or poor environmental quality fill material may have been placed at the Property in locations not assessed as part of the aforementioned investigations.

There is suspected soil and/or groundwater contamination at the Phase Two Property. Additional investigation and confirmation of soil and groundwater quality in this area of the Property is recommended at the time of excavation for site redevelopment. It should be noted that the proposed redevelopment includes excavation for at least two to three levels of underground parking, which is expected to be sufficient for remediation of the aforementioned environmental contamination at the Phase Two Property.

An environmental remediation program, including the bulk removal and off-site disposal of soil and groundwater in excess of the site condition standards is required for the Phase Two Property. Further delineation and confirmation of remediation sampling will be required prior to confirmation of compliance with the site condition standards and prior to the submission of a Record of Site Condition (RSC); however, these tasks can be completed at the time decommissioning and demolition of existing structures at the Phase Two Property in conjunction with the proposed redevelopment. The submission and acknowledgment of an RSC would be required prior to occupancy of the Phase Two Property for residential purposes following redevelopment, however, these tasks can be completed following decommissioning

and demolition of existing structure at the Phase Two Property. The Phase Two ESA could be then updated at that time to show compliance with site condition standards.

Preparation of a soil management plan in accordance with O.Reg. 406/19 will be required as part of management of excess soil generated as part of construction activities. It is recommended that a remedial action plan be prepared to develop a strategy for remediation, including soil and groundwater management, during redevelopment.

2. Introduction

Lopers & Associates (Lopers) was retained by 3223701 Canada Inc. (Brigil) to complete a Phase Two Environmental Site Assessment (Phase Two ESA) of the commercial property with Civic address No. 2829 Dumaaurier Avenue, Ottawa, Ontario ("Phase Two Property", "Property" or "Site"). The location of the Phase Two Property within the City of Ottawa is presented on Figure 1: Key Plan.

i. Site Description

The Phase Two Property has a Civic address of 2829 Dumaaurier Avenue, Ottawa, Ontario. The Property is legally described as Part of Lot 20, Concession 2, Ottawa Front, Registered Plan 479600, Township of Nepean, now in the City of Ottawa and has a property identifier number of 03944-0237. The boundaries of the Phase Two Property are presented on Figure 2: Site Plan.

Based on approximate dimensions obtained from the City of Ottawa's GIS mapping tool, the Phase Two Property has an approximate area of 4,200 m² (0.42 Hectares). The Phase Two Property is immediately surrounded by the adjoining south portion of Dumaaurier Plaza to the south, a municipal Right-of-Way followed by Dumaaurier Park to the east, by institutional properties to the north, and by residential properties to the west.

ii. Property Ownership

The Phase Two Property is currently owned by 3223701 Canada Inc., a subsidiary company of Brigil Construction ("Brigil"). This Phase Two ESA was commissioned by Mr. Jean-Luc Rivard, Director of Land Development and Infrastructure for Brigil Construction (Brigil), operating as 3223701 Canada Inc. Brigil has a business address of 98 Rue Lois, Gatineau, Quebec, J8Y 3R7 and a business telephone number of 819-243-7392.

iii. Current and Proposed Future Use

It is Lopers' understanding that Brigil intends to redevelop the Phase Two Property for mixed use (commercial and residential purposes), including the current concept for construction of one building, approximately 30 storeys in height, with subgrade parking, commercial ground floors and residential units above.

The redevelopment plan for the Phase Two Property includes mixed use (residential and commercial), which is the current zoning of the Phase Two Property. Given that the proposed redevelopment will involve a more stringent land use, a record of site condition (RSC) will be required to be filed with the Ministry of Environment, Conservation and Parks (MECP) for the Phase Two Property. An update to this Phase Two ESA (post-remediation) can be used as supporting documentation as part of filing of an RSC.

iv. Applicable Site Condition Standard

Through Ontario Regulation 153/04 (O.Reg. 153/04) the Ministry of Environment, Conservation and Parks (MECP) prescribes the conditions to determine the applicable site condition standard for a property.

The proposed future use of the Phase Two Property is for mixed ground floor commercial and residential use, however residential land use standards have been applied for the purposes of this report as they represent the more environmentally sensitive land use conditions.

The Phase Two Property and all other properties within 250 m of the property boundaries are supplied by the municipal drinking water system. There is no proposed agricultural use and there are no wells within 250 m of the property boundaries that are intended for use as a source of water for human consumption or agriculture. As such, the designation of non-potable groundwater setting is determined to be applicable [O.Reg. 153/04, section 35].

The soil and groundwater quality over the full depth of overburden was considered for this Phase Two ESA. The full depth generic site condition standards were selected for comparison for the Phase Two Property [O.Reg. 153/04, sections 36, 37, 38, 39 and 40].

The Phase Two Property is not situated within or adjacent to an area of natural significance and does not include any land within 30 m of an area of natural significance. The pH of the soil was analyzed as part of this Phase Two ESA and was reported at 7.44. As such, the Phase Two Property is not considered to be an environmentally sensitive area [O.Reg. 153/04, section 41].

A substantial layer of fill, consisting of silty sand and gravel, which would be classified as coarse grained soil, is present to near full depth to bedrock on the Phase Two Property. It is interpreted that greater than 1/3 of the Phase Two Property has coarse grained soil. For the purposes of this Phase Two ESA, the soil conditions are considered to be coarse grained, which provides a more conservative comparison to the MECP site condition standards than the fine-grained values [O.Reg. 153/04, section 42].

Review of the borehole/monitoring well logs completed as part of previous investigations was completed. It was determined that greater than 2/3 of the Phase Two Property has greater than 2 m of overburden soil. The Phase Two Property is not considered a shallow soil property [O.Reg. 153/04, section 43.1].

The Phase Two Property does not include and does not have any land located within 30 m of a water body. The MECP site condition standards for use within 30 m of a water body do not apply [O.Reg. 153/04, section 43.1].

The full depth generic site condition standards, with non-potable groundwater, coarse textured soil, for residential/parkland/institutional property use, as specified in Table 3 of the MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011 were determined to be the applicable site condition standards for the Phase Two Property as part of this Phase Two ESA.

3. Background Information

i. Physical Setting

No water bodies or areas of natural significance are located at the Phase Two Property or in the Phase One Study Area. There were no areas of natural and scientific interest (ANSIs) or areas of natural significance identified in the Phase One Study Area.

The local regional topography in the Phase One Study Area is undulating but generally slopes downward to the south. Regionally, the topography slopes downward to the northwest, toward the Ottawa River. The north portion of the Phase Two Property is elevated approximately 2 m with respect to the south portion of the Property. The Ottawa River is located approximately 1.3 km northwest of the Phase Two Property.

Surface water drainage at the Phase Two Property is by sheet drainage to catch basins located on the paved surfaces of the Property, which drain into the municipal stormwater sewer system.

No drinking water wells are located at the Phase Two Property and the Phase One Study Area are serviced by municipally treated drinking water. The Phase Two Property and Study Area are not located in the vicinity of any well-head protection areas or other designation identified by the City of Ottawa in its official plan for the protection of ground water. No private or agricultural water supply wells are located within the Phase One Study Area.

ii. Past Investigations

A Phase One ESA report was prepared prior to this Phase Two ESA: "Phase One Environmental Site Assessment, 2829 Dumauiet Avenue, Ottawa, Ontario" dated January 8, 2021 prepared for 3223701 Canada Inc. by Lopers & Associates. The Phase One ESA identified four potentially contaminating activities (PCAs) at the Phase One Property, which include:

- The presence of a former waste disposal site on the north portion of the Phase One Property is a significant PCA (PCA #1) which represents an APEC for the Property. Given that previous environmental reports and investigations have documented petroleum

hydrocarbon (PHC) groundwater contamination and that waste fill material has been observed in boreholes on the north portion of the Property, the Property is not in compliance with the Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, which are also for consideration of O.Reg. 153/04.

- The contaminants of potential concern (CPCs) associated with the former waste disposal site are volatile organic compounds (VOCs) (for groundwater only), metals, polycyclic aromatic hydrocarbons (PAHs) and PHCs/BTEXs. An investigation of the soil and groundwater quality with respect to these CPCs at the Property was completed by others in 2019.
- One active automotive service garage and a historical retail fuel outlet are located at properties in the Phase One Study Area and constitute PCA#2 and PCA#3, respectively. The PCAs at properties in the Phase One Study Area are located significant distances and/or at cross-gradient orientations with respect to the Phase One Property and are not considered to represent APECs for the Phase One Property.

Based on the identification of PCAs and APECs at the Phase One Property, a Phase Two Environmental Site Assessment was recommended to be completed to assess the soil groundwater quality in the vicinity of the APECs.

Brigil provided the following four reports for review prior to Lopers completing the Phase One ESA:

1. "Phase I Environmental Site Assessment, 2831, 2833, 2835, 2841 and 2865 Dumaaurier Avenue, Ottawa, Ontario", dated August 16, 2018, completed by GHD Limited for 3223701 Canada Inc.
2. "Phase Two Environmental Site Assessment, 2831, 2833, 2835, 2841 and 2865 Dumaaurier Avenue, Ottawa, Ontario", dated April 2, 2019, completed by GHD Limited for 3223701 Canada Inc.
3. "Geotechnical Investigation, Proposed Hi-Rise Building, 2829 Dumaaurier Avenue, Ottawa, Ontario", dated December 18, 2019, completed by Paterson Group Inc. for 3223701 Canada Inc.
4. "Methane Gas Detection Monitoring Program (2015-2019), Dumaaurier Plaza - 2829 Dumaaurier Avenue, Closed Pinecrest Landfill Site, Ottawa, Ontario", dated August 26, 2020, completed by Wood Canada Limited for 1248816 Ontario Inc.

2018 Phase I Environmental Site Assessment by GHD (2018 GHD Phase I ESA)

The 2018 GHD Phase I ESA was completed for a larger parcel of land which included that Phase One Property and the adjacent commercial land to the south, including the entire Dumaaurier Plaza. The Phase One Property was occupied by the northern portion of the present-day commercial plaza building at the time of the 2018 GHD Phase I ESA. The occupants of the plaza

were retail commercial and did not include any operations which were interpreted as PCAs. The presence of a former waste disposal site was identified on the northeast portion of the Phase One Property and on adjacent land to the east. This former waste disposal site is associated with the PCA of "Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners" (PCA #1). This former waste disposal site is a significant PCA and is considered to represent APEC #1 for the Property. The location of this PCA and APEC is depicted on Figure 3: Surrounding Land Use and are summarized in Table 6 in Section 7. (b).

An additional PCA, "Importation of Fill material of Unknown Quality" was identified to south of the Phase One Property (O.Reg. PCA item #30). This fill placement occurred off-Site and interpreted down- or cross-gradient with respect to the Property and is not considered to represent an APEC for the Property.

Based on the identification of a PCA and APEC at the Phase One Property, a Phase Two Environmental Site Assessment was recommended to be completed to assess the soil and/or groundwater quality in the vicinity of the identified APEC #1. Investigation of the aforementioned fill material was also recommended as part of the Phase Two ESA.

2019 Phase Two Environmental Site Assessment by GHD (2019 Phase Two ESA)

The 2019 GHD Phase Two ESA was completed for a larger parcel of land which included the Phase One Property and the adjacent commercial land to the south, including the entire Dumaurier Plaza. Only the findings at the Phase One Property have been included in this report summary.

The 2019 GHD Phase Two Environmental Site Assessment (2019 GHD Phase Two ESA) was completed to assess the APECs identified through a review of the 2018 GHD Phase I ESA, namely, the potential for residual soil and groundwater contamination in the vicinity of the former waste disposal site on the north and east portions of the Phase One Property, as well as fill material on the commercial property adjacent to the south of the Property.

Five boreholes, each instrumented with a groundwater monitoring well, were drilled as part of the 2019 GHD Phase Two ESA, however, only two of these boreholes/monitoring wells were located at the Phase One Property. Soil conditions on the northeast portion of the Property were found to consist of a layer silty sand and gravel fill, underlain by peat, followed by fractured limestone bedrock at approximately 3.7 m below ground surface (m BGS). Black staining was observed in the fill material. Groundwater was encountered at depths ranging from approximately 1.3 to 1.4 m BGS.

Soil and groundwater samples were submitted from each of the borehole/monitoring well locations, which were analyzed for a combination of petroleum hydrocarbons (PHCs), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), metals and inorganics. The one analyzed soil sample from the Property was in compliance with the site condition

standards (MECP Table 3). One of the three analyzed groundwater samples from the Property had exceedances of the site condition standards, with respect to PHCs. The 2019 GHD Phase Two ESA report concluded that the Property would require remediation or a risk assessment to be in compliance with the site condition standards. It was recommended that a remedial action plan, including a soil and groundwater management program be completed prior to the construction phase of redevelopment.

The pertinent data, findings and interpretations from the 2019 GHD Phase Two ESA have been incorporated to this Phase Two ESA report, as they pertain to the Site specifically. The analytical data from BH1, BH2, BH4 and BH5 (duplicate of BH4), located at the adjacent commercial property to the south of the Phase Two Property, have been redacted from the laboratory certificates of analysis, which have been included in Appendix E.

2019 Geotechnical Investigation by Paterson Group Inc. (2019 Paterson Geotechnical Investigation)

The 2019 Paterson Geotechnical Investigation was completed for the Phase One Property. Three boreholes, each instrumented with a groundwater monitoring well, were drilled as part of the 2019 Paterson Geotechnical Investigation. Soil conditions at the Property were found to consist of a layer silty sand and gravel fill, underlain by glacial till, fine sand and/or silty clay, followed by limestone bedrock at depths ranging from approximately 3.9 to 5.3 m BGS. Each of the boreholes were cored into the bedrock and monitoring wells were installed with their screens set at approximately 15 to 18 m BGS. Groundwater was encountered at depths ranging from approximately 5.8 to 7.1 m BGS.

2020 Methane Gas Detection Monitoring Program by Wood (2020 Wood Methane Monitoring)

The 2020 Wood Methane Monitoring report was completed to assess methane presence as a result of a former waste disposal site¹. Monitoring data was collected from three gas probes at the Phase One Property over the period from 2015 to 2019 at approximately quarterly intervals. The results of the methane monitoring indicate that, while a decreasing trend in methane concentrations does appear evident from 2015 to 2019, several regulation criteria including concentration at the site boundary (2.5% volume methane/total volume), concentration of indoor air in an on-site building (1% volume methane/total volume) and concentration of indoor air in an off-site building (0.05% volume methane/total volume) were intermittently exceeded by observed methane concentrations in some of the gas probes.

It is noted that the regulation which applies to landfills is Ontario Regulation (O.Reg.) 232/98 (as amended in 2011); this regulation is not part of O.Reg. 153/04 for which this Phase One ESA has been prepared in accordance with. It should also be noted that the on-Site building and off-Site

¹ For the purposes of this review section only, the word 'site' references a landfill site.

building criteria is based on indoor air monitoring, and as such the gas probes may provide data which is a conservative approximation of what indoor conditions may exist; it is not known if any indoor air monitoring for methane has been completed at the Phase One Property. Based on the current concept for construction for redevelopment of the Property, it is expected that all waste on the Property will be excavated and sent off-Site for disposal. Subgrade design of the proposed building may also include construction features for methane risk mitigation.

There were no discrepancies identified in review of documentation, information or data from previous investigations. As such, previous investigations are considered to be of adequate quality such that they can be relied upon for the purposes of this Phase Two ESA.

4. Scope of Investigation

i. Overview of Site Investigation

This Phase Two ESA was designed to meet the general requirements of O.Reg. 153/04 as amended, with details of scope presented in Lopers' Letter entitled "Proposal for Phase One Environmental Site Assessment and Phase Two Environmental Site Assessment, Proposed Residential Re-development, 2829 Dumauiier Avenue, Ottawa, ON", dated April 8, 2021, reference, No. PRO-004B-20-BRIGIL V2.

In 2018, Brigil was considering purchase of the entire Dumauiier Plaza property, which includes the Phase Two Property, as well as the adjacent land to the south. The scope of work for a Phase Two ESA investigation was discussed with Brigil and sampling and analysis plan (SAP) was prepared to achieve the objectives of the Phase Two ESA; the SAP prepared by GHD in 2018 is provided in Appendix A. Lopers completed an additional surveying, groundwater monitoring/sampling event of the viable shallow overburden monitoring wells and deep bedrock groundwater monitoring wells in 2021. Several aspects of the scope of work for this Phase Two ESA have been completed by others as part of historical investigations, including previous drilling programs; these activities have been referenced throughout this Phase Two ESA report as they comprise a portion of the scope of work for this Phase Two ESA. In the event that an RSC is required for the Phase Two Property, additional effort, including delineation, remediation and reporting would be required in order to demonstrate that the Site meets the Standard for its intended land use at the time of filing the RSC.

Underground utility locates were completed through Ontario 1-Call by GHD in 2018 to identify any active public services on the Phase Two Property. Following the completion of the public locates, USL-1 Underground Service Locators completed scanning of the Phase Two Property proposed drilling locations to locate privately owned underground services prior to initiating the field program. Various underground utility services, including natural gas, electricity, water and sewers were identified at the Phase Two Property. The natural gas, water and sewer services are

present in underground trenches which enter the Property from Dumaurier Avenue to the east and lead to the commercial building. Electricity enters the property through an underground service trench to the west of the commercial building. Copies of the underground locates are provided in Appendix B.

On October 5, 2018, two boreholes/monitoring wells (BH3D and BH3S) were drilled at the Phase Two Property, as supervised by GHD. On November 10 and 11, 2019, three boreholes/monitoring wells (BH1, BH2 and BH3) were drilled at the Phase Two Property, as supervised by Paterson. The boreholes were drilled using a truck mounted CME 55 drill rig operated by George Downing Estate Drilling. Soil samples were collected using stainless steel split spoons. Soil samples recovered during the sampling program were screened in the field for volatile vapour concentrations, as well as visual and olfactory observations.

Two additional boreholes/monitoring wells (MW95-1 and MW95-2) were present at the Property during this Phase Two ESA. References for the monitoring well IDs were obtained from figures in historical reporting, but no reference to the investigation or findings were provided. It is suspected that these monitoring wells were installed as part of an environmental assessment in 1995.

No new groundwater monitoring wells were installed at the time of this investigation. Based on the aforementioned investigations, a total of seven groundwater monitoring wells (MW95-1, MW95-2, BH1, BH2, BH3, BH3D and BH3S) were installed on the Phase Two Property. Four of these historical monitoring wells (MW95-1, MW95-2, BH1 and BH3) were monitored and/or sampled at the time of this Phase Two ESA; the remaining three monitoring wells (BH2, BH3D and BH3S) could not be located and are presumed to be buried. Based on the provided borehole logs and the interpretation of field observations, the groundwater monitoring wells were drilled to the localized depths ranging from 2.9 to 18.2 m below ground surface (m BGS). The shallow monitoring wells (MW95-1, MW95-2 and BH3S) appear to have been screened to straddle the shallow groundwater table; BH4 is an additional shallow monitoring well, which straddles the south Property limit (but may be on the adjacent property to the south) and was monitored for hydrogeological assessment purposes. The deeper monitoring wells were screened to provide vertical delineation (BH3D) or to provide an assessment of hydrogeological groundwater conditions for the proposed redevelopment. When possible, these groundwater monitoring wells were developed on day of drilling by removing at least three well volumes or by purging the wells dry three times.

The locations of the previously existing boreholes/monitoring at the Phase Two Property are presented on Figure 2: Site Plan. The placement of the boreholes was to assess the quality of fill material and extent of the historical waste disposal site; several boreholes (BH1, BH2 and BH3) were placed for geotechnical Site coverage. Groundwater monitoring wells were installed in all of the aforementioned boreholes.

Soil samples were selected for laboratory analysis of select contaminants of potential concern (CPCs) based on APECs and CPCs identified in the Phase One ESA, as described in Section 3.ii. above as well as field screening observations.

Groundwater monitoring and sampling of the monitoring wells during this Phase Two ESA included the existing groundwater monitoring wells (MW95-1, MW95-2 and BH4, which were interpreted as being screened in overburden and BH1 and BH3, screened in the bedrock) was completed on May 17, 2021. Static groundwater levels were measured prior to disturbance of the water column. During purging, water quality parameters were measured at regular intervals to monitor groundwater quality stabilization; once groundwater quality parameters stabilized (were within approximately 10% on successive readings), groundwater samples were collected. Groundwater samples were selected for laboratory analysis of select CPCs based on APECs and CPCs identified in the Phase One ESA.

An elevation survey was completed of the existing boreholes/monitoring wells which could be located at the Phase Two Property as part of the Phase Two ESA. The boreholes/monitoring wells were surveyed relative to a temporary benchmark of the top of spindle of the City of Ottawa fire hydrant located to the northeast of the Property on the west side of Dumaurier Avenue; this benchmark was assigned a reference elevation of 100.000 m ("Site Datum") for the purposes of this Phase Two ESA.

ii. Media Investigation

Based on the findings of historical investigations, which were consistent with the findings in the Phase One ESA, the following APECs and CPCs were identified for the following media:

The presence of a former waste disposal site on the north portion of the Phase One Property (PCA #1) is a significant PCA which represents APEC #1 for the Property. The contaminants of potential concern (CPCs) associated with the former waste disposal site are VOCs (for groundwater only), metals, PAHs and PHCs/BTEXs. An investigation of the soil and groundwater quality with respect to these CPCs at the Property was completed at BH3S and BH3D by others in 2019. Lopers completed additional assessment of the groundwater quality at MW95-1, MW95-2 and BH1 with respect to the aforementioned CPCs as part of this Phase Two ESA.

Soil quality at the Phase Two Property was investigated by GHD in 2018 through the collection of soil samples at varying depths facilitated by drilling using a truck mounted CME drill rig with stainless steel split spoon sampling.

Groundwater quality at the Phase Two Property was investigated through the installation and sampling of groundwater monitoring wells. The monitoring wells installed at the Phase Two Property were drilled to the localized depths ranging from 2.9 to 18.2 m BGS. The shallow monitoring wells (MW95-1, MW95-2 and BH3S) appear to have been screened to straddle the shallow groundwater table; BH4 is an additional shallow monitoring well, which straddles the south Property limit (but may be on the adjacent property to the south) and was monitored for

hydrogeological assessment purposes. The deeper monitoring wells were screened to provide vertical delineation (BH3D) or to provide an assessment of hydrogeological groundwater conditions for the proposed redevelopment. A bentonite seal was installed above the monitoring well screen's sand pack in each of the monitoring wells to prevent surface and precipitation water influence. When possible, these groundwater monitoring wells were developed on day of drilling by removing at least three well volumes or by purging the wells dry three times. Groundwater monitoring wells were sampled using a peristaltic pump.

There were no natural surface water bodies at the Phase Two Property, and as such no sediment sampling was completed as part of the Phase Two ESA.

iii. Phase One Conceptual Site Model

The Phase One Property, which has the same location orientation and property boundaries as the Phase Two Property, is located at Civic No. 2829 Dumaaurier Avenue, Ottawa, Ontario and has an approximate area of 0.42 Hectares.

The Phase One Property was unoccupied prior to the mid 1950's when it is reported that the City of Ottawa operated a waste disposal site on the north portion of the Phase One Property and adjacent lands to the north and east from approximately 1953 to 1957. The south portion of the Property was developed circa 1980, in conjunction with adjacent land to the south, with the present day commercial Dumaaurier Plaza. The north portion of the Property, which is elevated approximately 1 to 2 meters above the south portion of the Property, is landscaped. The remaining undeveloped areas of the Phase One Property are paved with asphalt and used for access or parking.

The Property is currently used for commercial purposes and is zoned for mixed use. 1248816 Ontario Inc. is the current registered owner of the Property, with a vendor take back agreement signed in 2018 for ownership to transfer to 3223701 Canada Inc. (Brigil) by July 2023 and it is understood that the intended future use is for residential purposes, with possible commercial use on the ground floor. The Phase One Property is immediately surrounded by the adjoining south portion of Dumaaurier Plaza to the south, a municipal Right-of-Way followed by Dumaaurier Park to the east, by institutional properties to the north, and by residential properties to the west.

The Phase One Study Area includes the Phase One Property and properties with their boundaries within 250 m of the Phase One Property limits. Based on a review of the Phase One Property and properties in the Phase One Study Area, their associated historical and/or current uses and operations and physical characteristics of the Phase One Study Area, it was determined that an assessment of properties within 250 m of the Phase One property was sufficient to meet the objectives of the scope of this investigation for a Phase One ESA.

No water bodies or areas of natural significance are located at the Phase One Property or in the Phase One Study Area. No drinking water wells are located at the Phase One Property and the

Phase One Study Area is serviced by municipally treated non-potable water. Seven existing groundwater monitoring wells were reportedly drilled at the Phase One Property by others as part of historical investigations; the locations of these wells are presented on Figure 2.

The local regional topography in the Phase One Study Area is undulating but generally slopes downward to the south. Regionally, the topography slopes downward to the northwest, toward the Ottawa River. The north portion of the Phase One Property is elevated approximately 2 m with respect to the south portion of the Property. The Ottawa River is located approximately 1.3 km northwest of the Phase One Property.

Based on the historical research, the general stratigraphy of the Phase One Property and Phase One Study Area consists of sand and gravel fill, underlain by silty clay, followed by silty sand. The overburden soil is underlain by interbedded shale and dolostone bedrock. Groundwater is expected at a depth of approximately 2 to 6 m BGS and to flow in a predominantly south direction.

The presence of a former waste disposal site (PCA#1) on the north portion of the Phase One Property is a significant PCA which represents APEC #1 for the Property. Given that reports were provided which document PHC groundwater contamination and that waste fill material has reportedly been observed in boreholes on the north portion of the Property, the Property is not in compliance with the Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, which are also for consideration of O.Reg. 153/04.

The contaminants of potential concern (CPCs) associated with the former waste disposal site are VOCs (for groundwater only), metals, PAHs and PHCs/BTEXs. An investigation of the soil and groundwater quality with respect to these CPCs at the Property was completed by others in 2019.

One active automotive service garage and a historical retail fuel outlet are located at neighbouring properties in the Phase One Study Area and constitute PCA#2 and PCA#3, respectively. The PCAs at neighbouring properties in the Phase One Study Area are located significant distances and/or at cross-gradient orientations with respect to the Phase One Property and are not considered to represent APECs for the Phase One Property.

Underground utility service trenches are present at the Phase One Property. The underground utility corridors have the potential to affect contaminant distribution and transport, as they would create preferential pathways for lateral migration. It should be noted that the groundwater table is expected to be present at greater depths than underground utility service trenches at the Property, therefore it is not suspected that significant migration of contaminants has occurred through underground utility corridors.

iv. Deviations from Sampling and Analysis Plan

The Sampling and Analysis Plan (SAP) was designed with the intent of collection groundwater elevation data and/or samples for laboratory analysis from all seven of the reported existing

groundwater monitoring wells at the Property. Since only four groundwater monitoring wells could be located at the property, BH4, an additional shallow monitoring well, which straddles the south Property limit (but may be on the adjacent property to the south) and was monitored for hydrogeological assessment purposes.

v. Impediments

Three of the known historical monitoring wells (BH3S, BH3D and BH2) could not be located and were not monitored or sampled as part of the 2021 field program for this Phase Two ESA.

5. Investigation Method

i. General

The investigation method for this Phase Two ESA involved an assessment and review of findings of historical investigations, which were consistent with the findings in the Phase One ESA for assessment of the soil and/or groundwater quality for the associated CPCs in the vicinity of the APECs identified during the Phase One ESA.

Investigation of soil was completed using a truck mounted CME drill rig, with stainless steel split spoons used to recover soil samples. Soil samples were screened in the field for volatile vapour concentrations, as well as visual and olfactory observations. Select soil samples were submitted based on all the indications mentioned above, as well as to capture representative soil and fill layers, for laboratory analysis for the CPCs.

Groundwater was assessed using groundwater monitoring wells which were installed at the Phase Two Property as part of historical previous investigations. The wells selected for monitoring/sampling were purged during the initial Site visit completed 3 days prior to sampling. Static groundwater levels were measured in the monitoring wells prior to disturbance of the water column during the initial Site visit and again on the day of sampling. Groundwater samples were collected using a peristaltic pump using low-flow procedures and were submitted for laboratory analysis for the CPCs.

An elevation survey was completed of the existing boreholes/monitoring wells which could be located at the Phase Two Property as part of the Phase Two ESA. The boreholes/monitoring wells were surveyed relative to a temporary benchmark of the top of spindle of the City of Ottawa fire hydrant located to the northeast of the Property on the west side of Dumaaurier Avenue.

The following sections provide further detailed information regarding the investigation methodology completed to produce this Phase Two ESA.

ii. Drilling

The Phase Two ESA drilling field program was completed on October 5, 2018 under full time supervision of GHD personnel; it should be noted that Mr. Luke Lopers, P. Eng. acted as project manager for the 2019 GHD Phase Two ESA. The geotechnical drilling field program was completed on November 10 and 11, 2019 under full time supervision of Paterson personnel. Seven boreholes were drilled for the Phase Two ESA by the drilling subcontractor George Downing Estate Drilling, located at 410 Principale Rue, Grenville-Sur-la-Rouge, Quebec, J0V 1B0. The drill rig used for the Phase Two ESA was a truck mounted CME drill, equipped with hollow stem augers and stainless-steel split spoons. At least four of the seven boreholes were advanced to auger refusal on suspected bedrock and/or were cored into the dolostone bedrock.

Two additional boreholes/monitoring wells (MW95-1 and MW95-2) were present at the Property during this Phase Two ESA. References for the monitoring well IDs were obtained from figures in historical reporting, but no reference to the investigation or findings were provided. It is suspected that these monitoring wells were installed as part of an environmental assessment in 1995.

Samples were collected using stainless steel split spoons from the near surface to the full depth of drilling. Split spoon samples, collected in 0.6 m segments, were recovered at continuous 0.76 m intervals; the additional 0.16 m between split spoon samples was over-drilled to provide undisturbed field measurement of geotechnical parameters (blow counts) and to prevent cave in materials from stratigraphic units above the intended sampling intervals from being collected at unrepresentative depths during sampling.

The split spoons, which were the only media to come into contact with the soil samples, were washed using soap and water and a scrub brush between samples to minimize the potential for cross-contamination among samples. The field technician used sterile nitrile gloves, which were changed prior to the handling of each soil sample to further reduce the potential of cross-contamination. The flights of the hollow stem augers were cleaned manually following each borehole.

Bedrock core samples were recovered directly from the HQ core barrels, and were placed into wax coated rock core boxes for review. The recovery lengths, rock quality designation and other observations were recorded for each core length recovered.

iii. Soil Sampling

As described above, soil samples were recovered using stainless steel split spoons.

Soil samples were initially collected in Ziploc bags for initial screening as part of sample selection. Soil samples selected for laboratory analysis were collected in dedicated clear glass jars prepared and provided by the analytical laboratory. Soil samples collected for BTEXs/VOCs and the F1 range of PHCs analysis were collected using a dedicated graduated syringe provided by the laboratory and placed directly into a glass vial with a known quantity of methanol

preservative. Analytes and associated preservatives were specified on each jar/vial by the laboratory. Each jar/vial sample set was provided with a unique sample identifier, project number and date of sampling in the field.

Detailed soil descriptions of the stratigraphy for each borehole/monitoring completed as part of the 2019 GHD Phase Two ESA and 2019 Paterson Geotechnical Investigation are included on the borehole logs from those respective reports provided in Appendix C. No historical borehole logs were available for MW95-1 or MW95-2.

Based on the observations of soil samples collected during the 2019 GHD Phase Two ESA and 2019 Paterson Geotechnical Investigation, there were eight stratigraphic units identified at the Phase Two Property, which include: Asphalt, Topsoil, Silty Sand and Gravel (Fill), Sand, Silty Clay, Peat, Silty Sand and Gravel (Till) and Bedrock. Further details and observations of the stratigraphic units identified at the Phase Two Property is presented in Section 6.i.

Field Screening Measurements

Initial field screening of the soil samples consisted of visual and olfactory observations made at the time of sample collection during the drilling program.

Additional field screening of the soil samples was completed using Photo Ionization Detector (PID). The RKI Eagle is capable of measuring volatile vapours at concentrations ranging from 0 parts per million (PPM) to 50% of the lower explosive limit (LEL). The RKI Eagle is also capable of measuring VOC vapours at concentrations ranging from 0.1 ppm to 1000 ppm.

Where soil samples were selected in a borehole within an APEC and the SAP identified proposed soil analysis in that borehole, the field screening was used as follows to select the appropriate sample for laboratory analysis.

1. Select sample with evidence of visual and/or olfactory indications of suspected contamination, such as staining, PHC odours or deleterious fill material.
2. Select sample with most significant elevated soil vapour concentration.
3. Select sample based on stratigraphy and/or moisture content, as certain CPCs are generally expected to be found in these defined conditions (i.e. fill material at shallow depths or PHC impacts near the groundwater table interface).

iv. Groundwater: Monitoring Well Installation

Installation of monitoring wells in BH1, BH2, BH3, BH3S and BH3D were completed by George Downing Estate Drilling. The wells were installed using slotted PVC No. 10 monitoring well screens, which were 51 mm in diameter. Based on the provided borehole logs and the interpretation of field observations, the groundwater monitoring wells were drilled to the localized depths ranging from 2.9 to 18.2 m below ground surface (m BGS). The shallow monitoring wells (MW95-1, MW95-2 and BH3S) appear to have been screened to straddle the shallow groundwater table; BH4 is an additional shallow monitoring well, which straddles the

south Property limit (but may be on the adjacent property to the south) and was monitored for hydrogeological assessment purposes. The deeper monitoring wells were screened to provide vertical delineation (BH3D) or to provide an assessment of hydrogeological groundwater conditions for the proposed redevelopment. Well screens were 1.5 m in length in the shallow overburden monitoring wells (MW95-1, MW95-2 and BH3S), 1.2 m in length in the shallow bedrock monitoring well (BH3D) or 3.1 m in length in all three of the deep monitoring wells (BH1, BH2 and BH3) installed at the Phase Two Property. The monitoring wells were extended to approximately 0.1 m below the surface grade with PVC riser, also 51 mm in diameter. A threaded PVC end cap was installed at the base of the screen to prevent sediment infiltration, while a J-Plug was installed at the top of the riser to prevent surface influence.

The annular space in each monitoring well was backfilled with clean silica sand to approximately 0.3 m above the monitoring well screens. A layer of bentonite chips was then used to make a hydraulic seal above the sand pack to near the ground surface. The monitoring wells were completed with aluminum flushmount protective casings, which were backfilled with sand to allow drainage of any surface water which may infiltrate into the casings. A steel stick-up casing was installed at BH1, and the PVC riser was extended to approximately 1.2 m above ground surface, while the steel casing was backfilled with sand.

Development of each of the monitoring wells to be monitored and/or sampled as part of this Phase Two ESA was completed using dedicated Waterra low density polyethylene (LDPE) tubing and a Waterra footvalve. The monitoring wells were developed on May 14, 2021 by purging the wells dry at least three times or removing up to 10 well volumes. The wells were left to stabilize for a period of three days prior to groundwater sampling.

v. Groundwater: Field Measurement of Water Quality Parameters

Measurements of the groundwater quality field parameters were completed to determine stabilization of these parameters prior to sampling. These measurements were completed using Horiba U-52 groundwater quality measurement device ("Horiba"). The Horiba used for groundwater quality parameter stabilization measurements as part of this Phase Two ESA was obtained from Maxim Environmental and Safety Inc. and was calibrated on May 14, 2021. The Horiba is capable of measuring temperature, pH, conductivity, turbidity, dissolved oxygen and oxidation reduction potential. Additional equipment and calibration information for the Horiba is provided on the certificate of calibration included in Appendix D.

Field measurement of water quality parameters were collected at regular intervals (0 L, 0.5 well volumes, 1 well volume, 2 well volumes, etc.) during purging of the monitoring wells prior to sampling. The Horiba was placed in a flow-through cell and water quality parameters were measured until they were found to stabilize to within approximately 10% of the previous measurements prior to sample collection.

vi. Groundwater: Sampling

Groundwater monitoring and sampling of the monitoring wells during this Phase Two ESA included the existing groundwater monitoring wells (MW95-1, MW95-2 and BH4, which were interpreted as being screened in overburden and BH1 and BH3, screened in the bedrock) was completed on May 17, 2021. Groundwater samples were selected for laboratory analysis of select CPCs based on APECs and CPCs identified in the Phase One ESA.

Stabilized groundwater levels were measured in each of the groundwater monitoring wells prior to disturbance of the water column prior to sampling. The dedicated Waterra LDPE tubing and footvalve was removed from each of the monitoring wells and 6 m Waterra LDPE tubing was placed in each of the monitoring wells. The LDPE tubing was connected to a dedicated length of silicon tubing, run through a peristaltic pump set to low flow (approximately 0.2-0.5 L/minute) during purging and sampling while monitoring groundwater level to minimize the drop in head. The monitoring wells were purged on the day of sampling while water quality parameters were measured as noted above.

Groundwater samples were collected in dedicated amber glass bottles and vials or plastic bottles prepared and provided by the analytical laboratory. Analytes and associated preservatives were specified on each bottle by the laboratory. Each bottle sample set was provided with a unique sample identifier, project number and date of sampling in the field. Samples for PHCs, BTEXs, VOCs, PAHs and general chemistry were unfiltered, while metals samples were field filtered using a dedicated 0.45 µm Waterra filter for each sample.

The field technician changed dedicated sterile nitrile gloves prior to initiating work at each monitoring well and changed gloves prior to sample collection to minimize the potential for cross-contamination.

vii. Sediment: Sampling

There were no natural surface water bodies at the Phase Two Property, and as such no sediment sampling was completed as part of the Phase Two ESA.

viii. Analytical Testing

Soil and groundwater analytical testing was conducted by AGAT Laboratories Ltd. (AGAT). AGAT is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) and the National Institute of Standards and Technology (NIST), Standard Services Division, National Voluntary Laboratory Accreditation Program (NVLAP) for specific environmental and IAQ tests listed in the Scopes of Accreditation registered with each association. AGAT is accredited for all of the analysis performed as part of this Phase Two ESA.

ix. Residue Management Procedures

Excess soil cuttings from drilling and monitoring well installations were containerized in steel 205 L drums, which were stored in the in the southeast portion of the Property. These drums

were marked with a wax crayon indicating the origin location(s) of the cuttings containerized within each.

Groundwater from well development and purging was initially placed in a graduated plastic bucket for volume measurements and then was transferred to a dedicated plastic 205 L drum, which was stored in the northwest portion of the Property. This drum was marked with a wax crayon indicating the origin location(s) of the water containerized within.

Fluids from equipment cleaning and decontamination were containerized within the purge water drum.

x. Elevation Surveying

An elevation survey was completed of the existing boreholes/monitoring wells which could be located at the Phase Two Property as part of the Phase Two ESA. The boreholes/monitoring wells were surveyed relative to a temporary benchmark of the top of spindle of the City of Ottawa fire hydrant located to the northeast of the Property on the west side of Dumaurier Avenue; this benchmark was assigned a reference elevation of 100.000 m ("Site Datum") for the purposes of this Phase Two ESA. The reference elevations of each borehole/monitoring well, which could be located at the time of the fieldwork for this Phase Two ESA, are provided in Tables 1 and 2 in Section 6.ii.

xi. Quality Assurance and Quality Control Measures

Soil samples, recovered at the time of the 2019 GHD Phase Two ESA, were collected in dedicated clear glass jars prepared and provided by the analytical laboratory. Soil samples collected for BTEXs/VOCs and the F1 range of PHCs analysis were collected using dedicated graduated syringes provided by the laboratory and placed directly into a glass vial with methanol preservative. Analytes and associated preservatives were specified on each jar/vial by the laboratory. Each jar/vial sample set was provided with a unique sample identifier, project number and date of sampling in the field.

