LOPERS & ASSOCIATES

Phase Two Environmental Site Assessment

729 Ridgewood Avenue
Ottawa, Ontario

Prepared for:
11684663 Canada Inc.

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1. Executive Summary

Lopers & Associates (Lopers) was retained by 11684663 Canada Inc. (Brigil) to complete a Phase Two Environmental Site Assessment (Phase Two ESA) of the commercial property with Civic address No. 729 Ridgewood 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. LOP20-001A, dated July 27, 2020) for Brigil at the Property. The Phase One ESA identified the presence of four potentially contaminating activities (PCAs) at the Property which were interpreted to represent areas of potential environmental concern (APECs). The presence of a former retail fuel outlet and automotive service garage were identified on the southeast portion of the Phase One Property (APEC #1 / #2). The contaminants of potential concern associated with retail fuelling are petroleum hydrocarbons (PHCs) and benzene, toluene, ethylbenzene and xylenes (BTEX), and metals, since this was an older facility and lead was historically present in gasoline. Based on historical soil analysis in this area of the Property, polycyclic aromatic hydrocarbons (PAH) and volatile organic compounds (VOCs) are also considered contaminants of potential concern associated with the former automotive garage operations. The practice of backfilling following demolition activities was identified on the central-south portion of the Phase One Property (APEC #3). The contaminants of potential concern commonly found in poor environmental quality backfill are PHCs/BTEXs, polycyclic aromatic hydrocarbons (PAHs) and metals. Based on the operations observed at the active automotive service garage (APEC #4), the contaminants of concern associated with this activity are PHCs and BTEXs. A Phase Two ESA was recommended to assess the soil and groundwater quality in the vicinity of the identified APECs.

The scope of work for the Phase Two ESA included drilling seven boreholes at the Phase Two Property. Three of the boreholes were instrumented with groundwater monitoring wells with screens installed in the overburden.

Six soil samples, including one duplicate sample, were submitted for laboratory analysis for a combination of PHCs, BTEXs, volatile organic compounds (VOCs), PAHs, metals and inorganics. One sample was also submitted for toxicity leaching characteristic procedure (TCLP) for waste characterization purposes.

Groundwater sampling was completed of the newly installed monitoring wells and two existing groundwater monitoring wells at the Phase Two Property, which were installed as part of historical investigations. A total of seven groundwater samples, including a duplicate sample and a trip blank, were submitted for laboratory analysis for a combination of PHCs, BTEXs, VOCs, PAHs, metals and inorganics.

The applicable sites standard was determined to be the full depth generic site condition standard, in a non-potable groundwater condition, with course 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.

At APEC #3 (placement of fill of unknown quality) the soil samples BH1-20-SS5 and BH11-20-SS5 (Duplicate of BH1-20-SS5), collected from a depth of approximately 3.1-3.7 m BGS, had reported concentrations of PHC F2 range (909 µg/g and 306 µg/g vs. 98 µg/g), Methylnaphthalene (7.61 µg/g and 2.26 µg/g vs. 0.99 µg/g) and reported concentrations of vanadium (101 µg/g and 104 µg/g vs. 86 µg/g). These samples also had respective cobalt concentrations of 20.1 µg/g and 22.5 µg/g compared to the site condition standard of 22 µg/g; since the average concentration of cobalt in these samples is less than the site condition standard, the marginal exceedance in the duplicate standard is not considered to exceed the site condition standard.

At APEC #1 (former retail fuel outlet) the soil sample BH3-20-SS6, collected from a depth of approximately 3.8-4.4 m BGS, had reported concentrations of PHC F1 range (117 µg/g vs. 55 µg/g), PHC F2 range (110 µg/g vs. 98 µg/g), benzene (3.02 µg/g vs. 0.21 µg/g), ethylbenzene (59 µg/g vs. 2 µg/g), toluene (73.5 µg/g vs. 2.3 µg/g) and xylenes (276 µg/g vs. 3.1 µg/g). Additionally, PAH exceedances from the same soil sample included Methylnaphthalene (1.95 µg/g vs. 0.99 µg/g) and Naphthalene (1.69 µg/g vs. 0.6 µg/g).

At APEC #1 (former retail fuel outlet), the groundwater samples BH3-20 and BH13-20 (Duplicate of BH3-20), collected from a screen depth of approximately 2.5-5.5 m BGS, had reported concentrations of PHC F1 range (3,600 µg/g and 3,790 µg/g vs. 750 µg/g), PHC F2 range (52,400 µg/g and 2,260 µg/g vs. 150 µg/g), PHC F3 range (3,940 µg/g vs. 500 µg/g), benzene (19,300 µg/g and 19,700 µg/g vs. 44 µg/g), ethylbenzene (3,800 µg/g and 3,700 µg/g vs. µg/g), toluene (65,200 µg/g and 60,900 µg/g vs. 18,000 µg/g) and xylenes (27,600 µg/g and 26,600 µg/g vs. 4,200 µg/g). Lead was also reported at concentrations of 51.6 µg/g and 54.6 µg/g vs. 25 µg/g.

All of the other soil and groundwater results for the Phase Two Property are in compliance with the applicable site condition standards. The Phase Two Property is not in compliance with the Table 3 site condition standards as of the certification date of June 30, 2020.

An environmental remediation program, including the bulk removal and off-site disposal of soil and groundwater in excess of the site condition standards is recommended for the Phase Two Property. Given the scope and timeline for the proposed redevelopment and the requirements for specialized construction techniques to complete remediation of the Phase Two Property to

meet the site condition standards, it is recommended that remediation be completed in conjunction with redevelopment of the Property. 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.

Further delineation and confirmation of remediation sampling will be required prior to the completion of an environmental remediation and program and confirmation of compliance with the site condition standards; however, these tasks can be completed at the time decommissioning and demolition of existing structures at the Phase Two Property. The submission of a record of site condition would be required in the event of a change of zoning of the Phase Two Property; however, these tasks can be completed at the time decommissioning and demolition of existing structures 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 11684663 Canada Inc. (Brigil) to complete a Phase Two Environmental Site Assessment (Phase Two ESA) of the commercial property with Civic address No. 729 Ridgewood 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 729 Ridgewood Avenue, Ottawa, Ontario. The Property is legally described as Part of Block C, Registered Plan 749, Part of Block C, Registered Plan 775 and Part of Lot 23 Junction Gore, Township of Gloucester, now in the City of Ottawa and has a property identifier number of 04071-0125. 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 13,200 m2 (1.32 Hectares). The Phase Two Property is immediately surrounded by a municipal Right-of-Way to the south followed by a mixed institutional/commercial property and by residential properties to the north, east and west.

ii. Property Ownership

The Phase Two Property is currently owned by 11684663 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 11684663 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 with five adjoining segments ranging from seven to twenty 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. A certified Planner should assist 11684663 Canada Inc. in determining whether 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. If so, and 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. 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 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 found to range from 7.14 to 7.40. 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 native glacial till, consisting of silty sand and gravel, which would be classified as coarse grained soil, is present underlaying a silty clay unit to full depth to bedrock on the south and central portions of the Phase Two Property while sand and gravel fill is present near surface elsewhere at the 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 drilling program and borehole/monitoring well logs completed as part of this Phase Two ESA and 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, course 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 regional topography in the Phase One Study Area is undulating but generally slopes downward to the west-northwest, toward the Rideau River. The topography on the south portion of the Phase Two Property slopes downward from west to east, with the neighbouring property to the east at an elevation approximately 1.5 m lower than the southeast Property limits. A local topographical high is present approximately 200 m west of the Phase Two Property, which may be associated with local bedrock undulation. The Rideau River is located approximately 550 m west 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 concurrently with this Phase Two ESA: "Phase One Environmental Site Assessment, 729 Ridgewood Avenue, Ottawa, Ontario" dated July 27, 2020 prepared for 11684663 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 retail fuel outlet and automotive service garage was identified on the southeast portion of the Phase One Property (O.Reg. PCA item #28 and #52). This former retail fuel outlet and automotive service garage are significant potentially contaminating activities (PCAs) which represent areas of potential environmental concern # 1 and #2 (APEC #1 / #2) for the Property. The contaminants of potential concern associated with retail fuelling are generally PHCs and BTEXs, with older facilities also having concerns associated with metals, as lead was historically present in gasoline. Based on historical soil

analysis in this area of the Property, PAH and VOCs are also considered contaminants of potential concern associated with the former automotive garage operations.

- The practice of backfilling following demolition activities was identified on the central-south portion of the Phase One Property (O.Reg. PCA item #30). Backfilling with fill of unknown environmental quality is a significant PCA which represents APEC #3 for the Property. The contaminants of potential concern commonly found in poor environmental quality backfill are PHCs/BTEXs, PAHs and metals.
- The presence of an active automotive service garage was observed on the central portion of the Phase One Property (O.Reg. PCA item #52). The active automotive service garage is a potentially contaminating activity (PCA) which represents area of potential environmental concern # 4 (APEC #4) for the Property. Based on the observations at this automotive garage, that contaminants of potential concern are considered to be PHCs and BTEXs.

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.

Additional reports and sources were reviewed and/or referenced as part of the aforementioned Phase One ESA, and included:

1. "Phase II Environmental Site Assessment, 729 Ridgewood Avenue, Ottawa, Ontario", dated January 12, 2018, completed by Pinchin Ltd. for Canadian Rental Development Services Inc.
2. "Verification Soil Sampling Program, 729 Ridgewood Avenue, Ottawa, Ontario", dated October 19, 2018, completed by Pinchin Ltd. for 561226 Ontario Inc.

These reports confirm the findings of the Phase One ESA completed by Lopers & Associates in 2020 and provide some additional detail of historical investigation and remediation work at the Phase Two Property.

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, 729 Ridgewood Avenue, Ottawa, ON", dated May 8, 2020,

reference, No. LOP-002-20-BRIGIL. The scope of work for investigation was discussed with Brigil and sampling and analysis plan (SAP) was prepared to achieve the objectives of the Phase Two ESA; the SAP is provided in Appendix A. In the event that an RSC is required for the Phase Two Property, additional effort, including delineation, remediation and reporting would be required.

Underground utility locates were completed through Ontario 1-Call 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 Ridgewood Avenue to the south and lead to the commercial buildings. Electricity enters the property through an underground service trench to the north of the north commercial building. Copies of the underground locates are provided in Appendix B.

On June 24, 2020, a total of seven boreholes (BH1-20 through BH7-20) were drilled at the Phase Two Property. 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.

A total of three groundwater monitoring wells (BH1-20, BH3-20, BH5-20) were installed on the central-south, southeast and central portions of the Phase Two Property. The boreholes which were instrumented with groundwater monitoring wells were drilled to the localized depths ranging from 5.9 to 6.7 m below ground surface (m BGS) and were screened to straddle the shallow groundwater table. 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.

A total of two existing groundwater monitoring wells were present on the southeast portion of the Phase Two Property prior to undertaking the field program for this Phase Two ESA. The existing monitoring wells were installed as part of past investigations by others. Based on the depths of these wells and the depth to bedrock in boreholes in the vicinity of these wells which were drilled as part of this Phase Two ESA, the existing monitoring wells are suspected to have their screens set within the overburden and may also straddle the shallow groundwater table. Both of the existing groundwater monitoring wells were developed on day of drilling by removing at least three well volumes.

The locations of the boreholes/monitoring wells drilled/installed as part of this Phase Two ESA as well as existing monitoring wells at the Phase Two Property are presented on Figure 2: Site Plan. The rationale for the placement of the boreholes/monitoring wells is provided below:

BH1-20 was drilled in the vicinity of the former suspected residential building at the Phase Two Property. This borehole was placed in a location to assess fill quality in the footprint of this former building (APEC #3). This borehole was instrumented with a groundwater monitoring well, with its screen installed within soil which was observed to be wet during the drilling/soil sample collection in an attempt to straddle the shallow groundwater table.

BH2-20 was drilled in the southeast portion of the Phase Two Property, near the east Property limit. This borehole was placed in a location to assess potential remnant soil contamination from the former retail fuel outlet and automotive service garage (APEC #1 / #2).

BH3-20 was drilled in the southeast portion of the Phase Two Property, near the south Property limit. This borehole was placed in a location to assess potential remnant soil and groundwater contamination from the former retail fuel outlet and automotive service garage (APEC #1 / #2). This borehole was instrumented with a groundwater monitoring well, with its screen installed within soil which was observed to be wet during the drilling/soil sample collection in an attempt to straddle the shallow groundwater table.

BH4-20 was drilled in the southeast portion of the Phase Two Property, near footprint of the former automotive service garage. This borehole was placed in a location to assess potential remnant soil contamination from the former retail fuel outlet and automotive service garage (APEC #1 / #2).

BH5-20 was drilled in the central portion of the Phase Two Property, near the south side of the active automotive service garage. This borehole was placed in a location to assess potential soil and groundwater contamination from the active automotive service garage (APEC #4). This borehole was instrumented with a groundwater monitoring well, with its screen installed within soil which was observed to be wet during the drilling/soil sample collection in an attempt to straddle the shallow groundwater table.

BH6-20 was drilled approximately 5 m to the west of the former suspected residential building at the Phase Two Property. This borehole was placed in a location to delineate potential soil impacts suspected in BH1-20.

BH7-20 was drilled approximately 8 m to the east of the former suspected residential building at the Phase Two Property. This borehole was also placed in a location to delineate potential soil impacts suspected in BH1-20.

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.

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 organics (PAHs and polychlorinated biphenyls (PCBs)). This sample was comprised

of a composite of worst case samples, as determined by field screening parameters, from BH1-20 and BH3-20.

Groundwater monitoring and sampling of the monitoring wells installed as part of this Phase Two ESA (BH1-20, BH3-20, BH5-20) as well as both existing groundwater monitoring wells (MW-6 and MW-8, which were interpreted as being screened in overburden) was completed on June 30, 2020. 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 boreholes/monitoring wells drilled as part of the Phase Two ESA as well as both existing monitoring wells at the Phase Two Property. The boreholes/monitoring wells were surveyed relative to a temporary benchmark of the top of spindle of the City of Ottawa fire hydrant located at the southwest corner of the Ridgewood Avenue and Dupont Street intersection; 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 finding of the Phase One ESA, the following APECs, and CPCs were identified for the following media:

The presence of a former retail fuel outlet and automotive service garage was identified on the southeast portion of the Phase One Property (O.Reg. PCA item #28 and #52). This former retail fuel outlet and automotive service garage are significant potentially contaminating activities (PCAs) which represent areas of potential environmental concern # 1 and #2 (APEC #1 / #2) for the Property. The contaminants of potential concern associated with retail fuelling are generally PHCs and BTEXs, with older facilities also having concerns associated with metals, as lead was historically present in gasoline. Based on historical soil analysis in this area of the Property, PAH and VOCs are also considered contaminants of potential concern associated with the former automotive garage operations.

The practice of backfilling following demolition activities was identified on the central-south portion of the Phase One Property (O.Reg. PCA item #30). Backfilling with fill of unknown environmental quality is a significant PCA which represents APEC #3 for the Property. The contaminants of potential concern commonly found in poor environmental quality backfill are PHCs/BTEXs, PAHs and metals.

The presence of an active automotive service garage was observed on the central portion of the Phase One Property (O.Reg. PCA item #52). The active automotive service garage is a potentially contaminating activity (PCA) which represents area of potential environmental

concern # 4 (APEC #4) for the Property. Based on the observations at this automotive garage, the contaminants of potential concern are considered to be PHCs and BTEXs.

Soil quality at the Phase Two Property was investigated 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 as part of the Phase Two ESA were drilled to the localized depths ranging from 5.9 to 6.7 m below ground surface (m BGS) and were screened to straddle the shallow groundwater table. The existing monitoring wells at the Phase Two Property were suspected to have monitoring well screens installed within the overburden. 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. 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. 729 Ridgewood Avenue, Ottawa, Ontario and has an approximate area of 1.32 Hectares.

The Phase One Property was undeveloped prior to the late 1950's when a suspected residential building was constructed on the central-south portion of the Phase One Property. Initial commercial development began circa 1965. The central and north portions of the Phase One Property have been occupied by two commercial plaza style buildings from circa 1965 to present. The southeast portion of the Phase One Property was formerly occupied by a retail fuel outlet and automotive service garage from 1965 to 2002 (retail fuel outlet) and 2017 (automotive service garage). Demolition of the former suspected residential building occurred prior to 1991. 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. 11684663 Canada Inc. (Brigil) purchased the Phase One Property in November of 2019, and it is understood that the intended future use is for mixed use, with commercial use on the ground floor and residential uses above the ground floor. The Phase One Property is immediately surrounded by a municipal Right-of-Way to the south followed by a mixed institutional/commercial property and by residential properties to the north, east and west.

The Phase One Study Area includes the Phase One Property and properties with the 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. Two existing groundwater monitoring wells were present at the Phase One Property; the locations of these wells are presented on Figure 2.

The regional topography in the Phase One Study Area is undulating but generally slopes downward to the west-northwest, toward the Rideau River. The topography on the south portion of the Phase One Property slopes downward from west to east, with the neighbouring property to the east at an elevation approximately 1.2 m lower than the southeast Property limits. A local topographical high is present approximately 200 m west of the Phase One Property, which may be associated with local bedrock undulation. The Rideau River is located approximately 550 m west 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 and gravel (till). Overburden soils are expected to be up to 8 m thick and underlain by interbedded shale and limestone bedrock. Groundwater is expected at a depth of approximately 4 to 5 m BGS and flow in a predominantly northwest direction.

Three active and/or historical fuel storage tank locations at neighbouring properties in the Phase One Study Area were identified as PCAs. The PCAs at neighbouring properties in the Phase One Study Area are located significant distances and/or at down- or 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 do 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 approximately 4 to 5 m BGS, while the underground utilities are expected to be present at depths of 2 to 3 m BGS, 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 to complete BH2-20 at the east Property limit, in the approximately location of remnant contaminated soil which was reported as part of historical sampling. The presence of fencing at the east Property limit prevented drilling with the CME 55 Tuck mounted drill within 3 m of the Property limit; BH2-20 was located as close as practical and safe drilling practices would permit.

v. Impediments

As noted above, the presence of fencing at the east Property limits, impeded the drilling investigation as planned in the SAP. It is suspected that remnant soil and/or groundwater contamination may be present in this area of the Phase Two Property based on historical sampling data, however, this could not be confirmed as part of this Phase Two ESA. 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.

5. Investigation Method

i. General

The investigation method for this Phase Two ESA involved an 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 as part of this Phase Two ESA drilling program and those which had been installed at the Phase Two Property as part of historical previous investigations. The wells selected for monitoring/sampling were purged during the drilling program. Static groundwater levels were measured in the monitoring wells prior to disturbance of the water column 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 of the boreholes and groundwater monitoring wells was completed and was referenced to a temporary benchmark, the top of spindle of a fire hydrant located to the southeast of the Phase Two Property.

The following sections provide further detailed information regarding the investigation methodology completed as part of the Phase Two ESA.

ii. Drilling

The drilling field program was completed on June 24, 2020 under full time supervision of Lopers & Associates 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. One of the seven boreholes was advanced to auger or cone refusal on suspected bedrock.

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.

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 are included on the borehole logs provided in Appendix C.

Based on the observations of soil samples collected during the Phase Two ESA field program, there were five stratigraphic units identified at the Phase Two Property, which include:

Asphalt

A layer of asphalt, approximately 0.10 to 0.13 m in thickness, was encountered at the ground surface in BH1-20, BH5-20, BH6-20 and BH7-20.