Groundwater samples were collected in dedicated amber glass bottles and vials or plastic bottles prepared and provided by the analytical laboratory. Analytes and associated preservatives were specified on each bottle by the laboratory. Each bottle sample set was provided with a unique sample identifier, project number and date of sampling in the field.

Following sample collection, the soil and groundwater samples were stored in an ice pack chilled cooler to minimize volatilization and begin the cooling process on the day of sampling. On each day of sample collection, following completion of the fieldwork, samples were delivered directly to the analytical laboratory. Standard chain of custody procedures were used to maintain a custody record of soil and groundwater samples between the field technician and the analytical laboratory.

During the 2019 GHD Phase Two ESA, the split spoons, which were the only media to come into contact with the soil samples, were washed using soap and water and a scrub brush between samples to minimize the potential for cross contamination among samples. The field technician used sterile nitrile gloves, which were changed prior to the handling of each soil sample to prevent cross-contamination. The field technician changed dedicated sterile nitrile gloves prior to initiating work at each monitoring well and changed gloves prior to groundwater sample collection to minimize the potential for cross-contamination.

Trip blank water samples for VOCs were submitted for laboratory analysis from the groundwater sampling event completed on October 19, 2018 by GHD and on May 17, 2021 by Lopers. No detectable VOC concentrations were reported in the trip blank water samples.

One soil sample was submitted to the laboratory as a blind field duplicate sample at the time of the 2019 GHD Phase Two ESA. The 2019 GHD Phase Two ESA was completed for the entire commercial property for Dumaaurier Plaza, and the duplicate sample analyzed at the time was from BH4, interpreted to be immediately south of the Phase Two Property. The duplicate sample was noted to have relative percent differences (RPDs) which were generally less than 40%. It was also noted that the parameters which were detected above the laboratory method detection limits in the duplicate samples, were generally detected at low concentrations, which could be an explanation for the variability in results. Additionally, the high degree of heterogeneity in soil samples can attribute to higher levels of variability in analytical ratios.

The groundwater sample (Dup-1) was submitted to the laboratory as a blind field duplicate sample of MW95-1, which was collected during this Phase Two ESA. The ratio of groundwater duplicate results to original sample results was generally less than 1% to 15 or 26% which meets the required ratio.

One blind field duplicate groundwater sample (MW6) was submitted for laboratory analysis of VOCs, PHCs, metals and inorganics for the groundwater samples collected from BH3S at the time of the 2019 GHD Phase Two ESA. These duplicate results were observed to be generally consistent for the VOCs and metals and inorganics parameter sets, but had some observed variability with respect to the PHC analytical results, which reported exceedances of the Site Condition Standards in the original sample but concentrations less than the laboratory method detection limits in the duplicate sample. The variability in the PHC results from this groundwater duplicate sample is suspected to be associated with sampling procedures and/or the presence of sediment in the original sample; sediment in PHC samples has been shown in previous groundwater quality assessments at other properties to result in false positive analytical results for the heavier fractions of PHCs.

The level of variability generally observed in the laboratory analytical results is considered to meet the objectives of confirmation of consistency in the laboratory data.

No equipment blank of groundwater was required since the groundwater samples were collected using dedicated tubing.

6. Review and Evaluation

i. Geology

Based on the observations of soil samples collected during the 2019 GHD Phase Two ESA and 2019 Paterson Geotechnical Investigation, there were eight stratigraphic units identified at the Phase Two Property, which include:

Asphalt

A layer of asphalt, approximately 0.08 m in thickness, was encountered at the ground surface in BH1 and BH3.

Topsoil

A surface layer of topsoil and grass, approximately 0.08 m in thickness, was encountered at the ground surface in BH3D/3S. This material was described as silty sand with organics, loose, dark brown, and damp.

Silty Sand and Gravel (Fill)

A layer of silty sand and gravel fill material, ranging from approximately 0.9 to 2.7 m in thickness, was encountered immediately below the topsoil or the asphalt in all of the boreholes. This material was identified to consist of silty sand and gravel and generally grey. This layer was encountered at varying moisture conditions, and moisture conditions were not documented on the Paterson borehole logs, however, it was noted that the fill layer was generally present above the static water table at the Property.

Black staining, suspected to be associated with poor quality fill placement were observed in BH3S/BH3D in this unit from an approximate depth of 1.2 to 2.4 m BGS. No petroleum hydrocarbon odours were noted in the stained soil from BH3S/BH3D.

Sand

A layer of fine sand, ranging from approximately 0.9 to 1.0 m in thickness, was encountered at depths ranging from approximately 2.0 to 2.9 m BGS, immediately below a peat layer in borehole BH2 and below the fill layer in BH1. This material was identified to consist of fine sand with silt and clay, was loose and grey. Moisture conditions were not documented on the Paterson borehole logs, however, it was noted that the sand layer was present above the static water table in BH2.

Silty Clay

A layer of silty clay, approximately 1.3 m in thickness, was encountered below the sand layer in borehole BH2. This material was identified to consist of silty clay with trace sand, and grey.

Moisture conditions were not documented on the Paterson borehole logs, however, it was noted that the silty clay layer was present above the static water table in BH2.

Peat

A layer of peat, ranging from approximately 0.4 to 1.2 m in thickness, was encountered immediately below the fill layer in BH2 and BH3S/BH3D. This material was described as black, organics with an organic odour (not suspected to be associated with environmental contamination). This layer was encountered at wet moisture conditions.

Silty Sand and Gravel (Till)

A layer of silty sand and gravel, ranging from approximately 0.8 to 1.5 m in thickness, was encountered at depths ranging from approximately 3.1 to 3.8 m BGS, immediately below a sand layer in borehole BH1 and below the fill layer in BH3. This material was identified to consist of sandy silt with some clay and gravel and was grey. Moisture conditions were not documented on the Paterson borehole logs, however, it was noted that the till layer was present near the static water at the Property.

Interbedded Limestone, Shale, Dolomite and Dolostone Bedrock

Bedrock was observed at depths ranging from approximately 3.7 to 5.3 m BGS in borehole BH1, BH2, BH3 and BH3S/BH3D. The bedrock was cored using HQ diamond coring equipment and observations of the bedrock were recorded following recovery. The bedrock was observed to be grey limestone, or green shale interbedded with dolomite and dolostone at intermittent depths. Bedrock quality was observed to be poor to excellent in quality with some to moderate fracturing near the bedrock surface and was generally increasing in Rock Quality Designation (RQD) with depth.

Aquifer

The shallow overburden (unconfined) aquifer is the aquifer of interest based on the PCAs, APECs and CPCs identified for the Phase Two Property. The shallow overburden aquifer is present in the native silty sand and gravel (till) layer, as well as in the sand and/or silty sand and gravel fill layers (where present in the former areas of backfilling).

The shallow aquifer is expected to have moderate relative permeability in more porous stratigraphic units such as the silty sand and gravel, sand and/or potential refuse/waste fill, while the shallow aquifer in the silty sand or more clayey till layers are expected to have low permeability and restrict the movement of groundwater and associated contaminants.

Some investigation into the localized groundwater quality of the deep bedrock aquifer was also completed for vertical delineation purposes.

Based on moisture contents observed in the soil samples collected as part of this Phase Two ESA it is expected that seasonal and annual variability affect the groundwater table elevation in the shallow aquifer.

ii. Groundwater and Elevations and Flow Direction

Based on the nature of the primary CPCs identified for groundwater at the Phase Two Property (including light non-aqueous phase liquids (LNAPLs)), the screened intervals of the existing groundwater monitoring wells selected for monitoring and sampling as part of this Phase Two ESA were interpreted to straddle the shallow groundwater table within the overburden.

The boreholes/monitoring wells were surveyed relative to a temporary benchmark of the top of spindle of the City of Ottawa fire hydrant located to the northeast of the Property on the west side of Dumauiet Avenue; this benchmark was assigned a reference elevation of 100.000 m ("Site Datum") for the purposes of this Phase Two ESA.

The shallow groundwater aquifer was present within the overburden on central, east and north portions of the Phase Two Property. Although these monitoring wells were installed as part of separate historical investigations, it has been interpreted that the same shallow aquifer exists across these units and can be used for a determination of groundwater flow direction and hydraulic gradient. Monitoring well construction details, where they are known, are presented in Table 1 below.

Table 1: Monitoring Well Construction Details

Monitoring Well	Ground Surface Elevation (m RSD)	Top of Piezometer Elevation (m RSD)	Screen Elevation (m RSD)	Sand Pack Elevation (m RSD)	Bentonite Seal (m RSD)
Shallow Overburden monitoring wells					
* MW95-1	98.51	98.43	95.51 – 97.03	Unknown	Unknown
* MW95-2	98.28	98.31	95.04 – 96.56	Unknown	Unknown
*** BH4	98.33	98.22	92.89 – 93.99	92.89 – 94.09	94.09 – 97.89
** BH3S	99.33	99.23	95.60 – 97.10	95.60 – 97.50	97.50 – 98.80
Deep Bedrock monitoring wells					
* BH1	99.95	100.83	81.66 – 84.71	81.66 – 85.02	85.02 – 94.85
* BH3	98.64	98.52	80.53 – 83.88	80.53 – 84.28	84.28 – 94.84
** BH3D	99.25	99.15	93.90 – 95.20	93.90 – 95.30	95.30 – 98.80

m RSD – metres Referenced to Site Datum

* Interpreted based on historical reports and/or field observations

** Based on data provided in the 2019 GHD Phase Two ESA

*** Interpreted to be present on the neighbouring property to the south

On May 17, 2021, following a period of three days for stabilization after re-developing the monitoring wells, the groundwater levels were measured and are presented in Table 2 below. The groundwater table in the shallow overburden aquifer was measured at depths ranging between 0.70 and 1.19 m BGS on May 17, 2021. The groundwater elevations of two deep bedrock monitoring wells (BH1 and BH3) were also measured as part of this Phase Two ESA, however, these elevations were not used for an interpretation of groundwater flow.

Table 2: Groundwater Table Elevations Measured on May 17, 2021

Monitoring Well	Ground Surface Elevation (m RSD)	Top of Piezometer Elevation (m RSD)	Depth to Groundwater (m below TOP)	Groundwater Table Elevation (m RSD)	Depth to Groundwater (m BGS)
Shallow Overburden monitoring wells					
* MW95-1	98.51	98.43	0.90	97.53	0.98
* MW95-2	98.28	98.31	0.73	97.58	0.70
*** BH4	98.33	98.22	1.08	97.14	1.19
Deep Bedrock monitoring wells					
* BH1	99.85	100.83	8.33	92.50	7.35
* BH3	98.64	98.52	6.05	92.47	6.17

m RSD – meters Referenced to Site Datum

m BGS – metres Below Ground Surface

* Interpreted based on historical reports and/or field observations

*** Interpreted to be present on the neighbouring property to the south

Three groundwater monitoring well water table elevations are required to triangulate groundwater elevations and determine an approximate groundwater flow direction. The groundwater table elevations in MW95-1, MW95-2 and BH4 were used for a determination of groundwater flow direction. Based on the measured groundwater table elevations in these monitoring wells, the local groundwater flow direction at the Phase Two Property is towards the west-southwest. This interpreted local groundwater flow direction is reasonable based on the local topography and groundwater recharge expected in the large field/park (former waste disposal site) to the east; however, it is expected that regional groundwater flow is toward the northwest in the direction of the nearest significant surface water body, the Ottawa River, which is 1.3 km to the northwest of the Phase Two Property.

No observations or indications of free product were observed in any of the monitoring wells accessed as part of this Phase Two ESA, as measured with an interface probe during water level measurements, and through observations of the purge water during development and sampling

of the monitoring wells. Slight to moderate petroleum hydrocarbon odours were observed in the purge water recovered from MW95-1 and MW95-2.

Given the shallow depth to groundwater and the interpreted flow direction, the underground utility corridors at the Phase Two Property do have the potential to affect contaminant distribution and transport, as they would create preferential pathways for lateral migration from the identified APEC (former waste disposal site to the north and east) towards the Property. Based on the depth to groundwater observed in the monitoring wells as part of this investigation, observed between 0.70 and 1.19 m BGS, the potential exists for migration of contaminants through underground utility service trenches (generally approximately 2 to 3 m BGS).

iii. Groundwater: Hydraulic Gradients

The horizontal hydraulic gradient was determined by plotting groundwater contours interpreted from groundwater elevations presented in Table 2 and then by dividing the difference in hydraulic head by the lateral separation distance in the groundwater contours. Based on the measured groundwater elevations in MW95-1, MW95-2 and BH4 the horizontal hydraulic gradient at the Phase Two Property is approximately 0.036 m/m.

iv. Course Grained Soil Texture

A substantial layer of fill, consisting of silty sand and gravel, which would be classified as coarse grained soil, is present to near full depth to bedrock on the Phase Two Property. It is interpreted that greater than 1/3 of the Phase Two Property has coarse grained soil. For the purposes of this Phase Two ESA, the soil conditions are considered to be coarse grained, which provides a more conservative comparison to the MECP site condition standards than the fine-grained values.

v. Soil Field Screening

Initial field screening of the soil samples consisted of visual and olfactory observations made at the time of sample collection during the drilling program as part of the 2019 GHD Phase Two ESA. Black staining, suspected to be associated with poor quality fill placement were observed in BH3S/BH3D in this unit from an approximate depth of 1.2 to 2.4 m BGS. No petroleum hydrocarbon odours were noted in the stained soil from BH3S/BH3D.

Additional field screening of the soil samples was completed using a PID. Combustible soil vapour screening concentrations in the soil samples recovered during the 2019 GHD Phase Two ESA were found to range from 0 to 3.9 ppm, which is low and generally not considered indicative of significant PHC contamination.

vi. Soil Quality

Location and Depth of Soil Samples

The following soil samples, which were collected from the boreholes drilled as part of this Phase Two ESA, were submitted for laboratory analysis.

Table 3: Soil Samples Selected for Laboratory Analysis

Sample Location	Sample ID	Sample Depth (m BGS)	Analytical Parameters
BH3D	BH3-SS3	1.2 – 1.8	PAHs, Metals & Inorganics

Comparison of Soil Analytical Results to Applicable Site Conditions Standards

The analytical soil results were compared to the full depth generic site condition standards, with non-potable groundwater, coarse textured soil, for residential property use, as specified in Table 3 of the MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

The aforementioned soil samples selected for laboratory analysis were submitted to AGAT under chain of custody No. T075943 on October 5, 2018. The laboratory certificate of analysis (AGAT Report # 18Z394508) is provided in Appendix E.

All of the analyzed soil samples were in compliance with the site condition standards. A full summary of the soil analytical results and comparison to the applicable site condition standards are presented in Table 5: Soil Analytical Results following the text of this report.

Comparison of TCLP Analytical Results to O.Reg. 558/00

A waste characterization sample was selected for laboratory analysis of toxicity characteristic leaching procedure (TCLP) analysis for flashpoint, leachate metals & inorganics, leachate VOCs and leachate PAHs. This sample was comprised of a composite of worst-case samples, as determined by field screening parameters.

The aforementioned composite soil sample selected for TCLP laboratory analysis was submitted to chain of custody No. T075943 on October 5, 2018. The laboratory certificate of analysis (AGAT Report # 18Z394508) is provided in Appendix E.

This composite sample was compared to the criteria specified in schedule IV of O.Reg. 558/00 and no measured parameter exceeded the toxicity criteria. Based on the analytical results and field screening, if excess soil generated from redevelopment of the Site cannot be reused as clean fill at an appropriate receiving site, it can be treated as solid non-hazardous waste.

Contaminants of Concern

The presence of a former waste disposal site on the north portion of the Phase One Property is a significant PCA which represents APEC #1 for the Property. The contaminants of potential concern (CPCs) in soil associated with the former waste disposal site are metals, PAHs and PHCs/BTEXs.

The contaminants of concern for a particular sample were based on the relative location and depth of the sample, visual and/or olfactory observations and combustible vapour screening concentrations.

Contaminants Related to Chemical and Biological Transformations

Contaminants related to chemical and biological transformations were not suspected to be present at the Phase Two Property and were not identified as part of the Phase Two ESA soil analysis.

Soil Serving as a Source of Contaminant Mass Contributing to Groundwater

Based on the analytical results, there is no soil that serves as a source of contaminant mass contributing to groundwater at the Phase Two Property.

Light or Dense Non-Aqueous Phase Liquids

The analytical results do not indicate the presence of light or dense non-aqueous phase liquids at the Phase Two Property.

- vii. Groundwater Quality

Locations and Sample Depth Interval of Groundwater Samples

The groundwater samples were collected using a peristaltic pump with tubing lowered to between the top and approximate (vertical) center of the water column within each monitoring well and withdrawing the water at low flow rates. The groundwater sample locations, screen depths and parameters analyzed are presented in Table 4 below.

Table 4: Groundwater Samples Selected for Laboratory Analysis

Sample Location	Groundwater Level (m RSD)	Screen Depth (m RSD)	Analytical Parameters
BH3D	97.34*	93.90 – 95.20	PHCs, VOCs, Metals & Inorganics
BH3S	96.25*	95.60 – 97.10	PHCs, VOCs, Metals & Inorganics
MW6 (Duplicate of BH3S)	96.25*	95.60 – 97.10	PHCs, VOCs, Metals & Inorganics
MW95-1	97.53	95.51 – 97.03	PHCs, VOCs, PAHs, Metals & Inorganics
DUP-1 (Duplicate of MW95-1)	97.53	95.51 – 97.03	PHCs, VOCs, PAHs, Metals & Inorganics
MW95-2	97.58	95.04 – 96.56	PHCs, VOCs, PAHs, Metals & Inorganics
BH1	92.50	81.66 – 84.71	PHCs, VOCs, PAHs, Metals & Inorganics

m RSD – metres Referenced to Site Datum

* Measured in 2018 as part of 2019 GHD Phase Two ESA

Field Filtering

Samples for PHCs, BTEXs, VOCs, PAHs and general chemistry were unfiltered, while metals samples were field filtered using a dedicated 0.45 µm Waterra filter for each sample.

Comparison of Groundwater Analytical Results to Applicable Site Conditions Standards

The analytical groundwater results were compared to the full depth generic site condition standards, with non-potable groundwater, coarse textured soil, as specified in Table 3 of the MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

The groundwater samples selected for laboratory analysis were submitted to AGAT under chain of custody Nos. T080076 and T118702 on October 19, 2018 and May 17, 2021, respectively. The laboratory certificates of analysis (AGAT Report #s 18Z399894 and 21Z747835) are provided in Appendix E. The following samples had exceedance concentrations reported compared to ('vs.') their respective site condition standards.

- BH3S, collected from a screen depth of approximately 2.2-3.7 m BGS, had reported concentrations of PHC F2 range (170 µg/g vs. 150 µg/g) and PHC F3 range (860 µg/g vs. 500 µg/g).

All of the other groundwater samples collected at the Phase Two Property were in compliance with the site condition standards. It should be noted that the monitoring well BH3D was installed for vertical delineation purposes for BH3S; BH3D had no detectable PHC concentrations in a sample collected the same date as the aforementioned sample from BH3S.

Monitoring well W95-2 had a reported chloroform concentration of 23.9 ug/L compared to the site condition standard of 2.4 ug/L. The reported chloroform concentration from MW95-2 is in the range of concentrations reported by the City of Ottawa for municipally treated drinking water. It is suspected that the observed chloroform exceedance is a result of a leaking watermain, is not representative of actual Site conditions and is not interpreted as an exceedance for the purposes of this report. Further exploration to the source of the chloroform should be undertaken at the time Site redevelopment.

A full summary of the groundwater analytical results and comparison to the applicable site condition standards are presented in Table 6: Groundwater Analytical Results following the text of this report.

Contaminants of Concern

The presence of a former waste disposal site on the north portion of the Phase One Property is a significant PCA #1 which represents APEC #1 for the Property. The CPCs in groundwater associated with the former waste disposal site are VOCs, metals, PAHs and PHCs/BTEXs.

The contaminants of concern for a particular sample were based on the relative location and depth of the sample, visual and/or olfactory observations of soil samples collected which could have come into contact with the groundwater table.

Contaminants Related to Chemical and Biological Transformations

Contaminants related to chemical and biological transformations were not suspected to be present at the Phase Two Property and were not identified as part of the Phase Two ESA groundwater analysis.

Soil Serving as a Source of Contaminant Mass Contributing to Groundwater

Based on the groundwater analytical results, there is no soil that serves as a source of contaminant mass contributing to groundwater at the Phase Two Property.

Light or Dense Non-Aqueous Phase Liquids

The presence of measurable levels LNAPL and/or DNAPL free product were not observed at the Phase Two Property, as measured with an interface probe and with observations of the purge water recovered from the monitoring wells.

The analytical groundwater results do not indicate the suspected presence of dense non-aqueous phase liquids at the Phase to Property.

viii. Sediment Quality

There were no natural surface water bodies at the Phase Two Property, and as such no sediment sampling was completed as part of the Phase Two ESA.

ix. Quality Assurance and Quality Control Results

One soil sample was submitted to the laboratory as a blind field duplicate sample at the time of the 2019 GHD Phase Two ESA. The 2019 GHD Phase Two ESA was completed for the entire commercial property for Dumaurier Plaza, and the duplicate sample analyzed at the time was from BH4, interpreted to be immediately south of the Phase Two Property. The duplicate sample was noted to have relative percent differences (RPDs) which were generally less than 40%. It was also noted that the parameters which were detected above the laboratory method detection limits in the duplicate samples, were generally detected at low concentrations, which could be an explanation for the variability in results. Additionally, the high degree of heterogeneity in soil samples can attribute to higher levels of variability in analytical ratios.

The groundwater sample (Dup-1) was submitted to the laboratory as a blind field duplicate sample of MW95-1, which was collected during this Phase Two ESA. The ratio of groundwater duplicate results to original sample results was generally less than 1% to 15 or 26% which meets the required ratio.

One blind field duplicate groundwater sample (MW6) was submitted for laboratory analysis of VOCs, PHCs, metals and inorganics for the groundwater samples collected from BH3S at the time of the 2019 GHD Phase Two ESA. These duplicate results were observed to be generally consistent for the VOCs and metals and inorganics parameter sets, but had some observed variability with respect to the PHC analytical results, which reported exceedances of the Site Condition Standards in the original sample but concentrations less than the laboratory method detection limits in the duplicate sample. The variability in the PHC results from this groundwater duplicate sample is suspected to be associated with sampling procedures and/or the presence of sediment in the original sample; sediment in PHC samples has been shown in previous groundwater quality assessments at other properties to result in false positive analytical results for the heavier fractions of PHCs.

The level of variability generally observed in the laboratory analytical results is considered to meet the objectives of confirmation of consistency in the laboratory data. The QA/QC duplicate sample results demonstrate that the data are reliable, appropriate and accurate in the determination of whether the phase two property meets the applicable site condition standards.

The laboratory made no qualifying statements regarding the sample handling or submission as part of this Phase Two ESA. Any laboratory remarks in certificates of analysis are related to internal QA and is not expected to impact the validity of any of the data.

All certificates of analysis were received pursuant to clause 47 (2) (b) of O.Reg. 153/04 and comply with subsection 47 (3) of O.Reg. 153/04.

The overall quality of the field data from the investigation with respect to the data quality objectives, demonstrate that decision-making was not affected, and the overall objectives of the investigation and the assessment were met.

x. Phase Two Conceptual Site Model

The presence of a former waste disposal site on the north portion of the Phase One Property (PCA #1) is a significant PCA which represents APEC #1 for the Property. The contaminants of potential concern (CPCs) associated with the former waste disposal site are VOCs (for groundwater only), metals, PAHs and PHCs/BTEXs.

Various underground utility services, including natural gas, electricity, water and sewers were identified at the Phase Two Property. The natural gas, water and sewer services are present in underground trenches which enter the Property from Dumaurier Avenue to the east and lead to the commercial building. Electricity enters the property through an underground service trench to the west of the commercial building. Given the shallow depth to groundwater and the interpreted flow direction, the underground utility corridors at the Phase Two Property do have the potential to affect contaminant distribution and transport, as they would create preferential pathways for lateral migration from the identified APEC (former waste disposal site to the north and east) towards the Property. Based on the depth to groundwater observed in the monitoring wells as part of this investigation, the potential exists for migration of contaminants through underground utility service trenches (generally approximately 2 to 3 m BGS).

The overburden stratigraphy of the Phase Two Property is present in eight geological units, including an asphalt or topsoil layer at ground surface, silty sand and gravel (fill) layer, sand, a native silty clay layer, a peat layer and a native silty sand and gravel layer. Historical reports referenced the presence of a layer of buried refuse/waste at the Phase Two Property, however, it should be noted that the specific investigations referenced were not available as part of this Phase Two ESA.

The shallow overburden (unconfined) aquifer is the aquifer of interest based on the PCAs, APECs and CPCs identified for the Phase Two Property. The shallow overburden aquifer is present in the native silty sand and gravel (till) layer, as well as in the sand and/or silty sand and gravel fill layers (where present in the former areas of backfilling).

The aquifer is expected to have moderate relative permeability in more porous stratigraphic units such as the silty sand and gravel, sand and/or potential refuse/waste fill, while the shallow aquifer in the silty sand or more clayey till layers are expected to have low permeability and restrict the movement of groundwater and associated contaminants.

The overburden soil is underlain by interbedded limestone, shale, dolomite and dolostone bedrock at depths ranging from approximately 3.7 to 5.3 m BGS.

The shallow overburden groundwater table was measured at depths ranging between 0.70 and 1.19 m BGS. The shallow groundwater aquifer was present within the overburden across the Phase Two Property. Monitoring from wells situated in the shallow aquifer was used for a determination of groundwater flow direction and hydraulic gradient. The horizontal hydraulic

gradient at the Phase Two Property was calculated to be approximately 0.036 m/m with a localized groundwater flow direction towards the west-southwest.

The proposed redevelopment of the Phase Two Property includes construction of one building, approximately 30 storeys in height, with subgrade parking, commercial ground floors and residential units above.

The Phase Two Property and all other properties within 250 m of the property boundaries are supplied by Ottawa's municipal potable water supply system. The RSC does not specify agricultural use and there are no wells within 250 m of the property boundaries that are intended for use as a source of water for human consumption or agriculture. As such, the designation of non-potable groundwater setting is determined to be applicable [O.Reg. 153/04, section 35].

The Phase Two Property is not situated within or adjacent to an area of natural significance and does not include any land within 30 m of an area of natural significance. The pH of the soil was analyzed as part of this Phase Two ESA and was reported at 7.44. As such, the Phase Two Property is not considered to be an environmentally sensitive area [O.Reg. 153/04, section 41].

Review of the borehole/monitoring well logs completed as part of previous investigations was completed. It was determined that greater than 2/3 of the Phase Two Property has greater than 2 m of overburden soil. The Phase Two Property is not considered a shallow soil property.

The Phase Two Property does not include and does not have any land located within 30 m of a water body. The MECP site condition standards for use within 30 m of a water body do not apply [O.Reg. 153/04, section 43.1].

The full depth generic site condition standards, with non-potable groundwater, coarse textured soil, for residential/parkland/institutional property use, as specified in Table 3 of the MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011 were determined to be the applicable site condition standards for the Phase Two Property as part of this Phase Two ESA.

All of the analyzed soil samples were in compliance with the site condition standards.

The groundwater sample BH3S, collected from a screen depth of approximately 2.2-3.7 m BGS, had reported concentrations of PHC F2 range (170 µg/g vs. 150 µg/g) and PHC F3 range (860 µg/g vs. 500 µg/g).

All of the other groundwater samples collected at the Phase Two Property were in compliance with the site condition standards. It should be noted that the monitoring well BH3D was installed for vertical delineation purposes for BH3S; BH3D had no detectable PHC concentrations in a sample collected the same date as the aforementioned sample from BH3S. The Phase Two Property is not in compliance with the site condition standards as of the certification date of May 17, 2021.

7. Conclusions

All of the analyzed soil samples were in compliance with the site condition standards.

The groundwater sample BH3S, collected in October of 2018 from a screen depth of approximately 2.2-3.7 m BGS, had reported concentrations of PHC F2 range (170 µg/g vs. 150 µg/g) and PHC F3 range (860 µg/g vs. 500 µg/g).

All of the other groundwater samples collected at the Phase Two Property were in compliance with the site condition standards. It should be noted that the monitoring well BH3D was installed for vertical delineation purposes for BH3S; BH3D had no detectable PHC concentrations in a sample collected the same date as the aforementioned sample from BH3S. The Phase Two Property is not in compliance with the site condition standards as of the certification date of May 17, 2021.

Historical environmental reports referenced the presence of a layer of buried refuse/waste at the Phase Two Property, however, the specific investigations (including associated borehole logs and laboratory analytical results) referenced were not available as part of this Phase Two ESA. Although there were no observations of refuse/waste or evidence of deleterious fill material identified in any of the boreholes drilled as part of the 2019 GHD Phase Two ESA or the 2019 Paterson Geotechnical Investigation, it is suspected that waste and/or poor environmental quality fill material may have been placed at the Property in locations not assessed as part of the aforementioned investigations. There is suspected soil and/or groundwater contamination at the Phase Two Property. Additional investigation and confirmation of soil and groundwater quality in this area of the Property is recommended at the time of excavation for site redevelopment. It should be noted that the proposed redevelopment includes excavation for at least two to three levels of underground parking, which is expected to be sufficient for remediation of the aforementioned environmental contamination at the Phase Two Property.

An environmental remediation program, including the bulk removal and off-site disposal of soil and groundwater in excess of the site condition standards is required for the Phase Two Property. Further delineation and confirmation of remediation sampling will be required prior to confirmation of compliance with the site condition standards and prior to the submission of a Record of Site Condition (RSC); however, these tasks can be completed at the time decommissioning and demolition of existing structures at the Phase Two Property in conjunction with the proposed redevelopment. The submission and acknowledgment of an RSC would be required prior to occupancy of the Phase Two Property for residential purposes following redevelopment, however, these tasks can be completed following decommissioning and demolition of existing structure at the Phase Two Property. The Phase Two ESA could be then updated at that time to show compliance with site condition standards.

Preparation of a soil management plan in accordance with O.Reg. 406/19 will be required as part of management of excess soil generated as part of construction activities. It is recommended that a remedial action plan be prepared to develop a strategy for remediation, including soil and groundwater management, during redevelopment.

i. Signatures

The Qualified Person for this study is Mr. Luke Lopers, P. Eng. Mr. Lopers has been a Professional Engineer, registered in Ontario since 2012 and has been working on environmental site assessments since 2006. Mr. Lopers has been an author, project manager and/or peer reviewer for hundreds of Phase One ESAs and Phase Two ESAs as well as previously filed RSCs.

The reviewer for this study is Mr. Don Plenderleith, P.Eng. Mr. Plenderleith is a Professional Engineer registered in Ontario since 1994 and has authored and/or reviewed hundreds of Phase One and Two ESAs in Ontario and the rest of Canada. The qualifications of the assessor/Qualified Person and reviewer are included in Appendix F.

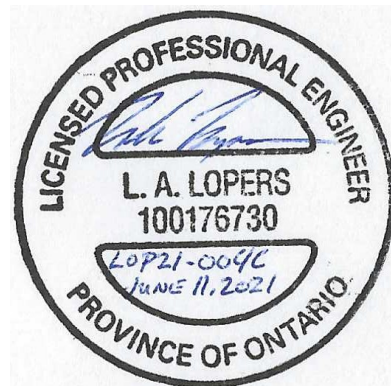
Sincerely,



Luke Lopers, P.Eng., QP_{ESA}



Don Plenderleith, P.Eng., QP_{ESA}



8. Limitations

The findings and conclusions of this Phase Two ESA are based on the information provided and/or reviewed as part of this study.

This Phase Two ESA has been completed with the standard of care generally expected in the industry for a study of this nature.

This Phase Two ESA has been prepared for the sole use of 3223701 Canada Inc. for the purposes of a due diligence assessment of the potential liabilities which may exist at the Phase Two Property. No other party is permitted to rely on the conclusions or findings of this report without the written consent of Lopers & Associates and 3223701 Canada Inc.

Changes to the physical setting of the Phase Two Property, Phase One Study Area and applicable regulations governing Phase One and Two Environmental Site Assessments have the potential to influence the validity of the conclusions and opinions presented in this Phase Two ESA.

9. References

Legal Survey Plan, Annis, O'Sullivan, Vollebekk Ltd., dated November 20, 2000.

City of Ottawa, geoOttawa mapping website, Visited May through June, 2021.

<http://maps.ottawa.ca/geottawa/>

Google Earth, Visited May through June, 2021.

"Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", produced by the Ontario Ministry of the Environment, dated April 15, 2011.

Current Site Development Design Concept Plan, RLA Architecture, dated February 20, 2020 and Brigil, dated April 30, 2020.

"Phase I Environmental Site Assessment, 2831, 2833, 2835, 2841 and 2865 Dumaaurier Avenue, Ottawa, Ontario", dated August 16, 2018, completed by GHD Limited for 3223701 Canada Inc.

"Phase II Environmental Site Assessment, 2831, 2833, 2835, 2841 and 2865 Dumaaurier Avenue, Ottawa, Ontario", dated April 2, 2019, completed by GHD Limited for 3223701 Canada Inc.

"Geotechnical Investigation, Proposed Hi-Rise Building, 2829 Dumaaurier Avenue, Ottawa, Ontario", dated December 18, 2019, completed by Paterson Group Inc. for 3223701 Canada Inc.

"Methane Gas Detection Monitoring Program (2015-2019), Dumaaurier Plaza - 2829 Dumaaurier Avenue, Closed Pinecrest Landfill Site, Ottawa, Ontario", dated August 26, 2020, completed by Wood Canada Limited for 1248816 Ontario Inc.

"Phase One Environmental Site Assessment, 2829 Dumaaurier Avenue, Ottawa, Ontario" dated January 8, 2021 prepared for 3223701 Canada Inc. by Lopers & Associates.

AGAT Certificate of Analysis – Report # 18Z399894 - Soil Sample Submission October 5, 2018

AGAT Certificate of Analysis – Report # 18Z394508 - Groundwater Sample Submission October 19, 2018

AGAT Certificate of Analysis – Report # 21Z747835 - Groundwater Sample Submission May 17, 2021

10. Appendices

Appendix A – Sampling and Analysis Plan

Appendix B – Underground Utility Locates

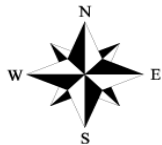
Appendix C – Borehole Logs

Appendix D – Certificates of Equipment Calibration

Appendix E – Laboratory Certificates of Analysis

Appendix F – Qualifications of Assessors

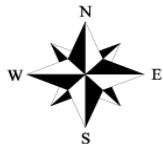
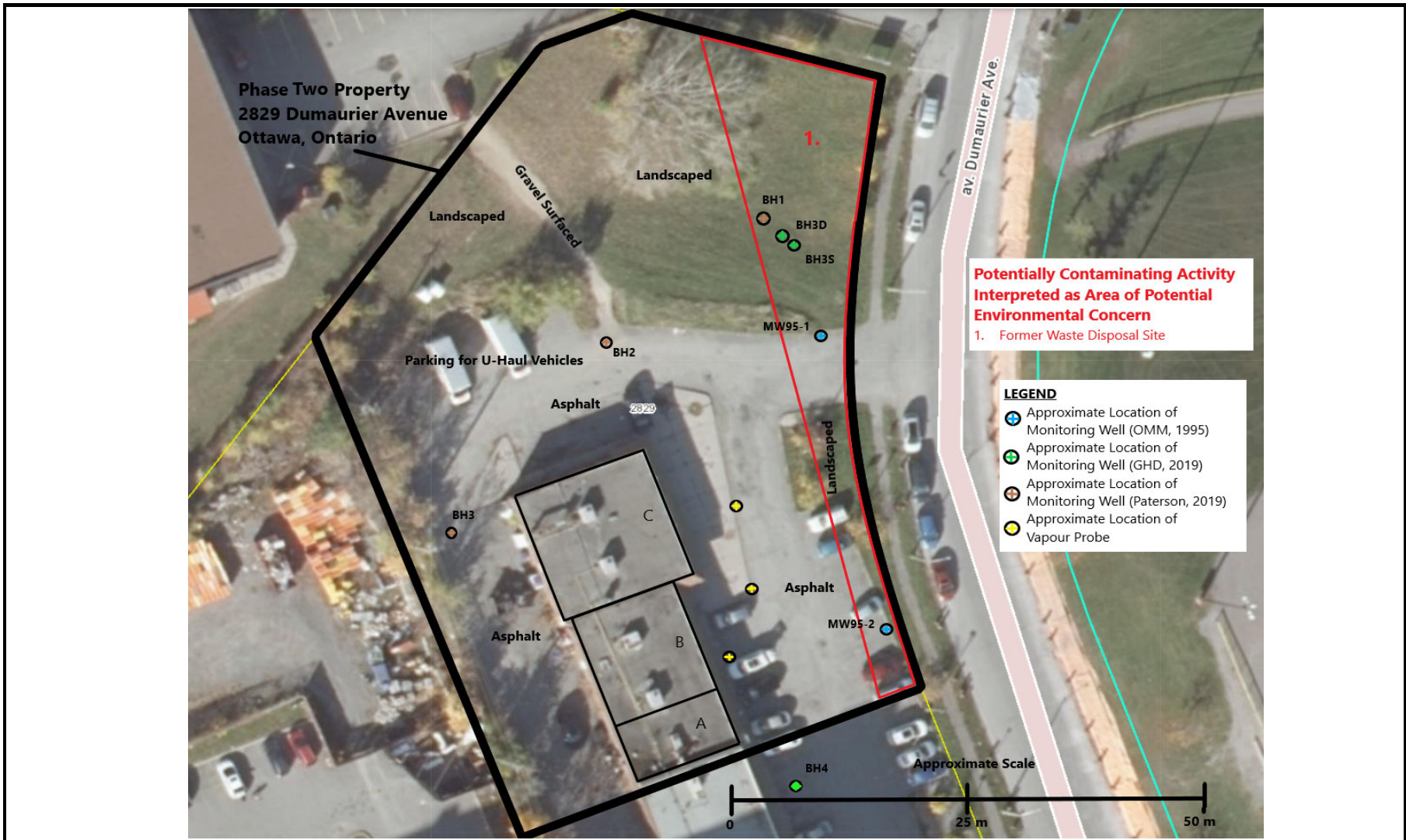
Figures



LOPERS & ASSOCIATES

Figure 1: Key Plan
 Phase Two Environmental Site Assessment
 2829 Dumaier Avenue, Ottawa, Ontario
 3223701 Canada Inc.

Project Reference No: LOP21-004C
 Drawing No.: LOP21-004C-1
 Date: June 9, 2021
 Author: L. Lopers
 Source: geoOttawa, Base Mapping



LOPERS & ASSOCIATES

Figure 2: Site Plan
 Phase Two Environmental Site Assessment
 2829 Dumaaurier Avenue, Ottawa, Ontario
 3223701 Canada Inc.

Project Reference No: LOP21-004C
 Drawing No.: LOP21-004C-2
 Date: June 9, 2021
 Author: L. Lopers
 Source: geoOttawa, 2019 Aerial Imagery

Tables

Table 5: Soil Analytical Results
Phase Two Environmental Site Assessment
2829 DuMaurier Avenue Ottawa, Ontario

Parameter	Units	MDL	O.Reg.153/04 Table 1	O.Reg.153/04 Table 3	BH3D
			Background residential/industrial	Full Depth non-potable, coarse grained residential/ parkland/ institutional	1.2-1.8 mBG Fill
Metals					
Antimony	ug/g dry	0.8	1.3	7.5	<0.8
Arsenic	ug/g dry	1	18	18	2
Barium	ug/g dry	2	220	390	56
Beryllium	ug/g dry	0.5	2.5	4	<0.5
Boron	ug/g dry	5	36	120	<5
Boron (Hot Water Soluble)	ug/g dry	0.1	NV	1.5	0.37
Cadmium	ug/g dry	0.5	1.2	1.2	<0.5
Chromium	ug/g dry	2	70	160	15
Cobalt	ug/g dry	0.5	21	22	4.7
Copper	ug/g dry	1	92	140	19
Lead	ug/g dry	1	120	120	28
Molybdenum	ug/g dry	0.5	2	6.9	<0.5
Nickel	ug/g dry	1	82	100	10
Selenium	ug/g dry	0.4	1.5	2.4	<0.4
Silver	ug/g dry	0.2	0.5	20	<0.2
Thallium	ug/g dry	0.4	1	1	<0.4
Uranium	ug/g dry	0.5	2.5	23	0.5
Vanadium	ug/g dry	1	86	86	21
Zinc	ug/g dry	5	290	340	124
Chromium VI	ug/g dry	0.2	0.66	8	<0.2
Cyanide	ug/g dry	0.04	0.051	0.051	<0.040
Mercury	ug/g dry	0.1	0.27	0.27	<0.10
Electrical Conductivity	ug/g dry	0.005	0.57	0.7	0.372
Sodium Adsorption Ratio	ug/g dry	NA	2.4	5	1.88
PAHs					
Naphthalene	ug/g dry	0.05	0.09	0.6	<0.05
Acenaphthylene	ug/g dry	0.05	0.093	0.15	<0.05
Acenaphthene	ug/g dry	0.05	0.072	7.9	<0.05
Fluorene	ug/g dry	0.05	0.12	62	<0.05
Phenanthrene	ug/g dry	0.05	0.69	6.2	0.06
Anthracene	ug/g dry	0.05	0.16	0.67	<0.05
Fluoranthene	ug/g dry	0.05	0.56	0.69	0.11
Pyrene	ug/g dry	0.05	1	78	0.09
Benz(a)anthracene	ug/g dry	0.05	0.36	0.5	0.06
Chrysene	ug/g dry	0.05	2.8	7	0.06
Benzo(b)fluoranthene	ug/g dry	0.05	0.47	0.78	0.07
Benzo(k)fluoranthene	ug/g dry	0.05	0.48	0.78	<0.05
Benzo(a)pyrene	ug/g dry	0.05	0.3	0.3	0.06
Indeno(1,2,3-cd)pyrene	ug/g dry	0.05	0.23	0.38	<0.05
Dibenz(a,h)anthracene	ug/g dry	0.05	0.1	0.1	<0.05
Benzo(g,h,i)perylene	ug/g dry	0.05	0.68	6.6	0.05
2-and 1-methyl Naphthalene	ug/g dry	0.05	0.59	0.99	<0.05
pH	NA	NA	NA	NA	7.44
Lab ID	-	-	-	-	9610086
Sample Date	-	-	-	-	5-Oct-18
Notes					
BOLD	Exceeds MECP site condition standards				
NA	Not Analysed by laboratory				

Table 6: Groundwater Analytical Results

Phase Two Environmental Site Assessment
2829 Dumaourier Avenue, Ottawa, Ontario

		Sample Location:		BH3S		BH3D	BH1	MW95-1		MW95-2	Trip Blank	Trip Blank
		Sample ID:	MW3S-101918	MW6-101918 Duplicate of BH3-21-GW2	MW3D-101918	BH1-GW1	MW95-1	Dup-1 Duplicate of MW95-2	MW95-2	MW95-2	Trip Blank	Trip Blank
		Sample Date:	October 19, 2018	October 19, 2018	October 19, 2018	May 17, 2021	May 17, 2021	May 17, 2021	May 17, 2021	May 17, 2021	October 19, 2018	May 17, 2021
		Laboratory Sample ID:	9641876	9641879	9641877	2478945	2478991	2478993	2478992	9641881	2478995	
Parameter	Units	Method Detection Limit (MDL)	MECP Table 3 Standards Coarse Grain Soil									
Petroleum Hydrocarbons (PHCs)												
F1 PHCs (C6-C10)	ug/L	25	750	ND	ND	ND	ND	ND	ND	ND	-	-
F2 PHCs (C10-C16)	ug/L	100	150	170	ND	ND	ND	ND	ND	ND	-	-
F3 PHCs (C16-C34)	ug/L	100	500	860	ND	ND	ND	ND	ND	ND	-	-
F4 PHCs (C34-C50)	ug/L	100	500	170	ND	ND	ND	ND	ND	ND	-	-
Volatile Organic Compounds (VOCs)												
Acetone	ug/L	1.0	130000	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ug/L	0.20	44	0.49	0.85	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ug/L	0.40	85000	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ug/L	0.10	380	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ug/L	0.20	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ug/L	0.20	0.79	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ug/L	0.10	630	0.64	1.3	ND	ND	ND	ND	ND	ND	ND
Chloroform	ug/L	0.20	2.4	ND	ND	ND	ND	ND	23.9	ND	ND	ND
Dibromochloromethane	ug/L	0.10	82000	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/L	0.40	4400	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ug/L	0.10	4600	ND	0.14	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ug/L	0.10	9600	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ug/L	0.10	8	0.79	1.6	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/L	0.30	320	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/L	0.20	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	ug/L	0.30	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	ug/L	0.20	1.6	ND	0.27	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	ug/L	0.20	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/L	0.20	16	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropene, total	ug/L	0.30	5.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ug/L	0.10	2300	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylene dibromide (dibromoethane, 1,2)	ug/L	0.10	0.25	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexane	ug/L	0.20	51	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Ethyl Ketone (2-Butanone)	ug/L	1.0	470000	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Isobutyl Ketone	ug/L	1.0	140000	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether	ug/L	0.20	190	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/L	0.30	610	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ug/L	0.10	1300	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ug/L	0.10	3.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/L	0.10	3.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	ug/L	0.20	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/L	0.20	18000	ND	0.32	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/L	0.30	640	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/L	0.20	4.7	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethylene	ug/L	0.20	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ug/L	0.40	2500	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ug/L	0.17	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
m/p-Xylene	ug/L	0.20	NV	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ug/L	0.10	NV	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes, total	ug/L	0.20	4200	ND	ND	ND	ND	ND	ND	ND	ND	ND
Polycyclic Aromatic Hydrocarbons												
Acenaphthene	ug/L	0.20	600	-	-	-	ND	ND	ND	ND	-	-
Acenaphthylene	ug/L	0.20	1.8	-	-	-	ND	ND	ND	ND	-	-
Anthracene	ug/L	0.10	2.4	-	-	-	ND	ND	ND	ND	-	-
Benzo[a]anthracene	ug/L	0.20	4.7	-	-	-	ND	ND	ND	ND	-	-
Benzo[a]pyrene	ug/L	0.01	0.81	-	-	-	ND	ND	ND	ND	-	-
Benzo[b]fluoranthene	ug/L	0.10	0.75	-	-	-	ND	ND	ND	ND	-	-
Benzo[g,h,i]perylene	ug/L	0.20	0.2	-	-	-	ND	ND	ND	ND	-	-
Benzo[k]fluoranthene	ug/L	0.10	0.4	-	-	-	ND	ND	ND	ND	-	-
Chrysene	ug/L	0.10	1	-	-	-	ND	ND	ND	ND	-	-
Dibenzo[a,h]anthracene	ug/L	0.20	0.52	-	-	-	ND	ND	ND	ND	-	-
Fluoranthene	ug/L	0.20	130	-	-	-	ND	ND	ND	ND	-	-
Fluorene	ug/L	0.20	400	-	-	-	ND	ND	ND	ND	-	-
Indeno[1,2,3-cd]pyrene	ug/L	0.20	0.2	-	-	-	ND	ND	ND	ND	-	-
1-Methylnaphthalene	ug/L	0.20	1800	-	-	-	ND	ND	ND	ND	-	-
2-Methylnaphthalene	ug/L	0.20	1800	-	-	-	ND	ND	ND	ND	-	-
Methylnaphthalene (1&2)	ug/L	0.20	1800	-	-	-	ND	ND	ND	ND	-	-
Naphthalene	ug/L	0.20	1400	-	-	-	ND	ND	ND	ND	-	-
Phenanthrene	ug/L	0.10	580	-	-	-	ND	ND	ND	ND	-	-
Pyrene	ug/L	0.20	68	-	-	-	ND	ND	ND	ND	-	-
Metals												
Mercury	ug/L	0.02	0.29	ND	ND	ND	ND	ND	ND	ND	-	-
Antimony	ug/L	1.0	20000	ND	ND	ND	ND	ND	ND	ND	-	-
Arsenic	ug/L	1	1900	3.1	ND	ND	1.8	5.1	6.6	4.6	-	-
Barium	ug/L	1	29000	680	688	1110	102	1130	1110	227	-	-
Beryllium	ug/L	0.5	67	ND	ND	ND	ND	ND	ND	ND	-	-
Boron	ug/L	10	45000	54.8	62.8	20	278	24.3	24.8	16.4	-	-
Cadmium	ug/L	0.1	2.7	ND	ND	ND	ND	ND	ND	0.28	-	-
Chromium	ug/L	1	810	12.6	10	14.5	ND	ND	ND	ND	-	-
Chromium (VI)	ug/L	10	140	ND	ND	ND	ND	ND	ND	ND	-	-
Cobalt	ug/L	0.5	66	1.2	1.3	ND	ND	ND	ND	ND	-	-
Copper	ug/L	0.5	87	ND	ND	2.2	ND	ND	ND	ND	-	-
Lead	ug/L	0.1	25	ND	ND	ND	ND	0.62	0.53	ND	-	-
Molybdenum	ug/L	0.5	9200	1.5	1.8	1.3	0.73	ND	ND	ND	-	-
Nickel	ug/L	1	490	ND	ND	ND	ND	ND	ND	ND	-	-
Selenium	ug/L	1	63	ND	ND	ND	ND	ND	ND	1.4	-	-
Silver	ug/L	0.1	1.5	ND	ND	ND	ND	ND	ND	ND	-	-
Sodium	ug/L	200	2300000	ND	ND	ND	ND	ND	ND	ND	-	-
Thallium	ug/L	0.1	510	ND	ND	1.5	1	ND	ND	1.38	-	-
Uranium	ug/L	0.1	420	3.3	2.8	4.1	ND	0.48	0.47	ND	-	-
Vanadium	ug/L	0.5	250	ND	ND	6	ND	ND	66.3	15.7	-	-
Zinc	ug/L	5	1100	ND	ND	ND	ND	ND	ND	ND	-	-
General Inorganics												
Cyanide, free	ug/L	2	66	ND	ND	ND	ND	ND	ND	ND	-	-
pH	pH Units	0.1	NV	7.09	7.12	7.57	7.78	7.43	7.48	7.75	-	-
Chloride	mg/L	0.10	2300	1150	1130	1400	83.1	925	928	316	-	-
Sodium	mg/L	0.05	2300	384	385	606	84.4	292	291	132	-	-
Electrical Conductivity	uS/cm	NV	NV	3603	3640	4580	768	3340	3290	1540	-	-

NV - No value listed in MECP site condition standards

- - Not Analyzed

ND - Not detected above laboratory method detection limits

Exceeds MECP site condition standards

BH3S-101918 - Sampling Completed by GHD - 2019 GHD Phase Two ESA

Appendix A

Sampling and Analysis Plan

(GHD, 2018)



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Attachment A Proposed Borehole/Monitoring Well Locations



1. Background

A Phase Two Environmental Site Assessment is to be completed for the mixed commercial/institutional property identified as 2831, 2851, and 2865 DuMaurier Avenue in Ottawa, Ontario ("Site") to investigate the areas of potential environmental concern (APECs) identified by the Phase One ESA.

The Phase One ESA identified

- PCA#1 / APEC#1 (Item 30: Importation of Fill Material of Unknown Quality) | On-Site, importation of Fill material of unknown environmental quality used for grading the Site, specifically, for infilling previously observed drainage features at the Site.
- PCA#2 / APEC#2 (Item 58: Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosolids as soil conditioners) | Off-Site, a former landfill Site was identified to the east of DuMaurier Avenue, approximately 20 m east of the Site.

The contaminants of potential concern (CPCs) to be assessed as part of the Phase Two Environmental Site Assessment in the soil and groundwater are:

- APEC#1 | VOCs, Metals, PAHs
- APEC#2 | VOCs, Metals, PAHs

Select boreholes/monitoring wells placed in locations of the Site will be sampled to provide an assessment of the Contaminants of Potential Concern (CPCs) in the vicinity of each APEC.

Should additional contaminants be suspected during the course of the drilling program, additional sampling should be discussed with the project manager to determine appropriate analytical testing.

2. Specific Objectives

The following are the specific objectives of the planning of the site investigation component this Phase Two Environmental Site Assessment, as stated in O. Reg. 153/04:

1. Plan an investigation that will achieve the general objectives of a Phase Two Environmental Site Assessment:
 - Through the use of appropriate and complete information base concerning the Phase Two property.
 - Through the conduct of an investigation based both on information obtained before the Phase Two Environmental Site Assessment begins and on the incorporation of information obtained during the Phase Two Environmental Site Assessment.
2. To develop a sampling and analysis plan that will adequately assess all areas of the Phase Two property where contaminants may be present in land or water on, in or under the property.



3. To develop a quality assurance program that is designed to effectively limit errors and bias in sampling and analysis through implementation of assessment and control measures that will ensure data are useful, appropriate and accurate in the determination of whether the Phase Two property, meets applicable site condition criteria.

3. Utility Service Clearances

Public and private utility service clearances will be provided to the field technician prior to commencing the drilling program. The project manager must be contacted immediately should any conflicts arise during the drilling program with the locations of underground services and the proposed borehole locations. Service clearances are included with the field instructions.

4. Specific Requirements

4.1 Media for Investigation

- Overburden soil sampling will be conducted on the day(s) of drilling.
- Groundwater monitoring wells will be installed during the drilling program to facilitate the collection of groundwater samples at a later date.
- No sediment is present on the Site, as such; sediment sampling will not be conducted as part of this investigation.
- No surface water bodies are present on the Site, as such; surface water sampling will not be conducted as part of this investigation.

4.2 Locations and Depths for Sampling

Locations

The proposed seven borehole locations are illustrated on the Proposed Borehole Location Plan sketch attached as Attachment A.

- Five boreholes advanced to practical auger refusal
- Approximately 1.5 m coring of bedrock at three borehole locations following refusal
- Install groundwater monitoring wells in all borehole locations including one nested well

The approximate locations and labelling of the boreholes/monitoring wells are indicated on the provided plan.

Depths

Continuous soil samples will be collected from the boreholes in 0.6 m intervals using stainless steel split spoons. Soil sampling will be conducted from ground surface down to proposed drilling depth (bedrock refusal).



Three of the groundwater monitoring wells will be screened screens within the upper layers of the bedrock. Two of the wells will be screened in the overburden material. Screens should be limited to a maximum wetted length of 3.0 m and a minimum total length of 1.5 m. The base of monitoring well screens used to assess PHCs should extend approximately 1.0 m below the expected groundwater table based on field observations. If additional drilling is required to intercept the groundwater table, please contact the project manager. Screens shall have a sand pack that extends a minimum of 0.15 m above the screen and must be sealed with a bentonite hole plug with a thickness of at least 0.6 m. If the depth of the groundwater and maximum screen length permits, monitoring well screens should straddle the groundwater table interface.

4.3 Parameters for Laboratory Analysis

Soil

A total of five original samples plus one duplicate sample will be selected for lab analysis. The following soil samples from the suggested depths below are suggestions for submittal for laboratory analysis of the specified analytical parameters:

Table 4.1 Soil Sampling

Location	Analytical Parameter	Approximate Depth/Stratigraphy
All Boreholes	Metals, PAHs, pH	Sample <ul style="list-style-type: none"> Near water table interface, or Just above impermeable layer or Fill layer, or Area of obvious contamination
Duplicate Sample	DUP-1	Any material sampled for Metals, PAHs, and pH
Worst Case	Reg. 558 – Iaflesche unknown petroleum package	Select 1 sample for leachate (TCLP) Metal, Flashpoint, PAH, VOC, and PAH testing from borehole with most evident contamination. Bulk sample from the same borehole should be worst case soil followed by TCLP sample.

Should contamination be detected in other locations or evident contamination requiring vertical delineation is suspected in any borehole, this should be discussed with the project manager immediately.

Soil Jarring requirements:

- Metals, PAHs, pH – one large soil jar and one vial
- Reg. 558 TCLP – three large soil jars

Should any visually or olfactory observations be made with respect to the potential presence of contaminants in the soil at a specific depth in a particular borehole location, the soil sample with the suspected contaminants will be submitted for laboratory analysis in lieu of the sample depth referenced in the table above.



Groundwater

The following groundwater samples from the screened intervals will be submitted for laboratory analysis of the specified analytical parameters:

Table 4.2 Groundwater Sampling

Location	Analytical Parameters	Approximate Depth of Sample
All wells	Metals, VOCs, BTEX, pH	Screened Interval
Duplicate	DUP-1-Duplicate of Metals, VOCs, BTEX, pH	1/10 samples
Trip Blank	VOC	1/cooler

Should contamination be detected in other locations or evident contamination, this should be discussed with the project manager immediately.

5. Quality Assurance/Quality Control

5.1 Decontamination of Sampling Equipment

All non-dedicated sampling equipment such as stainless steel split spoons will be washed between uses.

Water level monitoring equipment, including water level meters and interface probes will be decontaminated with Alconox and rinsed with deionized water between water level readings to prevent cross contamination.

5.2 Field Duplicates

Field duplicate samples shall be collected in each medium (soil and groundwater) being sampled. At least one field duplicate sample will be submitted for laboratory analysis for every ten samples submitted for laboratory analysis.

Field duplicates will be selected from samples which have the greatest probability of environmental contamination (i.e., where field observations indicate potential contamination is present). A duplicate sample will be selected should the presence of contamination be suspected in any of the soil or groundwater samples.

5.3 Trip Blanks

One laboratory prepared trip blank shall be analyzed for VOC when submitting groundwater samples for analysis.

5.4 Soil Vapour Screening

All soil samples will be screened for organic vapours in the field using a Photoionization detector (PID) in the field. Soil samples with notably elevated combustible gas concentrations should be discussed with the Project Manager and may be selected for laboratory analysis.



6. Standard Operating Procedures

GHD standard operating procedures (SOP) shall be used during borehole drilling and soil sampling. Deviations to the SOP shall be discussed with the project manager.

6.1 Well Development

Groundwater monitoring wells will be developed on the day of drilling. At least three and up to ten well volumes will be removed from the monitoring wells in order to remove all sediment from the wells. In cases where the monitoring well goes dry prior to purging three well volumes, the well should be purged dry a minimum of three times, waiting approximately 30 minutes between purging events. Waterra tubing should be removed from the monitoring wells following well development.

6.2 Borehole Locating

The locations of all boreholes and monitoring wells must be measured in the field on the day of drilling. Borehole locations should be measured with respect to building corners or known property boundaries and shown on a plan.

6.3 Elevation Survey

An elevation survey of all boreholes and monitoring wells will be conducted following the completion of the drilling program. A fixed temporary benchmark should be used as a reference elevation; the top of the spindle of a fire hydrant is preferred for this purpose as geodetic elevations can be obtained for these points. The ground surface elevation of all boreholes should be surveyed. The top of riser of each monitoring well should also be surveyed; this will ensure maximum accuracy in the interpretation of groundwater elevations.

6.4 Groundwater Elevation Survey

Following a period of stabilization (one week is recommended) a groundwater elevation survey will be completed for all monitoring wells. The depth to groundwater is recorded prior to disturbance of the water column and is recorded with respect to the top of riser of the monitoring well.

6.5 Groundwater Sampling

Groundwater sampling is conducted following the collection of groundwater elevations. A peristaltic pump or Waterra tubing and footvalve are used for groundwater sampling. The wells are purged of standing water by removing at least one well volume. Samples are collected in dedicated bottles prepared by the laboratory. Samples are field filtered in the case of metals sampling.

Appendix B

Underground Utility Locates

(2018)

Monique Larocque

From: Solutions@on1call.com
Sent: Wednesday, September 19, 2018 10:51 AM
To: moniquel@usl-1.com
Subject: Request 20183813706
Attachments: MapSelection_19092018_10492764.png; GHD.2831_Du_Maurier.png

<<https://www.on1call.com/wp-content/themes/ooc/images/ooc-logo-2.png>> LOCATE REQUEST CONFIRMATION

TICKET #: 20183813706 REQUEST PRIORITY: STANDARD REQUEST TYPE: REGULAR WORK TO BEGIN DATE:
09/26/2018

Update of Ticket # Project # Transmit date: 09/19/2018 10:51:00 AM

REQUESTOR'S CONTACT INFORMATION

Contractor ID#: 202 Company Phone #: (613) 226-8750
Contact Name: JACQUES DESJARDINS Cell #:
Alternate Contact Name: JEFF FORRESTER Fax #: (613) 226-8677
Company name: U S L Email: moniquel@usl-1.com
Address: 775 TAYLOR CREEK DR Alternate Contact #:

DIG INFORMATION

Region/County: OTTAWA Type of work: BORE HOLES Mark & Fax: NO
Community: Max Depth: 32.81 FT Area is not marked: NO
City: OTTAWA Machine Dig: YES Area is marked: YES
Address: 2831, DUMAURIER AVE To 2865 Hand Dig: NO Site Meet Req.: NO
Directional Drilling: NO Work being done for: GHD
Intersecting Street 1: RAMSEY CRES Public Property: YES
Intersecting Street 2: WATSON ST Private Property: YES

DETAILED DESCRIPTION OF WORK REMARKS

CORLOT=U Drilling throughout properties. Clear all of 2831 to 2865 Dumaurier Ave to all property lines and to sidewalk edge on Dumaurier Ave. Civic # 2831, 2833, 2835, 2865.

MEMBERS NOTIFIED: The following owners of underground infrastructure in the area of your excavation site have been notified.

Member name	Station Code	Initial Status
HYDRO OTTAWA (HOT1)	HOT1	Notification sent
PROMARK FOR ENBRIDGE GAS (ENOE01)	ENOE01	Notification sent
CITY OF OTTAWA WATER/SEWER (OTWAWS01)	OTWAWS01	Notification sent
BLACK AND MC DONALD FOR CITY OF OTTAWA STREET LIGHTS (OTWASL01)	OTWASL01	Notification sent
CLI FOR ROGERS (ROGOTT01)	ROGOTT01	Notification sent
PROMARK FOR BELL CANADA (BCOE01)	BCOE01	Notification sent

MAP SELECTION: Map Selection provided by the excavator through Ontario One Call's map tool or through agent interpretation by phone

CONTRACTOR'S SKETCH: A file provided directly by the excavator, not generated by Ontario One Call:

IMPORTANT INFORMATION: Please read.

Defining "NC" - Non-Compliant

- Non-compliant members have not met their obligations under section 5 of the Ontario Underground Infrastructure Notification Act. ON1Call has notified these members to ensure they are aware of your excavation. In this circumstance, should the member not respond, the excavator should contact the member directly to obtain their locates or request a status. ON1Call will not be provided with a locate status from the member regarding this ticket and therefore, cannot provide further information at this time. For locate status contact information please refer to our website.

You have a valid locate when...

- You have reviewed your locate request information for accuracy. CONTACT Ontario One Call (ON1Call) IMMEDIATELY if changes are needed and obtain a corrected locate request confirmation.
- You have obtained locates or clearances from all ON1Call members listed in this ticket before beginning your dig.

You've met your obligations when...

- In addition to this locate request, you have DIRECTLY contacted all owners of infrastructure who ARE NOT current members of ON1Call (such as owned buried infrastructure on private property), as well as arranged for contract locates for your private lines on your private property - where applicable. For a list of locate status contacts visit www.on1call.com.
- You respect the marks and instructions provided by the locators and dig with care; the marks and locator instructions MUST MATCH.
- You have obtained any necessary permits from the municipality in which you are excavating.

What does "Cleared" mean in the "Initial Status" section?

1. The information that you have provided about your dig will not affect that member's underground infrastructure and they have provided you with a clearance, if anything about your excavation changes, please ensure that you update your ticket immediately.

What are the images under "Map Selection":

1. A drawing created by an excavator directly within Ontario One Call's web ticket tool, this is expected to be an accurate rendition of the dig site, and it is the excavator's responsibility to ensure the location matches the information they provide under the 'Dig Location' section OR;
2. A drawing created by an Ontario One Call agent, this drawing is based on a verbal description by phone of the area by the excavator. Agents may create drawings that are larger than the proposed dig to minimize risk of interpretation. It is the excavator's responsibility to review these map selections for accuracy. Changes can be made by the excavator through the web ticket tool, to learn how visit www.on1call.com/contractors.
3. All drawings dictate which members are notified.

PR MARK TELECOM		Primary Locate Sheet		UNION GAS EMERGENCY # 1-877-969-0999
Phone: 613-723-9888	Fax: 613-723-9277	Toll free: 1-800-371-8866	Email:	Request # 20183813706 NORMAL

Utilities Located: <input checked="" type="radio"/> Bell <input checked="" type="radio"/> Gas <input checked="" type="radio"/> Hydro Ottawa <input type="checkbox"/> Hydro One <input type="checkbox"/> Videotron <input type="checkbox"/> Lakefront Utilities <input type="checkbox"/> Veridian Connections		Revised Excavation Date <div style="text-align: center; font-size: 24px;">N/A</div> <small>mm/dd/yyyy</small>	Excavation Date 10/01/2018 00:00:00 <small>mm/dd/yyyy</small>	Status STANDARD
Requested by: JACQUES DESJARDINS	Company: USL	Phone: (613)-226-8750 ext.	Fax/email: (613)-226-8677 ext.	Homeowner <input type="checkbox"/> Contractor <input checked="" type="radio"/> Project <input type="checkbox"/>

Appt Date: <div style="text-align: center; font-size: 24px;">N/A</div> <small>mm/dd/yyyy</small>	Received Date: 09/19/2018 <small>mm/dd/yyyy</small>	Locate Address: 2831 to 2865, DUMAURIER AVE 1st Inters.: RAMSEY CRES 2nd Inters.: WATSON ST
---	---	---

Type of work: BORE HOLES	City: OTTAWA
-----------------------------	-----------------

Caller's Remarks:
 CIVIC # 2831, 2833, 2835, 2865.
 MACH. DIG
 CORLOT-U DRILLING THROUGHOUT PROPERTIES. CLEAR ALL OF 2831 TO 2865 DUMAURIER AVE TO ALL PROPERTY LINES AND TO SIDEWALK EDGE ON DUMAURIER AVE.
 -75.793499, 45.350499, NO_SEGMENTS:2, NO_PLAN:613 828, BOOED01, ROOTT01, OTWASL01, OTWAWSD1, ENOE01, HOT1

Bell Mark Clear	Enbridge Gas Mark Clear	Hydro Ottawa Mark Clear	Street Lighting Mark Clear	Lakefront Mark Clear	Hydro One Mark Clear	Veridian Mark Clear	Union Gas Mark Clear	Videotron Mark Clear
1	1	1						

LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE.

Records Reference: _ Map _ Network X # <input checked="" type="radio"/> G-MOBILE _ Byers <input checked="" type="radio"/> Datapak <input checked="" type="radio"/> LAC Multiviewer Field Notes: CPU1389 NE123 Other: 6N592-1, 6N4012-6 DPT Remarks:	_ Third Party Notification _____ <div style="border: 2px solid black; padding: 10px; text-align: center;"> <p>***DANGER DO NOT PROCEED***</p> <p>Buried high voltage cables within 1.5M of the located area. You MUST send locate to HOLsupervisions@hydroottawa.com or contact Hydro Ottawa at 613-738-6418 for further information.</p> <p>AFTER HOURS *EMERGENCY* NUMBER IS 613-738-6422</p> </div> <p style="text-align: center;">Apply Sticker Here if Required</p>
---	--

Excavator shall notify & receive a clearance from Utility prior to excavation for the following:
 Telecon High Priority Cable Central Office Vicinity N/A

Method of Field Marking: Paint Stakes Flags Offset Flags Other (Telecom=Orange, Gas=Yellow, Hydro Ott. =Red)

Caution: Locates are VOID after 30 days. Hydro One valid for 60 days. See Disclaimer for the specific Facility Owner's Guidelines.

Caution: Any changes to location or nature of work require new locate. The Excavator must not work outside the Located Area without a new locate. Privately owned services within the located area have not been marked - check with service/property owner. For all Locate requests including remarks contact: Ontario One Call at 1-800-400-2255 or www.on1call.com.

Locator Name: ROOTS DAN	Start Time: 9:00	_ Mark & Fax _ Left on Site <input checked="" type="radio"/> Emailed Print: N/A Signature: N/A
ID #: 1717	End Time: 14:00	
Date: 09/28/2018	Total Hours: 5HR	

A copy of this Primary Locate Sheet and Auxiliary Locate Sheet(s) must be on site and in the hands of the machine operator during work operations. If sketch and markings do not coincide, the Excavator must obtain a new locate.



Auxiliary Locate Sheet

Union Gas Emergency #
1-877-969-0999

Phone:
613-723-9888

Fax:
613-723-9277

Toll free:
1-800-371-8866

Email

Utilities Located: Bell Gas Hydro Ottawa Hydro One Videotron Pael Fibre Veridian connections

Date Located:
09/28/2018

Request #
20183813706

Number of Services marked: (Specify building/house numbers) N/A

LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE

FROM: N.AE OF SW OF RAMSAY CRES

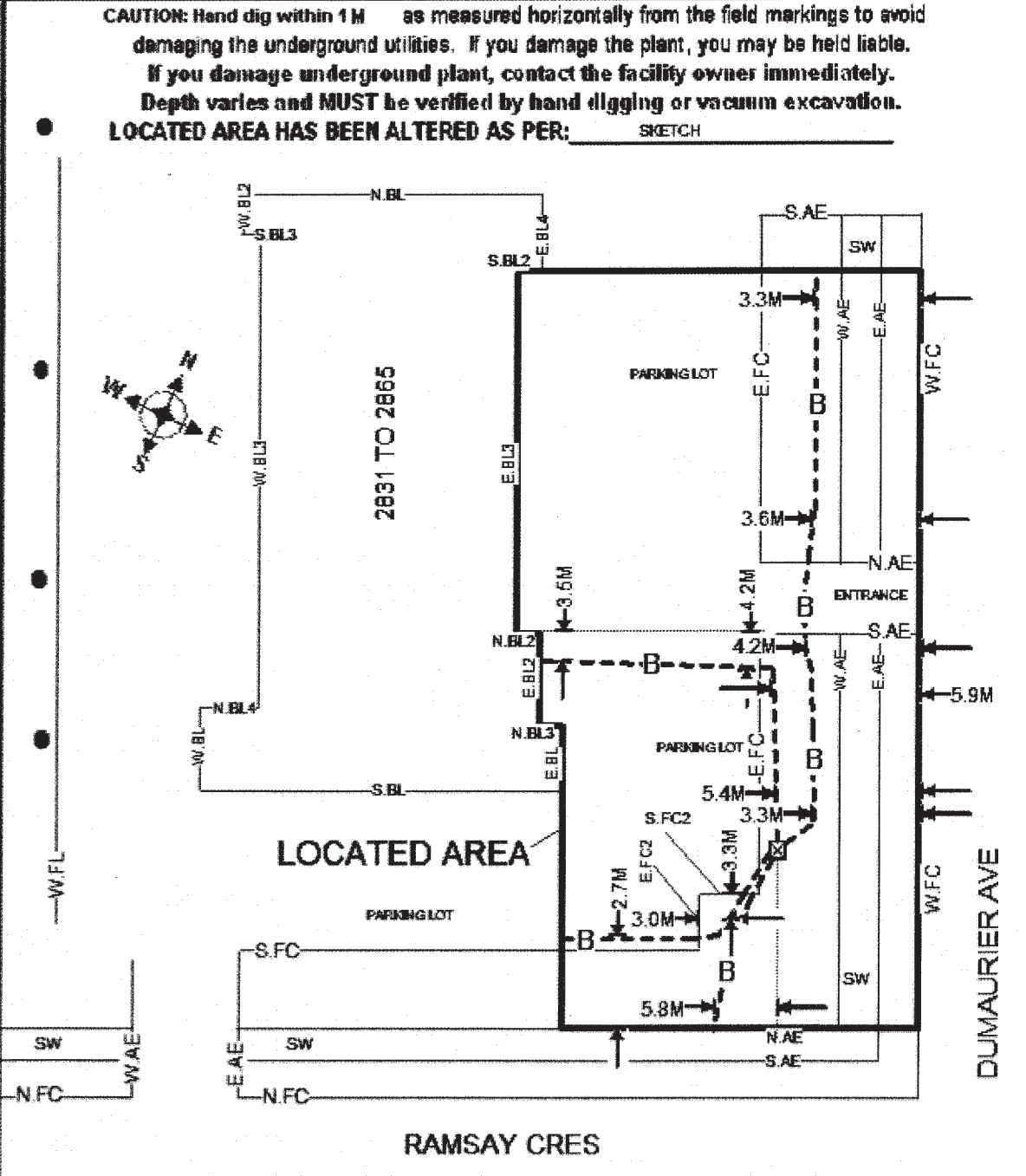
TO: S.BL2 OF 2831-2865 DUMAURIER AVE

FROM: E.BL3 OF 2831-2865 DUMAURIER AVE

TO: W.FC OF DUMAURIER AVE

CAUTION: Hand dig within 1M as measured horizontally from the field markings to avoid damaging the underground utilities. If you damage the plant, you may be held liable. If you damage underground plant, contact the facility owner immediately. Depth varies and MUST be verified by hand digging or vacuum excavation.
LOCATED AREA HAS BEEN ALTERED AS PER: SKETCH

- Legend**
- Building Line — BL
 - Fence Line — FL
 - Face of Curb — FC
 - Road Edge — RE
 - Property Line — PL
 - ASPHALT EDGE — AE
 - Driveway — DW
 - Catch Basin
 - Sidewalk
 - Demarcation
 - Railway
 - Pole
 - Flush to Grade Pedestal
 - Pedestal
 - Buried Cable — B
 - Conduit — C
 - Buried Service Wire — BSW
 - Manhole
 - Fibre Optic Cable — FO
 - Bell Hydro Service — HS
 - Gas Main — GM
 - Gas Service — GS
 - Gas Valve
 - Hydrant
 - Transformer
 - Hydro — H
 - Hydro Pole X
 - Street Light Cable — SL
 - Street Light
 - North N.
 - South S.
 - East E.
 - West W.



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Auxiliary Locate Sheet

Union Gas Emergency #
1-877-999-0999

Phone:
613-723-9888

Fax:
613-723-9277

Toll free:
1-800-371-8866

Email

Utilities Located: Bell Gas HydroOttawa Hydro One
 Videotron Peel Fibre Veridian connections

Date Located:
mm/dd/yyyy 09/28/2018

Request #
20183813706

Number of Services marked: (Specify building/house numbers) (0)

LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE

FROM: N.AE OF SW OF RAMSAY CRES

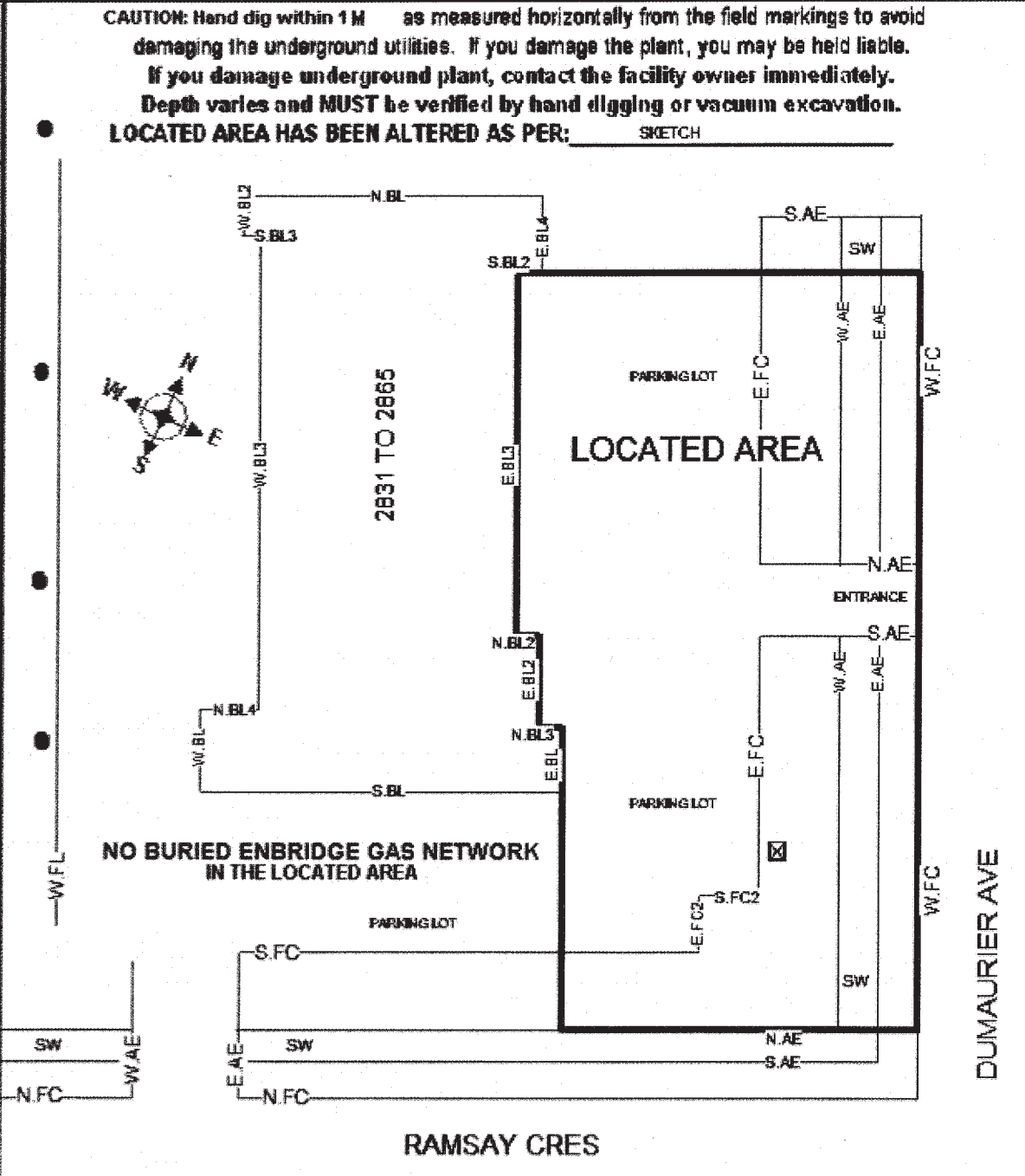
TO: S.BL2 OF 2831-2865 DUMAURIER AVE

FROM: E.BL3 OF 2831-2865 DUMAURIER AVE

TO: W.FC OF DUMAURIER AVE

CAUTION: Hand dig within 1M as measured horizontally from the field markings to avoid damaging the underground utilities. If you damage the plant, you may be held liable. If you damage underground plant, contact the facility owner immediately. Depth varies and MUST be verified by hand digging or vacuum excavation. LOCATED AREA HAS BEEN ALTERED AS PER: SKETCH

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 - Railway
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 - Flush to Grade Pedestal
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 - Buried Service Wire — BSW
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Auxiliary Locate Sheet

Union Gas Emergency #
1-877-969-0999

Phone:
613-723-9888

Fax:
613-723-9277

Toll free:
1-800-371-8866

Email

Utilities Bell Gas Hydro Ottawa Street Lighting
 Located: Blink Peel Fibre

Date Located:
mm/dd/yyyy 09/28/2018

Request # 20183813706

Number of Services marked: (Specify building/house numbers) N/A

LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE

FROM: N.AE OF SW OF RAMSAY CRES

TO: S.BL2 OF 2831-2865 DUMAURIER AVE

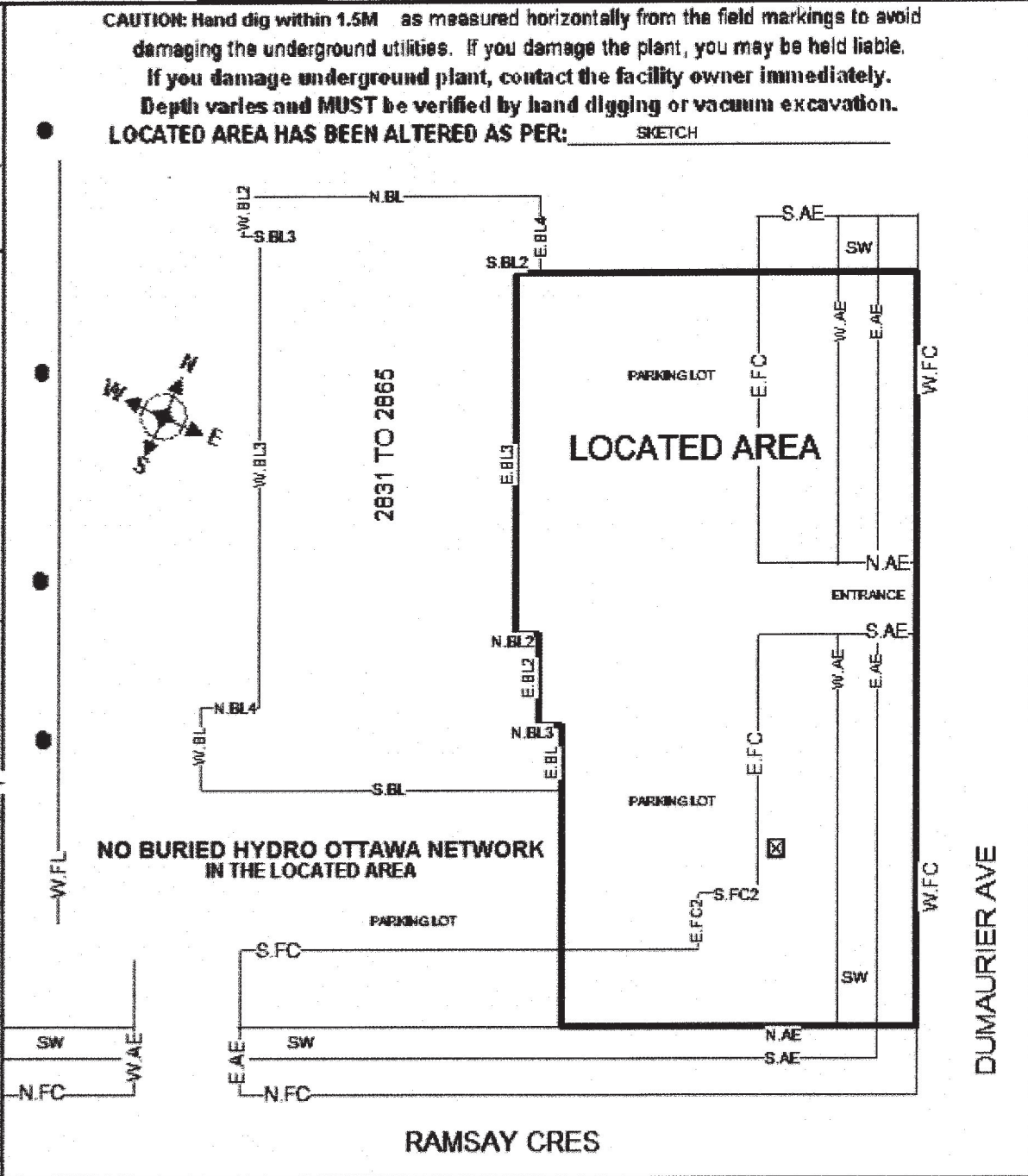
FROM: E.BL3 OF 2831-2865 DUMAURIER AVE

TO: W.FC OF DUMAURIER AVE

CAUTION: Hand dig within 1.5M as measured horizontally from the field markings to avoid damaging the underground utilities. If you damage the plant, you may be held liable. If you damage underground plant, contact the facility owner immediately. Depth varies and MUST be verified by hand digging or vacuum excavation.