Silty Sand and Gravel (Fill)

A layer of silty sand and gravel fill material, ranging from approximately 0.1 to 2.2 m in thickness, was encountered from ground surface, immediately below the asphalt layer, or stratified with

the sand (fill) layer in boreholes BH2-20 through BH7-20 drilled as part of the Phase Two ESA. This material was identified to consist of silty sand and gravel, was loose to compact and generally grey. This layer was encountered at varying moisture conditions, generally moist to dry at shallow depths and was observed to be wet at approximately 1.8 m BGS in BH5-20.

Sand (Fill)

A layer of sand fill material, ranging from approximately 1.3 to 4.2 m in thickness, was encountered from near the ground surface, below a thin layer of silty sand and gravel (fill), in boreholes BH2-20 through BH4-20 drilled as part of the Phase Two ESA. This material was identified to consist of clean, poorly graded (uniform grain size) sand, was loose and brown. This layer was encountered at varying moisture conditions, generally moist to dry at shallow depths and was observed to be wet at approximately 2.4 m BGS in BH4-20.

Silty Clay

A layer of silty clay, ranging from approximately 0.6 to 3.1 m in thickness, was encountered immediately below the silty sand and gravel fill layer in all of the boreholes drilled as part of this Phase Two ESA, with the exception of BH4-20, which had a thick layer of sand fill. This material was identified to consist of silty clay, firm and was grey or brown-grey. This layer was encountered at varying moisture conditions, generally moist at shallow depths becoming wet at depths ranging from 3.2 to 3.8 m BGS.

Petroleum hydrocarbon odours, suspected to be associated with weathered heating oil were observed in BH1-20 in this unit from an approximate depth of 0.8 m BGS extending through to below the silty clay layer. Petroleum hydrocarbon odours, suspected to be associated with weathered gasoline were observed in BH3-20 in this unit from an approximate depth of 2.3 m BGS extending through to below the silty clay layer.

Silty Sand and Gravel (Till)

A layer of silty sand and gravel, at least 0.8 to 3.5 m in thickness, was encountered below the silty clay layer and right above refusal in BH1-20; actual auger refusal was only encountered in BH1-20, as deeper drilling was not required to investigate the contaminants of potential concern in the boreholes drilled as part of this Phase Two ESA. This material consisted of grey silty sand and gravel with some clay was compact and wet. Where present, this material was found or suspected to be underlain by bedrock.

Petroleum hydrocarbon odours, suspected to be associated with weathered heating oil were observed in BH1-20 in this unit extending from the silty clay layer above to an approximate depth of 5.2 m BGS. Petroleum hydrocarbon odours, suspected to be associated with weathered gasoline were observed in BH3-20 in this unit extending from the silty clay layer above to an approximate depth of 5.2 m BGS.

iv. 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 an RKI Instruments Model Eagle-2 combustible gas detector ("RKI Eagle"). The RKI Eagle used for soil sample screening as part of this Phase Two ESA was obtained from Maxim Environmental and Safety Inc. and was calibrated by Maxim on June 23, 2020. The RKI Eagle is capable of measuring combustible 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 ppm to 1000 ppm. Additional equipment and calibration information for the RKI Eagle is provided on the certificate of calibration included in Appendix D.

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).

v. Groundwater: Monitoring Well Installation

Installation of monitoring wells in BH1-20, BH3-20 and BH5-20 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; these screens were installed at depths intended to straddle the shallow groundwater table in each of the aforementioned boreholes. Well screens were 3.0 m in length in all three of the monitoring wells installed as part of this Phase Two ESA. 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 present 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.

Development of each of the monitoring wells was completed using dedicated Waterra low density polyethylene (LDPE) tubing and a Waterra footvalve. The monitoring wells were

developed on June 24, 2020 by purging the wells dry at least three times. The wells were left to stabilize for a period of six days prior to groundwater sampling.

vi. 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 June 23, 2020. 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.

vii. Groundwater: Sampling

Groundwater sampling was completed on June 30, 2020 (six days after well installation). Groundwater samples were collected from monitoring wells BH1-20, BH3-20 and BH5-20, which were installed as part of this Phase Two ESA. Monitoring wells installed in MW-6 and MW-8, which were previously installed at the Phase Two Property within the APECs and in close proximity to APEC #1 / #2 were also sampled as part of this Phase Two ESA; it is suspected that these monitoring wells have their screens set in the overburden to straddle the shallow aquifer.

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.

viii. 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.

ix. Analytical Testing

Soil and groundwater analytical testing was conducted by Paracel Laboratories Ltd. (Paracel). Paracel 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. For the scope of accreditation under CALA Membership Number 1262, Paracel is accredited for analysis including, but not limited to, metals, organics, conventionals, bacteria, mold, and asbestos in various matrices.

x. 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 southeast 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.

xi. Elevation Surveying

An elevation survey was completed of the boreholes/monitoring wells drilled as part of the Phase Two ESA as well as the two existing monitoring wells at the Phase Two Property. The boreholes/monitoring wells were surveyed relative to a temporary benchmark of the top of spindle of the City of Ottawa fire hydrant located at the southwest corner of the Ridgewood Avenue and Dupont Street intersection; 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 are provided on the borehole logs in Appendix C.

xii. Quality Assurance and Quality Control Measures

Soil samples 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.

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.

A trip blank water sample for VOCs was submitted for laboratory analysis from the groundwater sampling event completed on June 30, 2020. No detectable VOC concentrations were reported in the trip blank water sample.

The soil sample (BH11-20-SS5) was submitted to the laboratory as a blind field duplicate sample of BH1-20-SS5). The ratio of soil duplicate results to original sample results was generally 1 to 25%, which meets the required ratio. The soil duplicate ratios for PAHs and PHCs observed had higher degrees of variability, with ratios ranging from 33 to 120%; it should be noted that where exceedances of the site condition standards were observed, they were present in both samples and that the sample results for these parameters are comparable. Additionally, the high degree of heterogeneity in soil samples can attribute to higher levels of variability in analytical ratios. These samples were analyzed for PHCs, VOCs (including BTEXs), PAHs and metals & inorganics, which provide a blind quality assurance and quality control QA/QC validation for all soil parameters analyzed as part of this Phase Two ESA.

The groundwater sample (BH13-20) was submitted to the laboratory as a blind field duplicate sample of BH3-20. The ratio of groundwater duplicate results to original sample results was generally 1 to 5 or 18% which meets the required ratio. The groundwater duplicate ratios of PAH parameters were found to range from 5 to 120%; however, the instance of higher variability was with individual parameters which were detected at very low concentrations and close to the laboratory method detection limits. The PAH groundwater sample results are generally comparable. The groundwater sample duplicate comparison results for PHC-F1 and benzene, ethylbenzene, toluene and xylenes were between 2% and 7%, which indicates good reliability. The comparison results in the F2 and F3 ranges of PHCs, however, display a high degree of variability. The laboratory was asked to verify the results of the two samples and stated that the extract which was rerun confirmed the original results. Given the magnitude of the PHC-F2 results in the BH3-20 sample, the explanation may be that it contained droplets of product while the dissolved phase concentrations were in good agreement. Given that exceedances of the site condition standards for PHCs were detected in both samples, the variability of these sample results does not affect the validity of the conclusions with respect to these results. These samples were analyzed for PHCs, VOCs (including BTEXs), PAHs and metals & inorganics, which provide a blind quality assurance and quality control QA/QC validation for all groundwater parameters analyzed as part of this Phase Two ESA.

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 Phase Two ESA field program, there were five stratigraphic units identified at the Phase Two Property, which include:

Asphalt

A layer of asphalt, approximately 0.10 to 0.13 m in thickness, was encountered at the ground surface in BH1-20, BH5-20, BH6-20 and BH7-20.

Silty Sand and Gravel (Fill)

A layer of silty sand and gravel fill material, ranging from approximately 0.1 to 2.2 m in thickness, was encountered from ground surface, immediately below the asphalt layer, or stratified with the sand (fill) layer in boreholes BH2-20 through BH7-20 drilled as part of the Phase Two ESA. This material was identified to consist of silty sand and gravel, was loose to compact and generally grey. This layer was encountered at varying moisture conditions, generally moist to dry at shallow depths and was observed to be wet at approximately 1.8 m BGS in BH5-20.

Sand (Fill)

A layer of sand fill material, ranging from approximately 1.3 to 4.2 m in thickness, was encountered from near the ground surface, below a thin layer of silty sand and gravel (fill), in boreholes BH2-20 through BH4-20 drilled as part of the Phase Two ESA. This material was identified to consist of clean, poorly graded (uniform grain size) sand, was loose and brown. This layer was encountered at varying moisture conditions, generally moist to dry at shallow depths and was observed to be wet at approximately 2.4 m BGS in BH4-20.

Silty Clay

A layer of silty clay, ranging from approximately 0.6 to 3.1 m in thickness, was encountered immediately below the silty sand and gravel fill layer in all of the boreholes drilled as part of this Phase Two ESA, with the exception of BH4-20, which had a thick layer of sand fill. This material was identified to consist of silty clay, firm and was grey or brown-grey. This layer was encountered at varying moisture conditions, generally moist at shallow depths becoming wet at depths ranging from 3.2 to 3.8 m BGS.

Petroleum hydrocarbon odours, suspected to be associated with weathered heating oil were observed in BH1-20 in this unit from an approximate depth of 0.8 m BGS extending through to below the silty clay layer. Petroleum hydrocarbon odours, suspected to be associated with weathered gasoline were observed in BH3-20 in this unit from an approximate depth of 2.3 m BGS extending through to below the silty clay layer.

Silty Sand and Gravel (Till)

A layer of silty sand and gravel, at least 0.8 to 3.5 m in thickness, was encountered below the silty clay layer and right above refusal in BH1-20; practical refusal was only encountered in BH1-20, as deeper drilling was not required to investigate the contaminants of potential concern in the boreholes drilled as part of this Phase Two ESA. This material consisted of grey silty sand and gravel with some clay was compact and wet. Where present, this material was found or suspected to be underlain by suspected bedrock.

Petroleum hydrocarbon odours, suspected to be associated with weathered heating oil were observed in BH1-20 extending from the silty clay layer above this unit to an approximate depth of 5.2 m BGS. Petroleum hydrocarbon odours, suspected to be associated with weathered gasoline were observed in BH3-20 extending from the silty clay layer above to an approximate depth of 5.2 m BGS.

Aquifer

The shallow (unconfined) aquifer is the aquifer of interest based on the nature of APECs and PCAs identified for the Phase Two Property. It is present in several geological units, including the native silty clay and silty sand and gravel (till) layers, as well as in the sand and/or silty sand and gravel fill layers (where present in the former areas of excavation of backfilling).

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 for the groundwater monitoring wells installed as part of this Phase Two ESA were selected to straddle the shallow groundwater table within the overburden. Based on previous investigations, it was suspected that existing monitoring wells located within the APECs at the Phase Two Property had monitoring well screens that are also installed within the overburden and would be expected to straddle the shallow groundwater table, and are thus in same aquifer as the 2020 monitoring wells and could be used for supplemental sampling as part of this 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 at the southwest corner of the Ridgewood Avenue and Dupont Street intersection, southeast of the Phase Two Property; 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, central-south and southeast portions of the Phase Two Property. Given the general consistency in depth of the groundwater table in different geological units at the Phase Two Property, it is suspected 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 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)
BH1-20	100.93	100.80	95.45 – 98.50	95.45 – 98.80	98.80 – 100.63
BH3-20	100.15	99.91	94.61 – 97.66	94.61 – 97.96	97.96 – 99.85
BH5-20	100.39	100.31	95.01 – 98.06	95.01 – 98.36	98.36 – 100.09
MW-6	99.73	99.66	93.74 - unknown	unknown	unknown
MW-8	99.89	99.86	93.89 - unknown	unknown	unknown

m RSD – metres Referenced to Site Datum

On June 30, 2020, following a period of six days for stabilization after drilling and developing the monitoring wells, the groundwater levels were measured and are presented in Table 2 below. The groundwater table was measured at depths ranging between 3.15 and 3.90 m BGS on June 30, 2020.

Table 2: Groundwater Table Elevations Measured on June 30, 2020

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)
BH1-20	100.93	100.80	3.46	97.34	3.59
BH3-20	100.15	99.91	3.66	96.25	3.90
BH5-20	100.39	100.31	3.10	97.21	3.18
MW-6	99.73	99.66	3.80	95.86	3.87
MW-8	99.89	99.86	3.12	96.74	3.15

m RSD – meters Referenced to Site Datum
m BGS – metres below Ground Surface.

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 BH1-20, BH3-20 and BH5-20 were used for a determination of groundwater flow direction, while MW-8 was used to verify the accuracy of the model. Based on the measured groundwater table elevations in these monitoring wells, the local groundwater flow direction on the central and southeast portion of the Phase Two Property is towards the southeast. This interpreted local groundwater flow direction is reasonable based on the regional topography; however, it is expected that regional groundwater flow is toward the west in the direction of the nearest significant surface water body, the Rideau River, which is 550 m to the west of the Phase Two Property. The water table elevation in MW-8 was treated as an outlier, however, this measure elevation indicates that there is local influence in groundwater flow based on the lower elevation of the adjacent property to the east 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. A petroleum hydrocarbon odour, suspected to consist primarily of gasoline, was observed in the groundwater sample collected from BH3-20. Slight to moderate petroleum hydrocarbon odours were observed in the purge water recovered from BH1-20, MW-6 and MW-8

The underground utility corridors associated with the storm and sanitary sewers (exiting the southeast corner of the Phase Two Property) and east water service (accessing the Property on the southeast portion of the Property) do have the potential to affect contaminant distribution and transport, as they would create preferential pathways for lateral migration in the areas of historically identified contaminated soil and groundwater. Based on the depth to groundwater observed in the monitoring wells as part of this investigation, observed between 3.15 and 3.9 m BGS, the potential exists for migration of contaminants through underground utility service trenches (generally approximately 2 to 3 m BGS) during periods of seasonally high groundwater table elevations.

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 BH1-20, BH3-20 and BH5-20 the horizontal hydraulic gradient at the Phase Two Property is approximately 0.02 m/m.

iv. Course Grained Soil Texture

A substantial layer of native glacial till, consisting of silty sand and gravel, which would be classified as coarse grained soil, is present underlaying a silty clay unit to full depth to bedrock on the south and central portions of the Phase Two Property while sand and gravel fill is present near surface elsewhere at the 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. Petroleum hydrocarbon odours, suspected to be associated with weathered heating oil were observed in BH1-20 from an approximate depth of 0.8 m BGS extending to an approximate depth of 5.2 m BGS. Petroleum hydrocarbon odours, suspected to be associated with weathered gasoline were observed in BH3-20 from an approximate depth of 2.3 m BGS extending to an approximate depth of 5.2 m BGS.

Additional field screening of the soil samples was completed using an RKI Eagle gas detector. A combustible soil vapour screening concentration of 700 ppm was encountered in soil sample BH3-20-SS6, collected from a depth of 3.8 to 4.4 m BGS; this elevated concentration was suspected to be indicative of PHC contamination. Combustible soil vapour screening concentrations in the other soil samples were found to range from 0 to 55 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
BH1-20	BH1-20-SS5	3.1 – 3.7	PHCs, VOCs, PAHs, Metals & Inorganics
Duplicate of BH1-20	BH11-20-SS5	3.1 – 3.7	PHCs, VOCs, PAHs, Metals & Inorganics
BH3-20	BH3-20-SS6	3.8 – 4.4	PHCs, BTEXs, PAHs
BH4-20	BH4-20-SS6	3.8 – 4.4	PHCs, BTEXs, PAHs, Metals & Inorganics
BH5-20	BH5-20-SS4	2.3 – 2.9	PHCs, BTEXs
BH5-20	BH5-20-SS7	4.6 – 5.2	PHCs, VOCs

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, course 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 Paracel under chain of custody No. 54317 on June 24, 2020. The laboratory certificate of analysis (Paracel Report # 2026367) is provided in Appendix E. The following samples had exceedance concentrations reported compared to ('vs.') their respective site condition standards.

- BH1-20-SS5 and BH11-20-SS5 (Duplicate of BH1-20-SS5), collected from a depth of approximately 3.1-3.7 m BGS, had reported concentrations of PHC F2 range (909 µg/g and 306 µg/g vs. 98 µg/g), Methylnaphthalene (7.61 µg/g and 2.26 µg/g vs. 0.99 µg/g) and reported concentrations of vanadium (101 µg/g and 104 µg/g vs. 86 µg/g). These samples also had respective cobalt concentrations of 20.1 µg/g and 22.5 µg/g compared to the site condition standard of 22 µg/g; since the average concentration of cobalt in these samples is less than the site condition standard, the marginal exceedance in the duplicate standard is not considered to exceed the site condition standard.
- BH3-20-SS6, collected from a depth of approximately 3.8-4.4 m BGS, had reported concentrations of PHC F1 range (117 µg/g vs. 55 µg/g), PHC F2 range (110 µg/g vs. 98 µg/g), benzene (3.02 µg/g vs. 0.21 µg/g), ethylbenzene (59 µg/g vs. 2 µg/g), toluene (73.5 µg/g vs.

2.3 µg/g) and xylenes (276 µg/g vs. 3.1 µg/g). Additionally, PAH exceedances from the same soil sample included Methylnaphthalene (1.95 µg/g vs. 0.99 µg/g) and Naphthalene (1.69 µg/g vs. 0.6 µg/g).

All of the other 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 1: 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 organics (PAHs and polychlorinated biphenyls (PCBs)). This sample was comprised of a composite of worst-case samples, as determined by field screening parameters, from BH1-20 and BH3-20.

The aforementioned composite soil sample selected for TCLP laboratory analysis was submitted to Paracel under chain of custody No. 54317 on June 24, 2020. The laboratory certificate of analysis (Paracel Report # 2026368) 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.

A full summary of the soil analytical results and comparison to the Schedule IV of O.Reg. 558/00 standards are presented in Table 2: TCLP Analytical Results following the text of this report.

Contaminants of Concern

The presence of a former retail fuel outlet and automotive service garage were identified on the southeast portion of the Phase One Property (APEC #1 / #2). The contaminants of potential concern associated with retail fuelling are petroleum hydrocarbons (PHCs) and benzene, toluene, ethylbenzene and xylenes (BTEXs), and metals, since this was an older facility and lead was historically present in gasoline. Based on historical soil analysis in this area of the Property, PAH and VOCs are also considered contaminants of potential concern associated with the former automotive garage operations. The practice of backfilling following demolition activities was identified on the central-south portion of the Phase One Property (APEC #3). The contaminants of potential concern commonly found in poor environmental quality backfill are PHCs/BTEXs, polycyclic aromatic hydrocarbons (PAHs) and metals. Based on the operations observed at the active automotive service garage (APEC #4), the contaminants of concern associated with this activity are PHCs and 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 may be soil that serves as a source of contaminant mass contributing to groundwater at the Phase Two Property. Soil contamination, namely PHCs and BTEXs were encountered at the southeast portion of the Phase Two Property (APEC #1 – former retail fuel outlet) and in the central-south portion of the Phase Two Property (APEC #3 – placement of fill material of unknown quality). There are detectable concentrations of PHCs and BTEXs in these areas of the Phase Two Property and it is suspected that soil serving as a source of contaminant mass is contributing to groundwater quality.

Light or Dense Non-Aqueous Phase Liquids

The analytical soil results indicate the potential presence of light non-aqueous phase liquids (LNAPLs) at the Phase Two Property, given that PHCs and BTEXs were identified in excess of the site condition standards. It should be noted that the concentrations of PHCs and BTEXs which exceed the site condition standards in the soil are not themselves indicative of the suspected presence of LNAPL free product at the Phase Two Property.

The analytical soil results do not indicate the suspected presence of dense non-aqueous phase liquids at the Phase to 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
BH1-20	97.34	95.45 – 98.50	PHCs, VOCs, PAHs, Metals & Inorganics
BH3-20	96.25	94.61 – 97.66	PHCs, VOCs, PAHs, Metals & Inorganics
BH13-20 (Duplicate of BH3-20)	96.25	94.61 – 97.66	PHCs, VOCs, PAHs, Metals & Inorganics
BH5-20	97.21	95.01 – 98.06	PHCs, BTEXs, PAHs
MW-6	95.86	93.74 - unknown	PHCs, BTEXs
MW-8	96.74	93.89 - unknown	PHCs, BTEXs

m RSD – metres Referenced to Site Datum

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, course 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 Paracel under chain of custody No. 126519 on June 30, 2020. The laboratory certificate of analysis (Paracel Report # 2027199) is provided in Appendix E. The following samples had exceedance concentrations reported compared to ('vs.') their respective site condition standards.

- BH3-20 and BH13-20 (Duplicate of BH3-20), collected from a screen depth of approximately 2.5-5.5 m BGS, had reported concentrations of PHC F1 range (3,600 µg/g and 3,790 µg/g vs. 750 µg/g), PHC F2 range (52,400 µg/g and 2,260 µg/g vs. 150 µg/g), PHC F3 range (3,940 µg/g vs. 500 µg/g), benzene (19,300 µg/g and 19,700 µg/g vs. 44 µg/g), ethylbenzene (3,800 µg/g and 3,700 µg/g vs. µg/g), toluene (65,200 µg/g and 60,900 µg/g vs. 18,000 µg/g) and xylenes (27,600 µg/g and 26,600 µg/g vs. 4,200 µg/g). Lead was also reported at concentrations of 51.6 µg/g and 54.6 µg/g vs. 25 µg/g.

All of the other groundwater samples were in compliance with the site condition standards. A full summary of the groundwater analytical results and comparison to the applicable site

condition standards are presented in Table 3: Groundwater Analytical Results following the text of this report.

Contaminants of Concern

The contaminants of potential concern associated with retail fueling (APEC #1) are generally PHCs and BTEXs, and metals, since this was an older facility and lead was historically present in gasoline. Based on historical groundwater analysis at the Property, PAH and VOCs are limited contaminants of potential concern in selected areas of the Property and are suspected to have been associated with the former automotive garage operations (APEC #2). The contaminants of potential concern commonly found in poor environmental quality backfill (APEC #3) are PHCs/BTEXs, PAHs and metals. Based on the operations observed at the active automotive service garage (APEC #4), the contaminants of concern associated with this activity are PHCs and 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 may be soil that serves as a source of contaminant mass contributing to groundwater at the Phase Two Property. Soil contamination, namely PHCs and BTEXs were encountered at the southeast portion of the Phase Two Property (APEC #1 – former retail fuel outlet) and in the central-south portion of the Phase Two Property (APEC #3 – placement of fill material of unknown quality). There are detectable concentrations of PHCs and BTEXs in soil in these areas of the Phase Two Property, and in the instance of APEC #1 there was identified groundwater contamination, and it is suspected that soil serving as a source of contaminant mass is contributing to groundwater quality.

Light or Dense Non-Aqueous Phase Liquids

The analytical groundwater results indicate the potential presence of light non-aqueous phase liquids (LNAPLs) at the Phase Two Property, given that PHCs and BTEXs were identified in excess of the site condition standards and at significant concentrations in the sample (and duplicate) from the monitoring well installed in BH3-20. It should be noted that the presence of measurable levels LNAPL 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. A light sheen was observed on the purge water recovered from the monitoring well installed in BH3-20.

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

The soil sample (BH11-20-SS5) was submitted to the laboratory as a blind field duplicate sample of BH1-20-SS5). These samples were analyzed for PHCs, VOCs (including BTEXs), PAHs and metals & inorganics, which provide a blind quality assurance and quality control QA/QC validation for all soil parameters analyzed as part of this Phase Two ESA.

The groundwater sample (BH13-20) was submitted to the laboratory as a blind field duplicate sample of BH3-20. These samples were analyzed for PHCs, VOCs (including BTEXs), PAHs and metals & inorganics, which provide a blind quality assurance and quality control QA/QC validation for all groundwater parameters analyzed as part of this Phase Two ESA.

The soil sample (BH11-20-SS5) was submitted to the laboratory as a blind field duplicate sample of BH1-20-SS5). The ratio of soil duplicates to samples was generally 1 to 25%, which meets the required ratio. The soil duplicate ratios for PAHs and PHCs observed had higher degrees of variability, with ratios ranging from 33 to 120%; it should be noted that where exceedances of the site condition standards were observed, they were observed in both samples and that the sample results for these parameters are comparable. Additionally, the high degree of heterogeneity in soil samples can attribute to higher levels of variability in analytical ratios. These samples were analyzed for PHCs, VOCs (including BTEXs), PAHs and metals & inorganics, which provide a blind quality assurance and quality control QA/QC validation for all soil parameters analyzed as part of this Phase Two ESA.

The groundwater sample (BH13-20) was submitted to the laboratory as a blind field duplicate sample of BH3-20. The ratio of groundwater duplicates to samples was generally 1 to 5 or 18% which meets the required ratio. The groundwater duplicate ratios of PAH parameters were found to range from 5 to 120%; however, the instance of higher variability was with individual parameters which were detected at very low concentrations and close to the laboratory method detection limits. The PAH groundwater sample results are generally comparable. The groundwater sample duplicate comparison results for PHC-F1 and benzene, ethylbenzene, toluene and xylenes were between 2% and 7%, which indicates good reliability. The comparison results in the F2 and F3 ranges of PHCs however display a high degree of variability. The laboratory was asked to verify the results of the two samples and stated that the extract which was rerun confirmed the original results. Given the magnitude of the PHC-F2 results in the BH3-

20 sample, the explanation may be that it contained droplets of product while the dissolved phase concentrations were in good agreement. Given that exceedances of the site condition standards for PHCs were detected in both samples, the variability of these sample results does not affect the validity of the conclusions with respect to these results. These samples were analyzed for PHCs, VOCs (including BTEXs), PAHs and metals & inorganics, which provide a blind quality assurance and quality control QA/QC validation for all groundwater parameters analyzed as part of this Phase Two ESA. 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 qualifying statements for login criteria on several sample results due to the difference in naming convention on the soil jars and vials compared to what was presented on the chain of custody. In these circumstances, the labeling on the jar was made for simplicity and no concerns are present with respect to the validity of any of the laboratory results. The laboratory noted that elevated detection limits were presented for the duplicate groundwater sample from BH3-20 due to dilution required because of high target analyte concentration; it should be noted that the original sample did not have elevated detection limits. The qualifying remarks in certificates of analysis are not expected to impact the validity of any results qualified.

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 retail fuel outlet and automotive service garage on the southeast portion of the Phase One Property are a significant PCAs which represent APEC #1 / #2 for the Property. Given that reports were provided which document remnant PHC/BTEXs soil contamination and that groundwater quality was not confirmed following the completion a remediation program, further investigation is warranted. The contaminants of potential concern associated with retail fuelling are generally PHCs and BTEXs, with older facilities also having concerns associated with metals, as lead was historically present in gasoline. Based on historical soil analysis in this area of the Property, PAH and VOCs are also considered contaminants of potential concern associated with the former automotive garage operations.

The practice of backfilling following demolition activities at the Phase One Property is a significant PCA which represents APEC #3 for the Property. Given that no reports were provided with analytical data to support the environmental quality of the backfill used to fill the former suspected residential building footprint on the central-south portion of the Property, this area warrants further investigation. The contaminants of potential concern commonly found in poor environmental quality backfill are PHCs/BTEXs, PAHs and metals.

The presence of an active automotive service garage was observed on the central portion of the Phase One Property at the time of the Site Investigation. Although this garage has only been operating for a short time period (2017 to present), these operations are a PCA which represents APEC #4 for the Property. Based on the observations at this automotive garage, that contaminants of potential concern are considered to be PHCs and 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 Ridgewood Avenue to the south and lead to the commercial buildings. Electricity enters the property through an underground service trench to the north of the north commercial building. The underground utility corridors associated with the storm and sanitary sewers (exiting the southeast corner of the Phase Two Property) and east water service (accessing the Property on the southeast portion of the Property) do have the potential to affect contaminant distribution and transport, as they would create preferential pathways for lateral migration in the areas of historically identified contaminated soil and groundwater.

The overburden stratigraphy of the Phase Two Property is present in five geological units, including an asphalt layer at ground surface, silty sand and gravel (fill) layer, sand (fill) layer primarily present on the southeast portion of the Property, a native silty clay layer present across the Property and a native silty sand and gravel layer, found below the silty clay across the Property.

The shallow (unconfined) aquifer is the aquifer of interest based on the nature of APECs and PCAs identified for the Phase Two Property. It is present in across several geological units, including the native silty clay and silty sand and gravel (till) layers, as well as in the sand and/or silty sand and gravel fill layers (where present in the former areas of excavation of backfilling). The aquifer is expected to have higher permeability in more porous stratigraphic units such as the silty sand and gravel and sand fill, while the shallow aquifer in the silty clay layer is expected to have low permeability and restrict the movement of groundwater and associated contaminants.

The overburden soil is underlain by interbedded shale and limestone bedrock at depths ranging from approximately 6 to 8 m BGS.

The groundwater table was measured at depths ranging between 3.15 and 3.90 m BGS The shallow groundwater aquifer was present within the overburden on central, central-south and southeast portions of the Phase Two Property. Given the general consistency in depth of the groundwater table in different geological units at the Phase Two Property, it is suspected that the same shallow aquifer exists across these units and can be used for a determination of groundwater flow direction and hydraulic gradient. The horizontal hydraulic gradient on the southeast portion of the Phase Two Property was calculated to be approximately 0.02 m/m with a localized groundwater flow direction towards the southeast.

The proposed redevelopment of the Phase Two Property includes construction of one building with five adjoining segments ranging from seven to twenty 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 found to range from 7.24 to 7.51. As such, the Phase Two Property is not considered to be an environmentally sensitive area [O.Reg. 153/04, section 41].

Review of the drilling program and borehole/monitoring well logs completed as part of this Phase Two ESA and 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, course 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 were determined to be the applicable site condition standards for the Phase Two Property as part of this Phase Two ESA.

The soil samples BH1-20-SS5 and BH11-20-SS5 (Duplicate of BH1-20-SS5), collected from a depth of approximately 3.1-3.7 m BGS, had reported concentrations of PHC F2 range (909 µg/g and 306 µg/g vs. 98 µg/g), Methylnaphthalene (7.61 µg/g and 2.26 µg/g vs. 0.99 µg/g) and reported concentrations of vanadium (101 µg/g and 104 µg/g vs. 86 µg/g). These samples also had respective cobalt concentrations of 20.1 µg/g and 22.5 µg/g compared to the site condition standard of 22 µg/g; since the average concentration of cobalt in these samples is less than the site condition standard, the marginal exceedance in the duplicate standard is not considered to exceed the site condition standard. It should be noted that based on past investigations, it has been observed that both Cobalt and Vanadium are known to exceed MECP standards in Ottawa region natural soils, particularly clay.

The soil sample BH3-20-SS6, collected from a depth of approximately 3.8-4.4 m BGS, had reported concentrations of PHC F1 range (117 µg/g vs. 55 µg/g), PHC F2 range (110 µg/g vs. 98 µg/g), benzene (3.02 µg/g vs. 0.21 µg/g), ethylbenzene (59 µg/g vs. 2 µg/g), toluene (73.5 µg/g vs. 2.3 µg/g) and xylenes (276 µg/g vs. 3.1 µg/g). Additionally, PAH exceedances from the same soil sample included Methylnaphthalene (1.95 µg/g vs. 0.99 µg/g) and Naphthalene (1.69 µg/g vs. 0.6 µg/g).

The groundwater samples BH3-20 and BH13-20 (Duplicate of BH3-20), collected from a screen depth of approximately 2.5-5.5 m BGS, had reported concentrations of PHC F1 range (3,600 µg/g and 3,790 µg/g vs. 750 µg/g), PHC F2 range (52,400 µg/g and 2,260 µg/g vs. 150 µg/g), PHC F3 range (3,940 µg/g vs. 500 µg/g), benzene (19,300 µg/g and 19,700 µg/g vs. 44 µg/g), ethylbenzene (3,800 µg/g and 3,700 µg/g vs. µg/g), toluene (65,200 µg/g and 60,900 µg/g vs. 18,000 µg/g) and xylenes (27,600 µg/g and 26,600 µg/g vs. 4,200 µg/g). Lead was also reported at concentrations of 51.6 µg/g and 54.6 µg/g vs. 25 µg/g.

All of the other soil and groundwater results for the Phase Two Property are in compliance with the applicable site condition standards. The Phase Two Property is not in compliance with the site condition standards as of the certification date of June 30, 2020.

7. Conclusions

The soil samples BH1-20-SS5 and BH11-20-SS5 (Duplicate of BH1-20-SS5), collected from a depth of approximately 3.1-3.7 m BGS, had reported concentrations of PHC F2 range (909 µg/g and 306 µg/g vs. 98 µg/g), Methylnaphthalene (7.61 µg/g and 2.26 µg/g vs. 0.99 µg/g) and reported concentrations of vanadium (101 µg/g and 104 µg/g vs. 86 µg/g). These samples also had respective cobalt concentrations of 20.1 µg/g and 22.5 µg/g compared to the site condition standard of 22 µg/g; since the average concentration of cobalt in these samples is less than the site condition standard, the marginal exceedance in the duplicate standard is not considered to exceed the site condition standard. It should be noted that based on past investigations, it has been observed that both Cobalt and Vanadium are known to exceed MECP standards in Ottawa region natural soils, particularly clay.

The soil sample BH3-20-SS6, collected from a depth of approximately 3.8-4.4 m BGS, had reported concentrations of PHC F1 range (117 µg/g vs. 55 µg/g), PHC F2 range (110 µg/g vs. 98 µg/g), benzene (3.02 µg/g vs. 0.21 µg/g), ethylbenzene (59 µg/g vs. 2 µg/g), toluene (73.5 µg/g vs. 2.3 µg/g) and xylenes (276 µg/g vs. 3.1 µg/g). Additionally, PAH exceedances from the same soil sample included Methylnaphthalene (1.95 µg/g vs. 0.99 µg/g) and Naphthalene (1.69 µg/g vs. 0.6 µg/g).

The groundwater samples BH3-20 and BH13-20 (Duplicate of BH3-20), collected from a screen depth of approximately 2.5-5.5 m BGS, had reported concentrations of PHC F1 range (3,600 µg/g and 3,790 µg/g vs. 750 µg/g), PHC F2 range (52,400 µg/g and 2,260 µg/g vs. 150 µg/g), PHC F3 range (3,940 µg/g vs. 500 µg/g), benzene (19,300 µg/g and 19,700 µg/g vs. 44 µg/g), ethylbenzene (3,800 µg/g and 3,700 µg/g vs. µg/g), toluene (65,200 µg/g and 60,900 µg/g vs. 18,000 µg/g) and xylenes (27,600 µg/g and 26,600 µg/g vs. 4,200 µg/g). Lead was also reported at concentrations of 51.6 µg/g and 54.6 µg/g vs. 25 µg/g.

All of the other soil and groundwater results for the Phase Two Property are in compliance with the applicable site condition standards. The Phase Two Property is not in compliance with the site condition standards as of the certification date of June 30, 2020.

It is suspected that remnant soil and/or groundwater contamination may be present near the east Property limits of the Phase Two Property based on historical sampling data, however, this could not be confirmed as part of this Phase Two ESA due to physical impediments (fencing) during the drilling program. 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 recommended for the Phase Two Property. Given the scope and timeline for the proposed redevelopment and the requirements for specialized construction techniques to complete remediation of the Phase Two Property to meet the site condition standards, it is recommended that remediation be completed in conjunction with redevelopment of the Property.

Further delineation and confirmation of remediation sampling will be required prior to the completion of an environmental remediation and program and confirmation of compliance with the site condition standards; however, these tasks can be completed at the time decommissioning and demolition of existing structures at the Phase Two Property. The submission of a record of site condition would be required in the event of a change of zoning of the Phase Two Property; however, these tasks can be completed at the time decommissioning and demolition of existing structures 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.

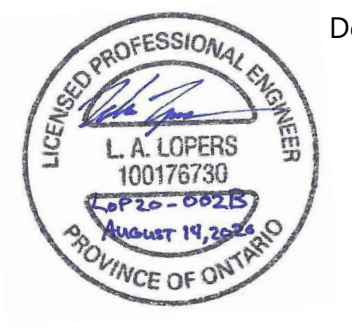
i. Signatures

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 11684663 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 11684663 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, Fairhall, Moffatt & Woodland Limited, dated January 8, 2018.

City of Ottawa, geoOttawa mapping website, Visited June through July, 2020. http://maps.ottawa.ca/geoottawa/

Google Earth, Visited June through July, 2020.

"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.

"Phase One Environmental Site Assessment, 729 Ridgewood Avenue, Ottawa, Ontario" dated July 27, 2020 prepared for 11684663 Canada Inc. by Lopers & Associates.

"Phase II Environmental Site Assessment, 729 Ridgewood Avenue, Ottawa, Ontario", dated January 12, 2018, completed by Pinchin Ltd. for Canadian Rental Development Services Inc.

"Verification Soil Sampling Program, 729 Ridgewood Avenue, Ottawa, Ontario", dated October 19, 2018, completed by Pinchin Ltd. for 561226 Ontario Inc.