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- Legend**
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 - Fence Line — FL—
 - Face of Curb — FC—
 - Road Edge — RE—
 - Property Line — PL—
 - ASPHALT EDGE — AE
 - Driveway — DW—
 - Catch Basin
 - Sidewalk
 - Demarcation
 - Railway
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 - Flush to Grade Pedestal
 - Pedestal
 - Buried Cable — B—
 - Conduit — C—
 - Buried Service Wire — BSW—
 - Manhole
 - Fibre Optic Cable — FO—
 - Gas Main — GM—
 - Gas Service — GS—
 - Gas Valve
 - Hydrant
 - Transformer
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 - Hydro Pole X
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Auxiliary Locate Sheet

Union Gas Emergency #
1-877-969-0999

Phone:
613-723-9888

Fax:
613-723-9277

Toll free:
1-800-371-8866

Email

Utilities Located: Bell Gas Hydro Ottawa Hydro One Videotron Past Fibre Veridian connections

Date Located:
mm/dd/yyyy 09/28/2018

Request #
20183813706

Number of Services marked: (Specify building/house numbers) N/A

LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE

FROM: W.FL OF 2831-2865 DUMAURIER AVE

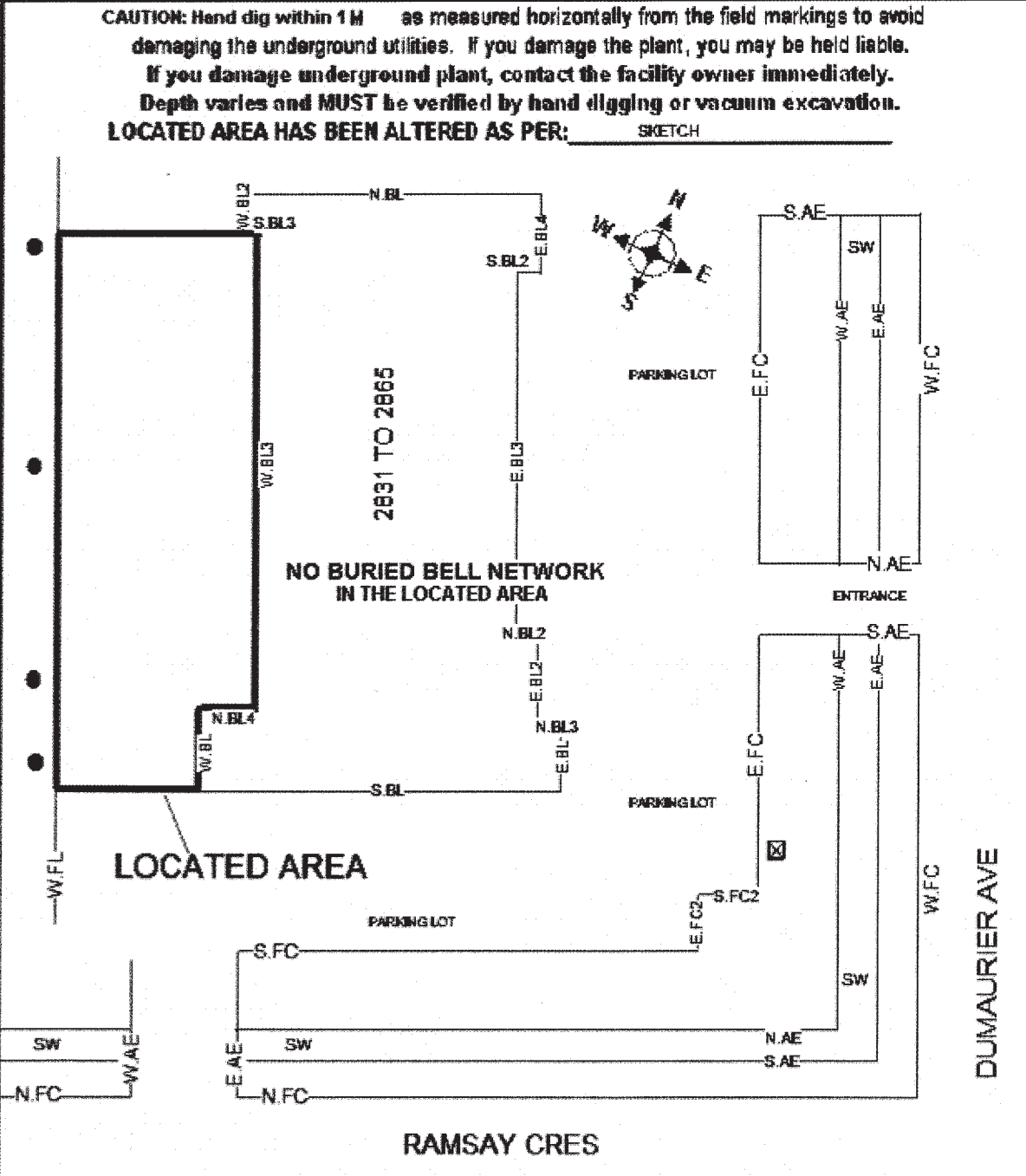
TO: W.BL3 OF 2831-2865 DUMAURIER AVE

FROM: S.BL OF 2831-2865 DUMAURIER AVE

TO: S.BL3 OF 2831-2865 DUMAURIER AVE

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Auxiliary Locate Sheet

Union Gas Emergency #
1-877-969-0999

Phone:
613-723-9888

Fax:
613-723-9277

Toll free:
1-800-371-8866

Email

Utilities Located: Bell Gas HydroOttawa Hydro One Videotron Paet Fibre Veridian connections

Date Located:
mm/dd/yyyy 09/28/2018

Request #
20183813706

Number of Services marked: (Specify building/house numbers) (0)

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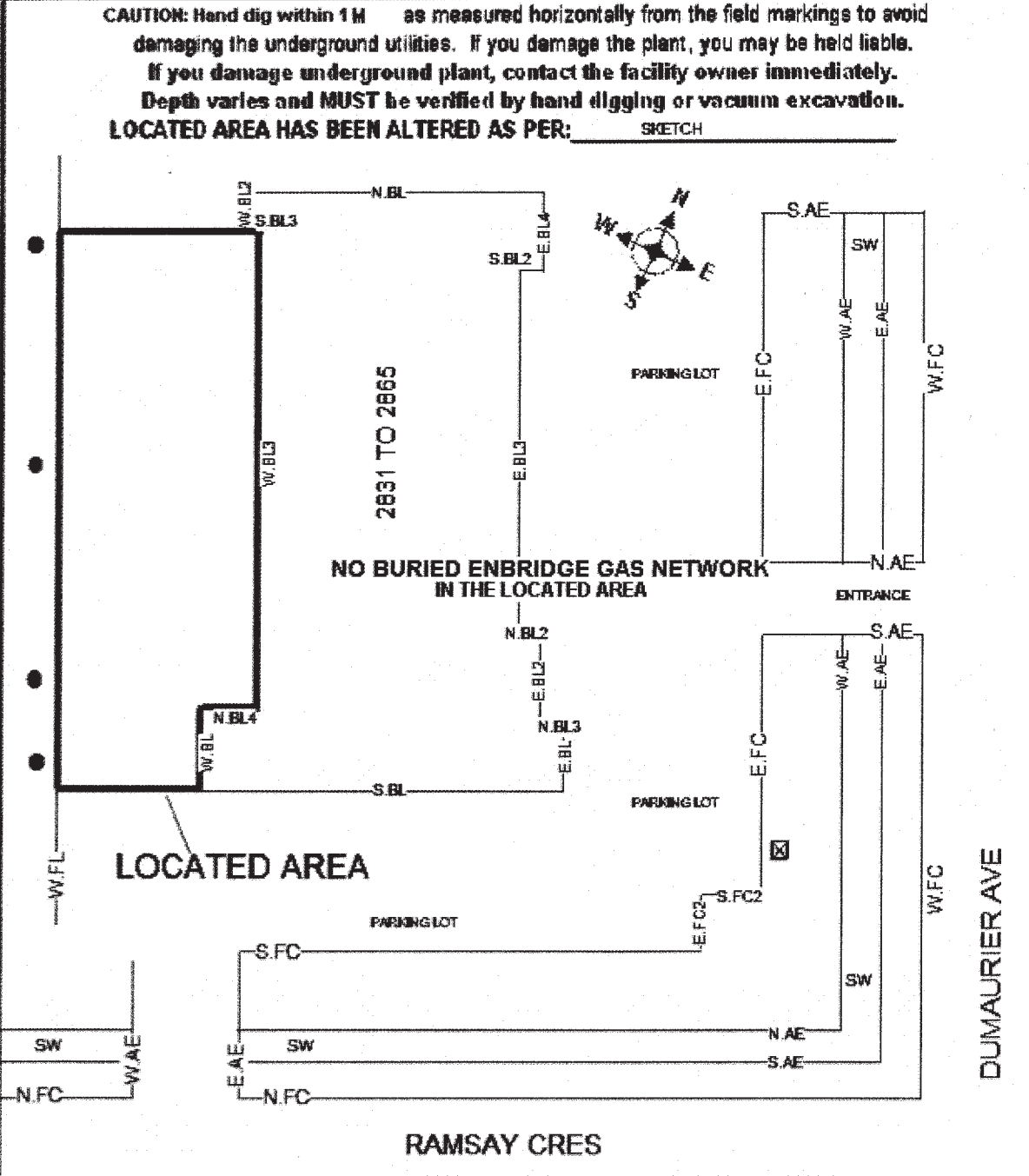
TO: W.BL3 OF 2831-2865 DUMAURIER AVE

FROM: S.BL OF 2831-2865 DUMAURIER AVE

TO: S.BL3 OF 2831-2865 DUMAURIER AVE

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 - Railway
 - Pole
 - Flush to Grade Pedestal
 - Pedestal
 - Buried Cable
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Auxiliary Locate Sheet

Union Gas Emergency #
1-877-999-0990

Phone:
613-723-9888

Fax:
613-723-9277

Toll free:
1-800-371-8866

Email

Utilities Bell Gas Hydro Ottawa Street Lighting
 Located: Blink Peel Fibre

Date Located:
mm/dd/yyyy 09/28/2018

Request # 20183813706

Number of Services marked: (Specify building/house numbers) N/A

LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE

FROM: W.FL OF 2831-2865 DUMAURIER AVE

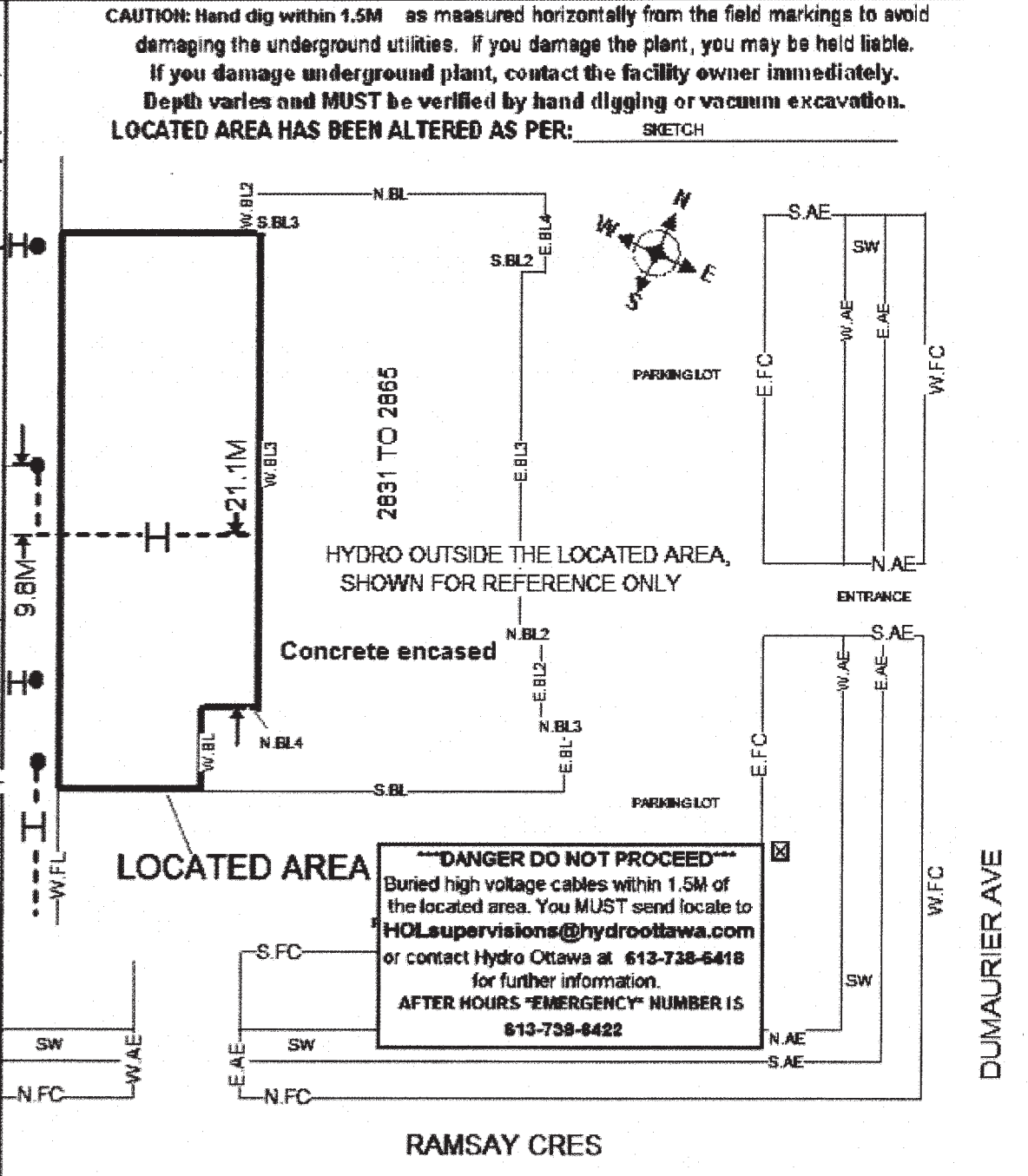
TO: W.BL3 OF 2831-2865 DUMAURIER AVE

FROM: S.BL OF 2831-2865 DUMAURIER AVE

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 - Flush to Grade Pedestal
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 - Buried Cable — B —
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Auxiliary Locate Sheet

Union Gas Emergency #
1-877-969-0999

Phone:
613-723-9888

Fax:
613-723-9277

Toll free:
1-800-371-8866

Email

Utilities Located: Bell Gas Hydro Ottawa Hydro One Videotron Peel Fibre Veridian connections

Date Located: 09/28/2018

Request # 20183813706

Number of Services marked: (Specify building/house numbers) N/A

LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE

FROM: 27.0M SOUTH OF N.FL OF 2831-2865 DUMAURIER AVE

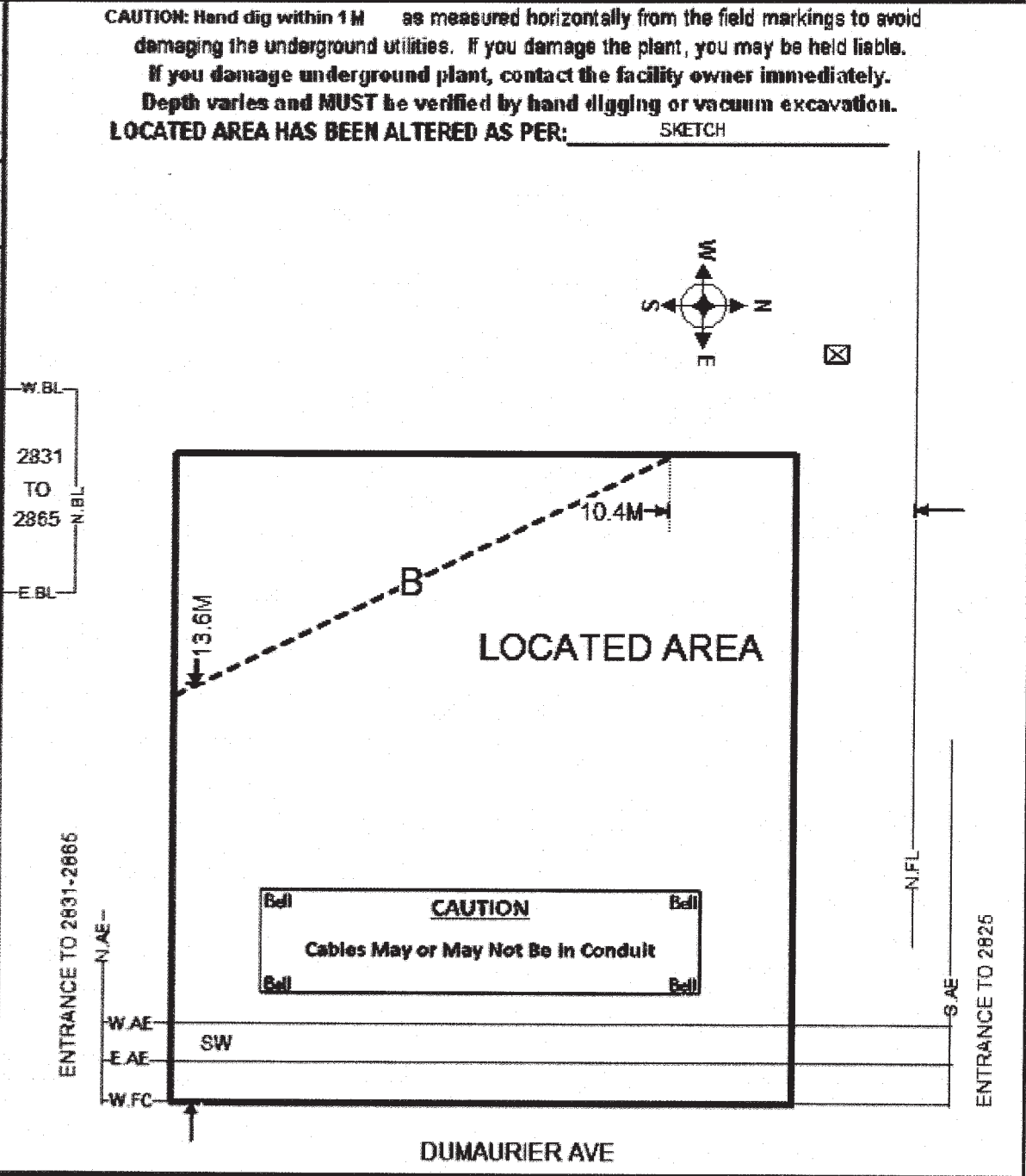
TO: 6.0M SOUTH OF N.FL OF 2831-2865 DUMAURIER AVE

FROM: W.FC OF DUMAURIER AVE

TO: 25.0M WEST OF W.FC OF DUMAURIER AVE

CAUTION: Hand dig within 1M as measured horizontally from the field markings to avoid damaging the underground utilities. If you damage the plant, you may be held liable. If you damage underground plant, contact the facility owner immediately. Depth varies and MUST be verified by hand digging or vacuum excavation. LOCATED AREA HAS BEEN ALTERED AS PER: SKETCH

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 - Pedestal
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Union Gas Emergency #
1-877-969-0999

Phone:
613-723-9888

Fax:
613-723-9277

Toll free:
1-800-371-9866

Email

Utilities Located: Bell Gas HydroOttawa Hydro One
 Videotron Pool Fibre Veridian connections

Date Located:
mm/dd/yyyy 09/28/2018

Request #
20183813706

Number of Services marked: (Specify building/house numbers) (0)

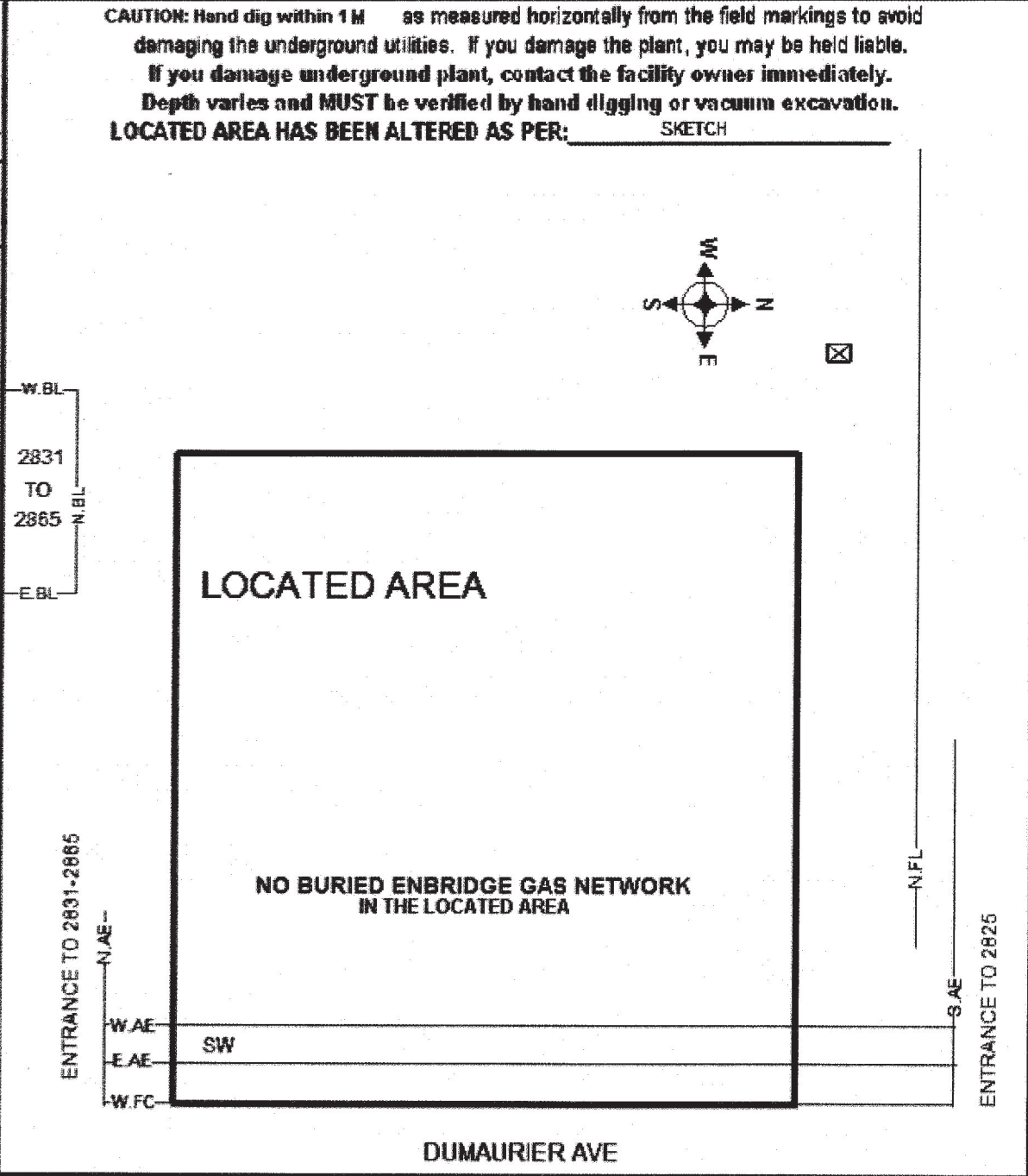
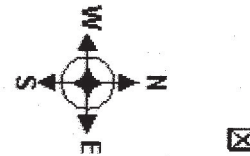
LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE

FROM: 27.0M SOUTH OF N.FL OF 2831-2865 DUMAURIER AVE
FROM: W.FC OF DUMAURIER AVE

TO: 6.0M SOUTH OF N.FL OF 2831-2865 DUMAURIER AVE
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Union Gas Emergency #
1-877-969-0999

Phone:
613-723-9888

Fax:
613-723-9277

Toll free:
1-800-371-8866

Email

Utilities Bell Gas Hydro Ottawa Street Lighting
 Located: Blink Peel Fibre

Date Located:
mm/dd/yyyy 09/28/2018

Request # 20183813706

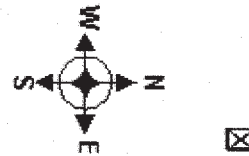
Number of Services marked: (Specify building/house numbers) N/A

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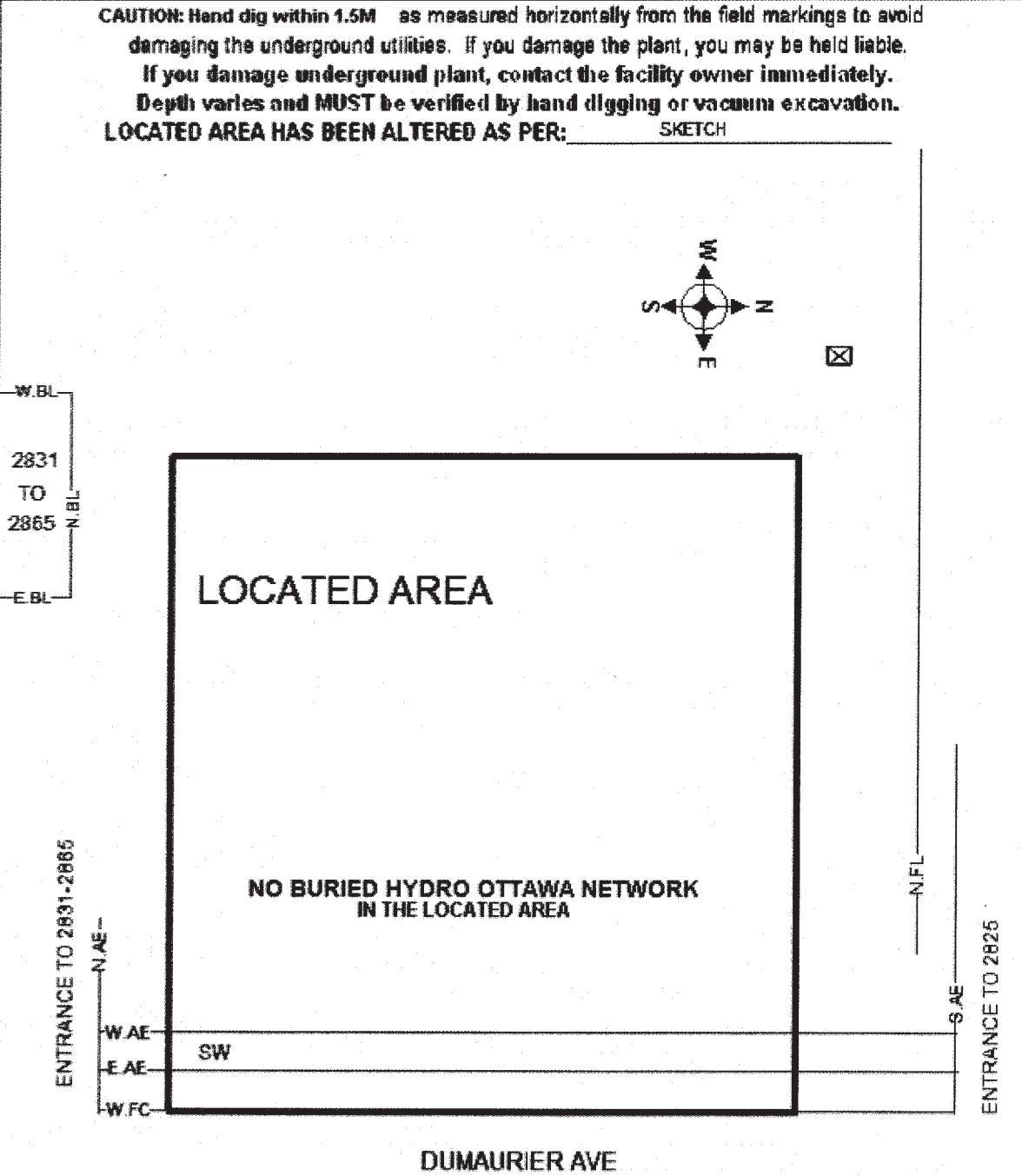
FROM: 27.0M SOUTH OF N.FL OF 2831-2865 DUMAURIER AVE
 FROM: W.FC OF DUMAURIER AVE

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MESSAGE REGARDING REQUESTED LOCATE

Dear Excavator,

Hydro One has completed your locate request based on the information you provided to Ontario One Call. The underground facility locate on our **Distribution system** is valid for **60 days** from the date shown on the Underground Cable Stakeout Report attached. The 60 day validity does not include Transmission locate requests. Please be aware new underground facilities can be installed any time after this locate was completed. It is your responsibility to contact Ontario One Call for a new locate if any changes are known or suspected or for a Relocate if excavation continues beyond 60 days.

Hydro One expects excavators to protect and preserve the paint marks and flags placed at the time of the original locate ticket. If markings are removed due to weather or excavation work, the excavator is expected to recreate the markings based on the tie-in measurements provided on the original locate ticket. However, if an excavator would like Hydro One to refresh their markings, please contact Ontario One Call at 1-800-400-2255 to request a Remark.

WARNINGS AND DISCLAIMERS:

Hand dig cautiously 1 meter around Hydro One's Red Paint Markings as indicated on the Underground Cable Stakeout Report. It is understood that the attached information has been provided from our records, and represents our knowledge of the approximate location of **Hydro One** plant only: the contractor must request stakeouts from other utilities to establish the location of their plant. The company or contractor must exercise extreme caution where mechanical equipment is used in the vicinity of the underground cable plant and where necessary to locate by hand its actual position. Liability for damages rests with the company or contractor.

Thank you,
Hydro One

20183922522

Bell

Dear Excavator:

We are in receipt of your recent request for a Bell relocate.

Please be advised that the original locate(s) issued for the request in question will remain valid for the duration of your project. If any of the exceptions below apply and you would like the site remarked for Bell or you would like to discuss your relocate request, please contact us during business hours at **1-844-225-5550, Option # 8:**

- The excavator did not start their work within 60 days of the original locate completion date
- Tie in's/offsets used as measurements on the original Bell locate are no longer there
- The excavator suspects new Bell plant has been added in the locate area since the original locate
- The excavator has lost control of the site for an extended period of time (i.e. the excavation begins however the excavator has left site and did not return for 60 days or more)
- There is a sticker on your locate indicating there is a Bell Hydro line in the locate area and you're entitled to a Relocate of that area.

Bell expects excavators will protect and preserve the paint marks placed at the time of their original locate. If markings are removed due to weather or ongoing excavation work, the excavator is expected to recreate the markings based on the tie-in measurements provided on the original locate sheet.

If an excavator would like their markings refreshed they can contact the Bell LSP (Locate Service Provider) directly and arrange for this at the excavator's expense. The LSP contact information is available on the original locate sheet.

Sincerely,

Bell Screening Centre

DISCLAIMER

Warning!

The Excavator must have a copy of this locate on the job site during excavation.

Located Area: The Excavator must not work outside the area indicated by the Located Area in the Diagram without a further locate by the Company

Locate the plant: The plant location information provided is the best we have available but constitutes only an estimate. Depth of underground plant varies and the exact location must be determined by hand digging prior to excavation with mechanical equipment.

Mechanical equipment must not be used within one metre of the estimated location of the plant.

Hydro Ottawa must be notified prior to excavation and inspector on site

Expose the plant: Once the plant has been located by hand digging, it must be exposed along its length adjacent to or in the immediate vicinity of the proposed excavation. For this purpose, mechanical equipment must not be used within 0.5 metres of the plant.

Digging around the exposed plant: When the plant has been exposed, any further excavation within 0.3 metres, must only be done by hand digging and not with mechanical equipment.

Support Requirements: If the underground plant is exposed over a distance of more than 1.25 metres, the Facility Owner must be notified. Underground plant must be supported at all times.

O. Reg. 210/01 Oil and Gas Pipeline systems EXCERPTS

9. (1) No person shall dig, bore, trench, grade, excavate or break ground with mechanical equipment or explosives without first ascertaining the location of any pipeline that may be interfered with.

10. No person shall interfere with or damage any pipeline without authority to do so.

Technical Standards & Safety Act 2000 EXCERPT

37 (1) Every person who contravenes or fails to comply with any provision of this act or the regulations; etc... is guilty of an offense and on conviction is liable to a fine of not more than \$50,000 or to imprisonment for a term of not more than one year, or to both.

Caution: The markings may disappear or be misplaced. Should sketch and markings not coincide, Excavator must obtain a new locate. This is based on information given at the time. Any changes to location or nature of work require a new locate. The Excavator must not work outside the indicated Located Area without a further locate. Privately owned services within the located area have not been marked - check with service/property owner.

Locate is VOID after 30 days.

For remarks contact Ontario One Call 1-800-400-2255.
or www.on1call.com



DISCLAIMER

Warning!

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Located Area: The Excavator must not work outside the area indicated by the Located Area in the Diagram without a further locate by the Company

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10. No person shall interfere with or damage any pipeline without authority to do so.

Technical Standards & Safety Act 2000 EXCERPT

37 (1) Every person who contravenes or fails to comply with any provision of this act or the regulations; etc... is guilty of an offense and on conviction is liable to a fine of not more than \$50,000 or to imprisonment for a term of not more than one year, or to both.

Caution: The markings may disappear or be misplaced. Should sketch and markings not coincide, Excavator must obtain a new locate. This is based on information given at the time. Any changes to location or nature of work require a new locate. The Excavator must not work outside the indicated Located Area without a further locate. Privately owned services within the located area have not been marked - check with service/property owner.

Locate is VOID after 30 days.

For remarks contact Ontario One Call 1-800-400-2255.
or www.on1call.com



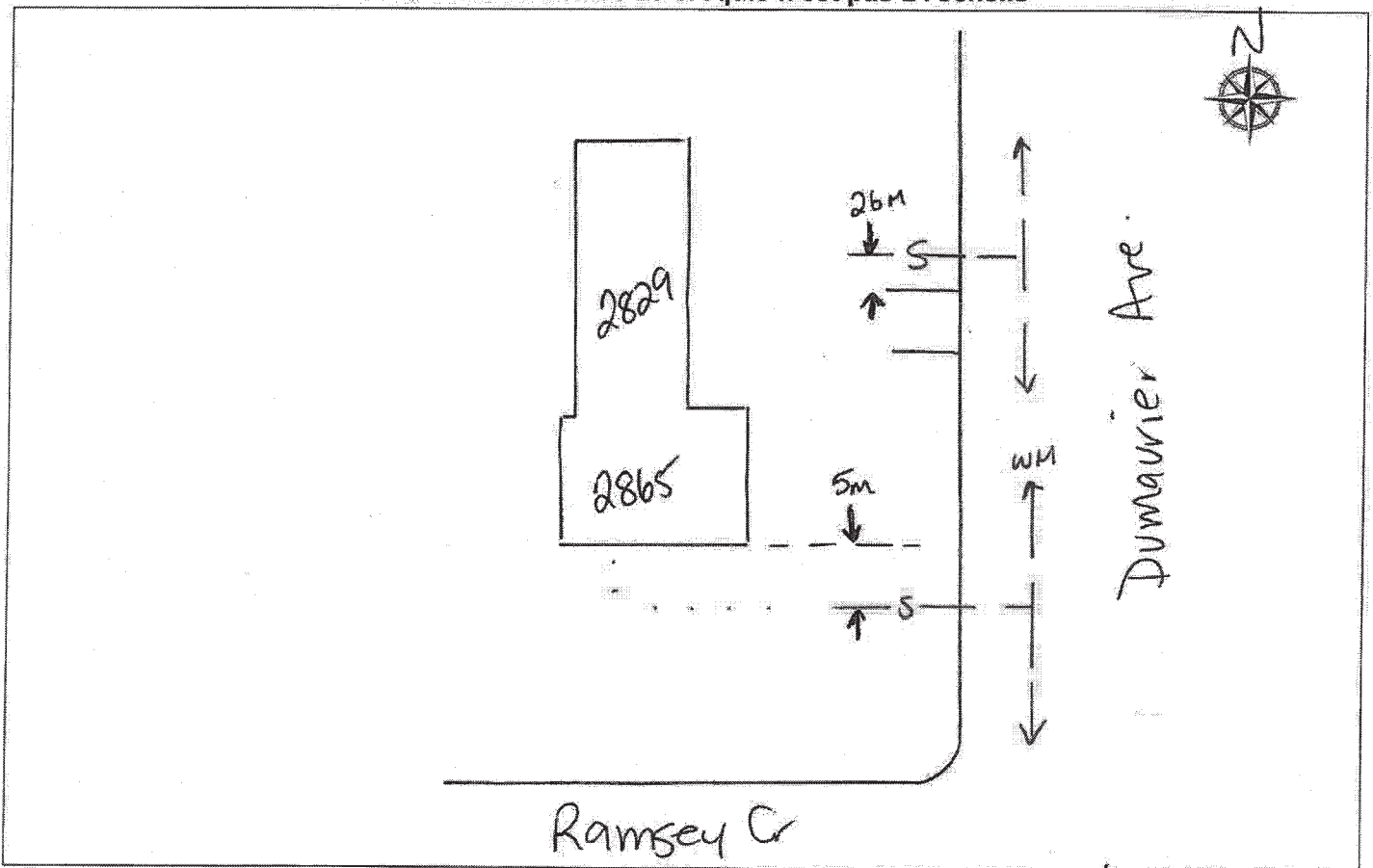
City of Ottawa Locate Report – Water and Sewer Utilities
Rapport de localisation des conduites d'eau et d'égout d'Ottawa



For more information / Pour de plus amples renseignements : 3-1-1 or/ou (613) 580-2424, ext. (poste) 22336.

Date : 26/9/18	Work Order # / No d'ordre de travail : 11668505
Location of Work / Lieu de travail : 2865 DUMaurier Ave.	ON1CALL # / No d'appel ON1 : 201838137061
Type of Work / Type de travail : bore holes	<input type="checkbox"/> ArcView attached Plan ArcView ci-joint
Contractor / Entrepreneur : USL	Fax / Télécopieur :

Sketch Not To Scale / Le croquis n'est pas à l'échelle



Contractor signature
Signature de l'entrepreneur

J Riddell
Locator (please print)
Marqueurs [en lettres moulées]

Method of marking / Méthode de marquage

- Flags / Drapeaux
- Paint / Peinture
- Other (specify) / Autre [précisez] :

Remarks / Commentaires : Cars in lot blocking valves

Office copy : White
Copie du bureau : Blanc

Contractor copy: Yellow
Copie de l'entrepreneur : Jaune

Void after 60 days.
Périmé après 60 jours.

Monique Larocque

From: ESD-Locate / SE-Localiser <esd-locate@ottawa.ca>
Sent: Thursday, September 27, 2018 8:01 AM
To: 'moniquel@usl-1.com'
Cc: ESD-Locate / SE-Localiser
Subject: Locate: DUMAURIER AVE - 20183813706
Attachments: 11668505.pdf; City of Ottawa Disclaimer - ville d'Ottawa avis de non-responsabilité - Copy - Copy.pdf

Please find attached the locate for DUMAURIER AVE.

Thank you,

Axel Grissa

City of Ottawa

Technology, Innovation & Engineering Support Services Public Works & Environmental Services Department

(613)-580-2424 x22336

<<http://ottawa.ca/en>>

Please note: City of Ottawa locates are only valid for sixty (60) days.



DISCLAIMER

The excavator must have a copy of this locate on the job site during excavation.

Locate area: The excavator must not work outside the area indicated in the location of work or located area in the diagram without an updated locate. Stakes or markings may disappear or be displaced. If any delays occur in acting on the stakeout information, or if markings become unclear, a new locate must be obtained.

Locating the plant: The plant location information provided is only an estimate. Depth of underground plant varies and the exact location must be determined by hand digging prior to excavation with mechanical equipment.

Warning: Do not use mechanical equipment within one (1) metre of the estimated location of the water or sewer plant. If the plant is larger than 406mm, mechanical equipment must not be used within three (3) meters.

Digging around exposed plants: Must do any further excavation within 0.3 metres of an exposed water or sewer plant by hand.

Contractors are to perform all work in accordance with applicable City of Ottawa By-laws and any applicable federal and provincial legislation or regulations, including but not limited to the *Public Utilities Act, R.S.O. 1990, c. P.52, s. 56(1)*; *Ontario Regulation 210/01 under the Technical Safety Standards Act, 2000, S.O. 2000 c. 16*; *Ontario Regulation 213/91 under the Occupational Health and Safety Act, R.S.O. 1990, c. O.1.*

AVIS DE NON-RESPONSABILITÉ

L'opérateur de l'excavatrice doit avoir en sa possession ce rapport de localisation pendant l'excavation.

Zone de localisation : l'opérateur de l'excavatrice ne doit pas creuser en dehors de la zone indiquée sur l'ordre de travail ni à l'extérieur de la zone indiquée sur le diagramme, à moins d'avoir en sa possession un rapport de localisation actualisé. Les piquets ou les marques peuvent disparaître ou être déplacés. S'il y a un retard à intervenir sur la base des données de surveillance ou si le marquage devient imprécis, il faut obtenir un nouveau rapport de localisation.

Déterminer l'emplacement des conduites : les renseignements sur l'emplacement des conduites sont approximatifs. Pour déterminer l'emplacement et la profondeur, on doit creuser manuellement avant d'utiliser une excavatrice.

Avertissement : n'utilisez pas d'équipement mécanique [excavatrice] à moins d'un [1] mètre de l'emplacement supposé de la conduite d'eau ou d'égout. Si la conduite compte plus de 406 mm de diamètre, aucun équipement mécanique ne doit être utilisé à moins [3] de trois mètres de celle-ci.

Creuser autour des conduites exposées : toute excavation à moins de 0,3 m d'une conduite d'eau ou d'égout doit se faire manuellement.

Les entrepreneurs doivent exécuter tous les travaux conformément aux règlements de la Ville d'Ottawa et aux lois et règlements fédéraux ou provinciaux applicables, y compris, mais sans s'y limiter, la *Loi sur les services publics, L.R.O. 1990, chap. P.52, art. 56[1]*; le *Règlement 210/01 de l'Ontario en vertu de la Loi de 2000 sur les normes techniques et la sécurité, L.O. 2000, chap. 16*; et le *Règlement 213/91 de l'Ontario en vertu de la Loi sur la santé et la sécurité au travail L.R.O. 1990, chap. O.1.*

GHD



ROGERS Primary Locate Sheet

ON 1 Call Ticket # :
20183813706

Ph: (905)479-5674 Email: ontario@canadianlocators.com

Contractor / Excavator : U S L		Contact Name : JACQUES DESJARDINS	
Tel : 613-226-8750	Alt. Phone :	Email : monique1@usl-1.com	
Received Date : Sep 20 2018	Excavation Date : Sep 26 2018	Revised Excavation Date :	Type of Work : BORE HOLES
Locate Address : 2831-2865 DUMAURIER AVE		City / Municipality : OTTAWA, ONTARIO	
Nearest Intersection : RAMSEY CREE & WATSON ST			
Method of Field Marking : <input checked="" type="checkbox"/> Paint <input type="checkbox"/> Stakes <input checked="" type="checkbox"/> Flags			

Caller's Remarks (Additional Info) :
CORLOT-U Drilling throughout properties. Clear all of 2831 to 2865 Dumaurier Ave to all property lines and to sidewalk edge on Dumaurier Ave.//Civic # 2831, 2833, 2835, 2865.

Utilities Marked :	<input checked="" type="checkbox"/> Coaxial Plant	<input checked="" type="checkbox"/> Fibre Optics Plant			This locate has multiple work areas which are greater than 100 m apart : <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Total Length :	205 m	Total Length :	5 m		

Field sketch and Located Area shown on auxiliary locate sheet(s)

This locate is for ROGERS plant infrastructure ONLY.

Apply sticker here if required

CAUTION : Locate is VOID after 60 days !

CAUTION : Hand dig within one (1) meter or 3.28 feet of markings. The Located Area defined on the Auxiliary Locate Sheet(s) contains all known ROGERS infrastructure. Any changes to excavation area or nature of work requires a new locate.

**For all cut cable, please call :
1-800-265-9501**

Locator's Comments :
160 X 50

Locator's Name : (Please Print)
Jason Vanslyke

Date : Oct 2 2018	Start Time : 12:30 PM	End Time : 1:30 PM
----------------------	--------------------------	-----------------------

A copy of this Primary Locate Sheet and Auxiliary Locate Sheet(s) must be on site and in the hands of the machine operator during work operations. Should sketch and markings not coincide, a new locate MUST be obtained.

Ph: (905) 479-5674 Email: ontario@canadianlocators.com

Utilities Marked :

Coaxial Plant 205 m Fibre Optics Plant 5 m

Number of Services Marked : (specify building/house numbers)

LOCATED AREA CONTAINS ALL KNOWN ROGERS INFRASTRUCTURE

FROM :
N/EL 2831-2865 DUMAURIER AVENUE

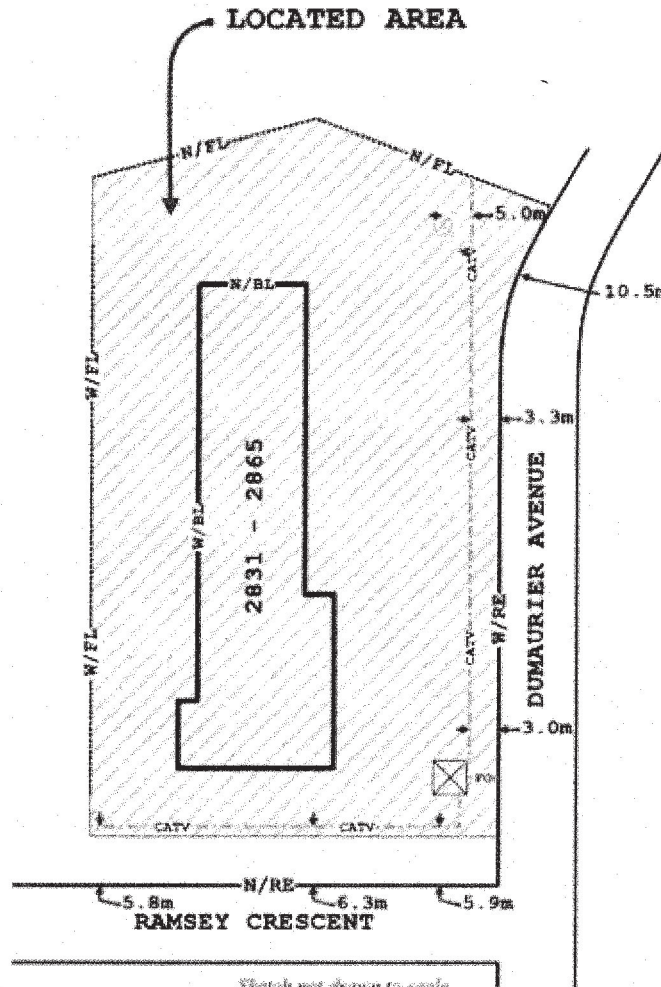
TO :
5m N/N/RE RAMSEY CRESCENT

FROM :
W/EL 2831-2865 DUMAURIER AVENUE

TO :
W/RE DUMAURIER AVENUE

Hand dig within 1 meter or 3.28 feet as measured horizontally from the field markings to avoid damaging the underground utilities.
If you damage the utilities, you may be held liable. For all cut cable, please call: 1-800-265-9501 immediately!
Depth of cable plant varies and MUST be determined by hand digging or vacuum excavation.

LOCATED AREA ALTERED AS PER :



Sketch not drawn to scale

LEGEND :

Fibre Optic	FO	Road Edge	RE	Property Line	PL	Tree	Transformer	Streetlight	SL
Cable / TV	CATV	Bldg Line	BL	Lot Line	LL	Pedestal	Manhole	Hand Hole	HH
Conduit	C	North Direction	N	Face of Curb	FC	Pole	Catch Basin	Hydrant	H
Railway		Sidewalk	SW	Driveway	DW	Valve	North	East	E
Work Area		Measurement		Fence Line	FL	Vault	South	West	W

A copy of this Auxiliary Locate Sheet(s) and the Primary Locate Sheet must be on site and in the hands of the machine operator during work operations. Should sketch and markings not coincide, a new locate MUST be obtained.

GHD

City of Ottawa Street Light Locate



Ontario One Call TF

NOTICE OF INTENT TO EXCAVATE

Header Code: STANDARD

Request Type: NORMAL

Ticket No: 20183813706

Original Call Date: 09/19/2018 10:51:27 AM

Work To Begin Date: 09/26/2018

Company: U S L

Contact Name: JACQUES DESJARDINS

Pager:

Contact Phone: (613)-226-8750 ext.

Cell:

Fax: (613)-226-8677 ext.

Alternate Contact: JEFF FORRESTER

Alt. Phone:

Place: OTTAWA

Street: 2831 DUMAUERIE AVE

Nearest Intersecting Street: RAMSEY CRES

Second Intersecting Street: WATSON ST

Subdivision: OTTAWA

Additional Dig Information:

CIVIC # 2831, 2833, 2835, 2865. CORLOT=U DRILLING THROURHOUT PROPERTIES. CLEAR ALL OF 2831 TO 2865 DUMAUERIE AVE TO ALL PROPERTY LINES AND TO SIDEWALK EDGE ON DUMAUERIE AVE. NO_PLAN:613 828

WO/JOB #: ANYTIME

Type Of Work: BORE HOLES

Remarks:

-75.793499 45.350499 NB_SEGMENTS::2 BCOE01 ROGOTT01 OTWASL01 OTWAWS01 ENOE01 HOT1

On1 Call #	20183813706
Date Requested	09/19/2018 10:51:27 AM

City of Ottawa Street Light Locate

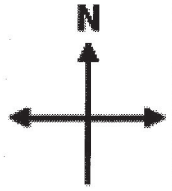
Dispatcher: Lisa Bisailon
Phone: 613-526-1226



Company	U S L
Name	JACQUES DESJARDINS
Phone	(613)-226-8750 ext.
FAX	(613)-226-8677 ext.
Site Contact	JEFF FORRESTER
Phone	

Instructions
 2831 to 2865, DUMAURIER AVE
 CIVIC # 2831, 2833, 2835, 2865. CORLOT=U DRILLING TRIHOURHOUT PROPERTIES. CLEAR ALL OF 2831 TO 2865 DUMAURIER AVE TO ALL PROPERTY LINES AND TO SIDEWALK EDGE ON DUMAURIER AVE.
 NO_PLAN::613 828

LOCATOR SKETCH



Clear

No City of Ottawa Street
Light assets in dig area

CLEAR PAST SIDEWALK

- Underground Street Light Cable
- Overhead/Aerial Wires
- Source/Transformer
- Street Light
- Globe/Decorative Light
- Hydro Pole

Locator Notes/Comments:

Locate is valid for 60 days. If sketch is different from markings, location or nature of work changes, a new locate must be requested. Hand dig within 1m (3.28ft) on either side of markings. Depth of buried plant varies.

Cette fiche n'est pas valide 60 jours de calendrier apres le reperege. Si les marques ne concordent pas avec celles sur le croquis, un nouveau reperege est requis. Tout changement a l'emplacement ou a la nature du travail necessite un nouveau reperege. Creuser a la main un metre (3.28 pieds) du repere. La profondeur des installation varie d'un endroit a l'autre.

Date Located	09/21/2018
Time of day	
Located by	JUSTIN VAVROS
Signature	
Page	2 of 2

Disclaimer

Black & McDonald

Warning!

The Excavator must have a copy of this locate on the job site during excavation.

Located Area: The Excavator must not work outside the area indicated, by the located area in the diagram, without a further locate completed by **Black & McDonald Limited**.

Locate the Plant: The plant location information provided is the best we have available, but constitutes only an estimate. Depth of underground plant varies and the exact location must be determined by hand digging prior to excavation with mechanical equipment.

Mechanical equipment must not be used within 1.0 meter of the estimated location of the plant.

Valid Documentation: This locate is valid only for the Agency accepting it. Other parties must obtain and accept their respective underground locate from **Ontario 1 Call**.

Excavator Alterations: Under no circumstance shall an Excavator touch or move an underground power cable. Arrangements must be made to have qualified personnel relocate any such cable.

Expose the plant: Once the plant has been located by hand digging, it must be exposed along its length adjacent to or in the immediate vicinity of the proposed excavation. For this purpose, mechanical equipment must not be used within 0.5 meters of the plant.

Digging around the Exposed Plant: When the plant has been exposed, any further excavation within 0.3 meters, must only be done by hand digging and not with mechanical equipment.

Support Requirements: If the underground plant is exposed over a distance of more than 1.25 meters, the Facility Owner must be notified. Underground plant must be supported at all times.

Private Cables: Please be advised that **Black & McDonald Limited** is not responsible for and does not locate private cables

New Cables: Be aware that new cables could be installed at any time after the locate has been completed. It is the Excavator's responsibility to call for new locates if any changes are known or suspected.

Caution: The markings may disappear or be misplaced. Should sketch and markings not coincide, the Excavator must obtain a new locate. This is based on the information given at the time. Any changes to location or nature of work require a new locate. The Excavator must not work outside the indicated located area without a further locate. Privately owned services within the located area have not been marked- check with service/property owner.

Liability: Any person or Excavator who interferes with or damages any underground electrical cable without having obtained a valid locate/clearance from **Black & McDonald Limited**, shall be liable for all cost incurred during the repair of the cable as well as any resulting legal actions.

This locate has been given as accurately as possible, but no locate is guaranteed. Excavators must always dig with extreme caution to prevent the possibility of damaging electrical cables and endangering safety.

Locate is void after 60 days

For remarks contact **Ontario One Call** 1-800-400-2255 or www.on1call.com



ONE-CALL SYSTEMS INC.
 775 TAYLOR CREEK DRIVE
 OTTAWA, ON, K4A 0Z9

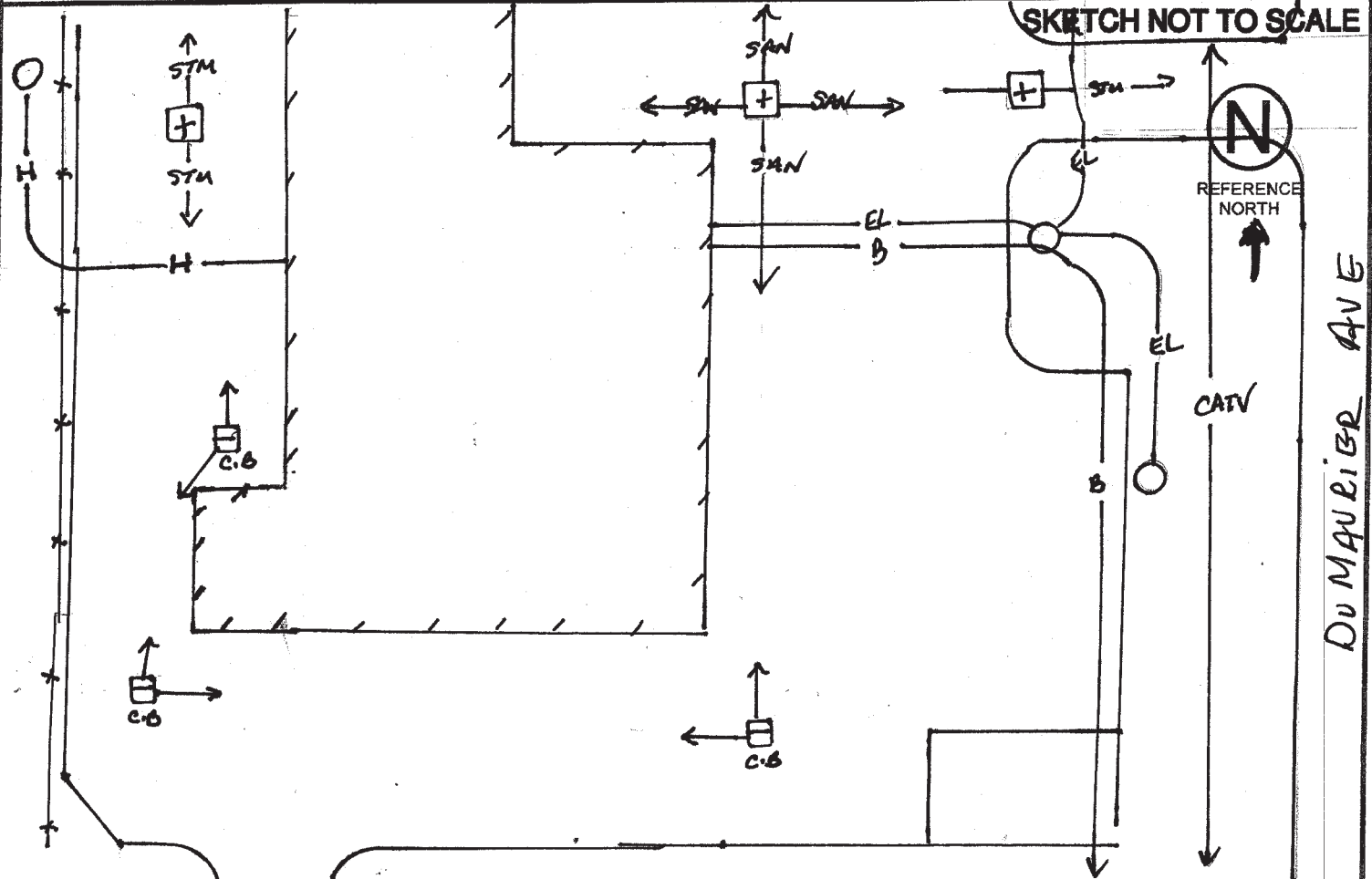
1 OF 3
 PHONE (613) 226-8750
 FAX (613) 226-8677

CUSTOMER: *GHD* REQUESTED BY: *RYAN*

LOCATION OF WORK: *2865 DuMAURIER AVE* LIMITS OF WORK: *AS PER MAP*

HYDRO -- H --	CABLE T.V. -- TV --	STEAM -- STEAM --
GAS -- G --	SANITARY <u>SAN</u>	ELECTRICAL <u>EL</u>
BELL -- B --	STORM <u>ST</u>	COMMUNICATIONS -- COM --
UNIDENTIFIED CABLE -- UC --	FIBER OPTIC -- FOC --	OTHER:
WATER -- W --		

LOCATES ONLY APPLICABLE TO INFO ABOVE - LOCATES VOID AFTER 30 DAYS!



USL-1 as a Private utility locator, is not permitted to locate Publicly owned utilities. In some cases, Public utilities may be noted on a sketch, but are FOR REFERENCE ONLY, and under no circumstances shall be used for excavation purposes. It is the contractor's responsibility to verify any Public utilities noted on the USL-1 sketch by referring to the Public utility locate sheets for physical LOCATION AND ACCURACY. USL-1 DOES NOT ASSUME LIABILITY FOR PUBLIC LOCATE INNACCURACIES.

If the proposed work area is on Private property, it does NOT mean that all buried utilities are Private. Regardless of when you are digging, and what the proposed depth of excavation is, it is the law to notify Ontario One Call (or Info-Excavation in Quebec) to obtain Public utility locates.

COMMENTS: *NO OTHER PRIVATE UTILITIES DETECTED*

THIS SKETCH IS NOT A PUBLIC UTILITY LOCATE/DOCUMENT. PUBLIC UTILITIES SHOWN ARE FOR REFERENCE ONLY. REFER TO USL-1 DISCLAIMER - FORM 101. CONTRACTOR IS RESPONSIBLE TO ENSURE THEY HAVE PUBLIC UTILITY LOCATES BEFORE COMMENCING WORK.

LOCATORS NAME: *CHRIS WHARTON* SIGNATURE: *[Signature]*

LOCATE RECEIVED AND REVIEWED BY _____ Print Name _____ Signature _____

CAUTION: HAND DIG WITHIN 1.5 METERS OF MARKINGS

ONE-CALL SYSTEMS INC.
 775 TAYLOR CREEK DRIVE
 OTTAWA, ON, K4A 0Z9

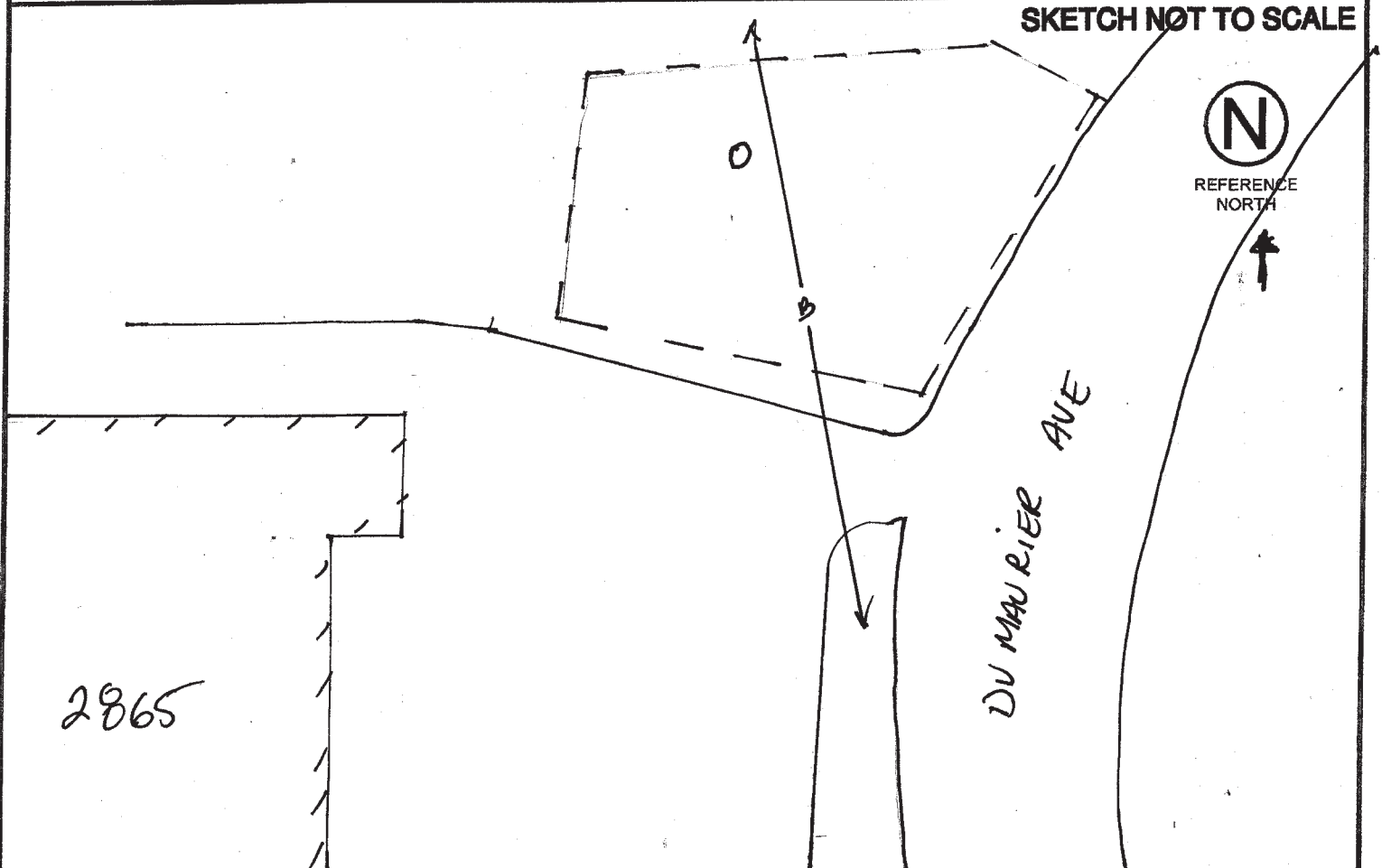
3 of 3
 PHONE (613) 226-8750
 FAX (613) 226-8677

CUSTOMER: BHD REQUESTED BY: RYAN

LOCATION OF WORK: 2865 DU MAURIER AVE LIMITS OF WORK: AS PER MAP

HYDRO	-- H --	CABLE T.V.	-- T.V. --	STEAM	-- STEAM --
GAS	-- G --	SANITARY	-- SAN --	ELECTRICAL	-- E --
BELL	-- B --	STORM	-- ST --	COMMUNICATIONS	-- COM --
UNIDENTIFIED CABLE	-- UC --	FIBER OPTIC	-- FOC --	OTHER:	
WATER	-- W --				

LOCATES ONLY APPLICABLE TO INFO ABOVE - LOCATES VOID AFTER 30 DAYS!



- USL-1 as a Private utility locator, is not permitted to locate Publicly owned utilities. In some cases, Public utilities may be noted on a sketch, but are FOR REFERENCE ONLY, and under no circumstances shall be used for excavation purposes. It is the contractor's responsibility to verify any Public utilities noted on the USL-1 sketch by referring to the Public utility locate sheets for physical LOCATION AND ACCURACY. USL-1 DOES NOT ASSUME LIABILITY FOR PUBLIC LOCATE INNACCURACIES.
- If the proposed work area is on Private property, it does NOT mean that all buried utilities are Private. Regardless of when you are digging, and what the proposed depth of excavation is, it is the law to notify Ontario One Call (or Info-Excavation in Quebec) to obtain Public utility locates.

COMMENTS: NO OTHER PRIVATE UTILITIES DETECTED

THIS SKETCH IS NOT A PUBLIC UTILITY LOCATE/DOCUMENT. PUBLIC UTILITIES SHOWN ARE FOR REFERENCE ONLY. REFER TO USL-1 DISCLAIMER - FORM 101. CONTRACTOR IS RESPONSIBLE TO ENSURE THEY HAVE PUBLIC UTILITY LOCATES BEFORE COMMENCING WORK.

LOCATORS NAME: CHRIS WHARTON SIGNATURE: [Signature]

LOCATE RECEIVED AND REVIEWED BY _____ Print Name _____ Signature _____

CAUTION: HAND DIG WITHIN 1.5 METERS OF MARKINGS

USL-1 DISCLAIMER - FORM 101

- It is our Client's responsibility to fully read and understand this document, prior to any ground disturbance taking place. Should any questions or clarifications be required, contact USL-1 before commencing work
- Locate is VOID after 30 days from the date the locate was completed. Contact USL-1 for remarks and/or new ticket requests, with a minimum notice of 5 business days
- If the scope of work, locate area, or site information changes, contact USL-1 before continuing work. In certain instances, a new ticket request may be required
- Any work within 1.5 metres laterally of a marked utility, must be hand dug or daylighted. Utility depths vary, as does the accuracy of the locate equipment, and therefore depths are typically not provided and should not be used for excavation purposes. Depth of utilities should also be verified by hand digging or daylighting. The best information is provided at the time of the locate, however the accuracy of field markings can vary with regard to equipment accuracy and external interference
- If the paint markings or flags on site differ from that of the sketch provided, please contact USL-1 before commencing work. If possible, the issue will be clarified by USL-1 and/or a site meet may be requested with the appropriate parties
- The "Excavator" is responsible for keeping a current copy of the locates on site, with the operators and in/on the excavation equipment AT ALL TIMES
- It is the "Excavator/Contractor's" responsibility to read ALL locate sheets, both public and private, to ensure they understand what potential hazards or buried utilities exist in their work area
- Special purpose locates such as sewer sounding, locate surveys, tunnel identification, conduit identification, ground fault detections, ground penetrating radar, well cap location, concrete scanning, or anything else that requires use of more than Radiodetection equipment, must be identified at the time of the original locate request. Should a USL-1 locator identify any special needs services during a normal Private utility locate, the client will be notified for the appropriate course of action
- Not all buried utilities can be traced. In many instances, water and sewer lines, irrigation systems, grounding cables, fibre optic cables, heating cables, protection cables, and communication cables may not be traceable. Typically, sewer lines will be painted and lined up directionally from manhole to manhole where possible. It may not be possible to detect bends in the sewer lines between manholes. If tracer wires have been buried with the utility, they will be used to locate the buried utility where possible. If a buried utility cannot be traced, it will be noted on the USL-1 report. USL-1 is not liable for damage to untraceable utilities
- Public utility locators have maps, plans and as-built diagrams for reference to work from. Private utility locators, for the most part, do not. USL-1 will attempt to locate any Private utilities on a site, using as-built plans provided to them. Building access is mandatory and must be arranged by our client. Any conduits or utilities noted entering or exiting a building will be traced if possible, as well as any other visible utilities observed on site. It is the responsibility of the contractor to provide any and all buried utility information and site contacts that they have. There is no guarantee that USL-1 can find all buried utilities if the property owner does not have records or information regarding their own buried utilities
- USL-1 cannot be held liable for damage to Private water and/or sewer laterals unless building access is granted, and the utility is locatable
- Thick snow and ice, frozen manhole lids, live traffic, parked cars, construction debris and activities etc, are all factors that can interfere with USL-1's ability to perform Private utility locates. USL-1 cannot guaranty location of all buried utilities when such factors impede the locate process. It is the contractor's responsibility to ensure that the work areas are safe and accessible for locates, prior to USL-1's arrival to site
- USL-1 as a Private utility locator, is not permitted to locate Publicly owned utilities. In some cases, Public utilities may be noted on a sketch, but are FOR REFERENCE ONLY, and under no circumstances shall be used for excavation purposes. It is the contractor's responsibility to verify any Public utilities noted on the USL-1 sketch by referring to the Public utility locate sheets for physical LOCATION AND ACCURACY. USL-1 DOES NOT ASSUME LIABILITY FOR PUBLIC LOCATE INNACCURACIES
- If the proposed work area is on Private property, it does NOT mean that all buried utilities are Private. Regardless of where you are digging, and what the proposed depth of excavation is, it is the law to notify Ontario One Call (or Info-Excavation in Quebec) to obtain Public utility locates
- NCC PROPERTY - assuming the contractor has been issued a Land Access Permit from the NCC, it is typically indicated within the permit that it is the contractor's responsibility to contact NCC for utility locates of their buried utilities

USL-1 - January 2016

Appendix C

Borehole Logs

(GHD, 2019)

(Paterson, 2019)



BOREHOLE No.: BH3D / MW3D
ELEVATION: 99.25 m

BOREHOLE LOG

Page: 1 of 1

CLIENT: 3223701 Canada Inc.
 PROJECT: Geotechnical Investigation
 LOCATION: 2831, 2851, and 2865 DuMaurier Ave.
 DESCRIBED BY: S. Wheeler CHECKED BY: L. Lopers
 DATE (START): 5 October 2018 DATE (FINISH): 5 October 2018

LEGEND

- ☒ SS Split Spoon
- ▬ GS Auger Sample
- ▨ ST Shelby Tube
- ▽ Water Level
- Water content (%)
- ┌ Atterberg limits (%)
- N Penetration Index based on Split Spoon sample
- N Penetration Index based on Dynamic Cone sample
- △ Cu Shear Strength based on Field Vane
- Cu Shear Strength based on Lab Vane
- S Sensitivity Value of Soil
- ▲ Shear Strength based on Pocket Penetrometer

SCALE		STRATIGRAPHY		MONITOR WELL	SAMPLE DATA			
Depth BGS	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK		Type and Number	Recovery	OVC	Penetration Index / RQD
meters	99.25		GROUND SURFACE			%	ppm	N
99.2	99.2	TOPSOIL		99.15				
99.0	99.0	FILL - Gravelly silty sand, brown, damp, compact		Sand	SS1	46	2.8	25
0.5		FILL - Sandy gravel, brown, damp, compact		0.46				
1.0					SS2	50	3.0	19
1.5	98.0	FILL - Silty sand, grey, moist to wet, very loose to loose		Riser				
		Black staining encountered		WL 1.37	SS3	71	3.9	10
				10/15/2018				
2.0					SS4	13	2.8	2
2.5	96.8	PEAT - black, organics and organic odour, wet, very loose		Bentonite				
3.0					SS5	75	0	PH
3.5		Auger refusal encountered at 3.7 mbgs			SS6	83	0	3
4.0	95.6	HIGHLY WEATHERED AND FRACTURED LIMESTONE- grey						
4.5	94.8	LIMESTONE- grey, poor quality		4.01 Sand	RC1	90		0
5.0				4.14				
5.5	93.9	End of borehole		Screen	RC2	100		35
6.0				5.36				

SCALE FOR TEST RESULTS
 50kPa 100kPa 150kPa 200kPa
 10 20 30 40 50 60 70 80 90

NOTES:
 mbgs: meters below ground surface

BOREHOLE LOG 11181273-A1-BOREHOLE LOGS.GPJ INSPEC_SOL.GDT 8/11/18



BOREHOLE No.: BH3S / MW3S
ELEVATION: 99.33 m

BOREHOLE LOG

Page: 1 of 1

CLIENT: 3223701 Canada Inc.
 PROJECT: Geotechnical Investigation
 LOCATION: 2831, 2851, and 2865 DuMaurier Ave.
 DESCRIBED BY: S. Wheeler CHECKED BY: L. Lopers
 DATE (START): 5 October 2018 DATE (FINISH): 5 October 2018

LEGEND

- SS Split Spoon
- GS Auger Sample
- ST Shelby Tube
- ▼ Water Level
- Water content (%)
- Atterberg limits (%)
- N Penetration Index based on Split Spoon sample
- N Penetration Index based on Dynamic Cone sample
- △ Cu Shear Strength based on Field Vane
- Cu Shear Strength based on Lab Vane
- S Sensitivity Value of Soil
- ▲ Shear Strength based on Pocket Penetrometer

SCALE		STRATIGRAPHY		MONITOR WELL	SAMPLE DATA			
Depth BGS	Elevation (m)	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK		Type and Number	Recovery	OVC	Penetration Index / RQD
meters	99.33		GROUND SURFACE			%	ppm	N
0.5				99.23 Sand				
				0.46 Riser				
1.0								
1.5				Bentonite WL 1.26 10/15/2018				
2.0				1.83 Sand				
2.5				2.19				
3.0				Screen				
3.5								
4.0	95.6		Augered to practical refusal at 3.7 mbgs for direct well installation in overburden	3.71				
4.5								
5.0								
5.5								
6.0								

SCALE FOR TEST RESULTS
 50kPa 100kPa 150kPa 200kPa
 10 20 30 40 50 60 70 80 90

BOREHOLE LOG 11181273-A1-BOREHOLE LOGS.GPJ INSPEC_SOL.GDT 8/11/18

NOTES:
 mbgs: meters below ground surface

DATUM TBM - Top spindle of fire hydrant located at the northeast corner of subject site.
Geodetic elevation = 74.952m.

REMARKS

FILE NO.
PG4928

HOLE NO.
BH 1

BORINGS BY CME 55 Power Auger

DATE 2019 November 11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE													
TOPSOIL	0.18					0	74.80						
FILL: Brown clayey silt, some sand and gravel		AU	1										
	0.86					1	73.80						
FILL: Brown silty sand		SS	2	42	7								
	1.52					2	72.80						
FILL: Brown sand, trace gravel		SS	3	62	5								
	2.90					3	71.80						
Loose, brown FINE SAND with silty clay		SS	4	8	3								
	3.81					4	70.80						
GLACIAL TILL: Dense, brown silty sand with gravel, clay and shale fragments		SS	5	75	5								
	5.28					5	69.80						
						6	68.80						
		RC	1	100	67								
						7	67.80						
BEDROCK: Fair to excellent quality, green shale interbedded with dolomite		RC	2	93	88								
						8	66.80						
		RC	3	100	84								
						9	65.80						
		RC	4	97	92								
						10	64.80						
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

DATUM TBM - Top spindle of fire hydrant located at the northeast corner of subject site.
Geodetic elevation = 74.952m.