Paracel Certificate of Analysis – Report # 2026367 - Soil Sample Submission June 24, 2020

Paracel Certificate of Analysis – Report # 2026368 - TCLP Sample Submission June 24, 2020

Paracel Certificate of Analysis – Report # 2027199 - Groundwater Sample Submission June 30, 2020

10. Appendices

Appendix A – Sampling and Analysis Plan

Appendix B – Underground Utility Locates

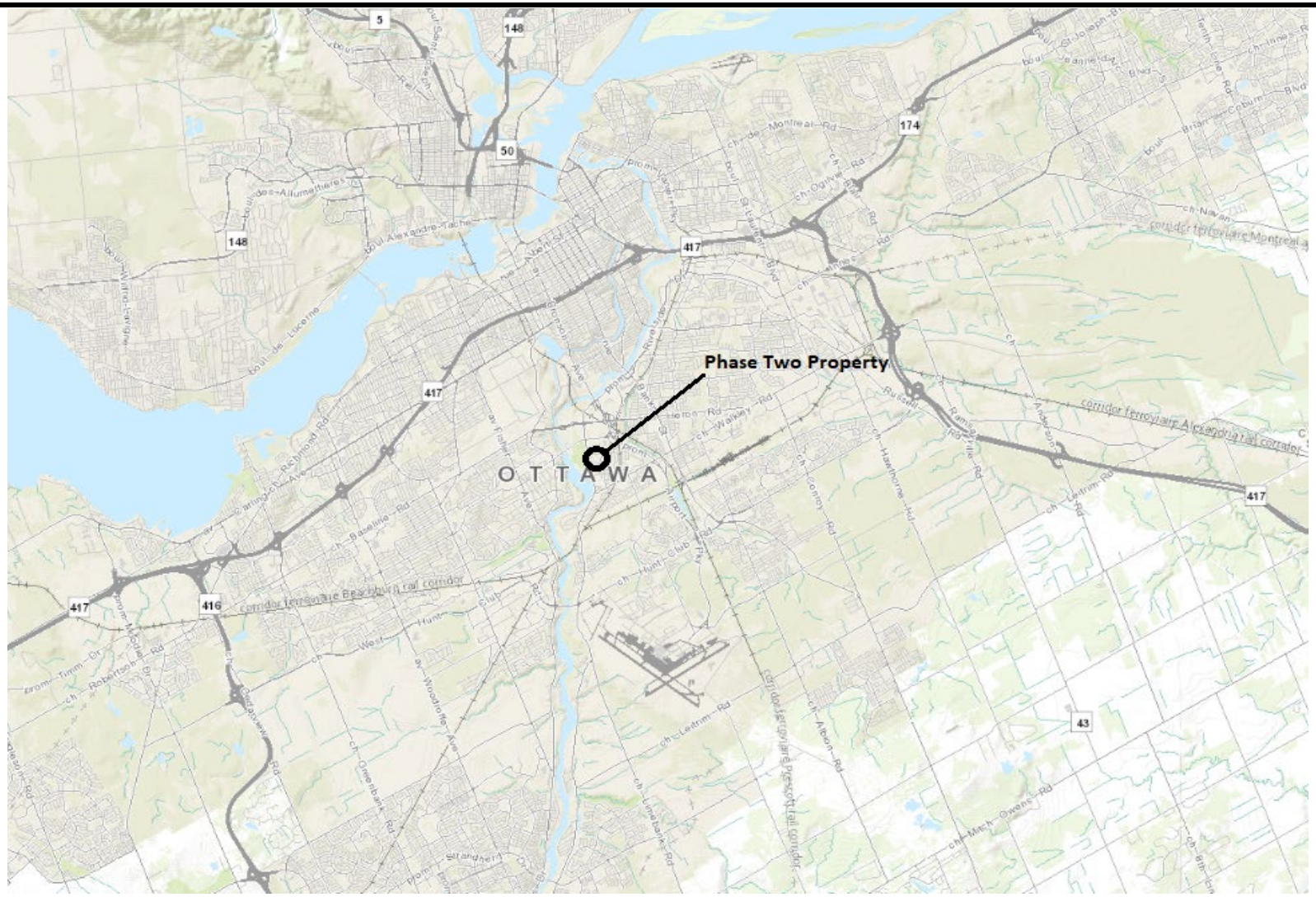
Appendix C – Borehole Logs

Appendix D – Certificates of Equipment Calibration

Appendix E – Laboratory Certificates of Analysis

Appendix F – Qualifications of Assessors

Figures



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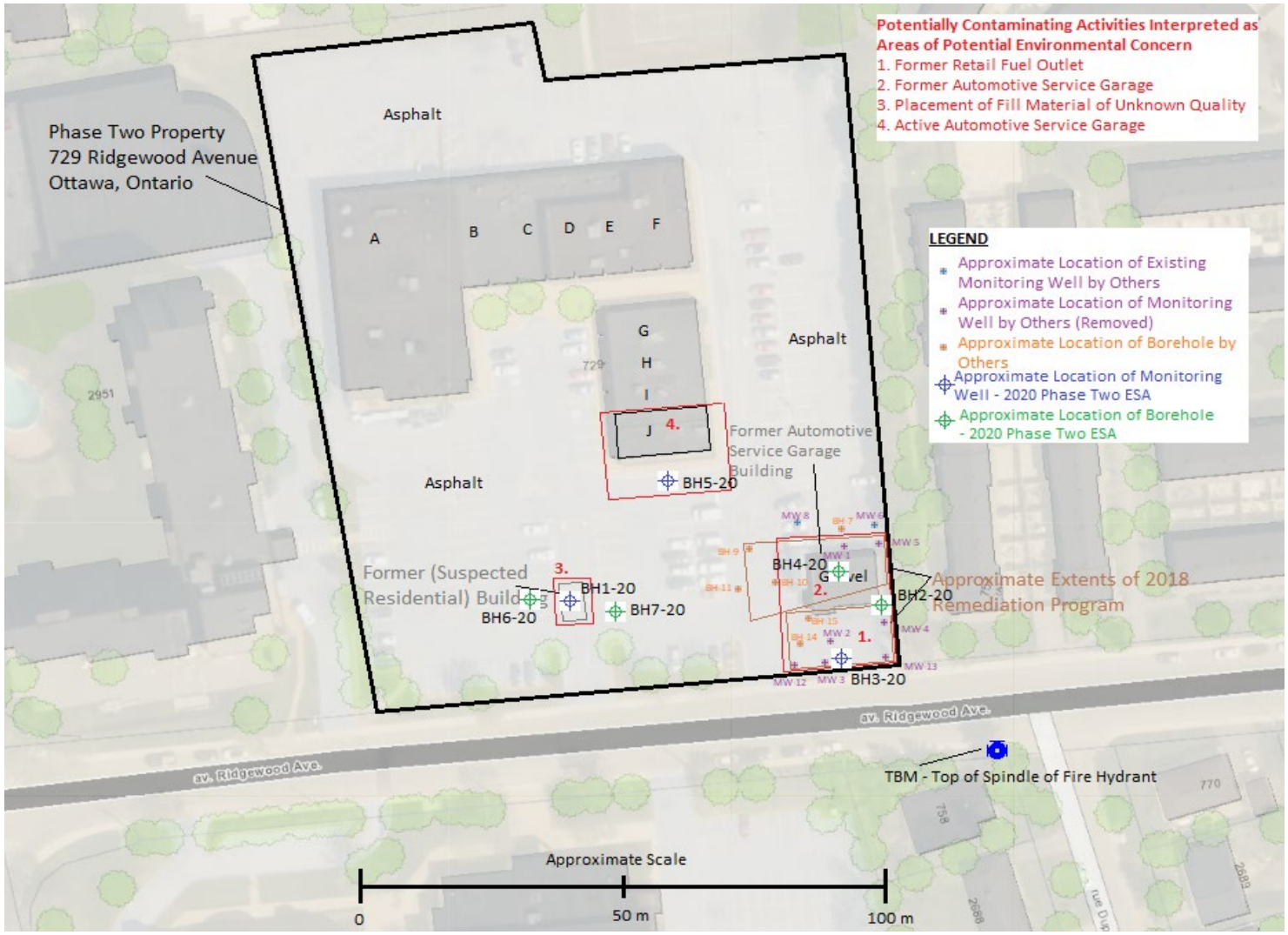
LOPERS & ASSOCIATES

Figure 1: Key Plan
Phase Two Environmental Site Assessment
729 Ridgewood Avenue, Ottawa, Ontario
11684663 Canada Inc.

Project Reference No:	LOP20-002B
Drawing No.:	LOP20-002B-1
Date:	July 24, 2020
Author:	L. Lopers
Source:	geoOttawa, Base Mapping



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LOPERS & ASSOCIATES

Figure 2: Site Plan
Phase Two Environmental Site Assessment
729 Ridgewood Avenue, Ottawa, Ontario
11684663 Canada Inc.

Project Reference No:	LOP20-002B
Drawing No.:	LOP20-002B-2
Date:	July 27, 2020
Author:	L. Lopers
Source:	geoOttawa, Base Mapping

Tables

Table 5: Soil Analytical Results

729 Ridgewod Avenue, Ottawa, Ontario

			Sample Location:	BH1-20-SS5	BH11-20-SS5	BH3-20-SS6	BH4-20-SS6	BH5-20-SS4	BH5-20-SS7
			Sample Depth:	3.1-3.7 m BGS	3.1-3.7 m BGS	3.8-4.4 m BGS	3.8-4.4 m BGS	2.3-2.9 m BGS	4.6-5.2 m BGS
			Sample Date:	June 24, 2020	June 24, 2020	June 24, 2020	June 24, 2020	June 24, 2020	June 24, 2020
			Laborartory Sample ID:	2026367-01	2026367-06	2026367-02	2026367-03	2026367-04	2026367-05
Parameter	Units	Method Detection Limit (MDL)	MECP Table 3: Residential Property Use Standard Coarse Grain Soil						
Petroluem Hydrocarbons (PHCs)									
F1 PHCs (C6-C10)	ug/g	7	55	22	34	117	ND	ND	ND
F2 PHCs (C10-C16)	ug/g	4	98	909	306	110	ND	ND	ND
F3 PHCs (C16-C34)	ug/g	8	300	102	25	11	ND	ND	ND
F4 PHCs (C34-C50)	ug/g	6	2800	ND	ND	ND	ND	ND	ND
F4G PHCs (gravimetric)	ug/g	50	2800	-	-	-	-	-	-
Volatile Organic Compounds (VOCs)									
Acetone	ug/g	0.50	16	ND	ND	-	-	-	ND
Benzene	ug/g	0.02	0.21	ND	ND	3.02	ND	ND	ND
Bromodichloromethane	ug/g	0.05	13	ND	ND	-	-	-	ND
Bromoform	ug/g	0.05	0.27	ND	ND	-	-	-	ND
Bromomethane	ug/g	0.05	0.05	ND	ND	-	-	-	ND
Carbon Tetrachloride	ug/g	0.05	0.05	ND	ND	-	-	-	ND
Chlorobenzene	ug/g	0.05	2.4	ND	ND	-	-	-	ND
Chloroform	ug/g	0.05	0.05	ND	ND	-	-	-	ND
Dibromochloromethane	ug/g	0.05	9.4	ND	ND	-	-	-	ND
Dichlorodifluoromethane	ug/g	0.05	16	ND	ND	-	-	-	ND
1,2-Dichlorobenzene	ug/g	0.05	3.4	ND	ND	-	-	-	ND
1,3-Dichlorobenzene	ug/g	0.05	4.8	ND	ND	-	-	-	ND
1,4-Dichlorobenzene	ug/g	0.05	0.083	ND	ND	-	-	-	ND
1,1-Dichloroethane	ug/g	0.05	3.5	ND	ND	-	-	-	ND
1,2-Dichloroethane	ug/g	0.05	0.05	ND	ND	-	-	-	ND
1,1-Dichloroethylene	ug/g	0.05	0.05	ND	ND	-	-	-	ND
cis-1,2-Dichloroethylene	ug/g	0.05	3.4	ND	ND	-	-	-	ND
trans-1,2-Dichloroethylene	ug/g	0.05	0.084	ND	ND	-	-	-	ND
1,2-Dichloropropane	ug/g	0.05	0.05	ND	ND	-	-	-	ND
cis-1,3-Dichloropropylene	ug/g	0.05		ND	ND	-	-	-	ND
trans-1,3-Dichloropropylene	ug/g	0.05		ND	ND	-	-	-	ND
1,3-Dichloropropene, total	ug/g	0.05	0.05	ND	ND	-	-	-	ND
Ethylbenzene	ug/g	0.05	2	ND	ND	59	ND	ND	ND
Ethylene dibromide (dibromoethane, 1,2-)	ug/g	0.05	0.05	ND	ND	-	-	-	ND
Hexane	ug/g	0.05	2.8	ND	ND	-	-	-	ND
Methyl Ethyl Ketone (2-Butanone)	ug/g	0.50	16	ND	ND	-	-	-	ND
Methyl Isobutyl Ketone	ug/g	0.50	1.7	ND	ND	-	-	-	ND
Methyl tert-butyl ether	ug/g	0.05	0.75	ND	ND	-	-	-	ND
Methylene Chloride	ug/g	0.05	0.1	ND	ND	-	-	-	ND
Styrene	ug/g	0.05	0.7	ND	ND	-	-	-	ND
1,1,1,2-Tetrachloroethane	ug/g	0.05	0.058	ND	ND	-	-	-	ND
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	ND	ND	-	-	-	ND
Tetrachloroethylene	ug/g	0.05	0.28	ND	ND	-	-	-	ND
Toluene	ug/g	0.05	2.3	ND	ND	73.5	ND	ND	ND
1,1,1-Trichloroethane	ug/g	0.05	0.38	ND	ND	-	-	-	ND
1,1,2-Trichloroethane	ug/g	0.05	0.05	ND	ND	-	-	-	ND
Trichloroethylene	ug/g	0.05	0.061	ND	ND	-	-	-	ND
Trichlorofluoromethane	ug/g	0.05	4	ND	ND	-	-	-	ND
Vinyl Chloride	ug/g	0.02	0.02	ND	ND	-	-	-	ND
m/p-Xylene	ug/g	0.05	NV	ND	0.08	196	ND	ND	ND
o-Xylene	ug/g	0.05	NV	ND	ND	80.3	ND	ND	ND
Xylenes, total	ug/g	0.05	3.1	ND	0.08	276	ND	ND	ND
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	ug/g	0.02	7.9	0.07	0.05	ND	ND	-	-
Acenaphthylene	ug/g	0.02	0.15	0.11	0.03	ND	ND	-	-
Anthracene	ug/g	0.02	0.67	ND	ND	ND	ND	-	-
Benzo[a]anthracene	ug/g	0.02	0.5	ND	ND	ND	ND	-	-
Benzo[a]pyrene	ug/g	0.02	0.3	ND	ND	ND	ND	-	-
Benzo[b]fluoranthene	ug/g	0.02	0.78	ND	ND	ND	ND	-	-
Benzo[g,h,i]perylene	ug/g	0.02	6.6	ND	ND	ND	ND	-	-
Benzo[k]fluoranthene	ug/g	0.02	0.78	ND	ND	ND	ND	-	-
Chrysene	ug/g	0.02	7	ND	ND	ND	ND	-	-
Dibenzo[a,h]anthracene	ug/g	0.02	0.1	ND	ND	ND	ND	-	-
Fluoranthene	ug/g	0.02	0.69	ND	ND	ND	ND	-	-
Fluorene	ug/g	0.02	62	0.26	0.1	ND	ND	-	-
Indeno[1,2,3-cd]pyrene	ug/g	0.02	0.38	ND	ND	ND	ND	-	-
1-Methylnaphthalene	ug/g	0.02	0.99	3.02	0.89	0.58	ND	-	-
2-Methylnaphthalene	ug/g	0.02	0.99	4.58	1.38	1.37	ND	-	-
Methylnaphthalene (1&2)	ug/g	0.04	0.99	7.61	2.26	1.95	ND	-	-
Naphthalene	ug/g	0.01	0.6	0.5	0.26	1.69	ND	-	-
Phenanthrene	ug/g	0.02	6.2	0.13	0.07	ND	ND	-	-
Pyrene	ug/g	0.02	78	ND	ND	ND	ND	-	-
Metals									
Boron, available	ug/g	0.5	1.5	ND	ND	-	ND	-	-
Chromium (VI)	ug/g	0.2	8	0.3	0.3	-	ND	-	-
Mercury	ug/g	0.1	0.27	ND	ND	-	ND	-	-
Antimony	ug/g	1.0	7.5	ND	ND	-	ND	-	-
Arsenic	ug/g	1.0	18	3.9	4	-	3.7	-	-
Barium	ug/g	1.0	390	284	327	-	46.3	-	-
Beryllium	ug/g	0.5	4	0.7	0.9	-	ND	-	-
Boron	ug/g	5.0	120	5.8	7.2	-	6.5	-	-
Cadmium	ug/g	0.5	1.2	ND	ND	-	ND	-	-
Chromium	ug/g	5.0	160	104	126	-	13.1	-	-
Cobalt	ug/g	1.0	22	20.1	22.5	-	5.6	-	-
Copper	ug/g	5.0	140	45.5	49	-	12.4	-	-
Lead	ug/g	1.0	120	6.1	6.8	-	5.2	-	-
Molybdenum	ug/g	1.0	6.9	ND	ND	-	ND	-	-
Nickel	ug/g	5.0	100	56.1	65.4	-	10.6	-	-
Selenium	ug/g	1.0	2.4	ND	ND	-	ND	-	-
Silver	ug/g	0.3	20	ND	ND	-	ND	-	-
Thallium	ug/g	1.0	1	ND	ND	-	ND	-	-
Uranium	ug/g	1.0	23	ND	ND	-	ND	-	-
Vanadium	ug/g	10.0	86	101	104	-	23.5	-	-
Zinc	ug/g	20.0	340	92.7	114	-	ND	-	-
General Inorganics									
SAR	N/A	0.01	5	0.76	0.81	-	1.12	-	-
Conductivity	uS/cm	5	700	636	670	-	627	-	-
Cyanide, free	ug/g	0.03	0.051	ND	ND	-	ND	-	-
pH	pH Units	0.05	NV	7.14	7.33	-	7.4	-	-

NV - No value listed in MECP site condition standards

- - Not Analyzed

ND - Not detected above laboratory method detection limits

Exceeds MECP site condition standards

Table 6: TCLP Analytical Results
729 Ridgewood Avenue, Ottawa, Ontario

Parameter	Units	Method Detection Limit (MDL)	Sample ID: / Laborartory Sample ID: / Sample Date: Reg 558 Schedule IV	**TCLP** 2026368-01 June 24, 2020
Physical Characteristics				
Flashpoint	°C			>70
TCLP Leachate Inorganics				
Fluoride	mg/L	0.05	150	0.32
Nitrate as N	mg/L	1	1000	ND
Nitrite as N	mg/L	1	1000	ND
Cyanide, free	mg/L	0.02	20	ND
TCLP Leachate Metals				
Mercury	mg/L	0.005	0.1	ND
Arsenic	mg/L	0.05	2.5	ND
Barium	mg/L	0.05	100	0.97
Boron	mg/L	0.05	500	0.05
Cadmium	mg/L	0.01	0.5	ND
Chromium	mg/L	0.05	5	ND
Lead	mg/L	0.05	5	ND
Selenium	mg/L	0.05	1	ND
Silver	mg/L	0.05	5	ND
Uranium	mg/L	0.05	10	ND
TCLP Leachate Volatiles				
Benzene	mg/L	0.005	0.5	ND
Carbon Tetrachloride	mg/L	0.005	0.5	ND
Chlorobenzene	mg/L	0.004	8	ND
Chloroform	mg/L	0.006	10	ND
1,2-Dichlorobenzene	mg/L	0.004	20	ND
1,4-Dichlorobenzene	mg/L	0.004	0.5	ND
1,2-Dichloroethane	mg/L	0.005	0.5	ND
1,1-Dichloroethylene	mg/L	0.006	1.4	ND
Methyl Ethyl Ketone (2-Butanone)	mg/L	0.30	200	ND
Methylene Chloride	mg/L	0.04	5	ND
Tetrachloroethylene	mg/L	0.005	3	ND
Trichloroethylene	mg/L	0.004	5	ND
Vinyl Chloride	mg/L	0.005	0.2	ND
TCLP Leachate Organics				
Benzo[a]pyrene	mg/L	0.0001	0.13	ND
Benzo[a]pyrene	mg/L	0.0001	0.001	ND
Nitrobenzene	mg/L	0.001	2	ND
Hexachloroethane	mg/L	0.001	3	ND
Hexachlorobenzene	mg/L	0.050	0.13	ND
Hexachlorobutadiene	mg/L	0.001	-	ND
2,3,4,6-Tetrachlorophenol	mg/L	0.002	10	ND
2,4,5-Trichlorophenol	mg/L	0.001	400	ND
2,4,6-Trichlorophenol	mg/L	0.001	0.5	ND
2,4-Dichlorophenol	mg/L	0.001	90	ND
2-Methylphenol	mg/L	0.001	200	ND
3/4-Methylphenol	mg/L	0.001	200	ND
Pentachlorophenol	mg/L	0.005	6	ND
PCBs, total	mg/L	0.003	0.3	ND

ND - Not detected above laboratory method detection limits

Table 7: Groundwater Analytical Results

729 Ridgewood Avenue, Ottawa, Ontario

			Sample Location:	BH1-20	BH3-20	BH13-20 Duplicate of BH3-20	BH5-20	MW-6	MW-8	Trip Blank
			Sample Date:	June 30, 2020	June 30, 2020	June 30, 2020	June 30, 2020	June 30, 2020	June 30, 2020	June 30, 2020
			Laborartory Sample ID:	2027199-01	2027199-02	2027199-04	2027199-03	2027199-05	2027199-06	2027199-07
Parameter	Units	Method Detection Limit (MDL)	MECP Table 3 Standards Coarse Grain Soil							
Petroluem Hydrocarbons (PHCs)										
F1 PHCs (C6-C10)	ug/L	25	750	123	3600	3790	ND	ND	ND	-
F2 PHCs (C10-C16)	ug/L	100	150	ND	52400	2260	ND	ND	ND	-
F3 PHCs (C16-C34)	ug/L	100	500	ND	3940	ND	ND	ND	ND	-
F4 PHCs (C34-C50)	ug/L	100	500	ND	ND	ND	ND	ND	ND	-
Volatile Organic Compounds (VOCs)										
Acetone	ug/L	5.0	130000	ND	ND (2500)	ND (2500)	-	-	-	ND
Benzene	ug/L	0.5	44	ND	19300	19700	-	-	-	ND
Bromodichloromethane	ug/L	0.5	85000	ND	ND (250)	ND (250)	-	-	-	ND
Bromoform	ug/L	0.5	380	ND	ND (250)	ND (250)	-	-	-	ND
Bromomethane	ug/L	0.5	5.6	ND	ND (250)	ND (250)	-	-	-	ND
Carbon Tetrachloride	ug/L	0.2	0.79	ND	ND (100)	ND (100)	-	-	-	ND
Chlorobenzene	ug/L	0.5	630	ND	ND (250)	ND (250)	-	-	-	ND
Chloroform	ug/L	0.5	2.4	ND	ND (250)	ND (250)	-	-	-	ND
Dibromochloromethane	ug/L	0.5	82000	ND	ND (250)	ND (250)	-	-	-	ND
Dichlorodifluoromethane	ug/L	1.0	4400	ND	ND (500)	ND (500)	-	-	-	ND
1,2-Dichlorobenzene	ug/L	0.5	4600	ND	ND (250)	ND (250)	-	-	-	ND
1,3-Dichlorobenzene	ug/L	0.5	9600	ND	ND (250)	ND (250)	-	-	-	ND
1,4-Dichlorobenzene	ug/L	0.5	8	ND	ND (250)	ND (250)	-	-	-	ND
1,1-Dichloroethane	ug/L	0.5	320	ND	ND (250)	ND (250)	-	-	-	ND
1,2-Dichloroethane	ug/L	0.5	1.6	ND	ND (250)	ND (250)	-	-	-	ND
1,1-Dichloroethylene	ug/L	0.5	1.6	ND	ND (250)	ND (250)	-	-	-	ND
cis-1,2-Dichloroethylene	ug/L	0.5	1.6	ND	ND (250)	ND (250)	-	-	-	ND
trans-1,2-Dichloroethylene	ug/L	0.5	1.6	ND	ND (250)	ND (250)	-	-	-	ND
1,2-Dichloropropane	ug/L	0.5	16	ND	ND (250)	ND (250)	-	-	-	ND
cis-1,3-Dichloropropylene	ug/L	0.5	NV	ND	ND (250)	ND (250)	-	-	-	ND
trans-1,3-Dichloropropylene	ug/L	0.5	NV	ND	ND (250)	ND (250)	-	-	-	ND
1,3-Dichloropropene, total	ug/L	0.5	5.2	ND	ND (250)	ND (250)	-	-	-	ND
Ethylbenzene	ug/L	0.5	2300	ND	3800	3700	-	-	-	ND
Ethylene dibromide (dibromoethane, 1,	ug/L	0.2	0.25	ND	ND (100)	ND (100)	-	-	-	ND
Hexane	ug/L	1.0	51	ND	ND (500)	ND (500)	-	-	-	ND
Methyl Ethyl Ketone (2-Butanone)	ug/L	5.0	470000	ND	ND (2500)	ND (2500)	-	-	-	ND
Methyl Isobutyl Ketone	ug/L	5.0	140000	ND	ND (2500)	ND (2500)	-	-	-	ND
Methyl tert-butyl ether	ug/L	2.0	190	ND	ND (1000)	ND (1000)	-	-	-	ND
Methylene Chloride	ug/L	5.0	610	ND	ND (2500)	ND (2500)	-	-	-	ND
Styrene	ug/L	0.5	1300	ND	ND (250)	ND (250)	-	-	-	ND
1,1,1,2-Tetrachloroethane	ug/L	0.5	3.3	ND	ND (250)	ND (250)	-	-	-	ND
1,1,2,2-Tetrachloroethane	ug/L	0.5	3.2	ND	ND (250)	ND (250)	-	-	-	ND
Tetrachloroethylene	ug/L	0.5	1.6	ND	ND (250)	ND (250)	-	-	-	ND
Toluene	ug/L	0.5	18000	ND	65200	60900	-	-	-	ND
1,1,1-Trichloroethane	ug/L	0.5	640	ND	ND (250)	ND (250)	-	-	-	ND
1,1,2-Trichloroethane	ug/L	0.5	4.7	ND	ND (250)	ND (250)	-	-	-	ND
Trichloroethylene	ug/L	0.5	1.6	ND	ND (250)	ND (250)	-	-	-	ND
Trichlorofluoromethane	ug/L	1.0	2500	ND	ND (500)	ND (500)	-	-	-	ND
Vinyl Chloride	ug/L	0.5	0.5	ND	ND (250)	ND (250)	-	-	-	ND
m/p-Xylene	ug/L	0.5	NV	ND	19200	18200	-	-	-	ND
o-Xylene	ug/L	0.5	NV	ND	8400	8320	-	-	-	ND
Xylenes, total	ug/L	0.5	4200	ND	27600	26600	-	-	-	ND
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	ug/L	0.05	600	0.12	0.29	0.21	ND	-	-	-
Acenaphthylene	ug/L	0.05	1.8	0.06	0.08	ND	ND	-	-	-
Anthracene	ug/L	0.01	2.4	ND	0.04	0.03	ND	-	-	-
Benzo[a]anthracene	ug/L	0.01	4.7	0.02	ND	ND	ND	-	-	-
Benzo[a]pyrene	ug/L	0.01	0.81	ND	ND	ND	ND	-	-	-
Benzo[b]fluoranthene	ug/L	0.05	0.75	ND	ND	ND	ND	-	-	-
Benzo[g,h,i]perylene	ug/L	0.05	0.2	ND	ND	ND	ND	-	-	-
Benzo[k]fluoranthene	ug/L	0.05	0.4	ND	ND	ND	ND	-	-	-
Chrysene	ug/L	0.05	1	ND	ND	ND	ND	-	-	-
Dibenzo[a,h]anthracene	ug/L	0.05	0.52	ND	ND	ND	ND	-	-	-
Fluoranthene	ug/L	0.01	130	0.21	0.04	0.01	0.19	-	-	-
Fluorene	ug/L	0.05	400	0.28	0.41	0.27	ND	-	-	-
Indeno[1,2,3-cd]pyrene	ug/L	0.05	0.2	ND	ND	ND	ND	-	-	-
1-Methylnaphthalene	ug/L	0.05	1800	18.2	50.8	37.8	ND	-	-	-
2-Methylnaphthalene	ug/L	0.05	1800	10.4	87.3	79.7	ND	-	-	-
Methylnaphthalene (1&2)	ug/L	0.10	1800	28.6	138	118	ND	-	-	-
Naphthalene	ug/L	0.05	1400	11.3	419	392	0.08	-	-	-
Phenanthrene	ug/L	0.05	580	0.69	0.34	0.19	0.43	-	-	-
Pyrene	ug/L	0.01	68	0.4	0.07	0.03	0.37	-	-	-
Metals										
Mercury	ug/L	0.1	0.29	ND	ND	ND	-	-	-	-
Antimony	ug/L	0.5	20000	ND	ND	ND	-	-	-	-
Arsenic	ug/L	1	1900	1	1	1	-	-	-	-
Barium	ug/L	1	29000	874	1880	1880	-	-	-	-
Beryllium	ug/L	0.5	67	ND	ND	ND	-	-	-	-
Boron	ug/L	10	45000	27	25	26	-	-	-	-
Cadmium	ug/L	0.1	2.7	ND	ND	ND	-	-	-	-
Chromium	ug/L	1	810	ND	ND	ND	-	-	-	-
Chromium (VI)	ug/L	10	140	ND	ND	ND	-	-	-	-
Cobalt	ug/L	0.5	66	11.3	6.5	6.8	-	-	-	-
Copper	ug/L	0.5	87	1.2	1	1.2	-	-	-	-
Lead	ug/L	0.1	25	ND	51.2	54.6	-	-	-	-
Molybdenum	ug/L	0.5	9200	1.2	1.4	1.4	-	-	-	-
Nickel	ug/L	1	490	23	12	13	-	-	-	-
Selenium	ug/L	1	63	ND	3	3	-	-	-	-
Silver	ug/L	0.1	1.5	ND	ND	ND	-	-	-	-
Sodium	ug/L	200	2300000	174000	202000	209000	-	-	-	-
Thallium	ug/L	0.1	510	ND	ND	ND	-	-	-	-
Uranium	ug/L	0.1	420	9.2	11.2	11.2	-	-	-	-
Vanadium	ug/L	0.5	250	1.2	1.1	1.2	-	-	-	-
Zinc	ug/L	5	1100	ND	7	ND	-	-	-	-
General Inorganics										
Cyanide, free	ug/L	2	66	ND	ND	ND	-	-	-	-
pH	pH Units	0.1	NV	7	7.2	7.2	-	-	-	-
Chloride	mg/L	1	2300	918	833	828	-	-	-	-

NV - No value listed in MECP site condition standards

- - Not Analyzed

ND - Not detected above laboratory method detection limits

ND(250) - Not detected above elevated laboratory method detection limits due to high analyte concentrations. Elevated MDL listed in "( )"

Exceeds MECP site condition standards

Appendix A

Sampling and Analysis Plan

LOPERS & ASSOCIATES

Sampling and Analysis Plan

729 Ridgewood Avenue
Ottawa, Ontario

Prepared for:

11684663 Canada Inc.

6/22/2020

Table of Contents

1. Background

Lopers & Associates (Lopers) was retained by 11684663 Canada Inc. (Brigil) to complete a Phase Two Environmental Site Assessment (Phase Two ESA) of the commercial property with Civic address No. 729 Ridgewood Avenue, Ottawa, Ontario ("Phase Two Property", "Property" or "Site").

Lopers has previously completed a Phase One Environmental Site Assessment (Phase One ESA) for Brigil at the Property. The Phase One ESA identified the presence of four potentially contaminating activities (PCAs) at the Property which were interpreted to represent areas of potential environmental concern (APECs).

The presence of a former retail fuel outlet and automotive service garage on the southeast portion of the Phase One Property are a significant potentially contaminating activities (PCAs) which represents areas of potential environmental concern (APECs) for the Property. Given that previous reports were provided which document remnant petroleum hydrocarbon (PHC) and benzene, toluene, ethylbenzene and xylenes (BTEX) soil contamination and that groundwater quality was not confirmed following the completion of a remediation program, further investigation is warranted. The contaminants of potential concern associated with retail fuelling are generally PHCs and BTEXs, and metals as this was an older facility and lead was historically present in gasoline. Based on historical soil analysis in this area of the Property, polycyclic aromatic hydrocarbons (PAH) and volatile organic compounds (VOCs) are also considered contaminants of potential concern associated with the former automotive garage operations.

The practice of backfilling following demolition activities at the Phase One Property is also a significant PCA which represents an APEC for the Property. Given that no reports were provided with analytical data to support the environmental quality of the backfill used to fill the former residential building footprint on the central-south portion of the Property, this area warrants further investigation. The contaminants of potential concern commonly found in poor environmental quality backfill are PHCs/BTEXs, PAHs and metals.

The presence of an active automotive service garage was observed during the Site walk over on the central portion of the Phase One Property at the time of the Site Investigation. Although this garage has only been operating for a short time period (2017 to present), these operations are a PCA which represents an APEC for the Property. Based on the observations at this automotive garage, that contaminants of potential concern are considered to be PHCs and BTEXs.

The scope of work for the Phase Two ESA includes drilling 5 boreholes at the Phase Two Property.

Three of the boreholes will be instrumented with groundwater monitoring wells with screens installed in the overburden. The two existing groundwater monitoring wells at the Phase Two Property, which were installed as part of historical investigations, may also be accessed and sampled to supplement the groundwater quality assessment.

In the event that additional contaminants of APECs are identified during the drilling or sampling fieldwork, additional scope of work will be discussed with Brigil to complete the Phase Two ESA.

2. Planning Site Investigation - Specific Objectives

The following are the specific objectives for planning a site investigation of the Phase Two Environmental Site Assessment, as defined in O.Reg. 153/04.

1. To plan an investigation that will achieve the general objectives of a Phase Two Environmental Site Assessment,

    i. through the use of an appropriate and complete information base concerning the Phase Two Property, and

    ii. 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, or any record of site condition (RSC) property within it, meets applicable site condition standards and any standards specified in a risk assessment.

3. Underground Utility Service Locates

Prior to completing the Phase Two ESA field investigation activities, public underground locates will be coordinated through Ontario One Call. Privately owned underground services and infrastructure are present at the Phase Two Property, as such, private locates were undertaken by USL-1 Underground Service Locators Inc.

The locations of the proposed boreholes will be reviewed in relation to the public underground locates and locations will be modified accordingly if conflicts exist between any location or if the location is in close proximity to an active underground service.

A copy of the public and private underground locates will be retained by Lopers' field personnel during all excavation components of the fieldwork.

4. Planning Site Investigation - Specific Requirements

The qualified person has ensured the following requirements were met in planning a site investigation. The Phase One conceptual site model for the Phase One Environmental Site Assessment report was used in conjunction with other information in determining:

i. Media for Investigation

Soil and groundwater sampling and analysis for the purpose of assessing environmental quality will be completed as part of the Phase Two ESA.

There are no surface water bodies at the Phase Two Property, as such, sediment and surface water quality sampling and analysis will not be completed as part of this Phase Two ESA.

ii. Locations and Depths for Sampling

A total of three borehole locations have been proposed to provide coverage of the APECs identified at the Phase Two Property. Boreholes will be located in the southeast portion of the Property to assess APEC #1 /2. One borehole has been proposed in the central-south portion of the Property to assess APEC #3. One borehole has been proposed in the central portion of the Phase Two Property to assess APEC #4.

Sampling depths will include as a minimum, collection of samples in 0.6 m intervals from the ground surface to native soil conditions within the groundwater table. Borehole/monitoring wells depths are proposed to be drilled to approximately 4 m to 6 m BGS to intercept the groundwater table in APECs were groundwater quality assessment is required.

iii. Parameters for Laboratory Analysis.

The parameters for laboratory analysis will be selected based on the contaminants of potential concern for each APEC as well as the field screening observations.

The contaminants of potential concern associated with retail fueling and a former automotive service garage (APEC #1 / 2) are generally PHCs and BTEXs, with older facilities also having concerns associated with metals, as lead was historically present in gasoline. Based on historical

soil analysis in this area of the Property, PAH and VOCs are also considered contaminants of potential concern associated with the former automotive garage operations.

The contaminants of potential concern commonly found in poor environmental quality backfill (APEC #3) are PHCs/BTEXs, PAHs and metals.

Based on the observations at the active automotive garage (APEC #4), the contaminants of potential concern are considered to be PHCs and BTEXs.

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

Information obtained after the completion of the phase one environmental site assessment shall be used to modify the investigation, as appropriate.

5. Quality Assurance and Quality Control

The qualified person has ensured that there is a quality assurance and quality control program, data quality objectives, standard operating procedures and a description of any physical impediments that interfere with or limit the ability to conduct sampling and analysis.

The quality assurance and quality control program includes the following requirements:

5.1 Field Equipment Decontamination

All non-dedicated sampling and monitoring equipment must be cleaned following each use.

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

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

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

5.2 Trip Blanks

Since groundwater samples are to be analyzed for benzene, toluene, ethylbenzene and xylenes (BTEXs), which are components of volatile organic compounds (VOCs), one trip blank sample shall be submitted for laboratory analysis with each laboratory submission of groundwater samples.

5.3 Field Duplicates

Sufficient field duplicate samples shall be collected in each medium (soil and groundwater) being sampled, so that at least one field duplicate sample can be submitted for laboratory analysis for every ten samples submitted for laboratory analysis.

At least one field duplicate sample shall be submitted for laboratory analysis for every ten samples submitted for laboratory analysis.

One field duplicate will be submitted from each medium sampled for each parameter suite analyzed as part of this Phase Two ESA.

5.4 Equipment Calibration

Field screening of the soil samples will be completed using an RKI Instruments Model Eagle-2 combustible gas detector ("RKI Eagle"). The RKI Eagle used for soil sample screening as part of this Phase Two ESA will be obtained from Maxim Environmental and Safety Inc. and will be calibrated prior to use.

Measurements of the groundwater quality field parameters will be completed to determine stabilization of these parameters prior to sampling. These measurements will be 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 will be obtained from Maxim Environmental and Safety Inc. and will be calibrated prior to use.

5.5 Data Quality Objectives

The data quality objectives for all types of field data collected during the Phase Two Environmental Site Assessment field investigation that set the level of uncertainty in environmental data shall be such that,

(a) the decision-making is not affected; and

(b) the overall objectives of the investigation are met.

6. Standard Operating Procedures

Standard operating procedures were developed for all of the following field investigation methods used in the field investigation.

6.1 Borehole Drilling

The drilling field program will be completed under full time supervision of Lopers & Associates personnel. The drilling subcontractor retained for the Phase Two ESA is 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 will be a track mounted CME drill, equipped with hollow stem augers and stainless steel split spoons. Operation of the drilling equipment is the responsibility of the drilling subcontractor, who is trained and competent in the operation of this equipment.

The field technician logs the drilling and recovery of soil samples from each borehole, noting the soil type, physical and environmental characteristics at each borehole location on the field borehole logs.

6.2 Soil Sampling

Samples are to be collected from auger cuttings at the ground surface for surficial samples (0-0.6 m below ground surface (m BGS)) and then using split spoons for subsequent samples. Split spoon samples are generally not collected from surficial depths, as poor recovery of loose packed fill material does not yield sufficient volume of samples required for field screening or laboratory analysis. Split spoon samples, collected in 0.6 m segments, are to be recovered at continuous 0.76 m intervals; the additional 0.16 m between split spoon samples will be 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.

Soil samples are initially collected in Ziploc bags for initial screening as part of sample selection. Soil samples selected for laboratory analysis are 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 are collected using a dedicated graduated syringe provided by the laboratory and placed directly into a glass vial with methanol preservative. Analytes and associated preservatives are specified on each jar/vial by the laboratory. Each jar/vial sample set is provided with a unique sample identifier, project number and date of sampling in the field.

6.3 Field Soil Screening Measurements

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

Additional field screening of the soil samples will be completed using an RKI Instruments Model Eagle-2 combustible gas detector ("RKI Eagle"). The RKI Eagle is capable of measuring combustible 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 ppm to 1000 ppm.

6.4 Monitoring Well Installation

Installation of monitoring wells in selected boreholes is to be completed by George Downing Estate Drilling, who is a licensed well driller in accordance with O.Reg. 903. The wells will be installed using slotted PVC No. 10 monitoring well screens, which are 51 mm in diameter; these screens are to be installed at the base of each of the aforementioned boreholes, directly above the bedrock surface. Well screens can range from 1.5 m to 4.5 m in length. The monitoring wells are extended to approximately 1.0 m above the surface grade with PVC riser, also 51 mm in diameter. A threaded PVC end cap should be installed at the base of the screen to prevent sediment infiltration, while a J-Plug is installed at the top of the riser to present surface influence.