REMARKS

BORINGS BY CME 55 Power Auger

DATE 2019 November 11

FILE NO. PG4928

HOLE NO. BH 1

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						10	64.80						
BEDROCK: Fair to excellent quality, green shale interbedded with dolomite		RC	5	97	92	11	63.80						
		RC	6	100	98	12	62.80						
		RC	7	100	93	13	61.80						
BEDROCK: Good excellent quality, grey dolostone		RC	7	100	93	14	60.80						
		RC	8	92	74	15	59.80						
		RC	9	95	85	16	58.80						
End of Borehole (GWL @ 7.12m - Nov. 20, 2019)						17	57.80						
						18	56.80						

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM TBM - Top spindle of fire hydrant located at the northeast corner of subject site.
Geodetic elevation = 74.952m.

REMARKS

FILE NO. PG4928

HOLE NO. BH 2

BORINGS BY CME 55 Power Auger

DATE 2019 November 11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE													
Asphaltic concrete	0.08					0	73.38						
FILL: Brown sand with gravel, crushed stone	0.33	AU	1										
FILL: Brown silty sand, trace clay		SS	2	25	15	1	72.38						
PEAT	1.62	SS	3	62	4	2	71.38						
	2.03	SS	4	62	6	3	70.38						
Loose, grey FINE SAND with silt and clay		SS	5	75	2	4	69.38						
Grey SILTY CLAY, trace sand		SS	6	0	50+	5	68.38						
	4.37	RC	1	100	0	6	67.38						
		RC	2	100	100	7	66.38						
BEDROCK: Excellent quality, green shale interbedded with dolostone		RC	3	98	89	8	65.38						
		RC	4	100	97	9	64.38						
		RC	5	100	100	10	63.38						

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM TBM - Top spindle of fire hydrant located at the northeast corner of subject site.
Geodetic elevation = 74.952m.

REMARKS

FILE NO. PG4928

HOLE NO. BH 2

BORINGS BY CME 55 Power Auger

DATE 2019 November 11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			20	40	60	80		
GROUND SURFACE						10	63.38						
BEDROCK: Excellent quality, green shale interbedded with dolostone		RC	6	85	80	11	62.38						
		RC	7	100	95	12	61.38						
		RC	8	95	88	13	60.38						
BEDROCK: Good to excellent quality, grey dolostone		RC	9	100	98	14	59.38						
		RC	10	98	98	15	58.38						
		RC	8	95	88	16	57.38						
		RC	9	100	98	17	56.38						
End of Borehole (GWL @ 5.75m - Nov. 20, 2019)						18	55.38						

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM TBM - Top spindle of fire hydrant located at the northeast corner of subject site.
Geodetic elevation = 74.952m.

REMARKS

FILE NO. PG4928

HOLE NO. BH 3

BORINGS BY CME 55 Power Auger

DATE 2019 November 11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction		
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			20	40	60	80			
GROUND SURFACE						10	63.56							
BEDROCK: Good quality, green shale interbedded with dolostone		RC	6	98	81	11	62.56							
						12	61.56							
BEDROCK: Fair to excellent quality, grey dolostone		RC	7	90	57	13	60.56							
		RC	8	100	92	14	59.56							
		RC	9	95	95	16	57.56							
		RC	10	97	97	17	56.56							
						18	55.56							
End of Borehole (GWL @ 5.94m - Nov. 20, 2019)														

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

Appendix D

Certificates of Equipment Calibration



ENVIRONMENTAL AND SAFETY INC.
 "Exceptional Customer Service!"

Certificate of Calibration

HORIBA U-52 Serial Number SGR2KAPX has been calibrated per the Manufacturers published instructions, using NIST traceable solutions and standards.

2, 2-Point pH	Cond.	Turb,	DO	ORP
4.00, 7.00	4.49 uS/cm	0, 100 NTU	8.91 mg/L @ 21 DegC	240mV
pH 4.0 Lot #0GK004 Exp11/22	Zero checked	Zero checked	Sodium Sulfite Zero	
pH 7.0 Lot# 0GE815 Exp.05/2022	Cond.Standard Lot#1GC833 Exp. 03/2022	StableCal Standard, 100 NTU Lot#A1007 Exp.01/2023	Oakton Zero Oxygen Solution Lot# 670227 Exp.03/2021	ORP Test Solution 240 mV

Solutions ref. to NIST SRM's

Lot # Lot
#5235Exp
04/2025



 Calibrated *[Signature]*

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Appendix E

Laboratory Certificates of Analysis

(Lopers, 2021 Groundwater)

(GHD, 2018 Groundwater)

(GHD, 2018 Soil)



CLIENT NAME: LOPERS & ASSOCIATES
30 LANSFIELD WAY
OTTAWA, ON K2G 3V8
613-327-9073

ATTENTION TO: Luke Lopers

PROJECT: LOP21-004B

AGAT WORK ORDER: 21Z747835

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

WATER ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Lab Manager

DATE REPORTED: May 25, 2021

PAGES (INCLUDING COVER): 16

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*Notes

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.*



Certificate of Analysis

AGAT WORK ORDER: 21Z747835

PROJECT: LOP21-004B

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
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FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: LOPERS & ASSOCIATES

SAMPLING SITE: Dumaurier

ATTENTION TO: Luke Lopers

SAMPLED BY: Luke Lopers

O. Reg. 153(511) - PAHs (Water)

DATE RECEIVED: 2021-05-17

DATE REPORTED: 2021-05-25

Parameter	Unit	SAMPLE DESCRIPTION:		BH1-GW1	MW95-1	MW95-2	Dup-1
		SAMPLE TYPE:		Water	Water	Water	Water
		DATE SAMPLED:		2021-05-17	2021-05-17	2021-05-17	2021-05-17
	G / S	RDL	2478945	2478991	2478992	2478993	
Naphthalene	µg/L	1400	0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthylene	µg/L	1.8	0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthene	µg/L	600	0.20	<0.20	<0.20	<0.20	<0.20
Fluorene	µg/L	400	0.20	<0.20	<0.20	<0.20	<0.20
Phenanthrene	µg/L	580	0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	µg/L	2.4	0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	µg/L	130	0.20	<0.20	<0.20	<0.20	<0.20
Pyrene	µg/L	68	0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)anthracene	µg/L	4.7	0.20	<0.20	<0.20	<0.20	<0.20
Chrysene	µg/L	1	0.10	<0.10	<0.10	<0.10	<0.10
Benzo(b)fluoranthene	µg/L	0.75	0.10	<0.10	<0.10	<0.10	<0.10
Benzo(k)fluoranthene	µg/L	0.4	0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)pyrene	µg/L	0.81	0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	µg/L	0.2	0.20	<0.20	<0.20	<0.20	<0.20
Dibenz(a,h)anthracene	µg/L	0.52	0.20	<0.20	<0.20	<0.20	<0.20
Benzo(g,h,i)perylene	µg/L	0.2	0.20	<0.20	<0.20	<0.20	<0.20
2-and 1-methyl Naphthalene	µg/L	1800	0.20	<0.20	<0.20	<0.20	<0.20
Sediment				No	No	No	No
Surrogate	Unit	Acceptable Limits					
Naphthalene-d8	%	50-140		107	100	100	98
Acridine-d9	%	50-140		113	86	73	120
Terphenyl-d14	%	50-140		71	71	89	68

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2478945-2478993 Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&(j)Fluoranthene isomers because the isomers co-elute on the GC column. 2- and 1-Methyl Naphthalene is a calculated parameter. The calculated value is the sum of 2-Methyl Naphthalene and 1-Methyl Naphthalene. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.

Sediment parameter is comment only based on visual inspection of the sample prior to extraction and is not an accredited test.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 21Z747835

PROJECT: LOP21-004B

5835 COOPERS AVENUE
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<http://www.agatlabs.com>

CLIENT NAME: LOPERS & ASSOCIATES

ATTENTION TO: Luke Lopers

SAMPLING SITE: Dumaurier

SAMPLED BY: Luke Lopers

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Water)

DATE RECEIVED: 2021-05-17

DATE REPORTED: 2021-05-25

Parameter	Unit	SAMPLE DESCRIPTION:		BH1-GW1	MW95-1	MW95-2	Dup-1
		G / S	RDL	2021-05-17	2021-05-17	2021-05-17	2021-05-17
F1 (C6-C10)	µg/L	750	25	<25	<25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L	750	25	<25	<25	<25	<25
F2 (C10 to C16)	µg/L	150	100	<100	<100	<100	<100
F2 (C10 to C16) minus Naphthalene	µg/L		100	<100	<100	<100	<100
F3 (C16 to C34)	µg/L	500	100	<100	<100	<100	<100
F3 (C16 to C34) minus PAHs	µg/L		100	<100	<100	<100	<100
F4 (C34 to C50)	µg/L	500	100	<100	<100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L		500	NA	NA	NA	NA
Sediment				No	No	No	No
Surrogate	Unit	Acceptable Limits					
Toluene-d8	% Recovery	50-140	78	105	104	87	
Terphenyl	% Recovery	60-140	93	94	80	87	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2478945-2478993 The C6-C10 fraction is calculated using toluene response factor.
C6-C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present. The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
C>10 - C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.
C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Sediment parameter is comment only based on visual inspection of the sample prior to extraction and is not an accredited test.

Analysis performed at AGAT Toronto (unless marked by *)

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Certificate of Analysis

AGAT WORK ORDER: 21Z747835

PROJECT: LOP21-004B

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CLIENT NAME: LOPERS & ASSOCIATES

ATTENTION TO: Luke Lopers

SAMPLING SITE: Dumaurier

SAMPLED BY: Luke Lopers

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2021-05-17

DATE REPORTED: 2021-05-25

Parameter	Unit	SAMPLE DESCRIPTION:		BH1-GW1	MW95-1	MW95-2	Dup-1	Trip Blank
		SAMPLE TYPE:		Water	Water	Water	Water	Water
		DATE SAMPLED:		2021-05-17	2021-05-17	2021-05-17	2021-05-17	
		G / S	RDL	2478945	2478991	2478992	2478993	2478995
Dichlorodifluoromethane	µg/L	4400	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Vinyl Chloride	µg/L	0.5	0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromomethane	µg/L	5.6	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L	2500	0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Acetone	µg/L	130000	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethylene	µg/L	1.6	0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methylene Chloride	µg/L	610	0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans- 1,2-Dichloroethylene	µg/L	1.6	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L	190	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L	320	0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L	470000	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis- 1,2-Dichloroethylene	µg/L	1.6	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	µg/L	2.4	0.20	<0.20	<0.20	23.9	<0.20	<0.20
1,2-Dichloroethane	µg/L	1.6	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L	640	0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L	0.79	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzene	µg/L	44	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	µg/L	16	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethylene	µg/L	1.6	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L	85000	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L	140000	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	µg/L	4.7	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L	18000	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	µg/L	82000	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylene Dibromide	µg/L	0.25	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Tetrachloroethylene	µg/L	1.6	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1,2-Tetrachloroethane	µg/L	3.3	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chlorobenzene	µg/L	630	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylbenzene	µg/L	2300	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
m & p-Xylene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 21Z747835

PROJECT: LOP21-004B

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CLIENT NAME: LOPERS & ASSOCIATES

SAMPLING SITE: Dumaurier

ATTENTION TO: Luke Lopers

SAMPLED BY: Luke Lopers

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2021-05-17

DATE REPORTED: 2021-05-25

Parameter	Unit	SAMPLE DESCRIPTION:		BH1-GW1	MW95-1	MW95-2	Dup-1	Trip Blank
		SAMPLE TYPE:		Water	Water	Water	Water	Water
		DATE SAMPLED:		2021-05-17	2021-05-17	2021-05-17	2021-05-17	
		G / S	RDL	2478945	2478991	2478992	2478993	2478995
Bromoform	µg/L	380	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Styrene	µg/L	1300	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L	3.2	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L	9600	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L	8	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	µg/L	4600	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichloropropene	µg/L	5.2	0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Xylenes (Total)	µg/L	4200	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
n-Hexane	µg/L	51	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Surrogate	Unit	Acceptable Limits						
Toluene-d8	% Recovery	50-140		86	85	89	84	89
4-Bromofluorobenzene	% Recovery	50-140		100	104	92	105	95

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2478945-2478995 Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.
The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 21Z747835

PROJECT: LOP21-004B

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: LOPERS & ASSOCIATES

SAMPLING SITE: Dumaurier

ATTENTION TO: Luke Lopers

SAMPLED BY: Luke Lopers

O. Reg. 153(511) - Metals & Inorganics (Water)

DATE RECEIVED: 2021-05-17

DATE REPORTED: 2021-05-25

Parameter	Unit	SAMPLE DESCRIPTION:		BH1-GW1		MW95-1		MW95-2		Dup-1
		SAMPLE TYPE:		Water		Water		Water		Water
		DATE SAMPLED:		2021-05-17		2021-05-17		2021-05-17		2021-05-17
		G / S	RDL	2478945	RDL	2478991	RDL	2478992	RDL	2478993
Dissolved Antimony	µg/L	20000	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0
Dissolved Arsenic	µg/L	1900	1.0	1.8	1.0	5.1	1.0	4.6	1.0	6.6
Dissolved Barium	µg/L	29000	2.0	102	20.0	1130	2.0	227	20.0	1110
Dissolved Beryllium	µg/L	67	0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	<0.50
Dissolved Boron	µg/L	45000	10.0	278	10.0	24.3	10.0	16.4	10.0	24.8
Dissolved Cadmium	µg/L	2.7	0.20	<0.20	0.20	<0.20	0.20	0.28	0.20	<0.20
Dissolved Chromium	µg/L	810	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0
Dissolved Cobalt	µg/L	66	0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	<0.50
Dissolved Copper	µg/L	87	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0
Dissolved Lead	µg/L	25	0.50	<0.50	0.50	0.62	0.50	<0.50	0.50	0.53
Dissolved Molybdenum	µg/L	9200	0.50	0.73	0.50	<0.50	0.50	<0.50	0.50	<0.50
Dissolved Nickel	µg/L	490	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0
Dissolved Selenium	µg/L	63	1.0	<1.0	1.0	<1.0	1.0	1.4	1.0	<1.0
Dissolved Silver	µg/L	1.5	0.20	<0.20	0.20	<0.20	0.20	<0.20	0.20	<0.20
Dissolved Thallium	µg/L	510	0.30	<0.30	0.30	<0.30	0.30	<0.30	0.30	<0.30
Dissolved Uranium	µg/L	420	0.50	1.00	0.50	<0.50	0.50	1.38	0.50	<0.50
Dissolved Vanadium	µg/L	250	0.40	<0.40	0.40	0.48	0.40	<0.40	0.40	0.47
Dissolved Zinc	µg/L	1100	5.0	<5.0	5.0	<5.0	5.0	15.7	5.0	66.3
Mercury	µg/L	0.29	0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02
Chromium VI	µg/L	140	2.000	<2.000	2.000	<2.000	2.000	<2.000	2.000	<2.000
Cyanide, Free	µg/L	66	2	<2	2	<2	2	<2	2	<2
Dissolved Sodium	µg/L	2300000	50	84400	250	292000	250	132000	250	291000
Chloride	µg/L	2300000	100	83100	100	925000	100	316000	100	928000
Electrical Conductivity	uS/cm	NA	2	768	2	3340	2	1540	2	3290
pH	pH Units		NA	7.78	NA	7.43	NA	7.75	NA	7.48

Certified By:

Anamjot Bhela




AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 21Z747835

PROJECT: LOP21-004B

5835 COOPERS AVENUE
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CLIENT NAME: LOPERS & ASSOCIATES

SAMPLING SITE: Dumaurier

ATTENTION TO: Luke Lopers

SAMPLED BY: Luke Lopers

O. Reg. 153(511) - Metals & Inorganics (Water)

DATE RECEIVED: 2021-05-17

DATE REPORTED: 2021-05-25

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

2478945-2478993 Metals analysis completed on a filtered sample.
Dilution required, RDL has been increased accordingly.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Anamjot Bhela



Exceedance Summary

AGAT WORK ORDER: 21Z747835

PROJECT: LOP21-004B

5835 COOPERS AVENUE
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CLIENT NAME: LOPERS & ASSOCIATES

ATTENTION TO: Luke Lopers

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
2478992	MW95-2	ON T3 NPGW CT	O. Reg. 153(511) - VOCs (Water)	Chloroform	µg/L	2.4	23.9

Quality Assurance

CLIENT NAME: LOPERS & ASSOCIATES
AGAT WORK ORDER: 21Z747835
PROJECT: LOP21-004B
ATTENTION TO: Luke Lopers
SAMPLING SITE: Dumaurier
SAMPLED BY: Luke Lopers

Trace Organics Analysis

RPT Date: May 25, 2021			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Water)

F1 (C6-C10)	2475061	<25	<25	NA	< 25	102%	60%	140%	104%	60%	140%	107%	60%	140%
F2 (C10 to C16)	2479694	630	570	10.0%	< 100	110%	60%	140%	84%	60%	140%	84%	60%	140%
F3 (C16 to C34)	2479694	550	520	5.6%	< 100	100%	60%	140%	91%	60%	140%	81%	60%	140%
F4 (C34 to C50)	2479694	< 100	< 100	NA	< 100	101%	60%	140%	88%	60%	140%	84%	60%	140%

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Water)

F2 (C10 to C16)	2490692	< 100	< 100	NA	< 100	112%	60%	140%	96%	60%	140%	61%	60%	140%
F3 (C16 to C34)	2490692	< 100	< 100	NA	< 100	106%	60%	140%	80%	60%	140%	64%	60%	140%
F4 (C34 to C50)	2490692	< 100	< 100	NA	< 100	86%	60%	140%	98%	60%	140%	95%	60%	140%

O. Reg. 153(511) - PAHs (Water)

Naphthalene	2485371	<0.20	<0.20	NA	< 0.20	96%	50%	140%	102%	50%	140%	98%	50%	140%
Acenaphthylene	2485371	<0.20	<0.20	NA	< 0.20	99%	50%	140%	114%	50%	140%	101%	50%	140%
Acenaphthene	2485371	<0.20	<0.20	NA	< 0.20	92%	50%	140%	96%	50%	140%	87%	50%	140%
Fluorene	2485371	<0.20	<0.20	NA	< 0.20	100%	50%	140%	105%	50%	140%	93%	50%	140%
Phenanthrene	2485371	<0.10	<0.10	NA	< 0.10	97%	50%	140%	106%	50%	140%	93%	50%	140%

Anthracene	2485371	<0.10	<0.10	NA	< 0.10	99%	50%	140%	99%	50%	140%	91%	50%	140%
Fluoranthene	2485371	<0.20	<0.20	NA	< 0.20	101%	50%	140%	95%	50%	140%	97%	50%	140%
Pyrene	2485371	<0.20	<0.20	NA	< 0.20	100%	50%	140%	110%	50%	140%	97%	50%	140%
Benzo(a)anthracene	2485371	<0.20	<0.20	NA	< 0.20	79%	50%	140%	111%	50%	140%	83%	50%	140%
Chrysene	2485371	<0.10	<0.10	NA	< 0.10	106%	50%	140%	114%	50%	140%	99%	50%	140%
Benzo(b)fluoranthene	2485371	<0.10	<0.10	NA	< 0.10	121%	50%	140%	110%	50%	140%	98%	50%	140%
Benzo(k)fluoranthene	2485371	<0.10	<0.10	NA	< 0.10	112%	50%	140%	98%	50%	140%	87%	50%	140%
Benzo(a)pyrene	2485371	<0.01	<0.01	NA	< 0.01	128%	50%	140%	91%	50%	140%	94%	50%	140%
Indeno(1,2,3-cd)pyrene	2485371	<0.20	<0.20	NA	< 0.20	87%	50%	140%	82%	50%	140%	75%	50%	140%
Dibenz(a,h)anthracene	2485371	<0.20	<0.20	NA	< 0.20	77%	50%	140%	96%	50%	140%	83%	50%	140%
Benzo(g,h,i)perylene	2485371	<0.20	<0.20	NA	< 0.20	83%	50%	140%	84%	50%	140%	80%	50%	140%

O. Reg. 153(511) - VOCs (Water)

Dichlorodifluoromethane	2477800	<0.20	<0.20	NA	< 0.20	92%	50%	140%	88%	50%	140%	93%	50%	140%
Vinyl Chloride	2477800	<0.17	<0.17	NA	< 0.17	111%	50%	140%	91%	50%	140%	96%	50%	140%
Bromomethane	2477800	<0.20	<0.20	NA	< 0.20	101%	50%	140%	102%	50%	140%	85%	50%	140%
Trichlorofluoromethane	2477800	<0.40	<0.40	NA	< 0.40	97%	50%	140%	94%	50%	140%	109%	50%	140%
Acetone	2477800	<1.0	<1.0	NA	< 1.0	116%	50%	140%	107%	50%	140%	103%	50%	140%
1,1-Dichloroethylene	2477800	<0.30	<0.30	NA	< 0.30	98%	50%	140%	92%	60%	130%	84%	50%	140%
Methylene Chloride	2477800	<0.30	<0.30	NA	< 0.30	102%	50%	140%	103%	60%	130%	98%	50%	140%
trans- 1,2-Dichloroethylene	2477800	<0.20	<0.20	NA	< 0.20	90%	50%	140%	94%	60%	130%	85%	50%	140%
Methyl tert-butyl ether	2477800	<0.20	<0.20	NA	< 0.20	92%	50%	140%	92%	60%	130%	96%	50%	140%
1,1-Dichloroethane	2477800	<0.30	<0.30	NA	< 0.30	92%	50%	140%	87%	60%	130%	87%	50%	140%
Methyl Ethyl Ketone	2477800	<1.0	<1.0	NA	< 1.0	96%	50%	140%	94%	50%	140%	85%	50%	140%
cis- 1,2-Dichloroethylene	2477800	<0.20	<0.20	NA	< 0.20	82%	50%	140%	76%	60%	130%	81%	50%	140%

Quality Assurance

CLIENT NAME: LOPERS & ASSOCIATES
 PROJECT: LOP21-004B
 SAMPLING SITE: Dumaurier

AGAT WORK ORDER: 21Z747835
 ATTENTION TO: Luke Lopers
 SAMPLED BY: Luke Lopers

Trace Organics Analysis (Continued)

RPT Date: May 25, 2021			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Chloroform	2477800		<0.20	<0.20	NA	< 0.20	97%	50%	140%	89%	60%	130%	75%	50%	140%
1,2-Dichloroethane	2477800		<0.20	<0.20	NA	< 0.20	101%	50%	140%	107%	60%	130%	116%	50%	140%
1,1,1-Trichloroethane	2477800		<0.30	<0.30	NA	< 0.30	99%	50%	140%	80%	60%	130%	95%	50%	140%
Carbon Tetrachloride	2477800		<0.20	<0.20	NA	< 0.20	95%	50%	140%	85%	60%	130%	100%	50%	140%
Benzene	2477800		<0.20	<0.20	NA	< 0.20	103%	50%	140%	100%	60%	130%	94%	50%	140%
1,2-Dichloropropane	2477800		<0.20	<0.20	NA	< 0.20	104%	50%	140%	94%	60%	130%	102%	50%	140%
Trichloroethylene	2477800		<0.20	<0.20	NA	< 0.20	87%	50%	140%	78%	60%	130%	83%	50%	140%
Bromodichloromethane	2477800		<0.20	<0.20	NA	< 0.20	101%	50%	140%	95%	60%	130%	101%	50%	140%
Methyl Isobutyl Ketone	2477800		<1.0	<1.0	NA	< 1.0	102%	50%	140%	115%	50%	140%	105%	50%	140%
1,1,2-Trichloroethane	2477800		<0.20	<0.20	NA	< 0.20	105%	50%	140%	96%	60%	130%	89%	50%	140%
Toluene	2477800		<0.20	<0.20	NA	< 0.20	103%	50%	140%	105%	60%	130%	91%	50%	140%
Dibromochloromethane	2477800		<0.10	<0.10	NA	< 0.10	96%	50%	140%	100%	60%	130%	93%	50%	140%
Ethylene Dibromide	2477800		<0.10	<0.10	NA	< 0.10	96%	50%	140%	90%	60%	130%	87%	50%	140%
Tetrachloroethylene	2477800		<0.20	<0.20	NA	< 0.20	87%	50%	140%	95%	60%	130%	86%	50%	140%
1,1,1,2-Tetrachloroethane	2477800		<0.10	<0.10	NA	< 0.10	99%	50%	140%	87%	60%	130%	100%	50%	140%
Chlorobenzene	2477800		<0.10	<0.10	NA	< 0.10	100%	50%	140%	95%	60%	130%	98%	50%	140%
Ethylbenzene	2477800		<0.10	<0.10	NA	< 0.10	92%	50%	140%	93%	60%	130%	94%	50%	140%
m & p-Xylene	2477800		<0.20	<0.20	NA	< 0.20	99%	50%	140%	101%	60%	130%	101%	50%	140%
Bromoform	2477800		<0.10	<0.10	NA	< 0.10	104%	50%	140%	103%	60%	130%	102%	50%	140%
Styrene	2477800		<0.10	<0.10	NA	< 0.10	96%	50%	140%	111%	60%	130%	101%	50%	140%
1,1,2,2-Tetrachloroethane	2477800		<0.10	<0.10	NA	< 0.10	110%	50%	140%	106%	60%	130%	103%	50%	140%
o-Xylene	2477800		<0.10	<0.10	NA	< 0.10	92%	50%	140%	89%	60%	130%	93%	50%	140%
1,3-Dichlorobenzene	2477800		<0.10	<0.10	NA	< 0.10	86%	50%	140%	97%	60%	130%	97%	50%	140%
1,4-Dichlorobenzene	2477800		<0.10	<0.10	NA	< 0.10	101%	50%	140%	90%	60%	130%	92%	50%	140%
1,2-Dichlorobenzene	2477800		<0.10	<0.10	NA	< 0.10	106%	50%	140%	101%	60%	130%	112%	50%	140%
n-Hexane	2477800		<0.20	<0.20	NA	< 0.20	84%	50%	140%	86%	60%	130%	90%	50%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By: _____



Quality Assurance

CLIENT NAME: LOPERS & ASSOCIATES

AGAT WORK ORDER: 21Z747835

PROJECT: LOP21-004B

ATTENTION TO: Luke Lopers

SAMPLING SITE: Dumaurier

SAMPLED BY: Luke Lopers

Water Analysis

RPT Date: May 25, 2021

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inorganics (Water)															
Dissolved Antimony	2469759		<1.0	<1.0	NA	< 1.0	97%	70%	130%	104%	80%	120%	104%	70%	130%
Dissolved Arsenic	2469759		<1.0	<1.0	NA	< 1.0	90%	70%	130%	106%	80%	120%	106%	70%	130%
Dissolved Barium	2469759		38.4	40.3	4.8%	< 2.0	101%	70%	130%	96%	80%	120%	107%	70%	130%
Dissolved Beryllium	2469759		<0.50	<0.50	NA	< 0.50	103%	70%	130%	112%	80%	120%	118%	70%	130%
Dissolved Boron	2469759		69.6	71.9	3.3%	< 10.0	99%	70%	130%	104%	80%	120%	110%	70%	130%
Dissolved Cadmium	2469759		<0.20	<0.20	NA	< 0.20	NA	70%	130%	99%	80%	120%	108%	70%	130%
Dissolved Chromium	2469759		<2.0	<2.0	NA	< 2.0	96%	70%	130%	95%	80%	120%	101%	70%	130%
Dissolved Cobalt	2469759		<0.50	<0.50	NA	< 0.50	94%	70%	130%	93%	80%	120%	102%	70%	130%
Dissolved Copper	2469759		<1.0	<1.0	NA	< 1.0	95%	70%	130%	96%	80%	120%	102%	70%	130%
Dissolved Lead	2469759		<0.50	<0.50	NA	< 0.50	90%	70%	130%	95%	80%	120%	100%	70%	130%
Dissolved Molybdenum	2469759		<0.50	<0.50	NA	< 0.50	97%	70%	130%	96%	80%	120%	103%	70%	130%
Dissolved Nickel	2469759		<3.0	<3.0	NA	< 3.0	95%	70%	130%	91%	80%	120%	99%	70%	130%
Dissolved Selenium	2469759		<1.0	1.8	NA	< 1.0	100%	70%	130%	111%	80%	120%	112%	70%	130%
Dissolved Silver	2469759		<0.20	<0.20	NA	< 0.20	96%	70%	130%	96%	80%	120%	103%	70%	130%
Dissolved Thallium	2469759		<0.30	<0.30	NA	< 0.30	93%	70%	130%	99%	80%	120%	104%	70%	130%
Dissolved Uranium	2469759		<0.50	<0.50	NA	< 0.50	97%	70%	130%	98%	80%	120%	102%	70%	130%
Dissolved Vanadium	2469759		<0.40	<0.40	NA	< 0.40	98%	70%	130%	94%	80%	120%	101%	70%	130%
Dissolved Zinc	2469759		<5.0	<5.0	NA	< 5.0	95%	70%	130%	89%	80%	120%	106%	70%	130%
Mercury	2480867		<0.02	<0.02	NA	< 0.02	104%	70%	130%	101%	80%	120%	100%	70%	130%
Chromium VI	2481695		<2.000	<2.000	NA	< 2	103%	70%	130%	106%	80%	120%	104%	70%	130%
Cyanide, Free	2476558		<2	<2	NA	< 2	103%	70%	130%	103%	80%	120%	111%	70%	130%
Dissolved Sodium	2478945	2478945	84400	82700	2.0%	< 50	99%	70%	130%	99%	80%	120%	99%	70%	130%
Chloride	2480867		87000	84900	2.4%	< 100	101%	70%	130%	106%	80%	120%	102%	70%	130%
Electrical Conductivity	2481240		1200	1220	1.7%	< 2	102%	90%	110%	NA			NA		
pH	2481240		5.92	5.68	4.1%	NA	101%	90%	110%	NA			NA		

Comments: NA Signifies Not Applicable

Duplicate NA: results are under 5X the RDL and will not be calculated.

Certified By:



Method Summary

CLIENT NAME: LOPERS & ASSOCIATES
AGAT WORK ORDER: 21Z747835
PROJECT: LOP21-004B
ATTENTION TO: Luke Lopers
SAMPLING SITE: Dumaurier
SAMPLED BY: Luke Lopers

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acenaphthylene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acenaphthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Fluorene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Phenanthrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(a)anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Chrysene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(b)fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(k)fluoranthene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(a)pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Dibenz(a,h)anthracene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Benzo(g,h,i)perylene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
2-and 1-methyl Naphthalene	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Naphthalene-d8	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Acridine-d9	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Terphenyl-d14	ORG-91-5105	modified from EPA 3510C and EPA 8270E	GC/MS
Sediment			
F1 (C6-C10)	VOL-91-5010	modified from MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	modified from MOE PHC-E3421	P&T GC/FID
Toluene-d8	VOL-91-5010	modified from MOE PHC-E3421	(P&T)GC/MS
F2 (C10 to C16)	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
F3 (C16 to C34)	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
F3 (C16 to C34) minus PAHs	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
F4 (C34 to C50)	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	modified from MOE PHC-E3421	BALANCE
Terphenyl	VOL-91-5010	modified from MOE PHC-E3421	GC/FID
Dichlorodifluoromethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS

Method Summary

CLIENT NAME: LOPERS & ASSOCIATES
AGAT WORK ORDER: 21Z747835
PROJECT: LOP21-004B
ATTENTION TO: Luke Lopers
SAMPLING SITE: Dumaurier
SAMPLED BY: Luke Lopers

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Vinyl Chloride	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Bromomethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Acetone	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Methylene Chloride	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
trans- 1,2-Dichloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Methyl tert-butyl ether	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
cis- 1,2-Dichloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Chloroform	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Benzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Trichloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Bromodichloromethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Toluene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Dibromochloromethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Ethylbenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS

Method Summary

CLIENT NAME: LOPERS & ASSOCIATES
AGAT WORK ORDER: 21Z747835
PROJECT: LOP21-004B
ATTENTION TO: Luke Lopers
SAMPLING SITE: Dumaurier
SAMPLED BY: Luke Lopers

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
m & p-Xylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Bromoform	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Styrene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
o-Xylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Xylenes (Total)	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
n-Hexane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS

Method Summary

CLIENT NAME: LOPERS & ASSOCIATES
AGAT WORK ORDER: 21Z747835
PROJECT: LOP21-004B
ATTENTION TO: Luke Lopers
SAMPLING SITE: Dumaurier
SAMPLED BY: Luke Lopers

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Dissolved Antimony	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Arsenic	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Barium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Beryllium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Boron	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Cadmium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Chromium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Cobalt	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Copper	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Lead	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Molybdenum	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Nickel	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Selenium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Silver	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Thallium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Uranium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Vanadium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Zinc	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Chromium VI	INOR-93-6034	modified from QuickChem Method 10-124-13-1-B	LACHAT FIA
Cyanide, Free	INOR-93-6052	modified from ON MOECC E3015, SM 4500-CN- I, G-387	TECHNICON AUTO ANALYZER
Dissolved Sodium	MET-93-6105	modified from EPA 6010D	ICP/OES
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	modified from SM 4500-H+ B	PC TITRATE



AGAT

Laboratories

LT (Bagged ice) - 3-8/4.3 14.6

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

166 BIK

Laboratory Use Only

Work Order #: 212747835

Cooler Quantity: one - on ice

Arrival Temperatures: 12.4 12.5 12.4

Custody Seal Intact: Yes No N/A

Notes:

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: LOPERS & ASSOCIATES
Contact: Luke Lopos
Address: 30 Consheld Way
Ottawa, ON
Phone: 613-327-9073 Fax: _____
Reports to be sent to: Luke@Lopers.ca
1. Email: _____
2. Email: _____

Regulatory Requirements:

(Please check all applicable boxes)

Regulation 153/04

Excess Soils R406

Sewer Use

Sanitary Storm

Table 3 Indicate One

Table _____ Indicate One

Region _____

Ind/Com

Res/Park

Regulation 558

Prov. Water Quality Objectives (PWQO)

Agriculture

Soil Texture (Check One)

CCME

Other

Coarse

Fine

Indicate One

Is this submission for a Record of Site Condition?
 Yes No

Report Guideline on Certificate of Analysis
 Yes No

Project Information:

Project: LOP21-004B
Site Location: Dumaurier
Sampled By: Luke Lopos
AGAT ID #: _____ PO: _____
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes No

Company: _____
Contact: _____
Address: _____
Email: _____

Sample Matrix Legend

B Biota
GW Ground Water
O Oil
P Paint
S Soil
SD Sediment
SW Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y / N	0. Reg 153		0. Reg 406		Potentially Hazardous or High Concentration (Y/N)
							Metals & Inorganics	VOC	Landfill Disposal Characterization TCLP:	Excess Soils SPLP Rainwater Leach	
BHI-GW1	May 18/21	AM	14	GW	Metals Samples are Filtered		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
MW95-1		PM	14	GW			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
MW95-2		AM	14	GW			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
DUP-1		PM	14	GW			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Trip Blank		AM	2	GW						<input checked="" type="checkbox"/>	
		AM									
		AM									
		AM									
		AM									
		AM									
		AM									
		AM									

Samples Relinquished By (Print Name and Sign): <u>Luke Lopos</u>	Date: <u>May 18/21</u>	Time: <u>1:30 PM</u>	Samples Received By (Print Name and Sign): <u>Webearth</u>	Date: <u>21/05/17</u>	Time: <u>13:45</u>
Samples Relinquished By (Print Name and Sign): <u>UP TOPIUO</u>	Date: <u>21/5/17</u>	Time: <u>10:00</u>	Samples Received By (Print Name and Sign): <u>SMRAN</u>	Date: <u>may 18/21</u>	Time: <u>9:10</u>
Page _____ of _____ No: T118702					



CLIENT NAME: GHD LIMITED
455 Phillip St
WATERLOO, ON N2V1C2
(519) 884-0510

ATTENTION TO: LUKE LOPERS

PROJECT: 11181273 (PO# 73513391)

AGAT WORK ORDER: 18Z399894

TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor

WATER ANALYSIS REVIEWED BY: Yris Verastegui, Report Reviewer

DATE REPORTED: Nov 13, 2018

PAGES (INCLUDING COVER): 14

VERSION*: 2

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

VERSION 2: Revised report issued November 13, 2018.