The annular space in each monitoring well is to be backfill with clean silica sand to approximately 0.3 m above the monitoring well screens. A layer of bentonite chips is then used to make a hydraulic seal above the sand pack to near the ground surface. The monitoring wells are to be completed with steel stickup protective casings, which were backfilled with sand to provide stability to the casing and PVC riser.

6.5 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 reference benchmark should be assigned a field site datum of 100.00 m for the purposes of the elevation survey. The ground surface elevation of all boreholes should be surveyed. The top of piezometer of each monitoring well should also be surveyed; this allows for higher accuracy in the interpretation of groundwater elevations.

6.6 Monitoring Well Development;

Groundwater monitoring wells will be developed on the day of drilling using LDPE tubing and a footvalve. At least three and up to ten well volumes will be removed from the monitoring wells in order to remove as much sediment as possible 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 at least one hour between purging events. The LDPE tubing should be removed from the monitoring wells following well development.

6.7 Field Measurement of Water Quality Indicators

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.

6.8 Groundwater Sampling

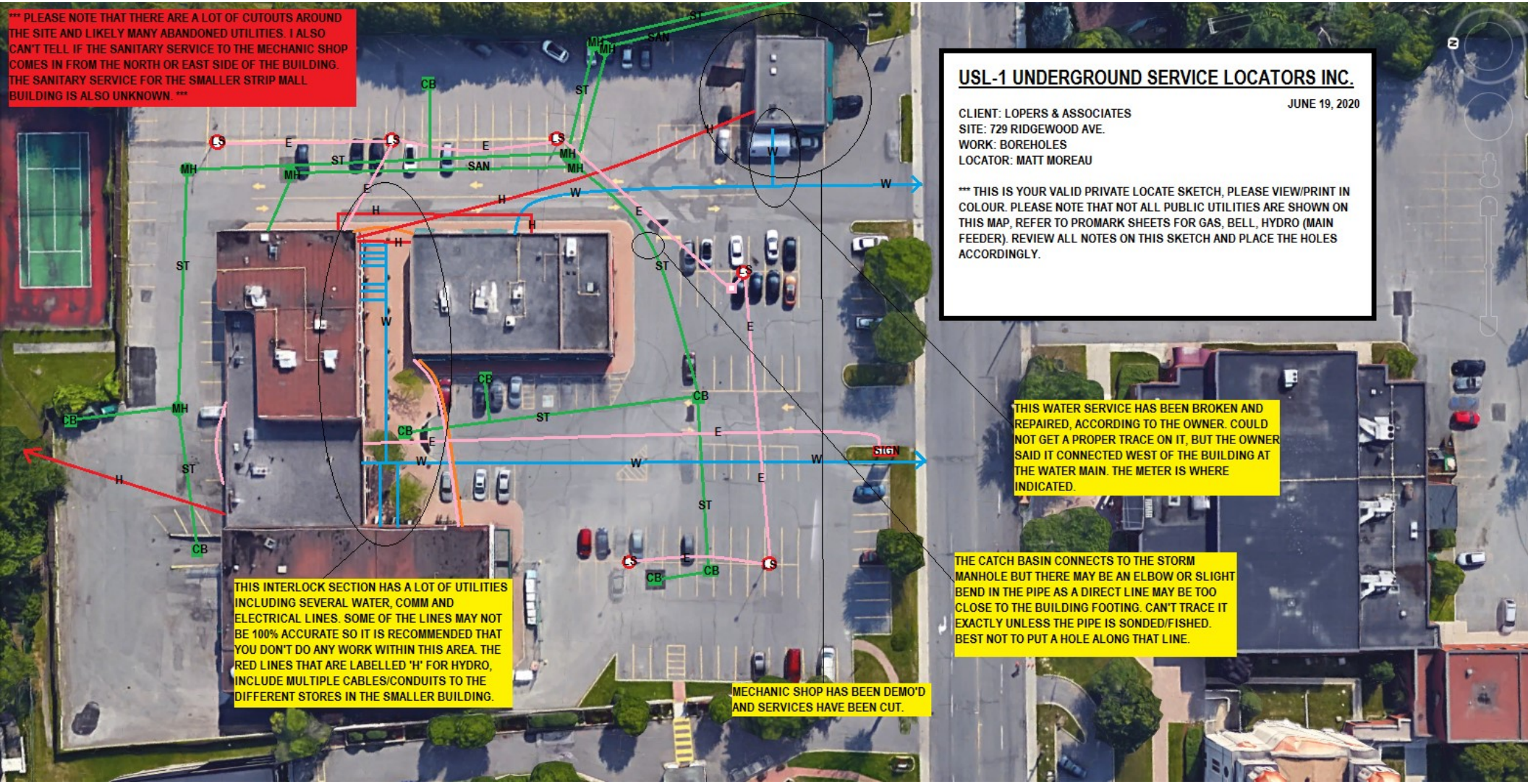
Follow a period of stabilization after drilling and monitoring well development (1 week recommended), static groundwater elevations are measured relative to the top of piezometer at each groundwater monitoring well on the day of sampling, prior to disturbance of the water column.

Following static groundwater elevation measurements, 6 mm LDPE tubing is placed in each of the monitoring wells. The LDPE tubing is connected to silicon tubing, run through a peristaltic pump set to low flow (approximately 0.2-0.5 L/minute) during purging and sampling. The peristaltic pump is used to avoid mixture of sediment into the groundwater column and prevent volatilization during sample collection. The monitoring wells are purged on the day of sampling while water quality parameters were measured and stabilize as noted above.

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

Appendix B

Underground Utility Locates


*** PLEASE NOTE THAT THERE ARE A LOT OF CUTOUTS AROUND THE SITE AND LIKELY MANY ABANDONED UTILITIES. I ALSO CAN'T TELL IF THE SANITARY SERVICE TO THE MECHANIC SHOP COMES IN FROM THE NORTH OR EAST SIDE OF THE BUILDING. THE SANITARY SERVICE FOR THE SMALLER STRIP MALL BUILDING IS ALSO UNKNOWN. ***
USL-1 UNDERGROUND SERVICE LOCATORS INC.
JUNE 19, 2020
CLIENT: LOPERS & ASSOCIATES
SITE: 729 RIDGEWOOD AVE.
WORK: BOREHOLES
LOCATOR: MATT MOREAU
*** THIS IS YOUR VALID PRIVATE LOCATE SKETCH, PLEASE VIEW/PRINT IN COLOUR. PLEASE NOTE THAT NOT ALL PUBLIC UTILITIES ARE SHOWN ON THIS MAP, REFER TO PROMARK SHEETS FOR GAS, BELL, HYDRO (MAIN FEEDER). REVIEW ALL NOTES ON THIS SKETCH AND PLACE THE HOLES ACCORDINGLY.
THIS WATER SERVICE HAS BEEN BROKEN AND REPAIRED, ACCORDING TO THE OWNER. COULD NOT GET A PROPER TRACE ON IT, BUT THE OWNER SAID IT CONNECTED WEST OF THE BUILDING AT THE WATER MAIN. THE METER IS WHERE INDICATED.
THE CATCH BASIN CONNECTS TO THE STORM MANHOLE BUT THERE MAY BE AN ELBOW OR SLIGHT BEND IN THE PIPE AS A DIRECT LINE MAY BE TOO CLOSE TO THE BUILDING FOOTING. CAN'T TRACE IT EXACTLY UNLESS THE PIPE IS SONDED/FISHED. BEST NOT TO PUT A HOLE ALONG THAT LINE.
THIS INTERLOCK SECTION HAS A LOT OF UTILITIES INCLUDING SEVERAL WATER, COMM AND ELECTRICAL LINES. SOME OF THE LINES MAY NOT BE 100% ACCURATE SO IT IS RECOMMENDED THAT YOU DON'T DO ANY WORK WITHIN THIS AREA. THE RED LINES THAT ARE LABELLED 'H' FOR HYDRO, INCLUDE MULTIPLE CABLES/CONDUITS TO THE DIFFERENT STORES IN THE SMALLER BUILDING.
MECHANIC SHOP HAS BEEN DEMO'D AND SERVICES HAVE BEEN CUT.
SIGN
MH
SAN
ST
CB
E
W
H
LS

USL-1
UNDERGROUND SERVICE LOCATORS INC.

USL-1 UNDERGROUND SERVICE LOCATORS INC.
100 – 1704 CARLING AVE. - OTTAWA, ON - K2H 1H3
613-226-8750 - WWW.USL-1.COM

COVER SHEET

DATE: JUNE 19/20 TO: LUKE –

RE: 753 RIDGEWOOD AVE. PAGES (INCLUDING COVER): 24

FROM: MATT MOREAU
613-218-7751 - MATTM@USL-1.COM

IF YOU DID NOT RECEIVE ALL OF THE PAGES FOR THIS REPORT, OR IF ANY PART OF IT IS UNCLEAR, PLEASE CONTACT ME. THANK YOU AND HAVE A GREAT DAY!

USL-1
UNDERGROUND SERVICE LOCATORS INC.

DATE: JUNE 19/20

CLIENT: LOPERS & ASSOC. JOB LOCATION: 753 RIDGEWOOD AVE. WORK: BHS

PUBLIC UTILITY LOCATE REPORT

	UTILITY	LOCATED BY	MARKED / CLEAR
(1)	BELL, GAS, HYDRO	PROMARK	MARKED
(2)	WATER, SEWER	CITY	CLEAR
(3)	ROGERS, TELUS	CLI	CLEAR
(4)	STREET LIGHTS	BLACK & MAC	CLEAR.

NOTES: BELL & GAS MARKED

--- ---

PRIVATE UTILITY LOCATE REPORT

UTILITY	MARKED / CLEAR or N/A	UTILITY	MARKED / CLEAR or N/A
HYDRO / ELECTRICAL	MARKED	STORM SEWER	CLEAR
COMMS / FOC	CLEAR	SANITARY SEWER	↓
GAS / PROPANE / FUEL	↓	STEAM / TUNNELS	N/A
WATER	MARKED	OTHER	

NOTES:

AS-BUILT OR UTILITY PLANS PROVIDED? YES / (NO) - WORK AREA MARKED? (YES) / NO

Sara S

From: solutions@on1call.com
Sent: Monday, June 1, 2020 1:08 PM
To: Locates
Subject: Request 2020234213

LOCATE REQUEST CONFIRMATION

TICKET #: 2020234213
REQUEST PRIORITY: STANDARD
REQUEST TYPE: REGULAR
WORK TO BEGIN DATE: 06/08/2020

Update of Ticket #
Project #
Transmit date: 06/01/2020 01:03:13 PM

REQUESTOR'S CONTACT INFORMATION	
Contractor ID#: 202	**Company Phone #:** (613) 226-8750
Contact Name: Sara Staniszewski	**Cell #:**
Alternate Contact Name: JACQUES DESJARDINS	**Fax #:** (613) 226-8677
Company name: U S L	**Email:** locates@usl-1.com
Address: 1704 Carling	**Alternate Contact #:**

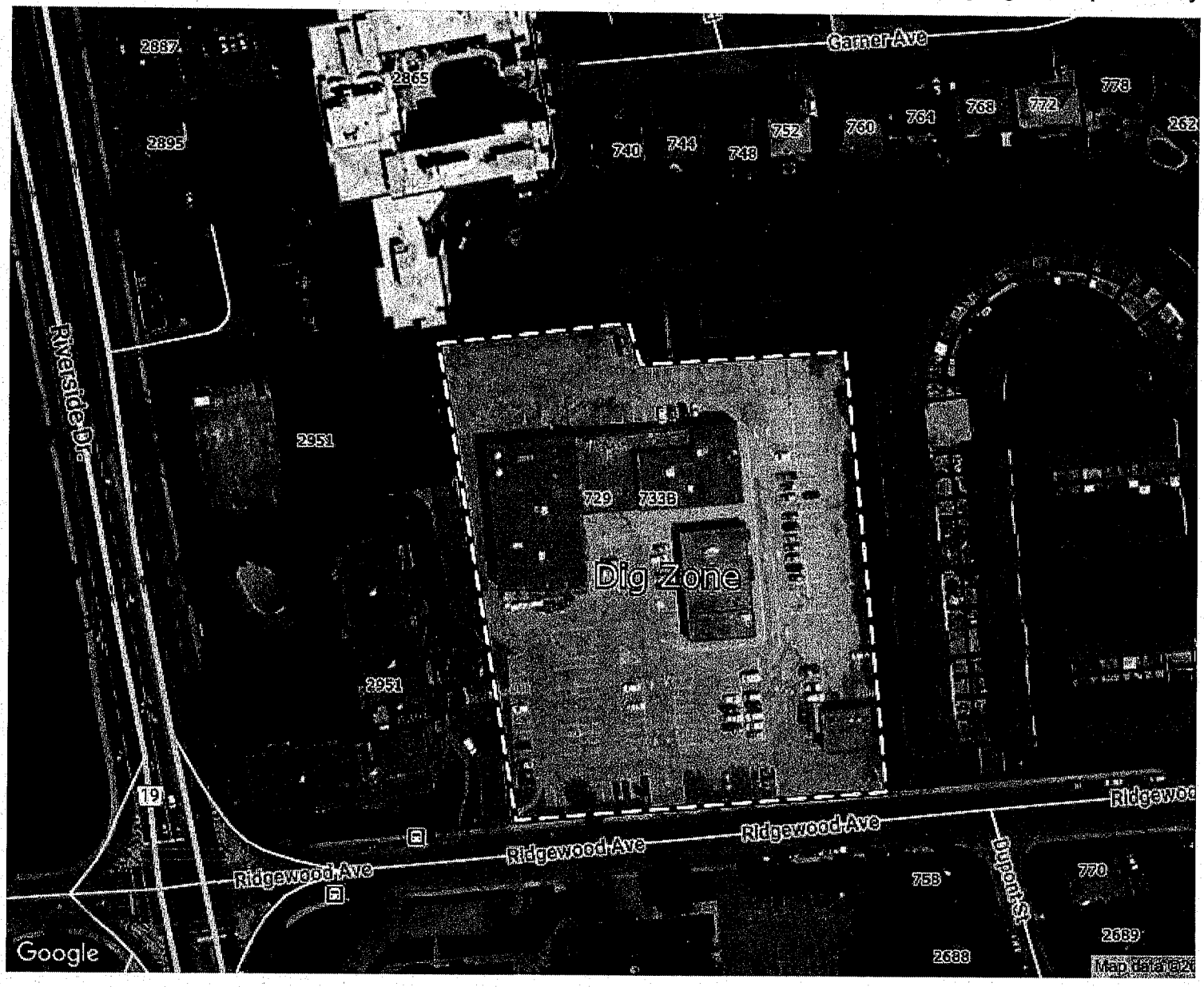
DIG INFORMATION		
Region/County: OTTAWA	**Type of work:** BORE HOLES	**Mark & Fax:** NO
Community:	**Max Depth:** 100.00 FT	**Area is not marked:** NO
City: OTTAWA	**Machine Dig:** YES	**Area is marked:** YES
Address: 729, RIDGEWOOD AVE To 753	**Hand Dig:** NO	**Site Meet Req.:** NO
	Directional Drilling: NO	**Work being done for:** Lopers and Associates
Intersecting Street 1: SPRINGLAND DR	**Public Property:** YES	
Intersecting Street 2: RIVERSIDE DR	**Private Property:** YES	

DETAILED DESCRIPTION OF WORK	REMARKS
CORLOT=U Drilling throughout property. Clear entir e property and to sidewalk along Ridgewood Ave. In cludes property known as 753 Ridgewood.	Civic # 729, 753.

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
TELUS (TELUSON3)	TELUSON3	Notification sent
CLI FOR ROGERS (ROGOTT01)	ROGOTT01	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
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



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 whichyou 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.

Promark telecon
Location of underground infrastructures

Primary Locate Sheet

UNION GAS EMERGENCY #
1-877-969-0999

Fax: 613-723-9277
Toll free: 1-800-371-8866
Email:

Request #
2020234213
NORMAL

Utilities Located	Revised Excavation Date	Excavation Date	Status
● Bell ● Gas ● Hydro Ottawa ☐ Hydro One ☐ Zayo ☐ Videotron ☐ Lakefront Utilities ☐ Elexicon Energy	N/A mm/dd/yyyy	06/12/2020 00:00:00 N/A mm/dd/yyyy	STANDARD Homeowner ☐ Contractor ● Project ☐

Requested by:	Company:	Phone:	Fax/email:
SARA STANISZEWSKI	U S L	(613)-226-8750 ext.	(613)-226-8677 ext. N/A

Appt Date:	Received Date:	Locate Address:
N/A mm/dd/yyyy	06/01/2020 N/A mm/dd/yyyy	**729 to 753, RIDGEWOOD AVE**

1st Inters.: SPRINGLAND DR 2nd Inters.: RIVERSIDE DR

Type of work:
BORE HOLES

City:
OTTAWA

Caller's Remarks:
CIVIC # 729, 753.
MACH. DIG
CORLOT=U DRILLING THROUGHOUT PROPERTY. CLEAR ENTIRE PROPERTY AND TO SIDEWALK ALONG RIDGEWOOD AVE. INCLUDES PROPERTY KNOWN AS 753 RIDGEWOOD.
-75.687939, 45.368339, NB_SEGMENTS::1, NO_PLAN::613 737, BCOE01, OTWASL01, OTWAWS01, ROGOTT01, TELUSON3, ENOE01, HOT1

Bell Mark | Clear	Gas Mark | Clear	Hydro Ottawa Mark | Clear	Street Lighting Mark | Clear	Lakefront Mark | Clear	Hydro One Mark | Clear	Zayo Mark | Clear	Elexicon Energy Mark | Clear	Videotron Mark | Clear
1	1	1	N/A	N/A	N/A	N/A	N/A	N/A

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

Records Reference:
● Map ● Network X #
_ Byers ● DatapakPMOTT190081
Field Notes: ● LAC Multiviewer
Other: GL38, FN-3871-1
DPT Remarks:

_ Third Party Notification

*****DANGER DO NOT PROCEED*****
BURIED HIGH VOLTAGE CABLES WITHIN THE LOCATED AREA. YOU MUST SEND LOCATE TO HOLsupervisions@hydroottawa.com OR CONTACT HYDRO OTTAWA AT 613-738-6418 FOR FURTHER INFORMATION "EMERGENCY" NUMBER IS 613-738-0188

Apply Sticker Here if Required

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

Gas Material Type: ☐Steel(st) ☐Plastic(PE) ☐Copper(CO)

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

Caution: Bell locate valid for life of excavation see attached document. Hydro One - Hydro Ottawa - Enbridge Gas - Lakefront Utilities - Elexicon Energy valid for 60 days, 360 valid for life of excavation. See disclaimer for Facility Owner 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: MAIN CULLEN	Start Time: 12:00	_ Mark & Fax _ Left on Site ● Emailed
ID #: 10879 1849	End Time : 16:00	Print:
Date Jun 12 2020	Total Hours: 4	Signature:

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.

Promark telecon
Locates of underground infrastructures

Auxiliary Locate Sheet

Union Gas Emergency # 1-877-969-0999

Fax: 613-723-9277 Toll free: 1-800-371-8866 Email

Utilities Located: ☐ Bell ● Gas ☐ HydroOttawa ☐ Hydro One ☐ Videotron ☐ Peel Fibre ☐ Elexicon Energy

Date Located: mm/dd/yyyy 06/12/2020

Request # 2020234213

Number of Services marked: (Specify building/house numbers) (1) 729-751 Ridgewood Avenue

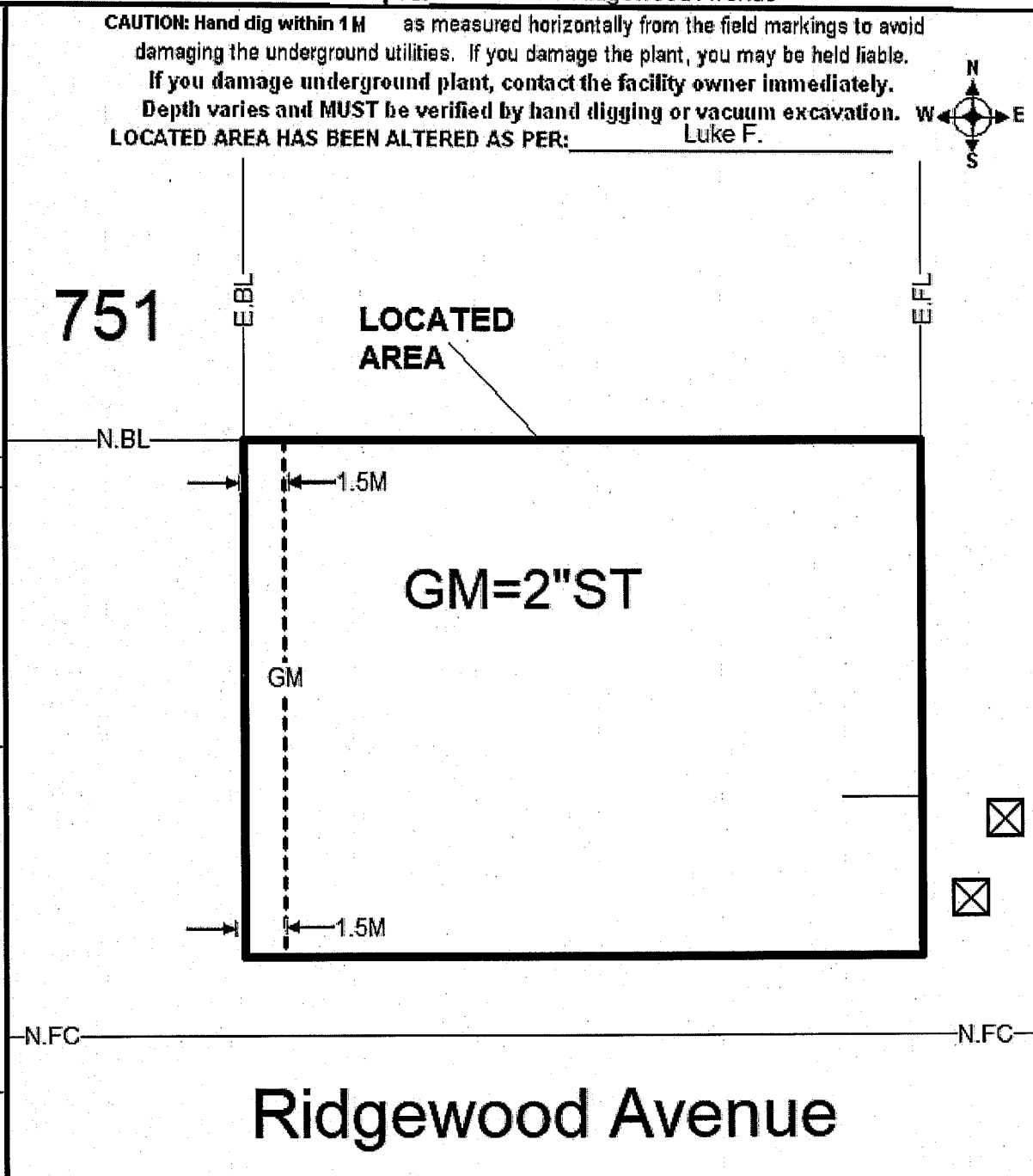
LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE

FROM: 3M N of N.FC Ridgewood Avenue
FROM: E.BL of 751 Ridgewood Avenue
TO: S.BL of 751 Ridgewood Avenue
TO: E.FL of 751 Ridgewood Avenue

Legend

Building Line	– BL –
Fence Line	– FL –
Face of Curb	– FC –
Asphalt Edge	– AE –
Sidewalk	SW
Driveway	– DW –
Manhole	M/H
Pedestal	
Flush to Grade Pedestal	FTG
Buried Service Wire	– BSW –
Buried Cable	– B –
Conduit	– C –
Fiber Optic Cable	– FO –
Bell Hydro Service	– BH –
Gas Valve	
Gas Service	– GS –
Gas Main	– GM –
Transformer	
Demarcation	DM
Hydro	– H –
Hydro Primary	– HP –
Hydro Secondary	– HS –
Catch Basin	CB
Sewer Manhole	
Water Valve	
Hydrant	
Water Valve Chamber	W
Hydro / Bell Pole	
Railway	
End Cap	
Traffic Manhole	T
Street Light Cable	– SL –
Street Light	
North	N.
East	E.
West	W.
South	S.

CAUTION: Hand dig within 1 M 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: Luke F.



THIS FORM VALID ONLY WITH Primary Locate Form. This sketch is not to scale.
Any privately owned services within the located area have not been marked- check with service/property owner.

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. If sketch and markings do not coincide, the Excavator must obtain a new locate.

Promark telecon
Locates of underground infrastructures

Auxiliary Locate Sheet

Union Gas Emergency # 1-877-969-0999

Fax: 613-723-9277 Toll free: 1-800-371-8866 Email

Utilities Located: ● Bell ☐ Gas ☐ HydroOttawa ☐ Hydro One ☐ Videotron ☐ Peel Fibre ☐ Elexicon Energy

Date Located: mm/dd/yyyy 06/12/2020

Request # 2020234213

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

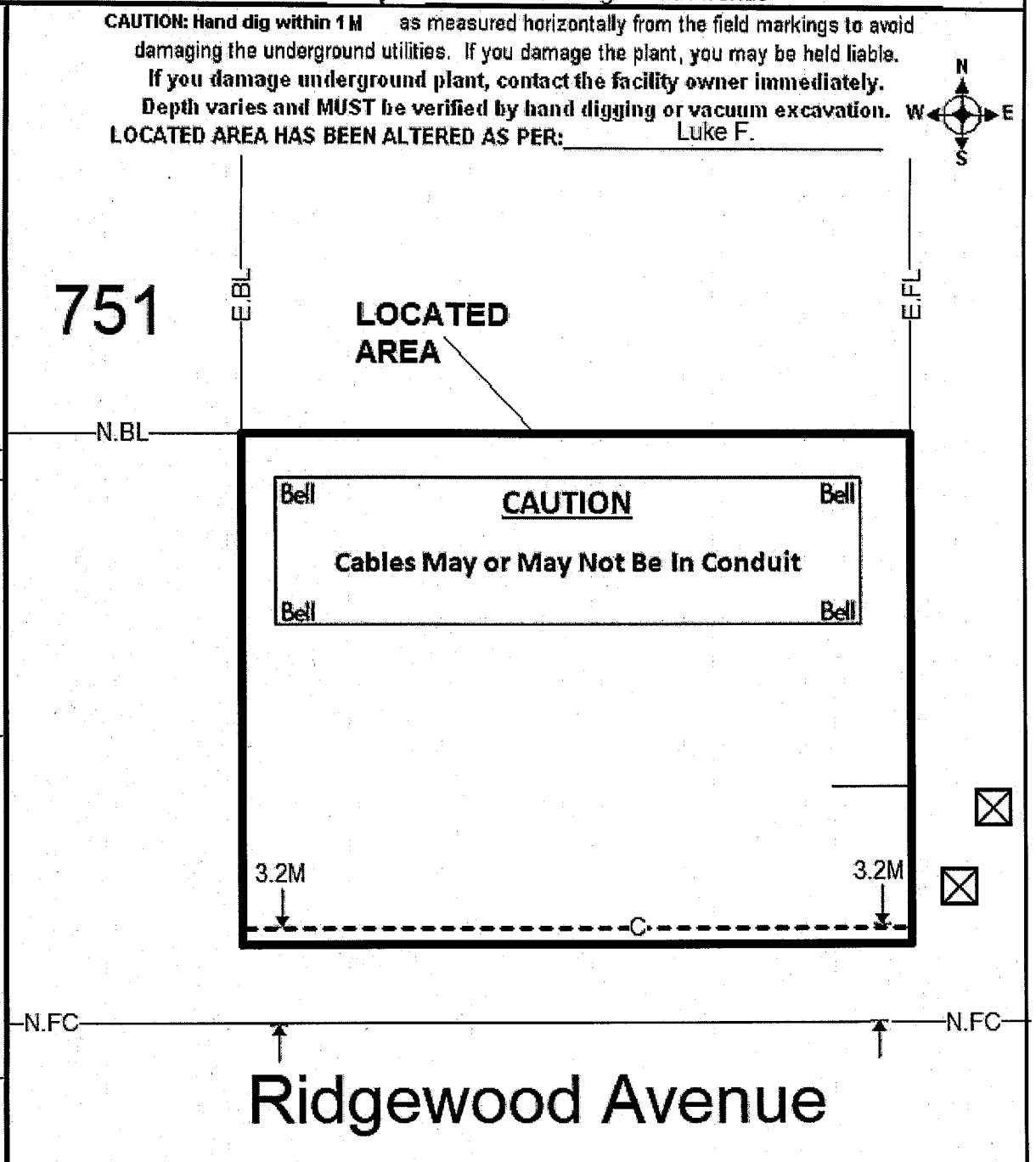
LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE

FROM: 3M N of N.FC Ridgewood Avenue
FROM: E.BL of 751 Ridgewood Avenue
TO: S.BL of 751 Ridgewood Avenue
TO: E.FL of 751 Ridgewood Avenue

Legend

Building Line	– BL –
Fence Line	– FL –
Face of Curb	– FC –
Asphalt Edge	– AE –
Sidewalk	SW
Driveway	– DW –
Manhole	M/H
Pedestal	☒
Flush to Grade Pedestal	FTG
Buried Service Wire	– BSW –
Buried Cable	– B –
Conduit	– C –
Fiber Optic Cable	– FO –
Bell Hydro Service	– BH –
Gas Valve	
Gas Service	– GS –
Gas Main	– GM –
Transformer	
Demarcation	DM
Hydro	– H –
Hydro Primary	– HP –
Hydro Secondary	– HS –
Catch Basin	CB
Sewer Manhole	
Water Valve	
Hydrant	
Water Valve Chamber	W
Hydro / Bell Pole	
Railway	
End Cap	
Traffic Manhole	T
Street Light Cable	– SL –
Street Light	
North	N.
East	E.
West	W.
South	S.

CAUTION: Hand dig within 1 M 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: Luke F.



THIS FORM VALID ONLY WITH Primary Locate Form. This sketch is not to scale.
Any privately owned services within the located area have not been marked- check with service/property owner.

A copy of this Auxillary Locate Sheet(s) and the Primary Locate Sheet 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.

Promark telecon
Locators of underground infrastructures

Auxiliary Locate Sheet

Union Gas Emergency # 1-877-969-0999

Fax: 613-723-9277 Toll free: 1-800-371-8866 Email

Utilities Located:					Date Located:	Request #
☐ Bell	☐ Gas	● HydroOttawa	☐ Street Lighting		mm/dd/yyyy 06/12/2020	2020234213
☐ Blink	☐ Peel Fibre	☐	☐			

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

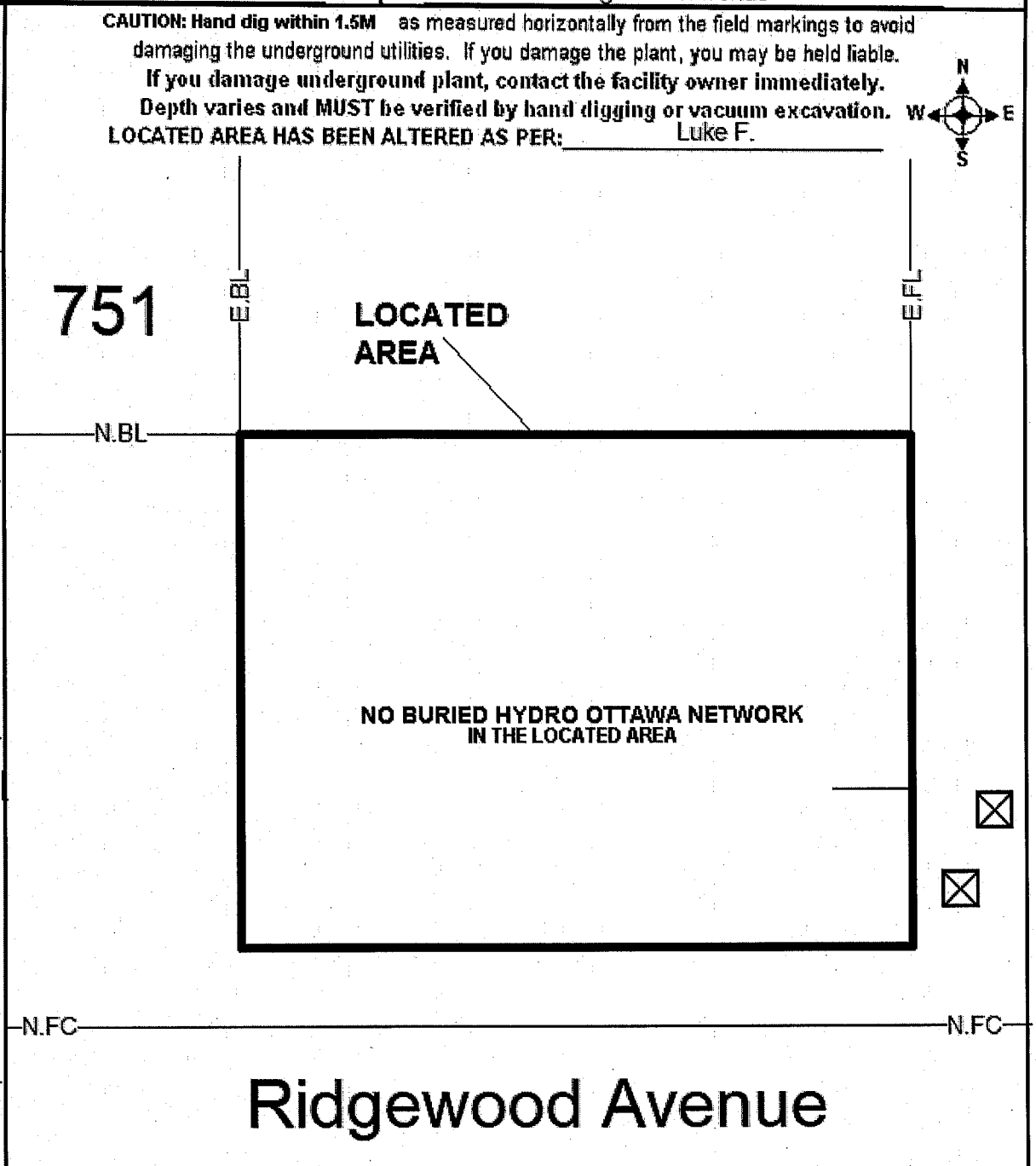
LOCATED AREA: EXCAVATOR SHALL NOT WORK OUTSIDE THE LOCATED AREA WITHOUT OBTAINING ANOTHER LOCATE.

FROM: 3M N of N.FC Ridgewood Avenue
FROM: E.BL of 751 Ridgewood Avenue
TO: S.BL of 751 Ridgewood Avenue
TO: E.FL of 751 Ridgewood Avenue

Legend

Building Line	– BL –
Fence Line	– FL –
Face of Curb	– FC –
Asphalt Edge	– AE –
Sidewalk	SW
Driveway	– DW –
Manhole	M/H
Pedestal	☒
Flush to Grade Pedestal	FTG
Buried Service Wire	– BSW –
Buried Cable	– B –
Conduit	– C –
Fiber Optic Cable	– FO –
Bell Hydro Service	– BH –
Gas Valve	⋈
Gas Service	– GS –
Gas Main	– GM –
Transformer	▲
Demarcation	DM
Hydro	– H –
Hydro Primary	– HP –
Hydro Secondary	– HS –
Catch Basin	CB
Sewer Manhole	⊗
Water Valve	⋈
Hydrant	⋈
Water Valve Chamber	W
Hydro / Bell Pole	○
Railway	
End Cap	▙
Traffic Manhole	T
Street Light Cable	– SL –
Street Light	✳
North	N.
East	E.
West	W.
South	S.

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.
LOCATED AREA HAS BEEN ALTERED AS PER: Luke F.



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Promark telecon
Locates of underground infrastructures

Auxiliary Locate Sheet

Union Gas Emergency #
1-877-969-0999

Fax: 613-723-9277 Toll free: 1-800-371-8866 Email

Utilities Located: ☐ Bell ● Gas ☐ HydroOttawa ☐ Hydro One ☐ Videotron ☐ Peel Fibre ☐ Elexicon Energy

Date Located: mm/dd/yyyy 06/12/2020

Request # 2020234213

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

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

FROM: 5M N of N.FC Ridgewood Avenue
FROM: 5M W of W.BL 729-751 Ridgewood Avenue
TO: S.BL2 of 729-751 Ridgewood Avenue
TO: E.BL of 729-751 Ridgewood Avenue

Legend

Building Line	– BL –
Fence Line	– FL –
Face of Curb	– FC –
Asphalt Edge	– AE –
Sidewalk	SW
Driveway	– DW –
Manhole	M/H
Pedestal	
Flush to Grade Pedestal	FTG
Buried Service Wire	– BSW –
Buried Cable	– B –
Conduit	– C –
Fiber Optic Cable	– FO –
Bell Hydro Service	– BH –
Gas Valve	
Gas Service	– GS –
Gas Main	– GM –
Transformer	
Demarcation	DM
Hydro	– H –
Hydro Primary	– HP –
Hydro Secondary	– HS –
Catch Basin	CB
Sewer Manhole	
Water Valve	
Hydrant	
Water Valve Chamber	W
Hydro / Bell Pole	
Railway	
End Cap	
Traffic Manhole	T
Street Light Cable	– SL –
Street Light	
North	N.
East	E.
West	W.
South	S.