Analytical Data from MW1, MW2 and MW4 redacted.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



Certificate of Analysis

AGAT WORK ORDER: 18Z399894
PROJECT: 11181273 (PO# 73513391)

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: GHD LIMITED
SAMPLING SITE: 2865 DuMaurier

ATTENTION TO: LUKE LOPERS
SAMPLED BY: S. Wheeler

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Water)

DATE RECEIVED: 2018-10-20

DATE REPORTED: 2018-11-13

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION:		MW3S-101918	MW3D-101918	MW6-101918
				Date Prepared	Date Analyzed	2018-10-19	2018-10-19	2018-10-19
F1 (C6 - C10)	µg/L		25	2018-11-08	2018-11-09	<25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L		25	2018-11-08	2018-11-09	<25	<25	<25
F2 (C10 to C16)	µg/L		100	2018-11-12	2018-11-12	170	<100	<100
F3 (C16 to C34)	µg/L		100	2018-11-12	2018-11-12	860	<100	<100
F4 (C34 to C50)	µg/L		100	2018-11-12	2018-11-12	170	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L		500	2018-11-12	2018-11-12	NA	NA	NA
Surrogate	Unit	Acceptable Limits						
Terphenyl	%		60-140	2018-11-12	2018-11-12	85	84	100

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
 9641620-9641879 The C6-C10 fraction is calculated using Toluene response factor.
 The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
 Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
 The chromatogram has returned to baseline by the retention time of nC50.
 Total C6-C50 results are corrected for BTEX contributions.
 This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
 nC6 and nC10 response factors are within 30% of Toluene response factor.
 nC10, nC16 and nC34 response factors are within 10% of their average.
 C50 response factor is within 70% of nC10 + nC16 nC34 average.
 Linearity is within 15%.
 Extraction and holding times were met for this sample.
 Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 18Z399894
PROJECT: 11181273 (PO# 73513391)

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: GHD LIMITED
SAMPLING SITE: 2865 DuMaurier

ATTENTION TO: LUKE LOPERS
SAMPLED BY: S. Wheeler

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2018-10-20

DATE REPORTED: 2018-11-13

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION:				MW3S-101918	MW3D-101918
				SAMPLE TYPE:		DATE SAMPLED:		Water	Water
				Date Prepared	Date Analyzed	2018-10-19	2018-10-19		
						RDL	RDL	9641876	9641877
Dichlorodifluoromethane	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
Vinyl Chloride	µg/L		0.17	2018-10-24	2018-10-25	0.68	0.17	<0.17	<0.17
Bromomethane	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L		0.40	2018-10-24	2018-10-25	1.60	0.40	<0.40	<0.40
Acetone	µg/L		1.0	2018-10-24	2018-10-25	4.0	1.0	<1.0	<1.0
1,1-Dichloroethylene	µg/L		0.30	2018-10-24	2018-10-25	1.20	0.30	<0.30	<0.30
Methylene Chloride	µg/L		0.30	2018-10-24	2018-10-25	1.20	0.30	<0.30	<0.30
trans- 1,2-Dichloroethylene	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L		0.30	2018-10-24	2018-10-25	1.20	0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L		1.0	2018-10-24	2018-10-25	4.0	1.0	<1.0	<1.0
cis- 1,2-Dichloroethylene	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
Chloroform	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
1,2-Dichloroethane	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L		0.30	2018-10-24	2018-10-25	1.20	0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
Benzene	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	0.49	<0.20
1,2-Dichloropropane	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
Trichloroethylene	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
Bromodichloromethane	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L		1.0	2018-10-24	2018-10-25	4.0	1.0	<1.0	<1.0
1,1,2-Trichloroethane	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
Toluene	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
Dibromochloromethane	µg/L		0.10	2018-10-24	2018-10-25	0.40	0.10	<0.10	<0.10
Ethylene Dibromide	µg/L		0.10	2018-10-24	2018-10-25	0.40	0.10	<0.10	<0.10
Tetrachloroethylene	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
1,1,1,2-Tetrachloroethane	µg/L		0.10	2018-10-24	2018-10-25	0.40	0.10	<0.10	<0.10
Chlorobenzene	µg/L		0.10	2018-10-24	2018-10-25	0.40	0.10	0.64	<0.10
Ethylbenzene	µg/L		0.10	2018-10-24	2018-10-25	0.40	0.10	<0.10	<0.10
m & p-Xylene	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 18Z399894
PROJECT: 11181273 (PO# 73513391)

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: GHD LIMITED
SAMPLING SITE: 2865 DuMaurier

ATTENTION TO: LUKE LOPERS
SAMPLED BY: S. Wheeler

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2018-10-20

DATE REPORTED: 2018-11-13

SAMPLE DESCRIPTION:

MW3S-101918 MW3D-101918

SAMPLE TYPE:

Water Water

DATE SAMPLED:

2018-10-19 2018-10-19

Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	RDL	RDL	9641876	9641877
Bromoform	µg/L		0.10	2018-10-24	2018-10-25	0.40	0.10	<0.10	<0.10
Styrene	µg/L		0.10	2018-10-24	2018-10-25	0.40	0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L		0.10	2018-10-24	2018-10-25	0.40	0.10	<0.10	<0.10
o-Xylene	µg/L		0.10	2018-10-24	2018-10-25	0.40	0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L		0.10	2018-10-24	2018-10-25	0.40	0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L		0.10	2018-10-24	2018-10-25	0.40	0.10	0.79	<0.10
1,2-Dichlorobenzene	µg/L		0.10	2018-10-24	2018-10-25	0.40	0.10	<0.10	<0.10
1,3-Dichloropropene	µg/L		0.30	2018-10-24	2018-10-25	1.20	0.30	<0.30	<0.30
Xylene Mixture	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
n-Hexane	µg/L		0.20	2018-10-24	2018-10-25	0.80	0.20	<0.20	<0.20
Surrogate	Unit	Acceptable Limits							
Toluene-d8	% Recovery	50-140		2018-10-24	2018-10-25			80	73
4-Bromofluorobenzene	% Recovery	50-140		2018-10-24	2018-10-25			109	91

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 18Z399894
PROJECT: 11181273 (PO# 73513391)

5835 COOPERS AVENUE
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CLIENT NAME: GHD LIMITED
SAMPLING SITE: 2865 DuMaurier

ATTENTION TO: LUKE LOPERS
SAMPLED BY: S. Wheeler

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2018-10-20

DATE REPORTED: 2018-11-13

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION:		MW6-101918	TRIP BLANK
				SAMPLE TYPE:		Water	Water
				DATE SAMPLED:		2018-10-19	2018-10-19
				Date Prepared	Date Analyzed	9641879	9641881
Dichlorodifluoromethane	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20
Vinyl Chloride	µg/L		0.17	2018-10-24	2018-10-25	<0.17	<0.17
Bromomethane	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20
Trichlorofluoromethane	µg/L		0.40	2018-10-24	2018-10-25	<0.40	<0.40
Acetone	µg/L		1.0	2018-10-24	2018-10-25	<1.0	<1.0
1,1-Dichloroethylene	µg/L		0.30	2018-10-24	2018-10-25	<0.30	<0.30
Methylene Chloride	µg/L		0.30	2018-10-24	2018-10-25	<0.30	<0.30
trans- 1,2-Dichloroethylene	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20
Methyl tert-butyl ether	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20
1,1-Dichloroethane	µg/L		0.30	2018-10-24	2018-10-25	<0.30	<0.30
Methyl Ethyl Ketone	µg/L		1.0	2018-10-24	2018-10-25	<1.0	<1.0
cis- 1,2-Dichloroethylene	µg/L		0.20	2018-10-24	2018-10-25	0.27	<0.20
Chloroform	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20
1,2-Dichloroethane	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20
1,1,1-Trichloroethane	µg/L		0.30	2018-10-24	2018-10-25	<0.30	<0.30
Carbon Tetrachloride	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20
Benzene	µg/L		0.20	2018-10-24	2018-10-25	0.85	<0.20
1,2-Dichloropropane	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20
Trichloroethylene	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20
Bromodichloromethane	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L		1.0	2018-10-24	2018-10-25	<1.0	<1.0
1,1,2-Trichloroethane	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20
Toluene	µg/L		0.20	2018-10-24	2018-10-25	0.32	<0.20
Dibromochloromethane	µg/L		0.10	2018-10-24	2018-10-25	<0.10	<0.10
Ethylene Dibromide	µg/L		0.10	2018-10-24	2018-10-25	<0.10	<0.10
Tetrachloroethylene	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20
1,1,1,2-Tetrachloroethane	µg/L		0.10	2018-10-24	2018-10-25	<0.10	<0.10
Chlorobenzene	µg/L		0.10	2018-10-24	2018-10-25	1.3	<0.10
Ethylbenzene	µg/L		0.10	2018-10-24	2018-10-25	<0.10	<0.10
m & p-Xylene	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 18Z399894
PROJECT: 11181273 (PO# 73513391)

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CLIENT NAME: GHD LIMITED
SAMPLING SITE: 2865 DuMaurier

ATTENTION TO: LUKE LOPERS
SAMPLED BY: S. Wheeler

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2018-10-20

DATE REPORTED: 2018-11-13

SAMPLE DESCRIPTION:						MW6-101918	TRIP BLANK
SAMPLE TYPE:						Water	Water
DATE SAMPLED:						2018-10-19	2018-10-19
Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	9641879	9641881
Bromoform	µg/L		0.10	2018-10-24	2018-10-25	<0.10	<0.10
Styrene	µg/L		0.10	2018-10-24	2018-10-25	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L		0.10	2018-10-24	2018-10-25	<0.10	<0.10
o-Xylene	µg/L		0.10	2018-10-24	2018-10-25	<0.10	<0.10
1,3-Dichlorobenzene	µg/L		0.10	2018-10-24	2018-10-25	<0.10	<0.10
1,4-Dichlorobenzene	µg/L		0.10	2018-10-24	2018-10-25	1.6	<0.10
1,2-Dichlorobenzene	µg/L		0.10	2018-10-24	2018-10-25	0.14	<0.10
1,3-Dichloropropene	µg/L		0.30	2018-10-24	2018-10-25	<0.30	<0.30
Xylene Mixture	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20
n-Hexane	µg/L		0.20	2018-10-24	2018-10-25	<0.20	<0.20
Surrogate	Unit	Acceptable Limits					
Toluene-d8	% Recovery	50-140		2018-10-24	2018-10-25	73	90
4-Bromofluorobenzene	% Recovery	50-140		2018-10-24	2018-10-25	107	81

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9641666 Dilution factor=4

The sample was diluted because it was foamy. The reporting detection limit has been corrected for the dilution factor used.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 18Z399894
PROJECT: 11181273 (PO# 73513391)

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CLIENT NAME: GHD LIMITED
SAMPLING SITE: 2865 DuMaurier

ATTENTION TO: LUKE LOPERS
SAMPLED BY: S. Wheeler

O. Reg. 153(511) - Metals & Inorganics (Water)

DATE RECEIVED: 2018-10-20

DATE REPORTED: 2018-11-13

Parameter	Unit	G / S	SAMPLE DESCRIPTION:				MW3S-101918		MW3D-101918	
			RDL	Date Prepared	Date Analyzed	RDL	Water		Water	
							2018-10-19		2018-10-19	
							9641876	RDL	9641877	
Antimony	µg/L		1.0	2018-10-25	2018-10-25	1.0	<1.0	1.0	<1.0	
Arsenic	µg/L		1.0	2018-10-25	2018-10-25	1.0	3.1	1.0	<1.0	
Barium	µg/L		2.0	2018-10-25	2018-10-25	2.0	680	2.0	493	
Beryllium	µg/L		0.5	2018-10-25	2018-10-25	0.5	<0.5	0.5	<0.5	
Boron	µg/L		10.0	2018-10-25	2018-10-25	10.0	58.4	10.0	20.0	
Cadmium	µg/L		0.2	2018-10-25	2018-10-25	0.2	<0.2	0.2	<0.2	
Chromium	µg/L		2.0	2018-10-25	2018-10-25	2.0	12.6	2.0	14.5	
Cobalt	µg/L		0.5	2018-10-25	2018-10-25	0.5	1.2	0.5	<0.5	
Copper	µg/L		1.0	2018-10-25	2018-10-25	1.0	<1.0	1.0	2.2	
Lead	µg/L		0.5	2018-10-25	2018-10-25	0.5	<0.5	0.5	<0.5	
Molybdenum	µg/L		0.5	2018-10-25	2018-10-25	0.5	1.5	0.5	1.3	
Nickel	µg/L		1.0	2018-10-25	2018-10-25	1.0	<1.0	1.0	1.0	
Selenium	µg/L		1.0	2018-10-25	2018-10-25	1.0	<1.0	1.0	<1.0	
Silver	µg/L		0.2	2018-10-25	2018-10-25	0.2	<0.2	0.2	<0.2	
Thallium	µg/L		0.3	2018-10-25	2018-10-25	0.3	<0.3	0.3	<0.3	
Uranium	µg/L		0.5	2018-10-25	2018-10-25	0.5	<0.5	0.5	1.5	
Vanadium	µg/L		0.4	2018-10-25	2018-10-25	0.4	3.3	0.4	4.1	
Zinc	µg/L		5.0	2018-10-25	2018-10-25	5.0	<5.0	5.0	<5.0	
Mercury	µg/L		0.02	2018-10-24	2018-10-24	0.02	<0.02	0.02	<0.02	
Chromium VI	µg/L		5	2018-10-25	2018-10-25	5	<5	5	<5	
Cyanide	µg/L		2	2018-10-26	2018-10-26	2	<2	2	<2	
Sodium	µg/L		5000	2018-10-29	2018-10-29	2500	384000	2500	606000	
Chloride	µg/L		5000	2018-10-25	2018-10-25	2000	1150000	5000	1400000	
Electrical Conductivity	uS/cm		2	2018-10-25	2018-10-25	2	3630	2	4580	
pH	pH Units		NA	2018-10-25	2018-10-25	NA	7.09	NA	7.57	

Certified By:

Jris Veraestegui



Certificate of Analysis

AGAT WORK ORDER: 18Z399894
PROJECT: 11181273 (PO# 73513391)

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CLIENT NAME: GHD LIMITED
SAMPLING SITE: 2865 DuMaurier

ATTENTION TO: LUKE LOPERS
SAMPLED BY: S. Wheeler

O. Reg. 153(511) - Metals & Inorganics (Water)

DATE RECEIVED: 2018-10-20

DATE REPORTED: 2018-11-13

SAMPLE DESCRIPTION:

MW6-101918

SAMPLE TYPE:

Water

DATE SAMPLED:

2018-10-19

Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	RDL	9641879
Antimony	µg/L		1.0	2018-10-25	2018-10-25	1.0	<1.0
Arsenic	µg/L		1.0	2018-10-25	2018-10-25	1.0	<1.0
Barium	µg/L		2.0	2018-10-25	2018-10-25	2.0	688
Beryllium	µg/L		0.5	2018-10-25	2018-10-25	0.5	<0.5
Boron	µg/L		10.0	2018-10-25	2018-10-25	10.0	62.8
Cadmium	µg/L		0.2	2018-10-25	2018-10-25	0.2	<0.2
Chromium	µg/L		2.0	2018-10-25	2018-10-25	2.0	10.0
Cobalt	µg/L		0.5	2018-10-25	2018-10-25	0.5	1.3
Copper	µg/L		1.0	2018-10-25	2018-10-25	1.0	<1.0
Lead	µg/L		0.5	2018-10-25	2018-10-25	0.5	<0.5
Molybdenum	µg/L		0.5	2018-10-25	2018-10-25	0.5	1.8
Nickel	µg/L		1.0	2018-10-25	2018-10-25	1.0	<1.0
Selenium	µg/L		1.0	2018-10-25	2018-10-25	1.0	<1.0
Silver	µg/L		0.2	2018-10-25	2018-10-25	0.2	<0.2
Thallium	µg/L		0.3	2018-10-25	2018-10-25	0.3	<0.3
Uranium	µg/L		0.5	2018-10-25	2018-10-25	0.5	<0.5
Vanadium	µg/L		0.4	2018-10-25	2018-10-25	0.4	2.8
Zinc	µg/L		5.0	2018-10-25	2018-10-25	5.0	6.0
Mercury	µg/L		0.02	2018-10-24	2018-10-24	0.02	<0.02
Chromium VI	µg/L		5	2018-10-25	2018-10-25	5	<5
Cyanide	µg/L		2	2018-10-26	2018-10-26	2	<2
Sodium	µg/L		2500	2018-10-29	2018-10-29	2500	385000
Chloride	µg/L		1000	2018-10-25	2018-10-25	2000	1130000
Electrical Conductivity	µS/cm		2	2018-10-25	2018-10-25	2	3640
pH	pH Units		NA	2018-10-25	2018-10-25	NA	7.12

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9641620-9641879 Elevated RDLs indicate the degree of sample dilutions prior to the analysis to keep analytes within the calibration range, reduce matrix interference and/or to avoid contaminating the instrument.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Jris Veraestegui

Quality Assurance

CLIENT NAME: GHD LIMITED
 PROJECT: 11181273 (PO# 73513391)
 SAMPLING SITE: 2865 DuMaurier

AGAT WORK ORDER: 18Z399894
 ATTENTION TO: LUKE LOPERS
 SAMPLED BY: S. Wheeler

Trace Organics Analysis

RPT Date: Nov 13, 2018			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper		Lower	Upper		Lower	Upper	

O. Reg. 153(511) - VOCs (Water)															
Dichlorodifluoromethane	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	77%	50%	140%	104%	50%	140%	96%	50%	140%
Vinyl Chloride	9641620	9641620	< 0.17	< 0.17	NA	< 0.17	75%	50%	140%	81%	50%	140%	75%	50%	140%
Bromomethane	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	79%	50%	140%	79%	50%	140%	71%	50%	140%
Trichlorofluoromethane	9641620	9641620	< 0.40	< 0.40	NA	< 0.40	71%	50%	140%	107%	50%	140%	87%	50%	140%
Acetone	9641620	9641620	< 1.0	< 1.0	NA	< 1.0	108%	50%	140%	111%	50%	140%	111%	50%	140%
1,1-Dichloroethylene	9641620	9641620	< 0.30	< 0.30	NA	< 0.30	81%	50%	140%	114%	60%	130%	119%	50%	140%
Methylene Chloride	9641620	9641620	< 0.30	< 0.30	NA	< 0.30	105%	50%	140%	114%	60%	130%	100%	50%	140%
trans- 1,2-Dichloroethylene	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	98%	50%	140%	105%	60%	130%	109%	50%	140%
Methyl tert-butyl ether	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	107%	50%	140%	98%	60%	130%	83%	50%	140%
1,1-Dichloroethane	9641620	9641620	< 0.30	< 0.30	NA	< 0.30	110%	50%	140%	102%	60%	130%	115%	50%	140%
Methyl Ethyl Ketone	9641620	9641620	< 1.0	< 1.0	NA	< 1.0	75%	50%	140%	112%	50%	140%	115%	50%	140%
cis- 1,2-Dichloroethylene	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	105%	50%	140%	114%	60%	130%	108%	50%	140%
Chloroform	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	119%	50%	140%	113%	60%	130%	107%	50%	140%
1,2-Dichloroethane	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	119%	50%	140%	110%	60%	130%	105%	50%	140%
1,1,1-Trichloroethane	9641620	9641620	< 0.30	< 0.30	NA	< 0.30	109%	50%	140%	116%	60%	130%	80%	50%	140%
Carbon Tetrachloride	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	114%	50%	140%	113%	60%	130%	102%	50%	140%
Benzene	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	111%	50%	140%	109%	60%	130%	102%	50%	140%
1,2-Dichloropropane	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	106%	50%	140%	118%	60%	130%	98%	50%	140%
Trichloroethylene	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	106%	50%	140%	112%	60%	130%	87%	50%	140%
Bromodichloromethane	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	109%	50%	140%	116%	60%	130%	95%	50%	140%
Methyl Isobutyl Ketone	9641620	9641620	< 1.0	< 1.0	NA	< 1.0	106%	50%	140%	111%	50%	140%	107%	50%	140%
1,1,2-Trichloroethane	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	109%	50%	140%	92%	60%	130%	78%	50%	140%
Toluene	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	98%	50%	140%	98%	60%	130%	81%	50%	140%
Dibromochloromethane	9641620	9641620	< 0.10	< 0.10	NA	< 0.10	100%	50%	140%	92%	60%	130%	79%	50%	140%
Ethylene Dibromide	9641620	9641620	< 0.10	< 0.10	NA	< 0.10	101%	50%	140%	92%	60%	130%	81%	50%	140%
Tetrachloroethylene	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	106%	50%	140%	101%	60%	130%	83%	50%	140%
1,1,1,2-Tetrachloroethane	9641620	9641620	< 0.10	< 0.10	NA	< 0.10	115%	50%	140%	89%	60%	130%	74%	50%	140%
Chlorobenzene	9641620	9641620	< 0.10	< 0.10	NA	< 0.10	106%	50%	140%	93%	60%	130%	77%	50%	140%
Ethylbenzene	9641620	9641620	< 0.10	< 0.10	NA	< 0.10	100%	50%	140%	89%	60%	130%	72%	50%	140%
m & p-Xylene	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	107%	50%	140%	95%	60%	130%	77%	50%	140%
Bromoform	9641620	9641620	< 0.10	< 0.10	NA	< 0.10	107%	50%	140%	78%	60%	130%	89%	50%	140%
Styrene	9641620	9641620	0.23	0.23	NA	< 0.10	116%	50%	140%	108%	60%	130%	88%	50%	140%
1,1,2,2-Tetrachloroethane	9641620	9641620	< 0.10	< 0.10	NA	< 0.10	98%	50%	140%	104%	60%	130%	92%	50%	140%
o-Xylene	9641620	9641620	< 0.10	< 0.10	NA	< 0.10	112%	50%	140%	96%	60%	130%	74%	50%	140%
1,3-Dichlorobenzene	9641620	9641620	< 0.10	< 0.10	NA	< 0.10	114%	50%	140%	94%	60%	130%	73%	50%	140%
1,4-Dichlorobenzene	9641620	9641620	< 0.10	< 0.10	NA	< 0.10	110%	50%	140%	91%	60%	130%	79%	50%	140%
1,2-Dichlorobenzene	9641620	9641620	< 0.10	< 0.10	NA	< 0.10	107%	50%	140%	85%	60%	130%	70%	50%	140%
1,3-Dichloropropene	9641620	9641620	< 0.30	< 0.30	NA	< 0.30	95%	50%	140%	86%	60%	130%	81%	50%	140%
n-Hexane	9641620	9641620	< 0.20	< 0.20	NA	< 0.20	97%	50%	140%	76%	60%	130%	109%	50%	140%



Quality Assurance

CLIENT NAME: GHD LIMITED
 PROJECT: 11181273 (PO# 73513391)
 SAMPLING SITE: 2865 DuMaurier

AGAT WORK ORDER: 18Z399894
 ATTENTION TO: LUKE LOPERS
 SAMPLED BY: S. Wheeler

Trace Organics Analysis (Continued)

RPT Date: Nov 13, 2018			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE		MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Water)

F1 (C6 - C10)	9641876	9641876	< 25	< 25	NA	< 25	96%	60%	140%	98%	60%	140%	94%	60%	140%
F2 (C10 to C16)		TW	< 100	< 100	NA	< 100	104%	60%	140%	76%	60%	140%	72%	60%	140%
F3 (C16 to C34)		TW	< 100	< 100	NA	< 100	102%	60%	140%	105%	60%	140%	85%	60%	140%
F4 (C34 to C50)		TW	< 100	< 100	NA	< 100	92%	60%	140%	93%	60%	140%	90%	60%	140%

Comments: Tap water analysis has been performed as QC sample testing for duplicate and matrix spike due to insufficient sample volume.
 When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Water)

F1 (C6 - C10)	9641879	9641879	< 25	< 25	NA	< 25	99%	60%	140%	88%	60%	140%	94%	60%	140%
F2 (C10 to C16)		TW	< 100	< 100	NA	< 100	92%	60%	140%	78%	60%	140%	77%	60%	140%
F3 (C16 to C34)		TW	< 100	< 100	NA	< 100	94%	60%	140%	105%	60%	140%	95%	60%	140%
F4 (C34 to C50)		TW	< 100	< 100	NA	< 100	86%	60%	140%	101%	60%	140%	90%	60%	140%

Certified By: _____

Quality Assurance

 CLIENT NAME: GHD LIMITED
 PROJECT: 11181273 (PO# 73513391)
 SAMPLING SITE: 2865 DuMaurier

 AGAT WORK ORDER: 18Z399894
 ATTENTION TO: LUKE LOPERS
 SAMPLED BY: S. Wheeler

Water Analysis

RPT Date: Nov 13, 2018			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper		Lower	Upper		Lower	Upper	

O. Reg. 153(511) - Metals & Inorganics (Water)															
Antimony	9641620	9641620	<1.0	<1.0	NA	< 1.0	101%	70%	130%	101%	80%	120%	100%	70%	130%
Arsenic	9641620	9641620	7.2	8.2	13.0%	< 1.0	100%	70%	130%	103%	80%	120%	106%	70%	130%
Barium	9641620	9641620	747	706	5.6%	< 2.0	98%	70%	130%	104%	80%	120%	101%	70%	130%
Beryllium	9641620	9641620	<0.5	<0.5	NA	< 0.5	98%	70%	130%	96%	80%	120%	112%	70%	130%
Boron	9641620	9641620	26.3	25.1	NA	< 10.0	99%	70%	130%	99%	80%	120%	117%	70%	130%
Cadmium	9641620	9641620	<0.2	<0.2	NA	< 0.2	101%	70%	130%	103%	80%	120%	99%	70%	130%
Chromium	9641620	9641620	31.4	29.6	5.9%	< 2.0	99%	70%	130%	100%	80%	120%	103%	70%	130%
Cobalt	9641620	9641620	2.2	2.1	NA	< 0.5	101%	70%	130%	101%	80%	120%	98%	70%	130%
Copper	9641620	9641620	1.1	1.2	NA	< 1.0	100%	70%	130%	106%	80%	120%	94%	70%	130%
Lead	9641620	9641620	<0.5	<0.5	NA	< 0.5	104%	70%	130%	103%	80%	120%	94%	70%	130%
Molybdenum	9641620	9641620	0.6	0.6	NA	< 0.5	102%	70%	130%	101%	80%	120%	102%	70%	130%
Nickel	9641620	9641620	1.5	1.6	NA	< 1.0	99%	70%	130%	102%	80%	120%	93%	70%	130%
Selenium	9641620	9641620	1.8	5.3	NA	< 1.0	99%	70%	130%	99%	80%	120%	103%	70%	130%
Silver	9641620	9641620	<0.2	<0.2	NA	< 0.2	101%	70%	130%	110%	80%	120%	96%	70%	130%
Thallium	9641620	9641620	<0.3	<0.3	NA	< 0.3	102%	70%	130%	102%	80%	120%	93%	70%	130%
Uranium	9641620	9641620	0.8	0.7	NA	< 0.5	107%	70%	130%	100%	80%	120%	91%	70%	130%
Vanadium	9641620	9641620	4.7	4.4	6.6%	< 0.4	100%	70%	130%	100%	80%	120%	103%	70%	130%
Zinc	9641620	9641620	<5.0	<5.0	NA	< 5.0	101%	70%	130%	99%	80%	120%	92%	70%	130%
Mercury	9641620	9641620	<0.02	<0.02	NA	< 0.02	98%	70%	130%	99%	80%	120%	102%	70%	130%
Chromium VI	9641877	9641877	<5	<5	NA	< 5	102%	70%	130%	101%	80%	120%	101%	70%	130%
Cyanide	9641666	9641666	<2	<2	NA	< 2	97%	70%	130%	97%	80%	120%	79%	70%	130%
Sodium	9641879	9641879	385000	383000	0.5%	< 500	96%	70%	130%	96%	80%	120%	90%	70%	130%
Chloride	9641878	9641878	472000	460000	2.6%	< 100	95%	70%	130%	103%	70%	130%	95%	70%	130%
Electrical Conductivity	9641620	9641620	5560	5790	4.1%	< 2	97%	90%	110%						
pH	9641620	9641620	6.80	6.88	1.2%	NA	99%	90%	110%						

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:



Method Summary

 CLIENT NAME: GHD LIMITED
 PROJECT: 11181273 (PO# 73513391)
 SAMPLING SITE: 2865 DuMaurier

 AGAT WORK ORDER: 18Z399894
 ATTENTION TO: LUKE LOPERS
 SAMPLED BY: S. Wheeler

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
F1 (C6 - C10)	VOL-91- 5010	MOE PHC E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC E3421	(P&T)GC/FID
F2 (C10 to C16)	VOL-91-5010	MOE PHC E3421	GC / FID
F3 (C16 to C34)	VOL-91-5010	MOE PHC E3421	GC / FID
F4 (C34 to C50)	VOL-91-5010	MOE PHC E3421	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	MOE PHC E3421	BALANCE
Terphenyl	VOL-91-5010		GC/FID
Dichlorodifluoromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Vinyl Chloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromomethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Acetone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methylene Chloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
trans- 1,2-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl tert-butyl ether	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
cis- 1,2-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chloroform	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Benzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Trichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromodichloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Toluene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Dibromochloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromoform	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Styrene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Xylene Mixture	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
n-Hexane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Toluene-d8	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS



Method Summary

CLIENT NAME: GHD LIMITED
 PROJECT: 11181273 (PO# 73513391)
 SAMPLING SITE: 2865 DuMaurier

AGAT WORK ORDER: 18Z399894
 ATTENTION TO: LUKE LOPERS
 SAMPLED BY: S. Wheeler

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW-846 7470 & 245.1	CVAAS
Chromium VI	INOR-93-6034	SM 3500-Cr B	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE METHOD CN- 3015 & SM 4500 CN- I	TECHNICON AUTO ANALYZER
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE



AGAT Laboratories

1 Large Black

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Laboratory Use Only

Work Order #: 18Z399894

Cooler Quantity: one

Arrival Temperatures: 11.1 | 11 | 10.9

LT: 2.4 | 2.6 | 2.0

Custody Seal Intact: Yes No N/A

Notes: on ice

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: GHD
Contact: LUKE LOPERS
Address: 179 colonnade RD # 4000
Ottawa ON
Phone: _____ Fax: _____
Reports to be sent to:
1. Email: LUKE.LOPERS@GHD.COM
2. Email: _____

Regulatory Requirements:

No Regulatory Requirement
(Please check all applicable boxes)
 Regulation 153/04 Sewer Use Regulation 558
Table _____ Sanitary CCME
 Ind/Com Storm Prov. Water Quality
 Res/Park Agriculture Other
 Agriculture Other
Soil Texture (Check One) Region _____
 Coarse MISA
 Fine MISA
Indicate One

Turnaround Time (TAT) Required:

Regular TAT 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply)
 3 Business Days 2 Business Days Next Business Day
OR Date Required (Rush Surcharges May Apply): _____

Project Information:

Project: 11181273
Site Location: 2865 Dymaurier
Sampled By: S. Wheeler
AGAT Quote #: _____ PO: 73513391
Please note: If quotation number is not provided, client will be billed full price for analysis.

Is this submission for a Record of Site Condition?

Yes No

Report Guideline on Certificate of Analysis

Yes No

Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays
For 'Same Day' analysis, please contact your AGAT CPM

Invoice Information:

Company: _____
Contact: _____
Address: _____
Email: _____
Bill To Same: Yes No

Sample Matrix Legend

B Biota
GW Ground Water
O Oil
P Paint
S Soil
SD Sediment
SW Surface Water

Field Filtered - Metals, Hg, CrVI	O. Reg 153		Full Metals Scan	Regulatory/Custom Metals	Nutrients: <input type="checkbox"/> TP <input type="checkbox"/> NH ₃ <input type="checkbox"/> TKN <input type="checkbox"/> NO ₂ <input type="checkbox"/> NO ₃ <input type="checkbox"/> NO ₂ +NO ₃	Volatiles: <input checked="" type="checkbox"/> VOC <input checked="" type="checkbox"/> BTEX <input type="checkbox"/> THM	PHCs F1 - F4	ABNs	PAHs	PCBs: <input type="checkbox"/> Total <input type="checkbox"/> Aroclors	Organochlorine Pesticides	TCLP: <input type="checkbox"/> M&I <input type="checkbox"/> VOCs <input type="checkbox"/> ABNs <input type="checkbox"/> B(a)P <input type="checkbox"/> PCBs	Sewer Use
	Metals and Inorganics	All Metals <input type="checkbox"/> 153 Metals (excl. Hydrides)											
	<input type="checkbox"/> All Metals <input type="checkbox"/> 153 Metals (excl. Hydrides)	<input type="checkbox"/> Hydride Metals <input type="checkbox"/> 153 Metals (incl. Hydrides)											
	ORPs: <input type="checkbox"/> B-HWS <input type="checkbox"/> Cl <input type="checkbox"/> CN <input type="checkbox"/> Cr ⁶⁺ <input type="checkbox"/> EC <input type="checkbox"/> FOC <input type="checkbox"/> Hg <input type="checkbox"/> pH <input type="checkbox"/> SAR												

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y / N
MW 1 - 10/19/18	10/19/18		12	GW	Cr(VI) Not Field Filtered	
MW 2 - 10/19/18	10/19/18		12	GW	only Hg Field Filtered	
MW 35 - 10/14/18	10/14/18		12	GW	Cr(VI) Not Field Filtered	
MW 30 - 10/19/18	10/19/18		12	GW	Cr(VI) Not Field Filtered	
MW 4 - 10/19/18	10/19/18		12	GW		
MW 6 - 10/19/18	10/19/18		12	GW		

* Do not analyze for PHCs. *
* except for MW35-10/19/18 *

Samples Relinquished By (Print Name and Sign): <u>Anthony O'Brien</u>	Date: <u>10/19/18</u>	Time: <u>6:03</u>	Samples Received By (Print Name and Sign): <u>Jeff Jones</u>	Date: <u>20/09/18</u>	Time: <u>1:500</u>
Samples Relinquished By (Print Name and Sign): <u>LBK to FedEx</u>	Date: <u>18/10/22</u>	Time: <u>16:00</u>	Samples Received By (Print Name and Sign): <u>RUPINDER KAUR</u>	Date: <u>Ruk 01/23/18</u>	Time: <u>9:40am</u>

Page 1 of 1
No: **T 080076**



**CLIENT NAME: GHD LIMITED
455 Phillip St
WATERLOO, ON N2V1C2
(519) 884-0510**

ATTENTION TO: LUKE LOPERS

PROJECT: 11181273-E2 (PO#73513391)

AGAT WORK ORDER: 18Z394508

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Supervisor

TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor

DATE REPORTED: Oct 15, 2018

PAGES (INCLUDING COVER): 16

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

***NOTES**

Analytical Data from BH1, BH2, BH4 and BH5 has been redacted.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



Certificate of Analysis

AGAT WORK ORDER: 18Z394508

PROJECT: 11181273-E2 (PO#73513391)

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: GHD LIMITED

SAMPLING SITE: DuMaurier Avenue, Ottawa, ON

ATTENTION TO: LUKE LOPERS

SAMPLED BY: Steven Wheeler

O. Reg. 153(511) - Metals & Inorganics (Soil)

DATE RECEIVED: 2018-10-07

DATE REPORTED: 2018-10-15

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION:		BH3
				Date Prepared	Date Analyzed	SS3-10-5-18
SAMPLE TYPE:						Soil
DATE SAMPLED:						2018-10-05
						9610086
Antimony	µg/g		0.8	2018-10-12	2018-10-12	<0.8
Arsenic	µg/g		1	2018-10-12	2018-10-12	2
Barium	µg/g		2	2018-10-12	2018-10-12	56
Beryllium	µg/g		0.5	2018-10-12	2018-10-12	<0.5
Boron	µg/g		5	2018-10-12	2018-10-12	<5
Boron (Hot Water Soluble)	µg/g		0.10	2018-10-11	2018-10-11	0.37
Cadmium	µg/g		0.5	2018-10-12	2018-10-12	<0.5
Chromium	µg/g		2	2018-10-12	2018-10-12	15
Cobalt	µg/g		0.5	2018-10-12	2018-10-12	4.7
Copper	µg/g		1	2018-10-12	2018-10-12	19
Lead	µg/g		1	2018-10-12	2018-10-12	28
Molybdenum	µg/g		0.5	2018-10-12	2018-10-12	<0.5
Nickel	µg/g		1	2018-10-12	2018-10-12	10
Selenium	µg/g		0.4	2018-10-12	2018-10-12	<0.4
Silver	µg/g		0.2	2018-10-12	2018-10-12	<0.2
Thallium	µg/g		0.4	2018-10-12	2018-10-12	<0.4
Uranium	µg/g		0.5	2018-10-12	2018-10-12	0.5
Vanadium	µg/g		1	2018-10-12	2018-10-12	21
Zinc	µg/g		5	2018-10-12	2018-10-12	124
Chromium VI	µg/g		0.2	2018-10-11	2018-10-11	<0.2
Cyanide	µg/g		0.040	2018-10-11	2018-10-11	<0.040
Mercury	µg/g		0.10	2018-10-12	2018-10-12	<0.10
Electrical Conductivity	mS/cm		0.005	2018-10-11	2018-10-11	0.372
Sodium Adsorption Ratio	NA		NA	2018-10-11	2018-10-11	1.88
pH, 2:1 CaCl ₂ Extraction	pH Units		NA	2018-10-11	2018-10-11	7.44

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9610083-9610088 EC & SAR were determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). pH was determined on the 0.01M CaCl₂ extract prepared at 2:1 ratio. Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Anamjot Bhela




Certificate of Analysis

AGAT WORK ORDER: 18Z394508

PROJECT: 11181273-E2 (PO#73513391)

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: GHD LIMITED

SAMPLING SITE: DuMaurier Avenue, Ottawa, ON

ATTENTION TO: LUKE LOPERS

SAMPLED BY: Steven Wheeler

O. Reg. 558 Metals and Inorganics

DATE RECEIVED: 2018-10-07

DATE REPORTED: 2018-10-15

SAMPLE DESCRIPTION: BH3-10-5-18

SAMPLE TYPE: Soil

DATE SAMPLED: 2018-10-05

Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	9610090
Arsenic Leachate	mg/L	2.5	0.010	2018-10-13	2018-10-13	<0.010
Barium Leachate	mg/L	100	0.100	2018-10-13	2018-10-13	1.21
Boron Leachate	mg/L	500	0.050	2018-10-13	2018-10-13	0.102
Cadmium Leachate	mg/L	0.5	0.010	2018-10-13	2018-10-13	<0.010
Chromium Leachate	mg/L	5	0.010	2018-10-13	2018-10-13	<0.010
Lead Leachate	mg/L	5	0.010	2018-10-13	2018-10-13	0.196
Mercury Leachate	mg/L	0.1	0.01	2018-10-13	2018-10-13	<0.01
Selenium Leachate	mg/L	1	0.010	2018-10-13	2018-10-13	<0.010
Silver Leachate	mg/L	5	0.010	2018-10-13	2018-10-13	<0.010
Uranium Leachate	mg/L	10	0.050	2018-10-13	2018-10-13	<0.050
Fluoride Leachate	mg/L	150	0.05	2018-10-12	2018-10-12	0.08
Cyanide Leachate	mg/L	20	0.05	2018-10-12	2018-10-12	<0.05
(Nitrate + Nitrite) as N Leachate	mg/L	1000	0.70	2018-10-12	2018-10-12	<0.70

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.
Analysis performed at AGAT Toronto (unless marked by *)

Certified By:





Certificate of Analysis

AGAT WORK ORDER: 18Z394508

PROJECT: 11181273-E2 (PO#73513391)

5835 COOPERS AVENUE
 MISSISSAUGA, ONTARIO
 CANADA L4Z 1Y2
 TEL (905)712-5100
 FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: GHD LIMITED

SAMPLING SITE: DuMaurier Avenue, Ottawa, ON

ATTENTION TO: LUKE LOPERS

SAMPLED BY: Steven Wheeler

O. Reg. 558 TCLP Preparation

DATE RECEIVED: 2018-10-07

DATE REPORTED: 2018-10-15

SAMPLE DESCRIPTION: BH3-10-5-18

SAMPLE TYPE: Soil

DATE SAMPLED: 2018-10-05

Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	9610090
Analysis Start Date					2018/10/11	
pH (Initial)	pH Units		N/A			7.96
pH (Final)	pH Units		N/A			5.41
Extraction Fluid						1

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria
 Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Anamjot Bhela




Certificate of Analysis

AGAT WORK ORDER: 18Z394508

PROJECT: 11181273-E2 (PO#73513391)

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CLIENT NAME: GHD LIMITED

SAMPLING SITE: DuMaurier Avenue, Ottawa, ON

ATTENTION TO: LUKE LOPERS

SAMPLED BY: Steven Wheeler

Flash Point Analysis

DATE RECEIVED: 2018-10-07

DATE REPORTED: 2018-10-15

SAMPLE DESCRIPTION: BH3-10-5-18

SAMPLE TYPE: Soil

DATE SAMPLED: 2018-10-05

Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	9610090
Flash point (Pensky Martin Closed Cup)	Deg C		NA	2018-10-12	2018-10-12	>100

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Calgary (unless marked by *)

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 18Z394508

PROJECT: 11181273-E2 (PO#73513391)

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<http://www.agatlabs.com>

CLIENT NAME: GHD LIMITED

SAMPLING SITE: DuMaurier Avenue, Ottawa, ON

ATTENTION TO: LUKE LOPERS

SAMPLED BY: Steven Wheeler

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2018-10-07

DATE REPORTED: 2018-10-15

Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	BH3
						SS3-10-5-18
SAMPLE DESCRIPTION:						Soil
SAMPLE TYPE:						2018-10-05
DATE SAMPLED:						9610086
Naphthalene	µg/g		0.05	2018-10-15	2018-10-15	<0.05
Acenaphthylene	µg/g		0.05	2018-10-15	2018-10-15	<0.05
Acenaphthene	µg/g		0.05	2018-10-15	2018-10-15	<0.05
Fluorene	µg/g		0.05	2018-10-15	2018-10-15	<0.05
Phenanthrene	µg/g		0.05	2018-10-15	2018-10-15	0.06
Anthracene	µg/g		0.05	2018-10-15	2018-10-15	<0.05
Fluoranthene	µg/g		0.05	2018-10-15	2018-10-15	0.11
Pyrene	µg/g		0.05	2018-10-15	2018-10-15	0.09
Benz(a)anthracene	µg/g		0.05	2018-10-15	2018-10-15	0.06
Chrysene	µg/g		0.05	2018-10-15	2018-10-15	0.06
Benzo(b)fluoranthene	µg/g		0.05	2018-10-15	2018-10-15	0.07
Benzo(k)fluoranthene	µg/g		0.05	2018-10-15	2018-10-15	<0.05
Benzo(a)pyrene	µg/g		0.05	2018-10-15	2018-10-15	0.06
Indeno(1,2,3-cd)pyrene	µg/g		0.05	2018-10-15	2018-10-15	<0.05
Dibenz(a,h)anthracene	µg/g		0.05	2018-10-15	2018-10-15	<0.05
Benzo(g,h,i)perylene	µg/g		0.05	2018-10-15	2018-10-15	0.05
2-and 1-methyl Naphthalene	µg/g		0.05	2018-10-15	2018-10-15	<0.05
Moisture Content	%		0.1	2018-10-15	2018-10-15	15.1
Surrogate	Unit	Acceptable Limits				
Chrysene-d12	%	50-140		2018-10-15	2018-10-15	106

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9610083-9610088 Results are based on the dry weight of the soil.

Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&j)Fluoranthene isomers because the isomers co-elute on the GC column.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 18Z394508

PROJECT: 11181273-E2 (PO#73513391)

5835 COOPERS AVENUE
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<http://www.agatlabs.com>

CLIENT NAME: GHD LIMITED

SAMPLING SITE: DuMaurier Avenue, Ottawa, ON

ATTENTION TO: LUKE LOPERS

SAMPLED BY: Steven Wheeler

O. Reg. 558 - Benzo(a) pyrene

DATE RECEIVED: 2018-10-07

DATE REPORTED: 2018-10-15

SAMPLE DESCRIPTION: BH3-10-5-18

SAMPLE TYPE: Soil

DATE SAMPLED: 2018-10-05

Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	9610090
Benzo(a)pyrene	mg/L	0.001	0.001	2018-10-15	2018-10-15	<0.001

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9610090 The sample was leached according to Regulation 558 protocol. Analysis was performed on the leachate.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 18Z394508

PROJECT: 11181273-E2 (PO#73513391)

5835 COOPERS AVENUE
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CLIENT NAME: GHD LIMITED

SAMPLING SITE: DuMaurier Avenue, Ottawa, ON

ATTENTION TO: LUKE LOPERS

SAMPLED BY: Steven Wheeler

O. Reg. 558 - PCBs

DATE RECEIVED: 2018-10-07

DATE REPORTED: 2018-10-15

SAMPLE DESCRIPTION: BH3-10-5-18

SAMPLE TYPE: Soil

DATE SAMPLED: 2018-10-05

Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	9610090
Polychlorinated Biphenyls	mg/L	0.3	0.005	2018-10-12	2018-10-12	<0.005
Surrogate	Unit	Acceptable Limits				
Decachlorobiphenyl	%	60-130		2018-10-12	2018-10-12	99

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria
 Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9610090 The soil sample was leached using the Regulation 558 procedure. Analysis was performed on the leachate.
 Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 18Z394508

PROJECT: 11181273-E2 (PO#73513391)

5835 COOPERS AVENUE
 MISSISSAUGA, ONTARIO
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 TEL (905)712-5100
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<http://www.agatlabs.com>

CLIENT NAME: GHD LIMITED

SAMPLING SITE: DuMaurier Avenue, Ottawa, ON

ATTENTION TO: LUKE LOPERS

SAMPLED BY: Steven Wheeler

O. Reg. 558 - VOCs

DATE RECEIVED: 2018-10-07

DATE REPORTED: 2018-10-15

SAMPLE DESCRIPTION: BH3-10-5-18

SAMPLE TYPE: Soil

DATE SAMPLED: 2018-10-05

Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	9610090
Vinyl Chloride	mg/L	0.2	0.030	2018-10-12	2018-10-15	<0.030
1,1 Dichloroethene	mg/L	1.4	0.020	2018-10-12	2018-10-15	<0.020
Dichloromethane	mg/L	5.0	0.030	2018-10-12	2018-10-15	<0.030
Methyl Ethyl Ketone	mg/L	200	0.090	2018-10-12	2018-10-15	<0.090
Chloroform	mg/L	10.0	0.020	2018-10-12	2018-10-15	<0.020
1,2-Dichloroethane	mg/L	0.5	0.020	2018-10-12	2018-10-15	<0.020
Carbon Tetrachloride	mg/L	0.5	0.020	2018-10-12	2018-10-15	<0.020
Benzene	mg/L	0.5	0.020	2018-10-12	2018-10-15	<0.020
Trichloroethene	mg/L	5.0	0.020	2018-10-12	2018-10-15	<0.020
Tetrachloroethene	mg/L	3.0	0.050	2018-10-12	2018-10-15	<0.050
Chlorobenzene	mg/L	8.0	0.010	2018-10-12	2018-10-15	<0.010
1,2-Dichlorobenzene	mg/L	20.0	0.010	2018-10-12	2018-10-15	<0.010
1,4-Dichlorobenzene	mg/L	0.5	0.010	2018-10-12	2018-10-15	<0.010

Surrogate	Unit	Acceptable Limits	Date Prepared	Date Analyzed	9610090
Toluene-d8	% Recovery	60-130	2018-10-12	2018-10-15	79

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria
 Guideline values are for general reference only. The guidelines provided may or may not be relevant to the intended use. Refer directly to the applicable standard for regulatory interpretation.

9610090 Sample was prepared using Regulation 558 protocol and a zero headspace extractor.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Quality Assurance

CLIENT NAME: GHD LIMITED

AGAT WORK ORDER: 18Z394508

PROJECT: 11181273-E2 (PO#73513391)

ATTENTION TO: LUKE LOPERS

SAMPLING SITE: DuMaurier Avenue, Ottawa, ON

SAMPLED BY: Steven Wheeler

Soil Analysis

RPT Date: Oct 15, 2018			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE		MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

O. Reg. 153(511) - Metals & Inorganics (Soil)

Antimony	9610083	9610083	< 0.8	<0.8	NA	< 0.8	98%	70%	130%	107%	80%	120%	74%	70%	130%
Arsenic	9610083	9610083	2	2	NA	< 1	101%	70%	130%	112%	80%	120%	103%	70%	130%
Barium	9610083	9610083	94	90	4.3%	< 2	89%	70%	130%	99%	80%	120%	86%	70%	130%
Beryllium	9610083	9610083	< 0.5	<0.5	NA	< 0.5	80%	70%	130%	112%	80%	120%	105%	70%	130%
Boron	9610083	9610083	6	6	NA	< 5	101%	70%	130%	106%	80%	120%	90%	70%	130%
Boron (Hot Water Soluble)	9610083	9610083	0.27	0.31	NA	< 0.10	114%	60%	140%	101%	70%	130%	118%	60%	140%
Cadmium	9610083	9610083	< 0.5	<0.5	NA	< 0.5	102%	70%	130%	102%	80%	120%	97%	70%	130%
Chromium	9610083	9610083	37	36	2.7%	< 2	74%	70%	130%	97%	80%	120%	100%	70%	130%
Cobalt	9610083	9610083	8.2	8.0	2.5%	< 0.5	84%	70%	130%	102%	80%	120%	90%	70%	130%
Copper	9610083	9610083	14	13	7.4%	< 1	84%	70%	130%	113%	80%	120%	92%	70%	130%
Lead	9610083	9610083	11	11	0.0%	< 1	94%	70%	130%	100%	80%	120%	88%	70%	130%
Molybdenum	9610083	9610083	< 0.5	<0.5	NA	< 0.5	94%	70%	130%	102%	80%	120%	94%	70%	130%
Nickel	9610083	9610083	18	18	0.0%	< 1	89%	70%	130%	107%	80%	120%	93%	70%	130%
Selenium	9610083	9610083	< 0.4	<0.4	NA	< 0.4	111%	70%	130%	98%	80%	120%	98%	70%	130%
Silver	9610083	9610083	< 0.2	<0.2	NA	< 0.2	96%	70%	130%	102%	80%	120%	91%	70%	130%
Thallium	9610083	9610083	< 0.4	<0.4	NA	< 0.4	86%	70%	130%	93%	80%	120%	92%	70%	130%
Uranium	9610083	9610083	1.3	1.3	NA	< 0.5	83%	70%	130%	102%	80%	120%	94%	70%	130%
Vanadium	9610083	9610083	41	40	2.5%	< 1	78%	70%	130%	96%	80%	120%	74%	70%	130%
Zinc	9610083	9610083	58	57	1.7%	< 5	90%	70%	130%	110%	80%	120%	100%	70%	130%
Chromium VI	9610083	9610083	<0.2	<0.2	NA	< 0.2	74%	70%	130%	100%	80%	120%	98%	70%	130%
Cyanide	9613642		<0.040	<0.040	NA	< 0.040	99%	70%	130%	105%	80%	120%	107%	70%	130%
Mercury	9610083	9610083	< 0.10	<0.10	NA	< 0.10	97%	70%	130%	97%	80%	120%	91%	70%	130%
Electrical Conductivity	9610083	9610083	1.87	1.88	0.5%	< 0.005	94%	90%	110%	NA			NA		
Sodium Adsorption Ratio	9610083	9610083	15.5	16.0	3.2%	NA	NA			NA			NA		
pH, 2:1 CaCl2 Extraction	9610083	9610083	6.82	6.77	0.7%	NA	101%	80%	120%	NA			NA		

O. Reg. 558 Metals and Inorganics

Arsenic Leachate	9610090	9610090	<0.010	<0.010	NA	< 0.010	104%	90%	110%	105%	80%	120%	115%	70%	130%
Barium Leachate	9610090	9610090	1.21	1.20	0.8%	< 0.100	101%	90%	110%	102%	80%	120%	106%	70%	130%
Boron Leachate	9610090	9610090	0.102	0.107	NA	< 0.050	104%	90%	110%	94%	80%	120%	83%	70%	130%
Cadmium Leachate	9610090	9610090	<0.010	<0.010	NA	< 0.010	102%	90%	110%	103%	80%	120%	111%	70%	130%
Chromium Leachate	9610090	9610090	<0.010	<0.010	NA	< 0.010	101%	90%	110%	111%	80%	120%	114%	70%	130%
Lead Leachate	9610090	9610090	0.196	0.191	2.6%	< 0.010	102%	90%	110%	98%	80%	120%	103%	70%	130%
Mercury Leachate	9610090	9610090	<0.01	<0.01	NA	< 0.01	99%	90%	110%	101%	80%	120%	103%	70%	130%
Selenium Leachate	9610090	9610090	< 0.010	< 0.010	NA	< 0.010	105%	90%	110%	108%	80%	120%	112%	70%	130%
Silver Leachate	9610090	9610090	<0.010	<0.010	NA	< 0.010	102%	90%	110%	106%	80%	120%	102%	70%	130%
Uranium Leachate	9610090	9610090	<0.050	<0.050	NA	< 0.050	108%	90%	110%	101%	80%	120%	111%	70%	130%
Fluoride Leachate	9610090	9610090	0.08	0.08	NA	< 0.05	100%	90%	110%	108%	90%	110%	107%	70%	130%
Cyanide Leachate	9610090	9610090	<0.05	<0.05	NA	< 0.05	92%	90%	110%	104%	90%	110%	84%	70%	130%
(Nitrate + Nitrite) as N Leachate	9610090	9610090	<0.70	<0.70	NA	< 0.70	98%	80%	120%	97%	80%	120%	100%	70%	130%

Quality Assurance

CLIENT NAME: GHD LIMITED

AGAT WORK ORDER: 18Z394508

PROJECT: 11181273-E2 (PO#73513391)

ATTENTION TO: LUKE LOPERS

SAMPLING SITE: DuMaurier Avenue, Ottawa, ON

SAMPLED BY: Steven Wheeler

Soil Analysis (Continued)

RPT Date: Oct 15, 2018			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL

Certified By: _____



Quality Assurance

CLIENT NAME: GHD LIMITED
AGAT WORK ORDER: 18Z394508
PROJECT: 11181273-E2 (PO#73513391)
ATTENTION TO: LUKE LOPERS
SAMPLING SITE: DuMaurier Avenue, Ottawa, ON
SAMPLED BY: Steven Wheeler

Trace Organics Analysis

RPT Date: Oct 15, 2018			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper		Lower	Upper		Lower	Upper	

O. Reg. 153(511) - PAHs (Soil)

Naphthalene	9610086	9610086	< 0.05	< 0.05	NA	< 0.05	92%	50%	140%	98%	50%	140%	93%	50%	140%
Acenaphthylene	9610086	9610086	< 0.05	< 0.05	NA	< 0.05	96%	50%	140%	98%	50%	140%	90%	50%	140%
Acenaphthene	9610086	9610086	< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	98%	50%	140%	89%	50%	140%
Fluorene	9610086	9610086	< 0.05	< 0.05	NA	< 0.05	94%	50%	140%	94%	50%	140%	90%	50%	140%
Phenanthrene	9610086	9610086	0.06	0.06	NA	< 0.05	97%	50%	140%	97%	50%	140%	90%	50%	140%
Anthracene	9610086	9610086	< 0.05	< 0.05	NA	< 0.05	94%	50%	140%	91%	50%	140%	89%	50%	140%
Fluoranthene	9610086	9610086	0.11	0.11	NA	< 0.05	98%	50%	140%	98%	50%	140%	98%	50%	140%
Pyrene	9610086	9610086	0.09	0.08	NA	< 0.05	98%	50%	140%	99%	50%	140%	100%	50%	140%
Benz(a)anthracene	9610086	9610086	0.06	0.06	NA	< 0.05	97%	50%	140%	95%	50%	140%	102%	50%	140%
Chrysene	9610086	9610086	0.06	0.06	NA	< 0.05	96%	50%	140%	94%	50%	140%	104%	50%	140%
Benzo(b)fluoranthene	9610086	9610086	0.07	0.07	NA	< 0.05	98%	50%	140%	97%	50%	140%	88%	50%	140%
Benzo(k)fluoranthene	9610086	9610086	< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	88%	50%	140%	97%	50%	140%
Benzo(a)pyrene	9610086	9610086	0.06	0.06	NA	< 0.05	97%	50%	140%	95%	50%	140%	91%	50%	140%
Indeno(1,2,3-cd)pyrene	9610086	9610086	< 0.05	< 0.05	NA	< 0.05	96%	50%	140%	91%	50%	140%	96%	50%	140%
Dibenz(a,h)anthracene	9610086	9610086	< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	91%	50%	140%	90%	50%	140%
Benzo(g,h,i)perylene	9610086	9610086	0.05	0.05	NA	< 0.05	97%	50%	140%	96%	50%	140%	97%	50%	140%
2-and 1-methyl Naphthalene	9610086	9610086	< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	91%	50%	140%	90%	50%	140%

O. Reg. 558 - PCBs

Polychlorinated Biphenyls	9610090	9610090	< 0.005	< 0.005	NA	< 0.005	103%	60%	130%	95%	60%	130%	NA	60%	130%
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O. Reg. 558 - VOCs

Vinyl Chloride	9610090	9610090	< 0.030	< 0.030	NA	< 0.030	73%	60%	140%	79%	60%	140%	NA	60%	140%
1,1 Dichloroethene	9610090	9610090	< 0.020	< 0.020	NA	< 0.020	85%	70%	130%	72%	70%	130%	NA	60%	140%
Dichloromethane	9610090	9610090	< 0.030	< 0.030	NA	< 0.030	96%	70%	130%	85%	70%	130%	NA	60%	140%
Methyl Ethyl Ketone	9610090	9610090	< 0.090	< 0.090	NA	< 0.090	117%	70%	130%	116%	70%	130%	NA	60%	140%
Chloroform	9610090	9610090	< 0.020	< 0.020	NA	< 0.020	75%	70%	130%	85%	70%	130%	NA	60%	140%
1,2-Dichloroethane	9610090	9610090	< 0.020	< 0.020	NA	< 0.020	96%	70%	130%	88%	70%	130%	NA	60%	140%
Carbon Tetrachloride	9610090	9610090	< 0.020	< 0.020	NA	< 0.020	85%	70%	130%	94%	70%	130%	NA	60%	140%
Benzene	9610090	9610090	< 0.020	< 0.020	NA	< 0.020	88%	70%	130%	87%	70%	130%	NA	60%	140%
Trichloroethene	9610090	9610090	< 0.020	< 0.020	NA	< 0.020	99%	70%	130%	74%	70%	130%	NA	60%	140%
Tetrachloroethene	9610090	9610090	< 0.050	< 0.050	NA	< 0.050	78%	70%	130%	71%	70%	130%	NA	60%	140%
Chlorobenzene	9610090	9610090	< 0.010	< 0.010	NA	< 0.010	89%	70%	130%	79%	70%	130%	NA	60%	140%
1,2-Dichlorobenzene	9610090	9610090	< 0.010	< 0.010	NA	< 0.010	94%	70%	130%	77%	70%	130%	NA	60%	140%
1,4-Dichlorobenzene	9610090	9610090	< 0.010	< 0.010	NA	< 0.010	97%	70%	130%	85%	70%	130%	NA	60%	140%

O. Reg. 558 - Benzo(a) pyrene

Benzo(a)pyrene	9610090	9610090	< 0.001	< 0.001	NA	< 0.001	95%	70%	130%	94%	70%	130%	NA	70%	130%
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Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).



Quality Assurance

CLIENT NAME: GHD LIMITED

AGAT WORK ORDER: 18Z394508

PROJECT: 11181273-E2 (PO#73513391)

ATTENTION TO: LUKE LOPERS

SAMPLING SITE: DuMaurier Avenue, Ottawa, ON

SAMPLED BY: Steven Wheeler

Trace Organics Analysis (Continued)

RPT Date: Oct 15, 2018			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Flash Point Analysis

Flash point (Pensky Martin Closed Cup)	2424	butanol	35	35	0.0%	100%	80%	120%
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Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Certified By: _____



Method Summary

CLIENT NAME: GHD LIMITED

AGAT WORK ORDER: 18Z394508

PROJECT: 11181273-E2 (PO#73513391)

ATTENTION TO: LUKE LOPERS

SAMPLING SITE: DuMaurier Avenue, Ottawa, ON

SAMPLED BY: Steven Wheeler

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Barium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron (Hot Water Soluble)	MET-93-6104	EPA SW 846 6010C; MSA, Part 3, Ch.21	ICP/OES
Cadmium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Copper	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Nickel	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Selenium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Silver	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Thallium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Uranium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Zinc	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium VI	INOR-93-6029	SM 3500 B; MSA Part 3, Ch. 25	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE CN-3015 & E 3009 A; SM 4500 CN	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Electrical Conductivity	INOR-93-6036	McKeague 4.12, SM 2510 B	EC METER
Sodium Adsorption Ratio	INOR-93-6007	McKeague 4.12 & 3.26 & EPA SW-846 6010C	ICP/OES
pH, 2:1 CaCl ₂ Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER
Arsenic Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Barium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Boron Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Cadmium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Chromium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Lead Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Mercury Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Selenium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Silver Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Uranium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Fluoride Leachate	INOR-93-6018	EPA SW-846-1311 & SM4500-F- C	ION SELECTIVE ELECTRODE
Cyanide Leachate	INOR-93-6052	EPA SW-846-1311 & MOE 3015 & SM 4500 CN- I	TECHNICON AUTO ANALYZER
(Nitrate + Nitrite) as N Leachate	INOR-93-6053	EPA SW 846-1311 & SM 4500 - NO ₃ - I	LACHAT FIA
Analysis Start Date			N/A
pH (Initial)	LAB 4025	EPA SW-846 1311	PH METER
pH (Final)	LAB 4025	EPA SW-846 1311	PH METER
Extraction Fluid	LAB-93-4025	EPA SW-846 1311	N/A

Method Summary

CLIENT NAME: GHD LIMITED
AGAT WORK ORDER: 18Z394508
PROJECT: 11181273-E2 (PO#73513391)
ATTENTION TO: LUKE LOPERS
SAMPLING SITE: DuMaurier Avenue, Ottawa, ON
SAMPLED BY: Steven Wheeler

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Flash point (Pensky Martin Closed Cup)	TO 2210	ASTM D93	Pensky Martin Closed Cup
Naphthalene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Acenaphthylene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Acenaphthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Fluorene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Phenanthrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benz(a)anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Chrysene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(b)fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(k)fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(a)pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Dibenz(a,h)anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(g,h,i)perylene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
2-and 1-methyl Naphthalene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Moisture Content	ORG-91-5106	EPA SW-846 3541 & 8270	BALANCE
Chrysene-d12	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(a)pyrene	ORG-91-5114	EPA SW846 3540 & 8270	GC/MS
Polychlorinated Biphenyls	ORG-91-5112	Regulation 558, EPA SW846 3510C/8082	GC/ECD
Decachlorobiphenyl	ORG-91-5112	EPA SW846 3510C/8082	GC/ECD
Vinyl Chloride	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
1,1 Dichloroethene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Dichloromethane	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Chloroform	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Benzene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Trichloroethene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Tetrachloroethene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS
Toluene-d8	VOL-91-5001	EPA SW-846 5230B & 8260	(P&T)GC/MS



AGAT

Laboratories

1Mcl

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Laboratory Use Only

Work Order #: 18Z3945008
Cooler Quantity: one - on ice
Arrival Temperatures: 10.6 | 9.8 | 10.1
96 | 94 | 89
Custody Seal Intact: Yes No N/A
Notes:

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: GHD Ltd.
Contact: Luke Lopers
Address: 179 Colonnade Rd. Suite 400
Ottawa, ON
613 288 1723 Fax: _____
Reports to be sent to:
1. Email: Luke.Lopers@GHD.com
2. Email: Steven.Wheeler@GHD.com

Regulatory Requirements:

No Regulatory Requirement
 Regulation 153/04 Sewer Use Regulation 558
Table _____ Indicate One Sanitary CCME
 Ind/Com Storm Prov. Water Quality Objectives (PWQO)
 Res/Park Agriculture Other
 Agriculture
Soil Texture (Check One) Region _____ Indicate One
 Coarse MISA
 Fine _____ Indicate One

Project Information:

Project: 11181273-E2
Site Location: Du Maurier Avenue, Ottawa, ON
Sampled By: Steven Wheeler
AGAT Quote #: PO# 73913391 PO: _____

Is this submission for a Record of Site Condition?

Yes No

Report Guideline on Certificate of Analysis

Yes No

Turnaround Time (TAT) Required:

Regular TAT 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply)
 3 Business Days 2 Business Days Next Business Day
OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CPM

Invoice Information:

Same as RPT info Bill To Same: Yes No
Company: _____
Contact: _____
Address: _____
Email: _____

Sample Matrix Legend

B Biota
GW Ground Water
O Oil
P Paint
S Soil
SD Sediment
SW Surface Water

Field Filtered - Metals, Hg, CrVI

Metals and Inorganics	O. Reg 153		Full Metals Scan	Regulatory/Custom Metals	Nutrients: TP, NH ₃ , TKN, NO ₂ , NO ₃ , NO ₂ , NO ₃ +NO ₂	Volatiles: VOC, BTEX, THM	PHCs F1 - F4	ABNS	PAHS	PCBs: Total, Aroclors	Organochlorine Pesticides	TCLP: M&I, VOCs, ABNS, B(a)P, PCBs	Sewer Use
	All Metals 153 Metals (excl. Hydrides)	Hydride Metals 153 Metals (incl. Hydrides)											
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Appendix F

Qualifications of Assessors



PROFILE

Mr. Lopers is an environmental engineer with over 12 years of experience in environmental engineering specializing in due diligence investigations. Mr. Lopers has extensive experience in Phase I and II Environmental Site Assessments; environmental remediation, and investigations; record of site condition submissions; asset inventory, designated substance surveys and abatement projects; environmental expertise on legal issues; and coordination of various monitoring programs (groundwater, surface water, air).

Mr. Lopers has participated in various Property Condition and Building Envelope mandates at various residential and commercial properties throughout Ontario.

Mr. Lopers has a strong commitment to health and safety, having experience leading a regional health and safety committee as a certified employee representative. Mr. Lopers has extensive training including OSHA 40-hour HAZWOPER, ASP Health and Safety on Construction Sites in Quebec, Ontario Working at Heights, Emergency First Aid/CPR and WHMIS.

CONTACT

EMAIL:
Luke@Lopers.ca

LUKE LOPERS

Principal

LOPERS & ASSOCIATES

EDUCATION

University of Waterloo,
B.A.Sc., Honours Environmental Engineering
Management Science Option Designation - 2002 - 2008

PROFESSIONAL EXPERIENCE

Lopers & Associates, Principal, Project Manager, Senior Environmental Engineer

Ottawa, Ontario - 2020–Present
Responsible for the management, coordination, supervision, completion and delivery of Phase I/1 and II/2 Environmental Site Assessments, Environmental Remediation Programs, Environmental litigation support, Designated Substance Surveys, scope of work development, cost estimates and proposals

GHD Limited, Project Manager, Senior Environmental Engineer

Ottawa, Ontario - 2013–2020
Responsible for the management, senior technical review, coordination, supervision, completion and delivery of Phase I/1 and II/2 Environmental Site Assessments, Environmental Remediation Programs, Environmental litigation support, Designated Substance Surveys, scope of work development, cost estimates and proposals
Office Safety Captain and Joint Health and Safety Committee team leader

Paterson Group Inc., Project Manager, Environmental Engineer

Ottawa, Ontario - 2009–2013
Responsible for supervision, completion and review for Phase I/1 and II/2 Environmental Site Assessments, Environmental Remediation Programs, Designated Substance Surveys

NEXT Environmental Inc., Site Investigation Staff

Burnaby, British Columbia - 2008–2009
Responsible for fieldwork and reporting for Stage/Phase I and II Environmental Site Assessments, Environmental Remediation Programs

PROFESSIONAL DESIGNATIONS

Licensed Professional Engineer (P.Eng.) with Professional Engineers Ontario (PEO) since 2012

Qualified Person (QP), Environmental Site Assessments with Ontario Ministry of the Environment, Conservation and Parks

PROJECT EXPERIENCE

Environmental Site Assessments

**Project Engineer/Manager
Phase 1 Environmental Site
Assessment | Various Clients |
Ontario, Quebec and British
Columbia | 2006-2020**

**Project Engineer/Manager
Phase Two Environmental Site
Assessments | Various Clients |
Various Locations | 2008-2020**

**Project Manager
Phase One, Phase Two
Environmental Site
Assessments, Environmental
Delineation Quality Assurance
Program | Costco Wholesale |
Ottawa, ON | 2014-2019**

Environmental Remediation Programs

**Project Engineer
Underground Fuel Storage
Tank Removals and
Environmental Remediation
Programs in Vicinity of Active
Underground Services |
Ottawa, ON | 2010, 2012**

Project Engineer/Manager for Phase I Environmental Site Assessments in support of acquisition/divestiture/regulatory requirements for various properties in Ontario, Quebec and British Columbia, including the following:

- Canadian Tire Retail Store and Gas Bar, CTR 417 - 2560 Princess Street, Kingston, Ontario
- Former Automotive Dealership and Service Garage, North Vancouver, British Columbia
- Former Philips Cable Plant, Brockville, Ontario
- Former Cornwall Cotton Mill, Cornwall, Ontario
- Retail Fuel Outlet and Automotive Service Garage, Ottawa, Ontario
- Jack Garland Airport Land, North Bay, Ontario
- Various Commercial/Residential Properties, Ontario and British Columbia
- Various Residential Properties, Ontario, Quebec and British Columbia
- Rochester Heights (811, 818 Gladstone Avenue), Ottawa, Ontario

Project Engineer/Manager for the following field investigation and/or regulatory reporting requirements for Phase II ESAs and other Site Investigations:

- Proposed Canadian Tire Development, CTR 693P - Terry Fox Drive at Eagleson Road, Stittsville, Ontario
- Former Retail/Private Fuel Outlets, Ottawa/North Bay/Vancouver, Canada
- Operational/Former Industrial Facilities, Ottawa/Cornwall/Sarnia/Brockville/Gananoque, Ontario
- Existing Dry Cleaning Facilities, Ottawa/Amprior, Ontario
- Automotive Service Garages, Ottawa/Vancouver, Canada
- Various Commercial/Residential Properties, Eastern Ontario
- Tetrachloroethylene Groundwater Plume, Commercial Property, Ottawa, Ontario
- Rochester Heights (811, 818 Gladstone Avenue), Ottawa, Ontario

Project Manager for the completion of a Phase One ESA for the potential acquisition of a commercial property. Upon discovery of APECs at the Site and significant data gaps in previous investigations, completed a Phase Two ESA to evaluate soil and groundwater quality at the Site. Further oversight of original owner's environmental consultants was completed to ensure adequate delineation and characterization of a dNAPL groundwater plume at the Site, present at significant depths in shale bedrock, which originated as a result of a former on-Site dry-cleaning operation.

Project Engineer for removal of underground heating oil storage tanks adjacent to residential buildings. Completed excavation supervision of contaminated soil around and below active underground services, including hydro, water and natural gas infrastructure at residential properties. Activities included oversight of removal of petroleum, impacted soil, and field screening and collection of confirmatory soil and groundwater samples for petroleum hydrocarbon analysis. Prepared Phase I, II and III Environmental Site Assessment reports.

**Project Engineer
Retail Fuel Outlet
Decommissioning and
Remediation | Ottawa, ON |
2012**

**Project Engineer/Manager
Former Fuel Outlet
Investigation and Remediation |
Merrickville, ON | 2016-2017**

Record of Site Conditions

**Project Manager/Engineer
Residential Redevelopment |
Environmental Remediation
Program and Record of Site
Condition Submission | Ottawa
| 2015**

**Project Manager/Engineer
Industrial Development |
Environmental Assessment and
Record of Site Condition
Submission | Township of
Edwardsburgh/Cardinal | 2015**

Excess Soil Management

**Project Engineer/Manager
Management of Excess Soil |
CTREL, Brigid, Ottawa
Community Housing
Corporation | Ottawa and
Pembroke, Ontario | 2016, 2018**

Designated Substance Surveys

**Project Manager
Designated Substance Surveys
and Hazardous Building
Materials Assessment |
Ottawa, Pembroke,
Southeastern Ontario | 2010-
2020**

Environmental Litigation Support

**Project Manager, Field
Engineer, Expert Witness
Ottawa, Ontario | 2014-2020**

Project Engineer for UST removal and confirmatory soil sampling at former ESSO gas station in Ottawa, Ontario. Activities included oversight of removal of USTs and product lines, oversight of removal of petroleum-impacted soil and groundwater encountered and backfilling operations, and field screening and collection of confirmatory soil and groundwater samples for petroleum hydrocarbon analysis.

Project Engineer for confirmatory soil and groundwater sampling following UST removal at former Shell gas station. Activities included oversight of removal of petroleum-impacted soil, pumping of groundwater encountered and backfilling operations, and field screening and collection of confirmatory soil and groundwater samples for petroleum hydrocarbon analysis. Additional borehole/monitoring well drilling also completed.

Project Manager for delineation of soil contamination and groundwater sampling for a former automotive garage and gas station property in Ottawa, Ontario. Presented and implemented remedial action plan to remediate on-site contamination. Directed staff in collection of post remediation confirmatory soil and groundwater samples for contaminants of concern. Prepared remediation closure report and record of site condition supporting documentation for submission to the Ministry of the Environment and Climate Change.

Project Manager for environmental assessments for a proposed industrial business park, in an existing industrial area within the Township of Edwardsburgh/Cardinal, Ontario. Prepared environmental assessment reports and record of site condition supporting documentation for submission to the Ministry of the Environment and Climate Change.

Project Engineer/Manager for sampling, analytical testing, development of soil management plans and monitoring during removal of excess soil generated as part of construction activities, including the following properties/facilities:

- Rochester Heights (811, 818 Gladstone Avenue), Ottawa, Ontario
- Residential redevelopment, 121 Parkdale Avenue, Ottawa, Ontario
- CTR 079, 1104 Pembroke Street East, Pembroke, Ontario
- CTR 297, 2010 Ogilvie Road, Ottawa, Ontario

Project Manager for asbestos containing material (ACM) surveys, designated substance surveys (DSSs), Hazardous Building Materials Assessments (HBMA) or mould assessments at the following sites:

- DSSs at various municipal facilities for the City of Pembroke, Pembroke, Ontario. Preparation of Asbestos Management Plan.
- HBMA at various institutional buildings for the Catholic District School Board of Eastern Ontario, Southeastern Ontario.
- DSSs and ACM surveys at various residential, buildings (dwellings and apartment buildings) for private residential clients, Ottawa, Ontario.
- DSS and abatement oversight during demolition, residential buildings (townhouses) for Ottawa Community Housing Corporation, 818 Gladstone Avenue, Ottawa, Ontario.

Project Manager, Field Engineer and Expert Witness for a fuel spill, remediation program, groundwater monitoring program and litigation review for redevelopment of a residential property adjacent to a central heating plant at an institutional facility.

Education

BEng Geological Engineering, École Polytechnique de Montreal, Montreal, Quebec, 1990

MSc Geophysics, University of British Columbia, Vancouver, British Columbia, 1983

BSc Geophysics, Honours, University of British Columbia, Vancouver, British Columbia, 1980

Certifications

Registered as PMP with Project Management Institute since 2012, requalified in 2018

Qualified Person (QP) for Environmental Site Assessments with Ontario Ministry of Environment and Conservation and Parks

Professional Affiliations

Licensed as P.Eng. with the Professional Engineers of Ontario (PEO) since 1994

Licensed as Ing. with l'Ordre des ingénieurs du Québec (OIQ), 1992

Licensed as P.Eng. with NAPEG (NWT and Nunavut), since 2009.

Licensed as P.Eng with Engineers Yukon since 2018

Federal Clearance Level

Secret ID # 95251065

DON PLENDERLEITH

Senior Environmental Engineer and Project Manager

PROFESSIONAL SUMMARY

Mr. Plenderleith has been an environmental engineer for 30 years. From 1990 to 2000 he worked at specialty firms in Montreal and Ottawa where he gained field and reporting experience in site assessment and remediation of retail fuel outlets and railway yards. In 1991 and 1992 he worked on a CIDA sponsored project to assess additional water resource potential in two provinces in Indonesia. He worked for Golder for 19 years on projects in Ottawa, the North and overseas.

His expertise covers all steps in contaminated site management: Phase I, II and III environmental site assessments (ESAs), risk assessments, remedial options evaluations, remedial action plans, tender plans and specifications, remediation project oversight, long-term monitoring and project closure. He has largely concentrated on federal sites since 2002 and was Golder's initial point of contact on the Environmental Standing Offer Agreement with PSPC in the National Capital over that time.

Don led Golder's national client service team for Federal government and was responsible to Golder's management for maintaining strong relations with the federal government. Locally, he provided project management and technical direction of a variety of environmental projects from the Ottawa office. Don mentored several junior professionals. His site portfolio included: military bases, Northern sites, navigational sites, correctional facilities, research labs, commercial buildings and Canadian embassies abroad. On several multi-year projects (Kingston Penitentiary and Connaught Ranges landfill) he directed all steps of site management from initial investigations, through to site closure.

Don is equally experienced at providing strategic and portfolio-level assistance to clients as well as site-specific level work. He has written contaminated sites management plans for several federal Departments. He helped to develop components of the FCSAP project manager's tool kit and has trained federal project managers in its use. He has provided program-level assistance to the FCSAP Secretariat for funding demand forecasting and long-term strategy and risk management. For nine years he led a multi-disciplinary team that performed contaminated site liability peer reviews for the Office of the Auditor General of Canada.

Don completed his engineering degree in French and is licensed to practice in Quebec. He frequently coordinates the French language component at bilingual meetings and workshops.

**Public Services and
Procurement Canada,
National Capital Region,
Environmental
Engineering Standing
Offer (2002-2019).**

PROJECT EXPERIENCE – STANDING OFFER MANAGER

Don managed Golder's Environmental Standing Offer Agreement (SOA) with PSPC in the National Capital Region from 2002 to 2019. He was the first point of contact with PSPC for new call-ups. He formed project teams from the approved resources and reviewed the work plans under each call-up. He was responsible and accountable for Golder's overall project performance to PSPC.

**Phase I, II, and III and
Remediation at Pittsburgh
Institution and Kingston
Penitentiary for PSPC/CSC
near Kingston, Ontario**

PROJECT EXPERIENCE – SENIOR PROJECT MANAGER

Environmental Site Assessment, Remediation Planning and Implementation for the Pittsburgh Institution and Kingston Penitentiary, Kingston, Ontario from 2007 to 2015 - Don was the Senior Project Manager and project reviewer for the Phase I, II and III of contaminated sites on two similar projects at these federal penitentiaries. Don performed project management and provided technical direction during the full suite of services from site assessment through to remediation. Federal project management tools, and FCSAP technical tools (GOST) were used to assist with procedural compliance. Don assisted PSPC with the tender specification for both remediation projects and performed on-site supervision during the fast-track remediation work at Pittsburgh. Don also performed senior review of the draft and final reports.

**Peer Review and Liability
Review of US Steel Site in
Hamilton Harbour for
PSPC and Transport
Canada (July-August 2016)**

Don was the Senior Project Manager for a Peer Review of reports pertaining to the US Steel site on Hamilton Harbour that the Hamilton Port Authority (HPA) was considering purchasing. TC requested the peer review and liability review in its oversight role over the HPA. Don brought a senior expert in at steel industry at Golder onto the project team. With his input some important gaps in the previous site assessments, management plans and liability estimates were identified to TC.

**Contaminated Site
Reporting and Review for
Department of National
Defence Ottawa, Ontario,
Canada**

Don has managed several projects for DND's Director General Environment, related to the financial reporting of DND's contaminated sites. He managed the EcoNet validation project in 2006, in which the systems and procedures by which site cost and liability information are input to DND's Contaminated Site database, Econet. Several of DND's major projects being run out of headquarters were reviewed in that exercise. In 2008 he assisted DND by producing the 2008 update of their Contaminated Sites Management Plan (CSMP) for Treasury Board submission. Nine divisional CSMPs were reviewed, summarized and incorporated into the departmental CSMP.

PROGRAM LEVEL WORK – FEDERAL CONTAMINATED SITES

Project Management Tools for Contaminated Sites, Ottawa, Ontario, Canada

Mr. Plenderleith developed two of the FCSAP Project Management Tools: Status Reporting and Project Risk Management. He has provided training in the tools to federal project managers country-wide. He has delivered training sessions at RPIC National Contaminated Sites workshops on several occasions on the PM Tools, the Sustainable Development Tool (SDAT), and Guidance Tool for Selection of Technologies Tools (GOST).

Assistance to FCSAP for program-level Risk Management, PWGSC/ECCC Ottawa, Ontario

Don has led a team at Golder that provided assistance to the FCSAP Secretariat from 2013 to 2019 in the areas of cost projections for funding demand estimates. He devised a method of projecting the costs of unassessed sites based on closure costs of similar sites. This tool was used to estimate the funding demand for FCSAP Phase III and past Phase III. Don assisted the Secretariat with Long-Term Strategic planning for FSCAP post 2020 when the 15-year program is due to sunset.

Secondments to Federal Departments

Mr. Plenderleith has been seconded from Golder to the Department of Foreign Affairs and International Trade (now Global Affairs Canada “GAC”) on three occasions to develop their Contaminated Sites Management Plans and to fill in while GAC was staffing their full-time environmental engineer position. Through these secondments he has developed a greater understanding of the role of federal custodians in managing their programs.

PROJECT EXPERIENCE – NORTHERN SITES

DEW Line Site Monitoring, Baffin Region, DND (2015-19)

Mr. Plenderleith was the project director of Golder’s DEW Line Monitoring contract with DND from four years 2015 to 2019. He was responsible for overall program quality and liaison with the client and management of Inuit subcontractors. The project was multi-disciplinary, involving geotechnical and environmental components. Mr. Plenderleith has developed a very positive working relationship with the hamlet of Qikiqtarjuaq and the Inuit staff from that community, many of whom have returned to work with Golder every year. All Inuit Participation Targets were exceeded.

Tundra Mine Remediation Monitoring PSPC/INAC (2016-2018)

Don was the Senior project director for Golder’s Remediation Monitoring of Tundra Mine (NWT) for PSPC and INAC. This project is multi-disciplinary involving surface water and groundwater environmental monitoring and aquatic monitoring for the final stages of the remediation of Tundra Mine. Don has reviewed the monthly and annual monitoring reports produced for the Water Licence. His earlier experience with the RAP for Tundra has been valuable on this project.

**Remedial Options Review
and Remedial Action
Planning Former Water
Tanker Base, Inuvik
Airport, NWT 2010-12**

From 2010 to 2012, Mr. Plenderleith was the technical director for the Phase III ESA detailed site assessment and remediation planning of the former Water Tanker Base at the Inuvik Airport in NWT. The work included determining the contaminants of concern, delineation of contaminated soil and seasonal groundwater areas, and assessing remedial options. The remedial action plan reviewed chemical oxidation and removal & disposal options within the constraints of northern work season, and the distance to a disposal facility. Descriptions, costs, advantages and limitations were provided for several options. GNWT performed the remediation with own forces.