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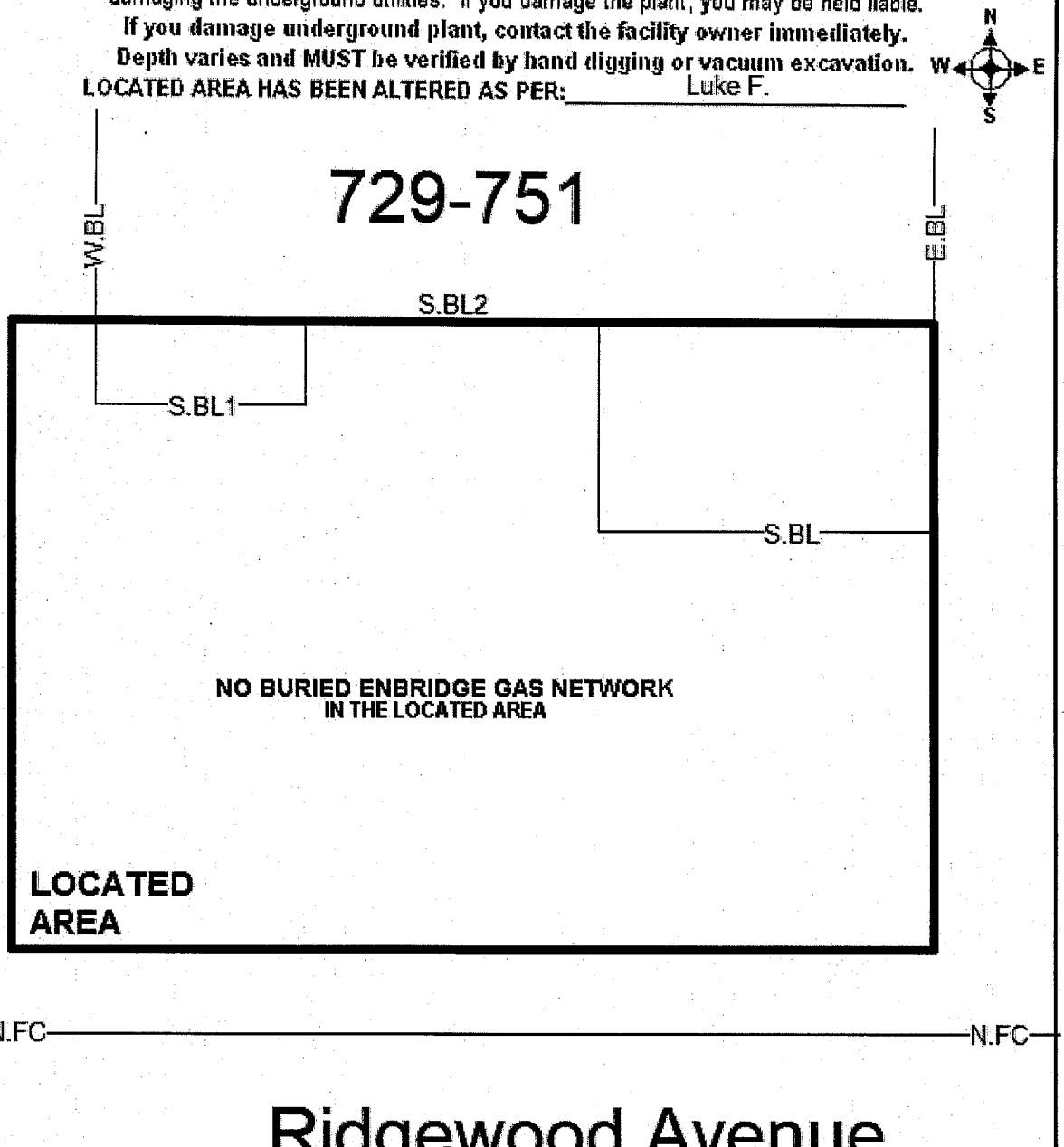

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FROM: 5M W of W.BL 729-751 Ridgewood Avenue
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Legend

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Transformer	▲
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Hydro Primary	– HP –
Hydro Secondary	– HS –
Catch Basin	CB
Sewer Manhole	⊗
Water Valve	⋈
Hydrant	⋈
Water Valve Chamber	W
Hydro / Bell Pole	○
Railway	|||||
End Cap	⌊
Traffic Manhole	T
Street Light Cable	– SL –
Street Light	☼
North	N.
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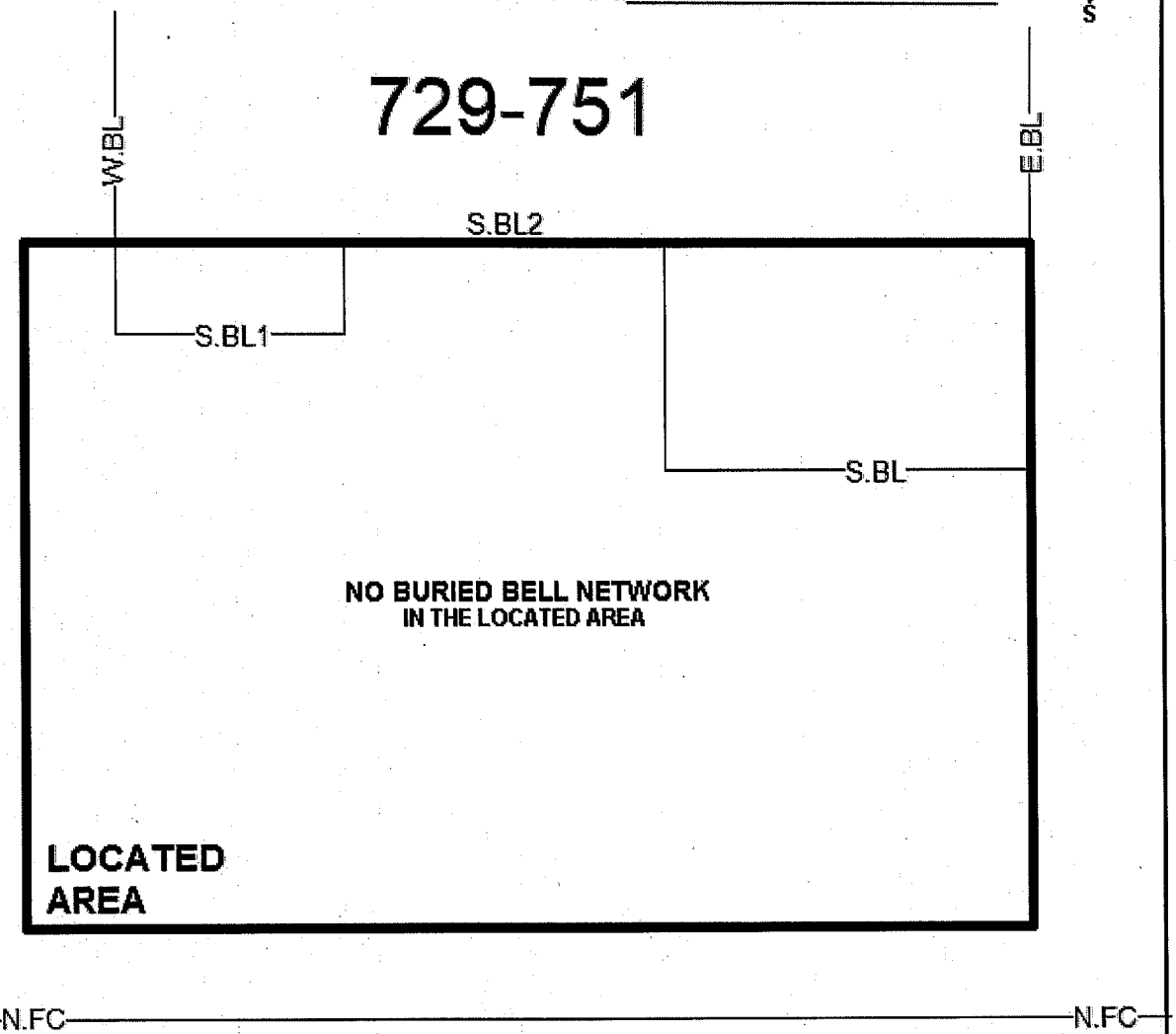

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Promark telecon
Locates of underground infrastructures

Auxiliary Locate Sheet

Union Gas Emergency # 1-877-969-0999

Fax: 613-723-9277 Toll free: 1-800-371-8866 Email

Utilities ☐ Bell ☐ Gas ● HydroOttawa ☐ Street Lighting
Located: ☐ Blink ☐ Peel Fibre ☐ ☐

Date Located: mm/dd/yyyy 06/12/2020

Request # 2020234213

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

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

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FROM: 5M W of W.BL 729-751 Ridgewood Avenue
TO: S.BL2 of 729-751 Ridgewood Avenue
TO: E.BL of 729-751 Ridgewood Avenue

Legend

Building Line	– BL –
Fence Line	– FL –
Face of Curb	– FC –
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Gas Valve	
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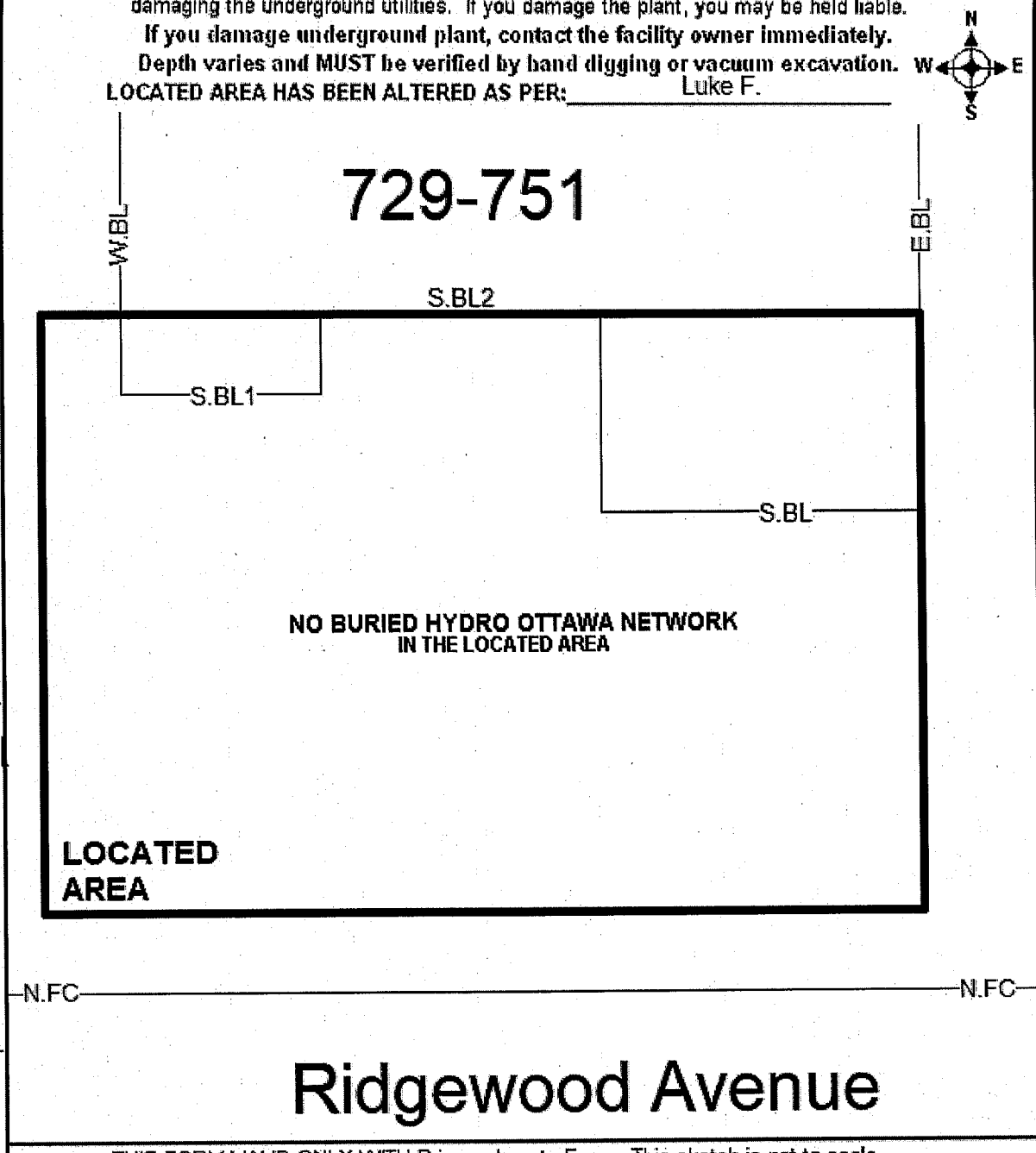

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Promark telecon
Locates of underground infrastructures

Auxiliary Locate Sheet

Union Gas Emergency # 1-877-969-0999

Fax: 613-723-9277 Toll free: 1-800-371-8866 Email

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Date Located: mm/dd/yyyy 06/12/2020

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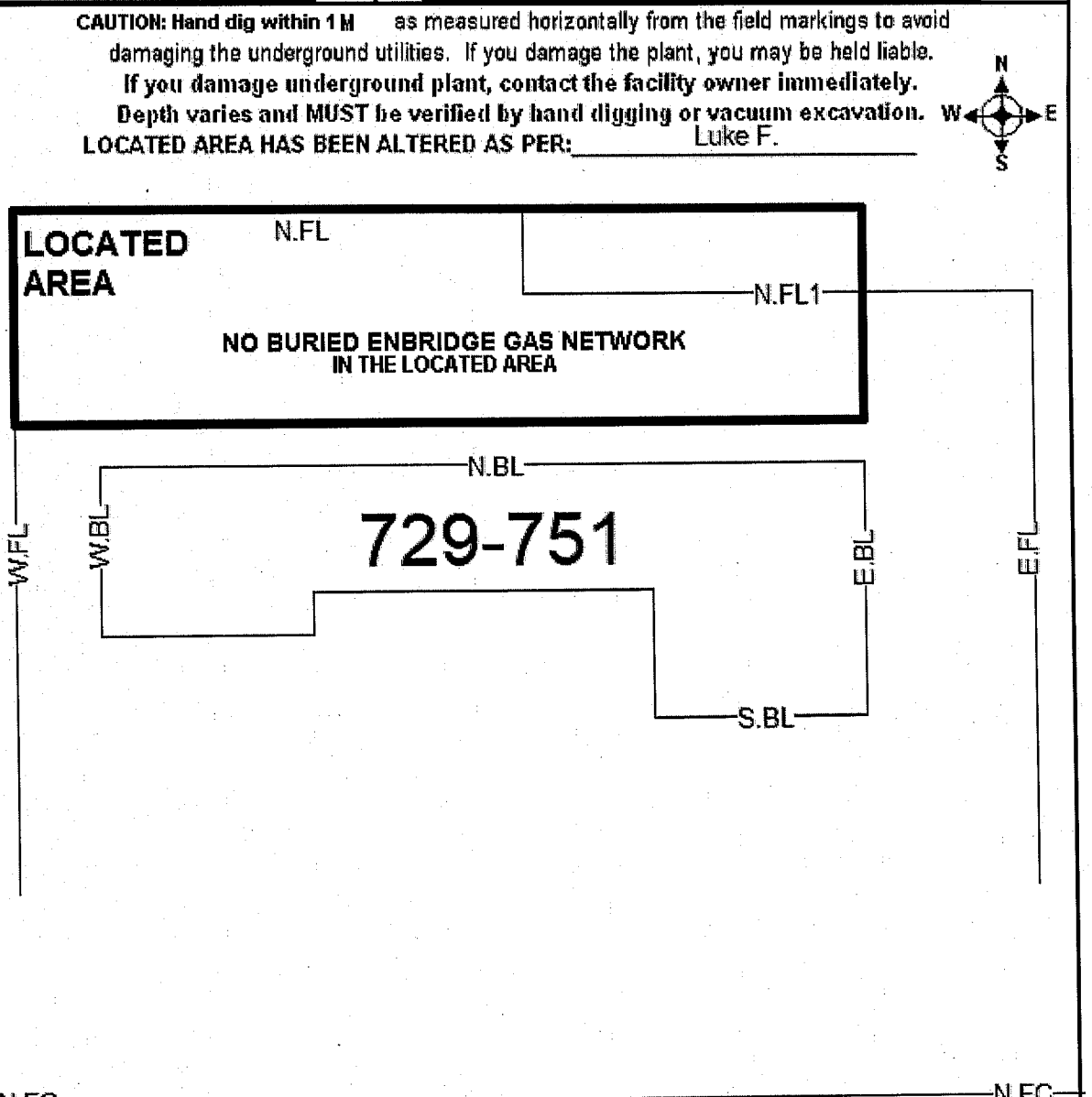

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Promark telecon
Locates of underground infrastructure

Auxiliary Locate Sheet

Union Gas Emergency #
1-877-969-0999

Fax: 613-723-9277 Toll free: 1-800-371-8866 Email

Utilities Located: ● Bell ☐ Gas ☐ HydroOttawa ☐ Hydro One ☐ Videotron ☐ Peel Fibre ☐ Elexicon Energy

Date Located: mm/dd/yyyy 06/12/2020

Request # 2020234213

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Hydrant	⋇
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Railway	▭▭▭
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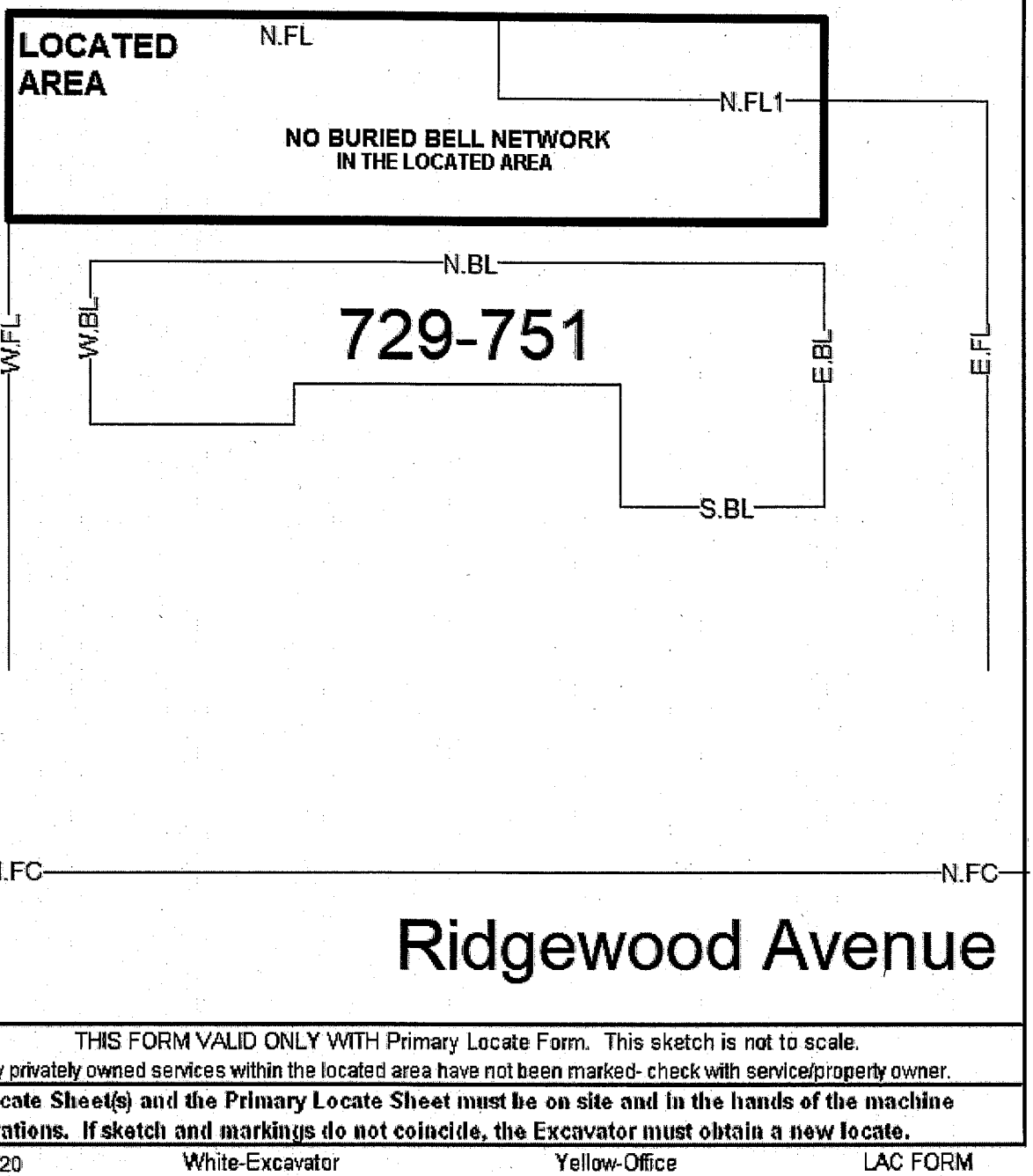

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Promark telecon
Location of underground infrastructures

Auxiliary Locate Sheet

Union Gas Emergency # 1-877-969-0999

Fax: 613-723-9277 Toll free: 1-800-371-8866 Email

Utilities ☐ Bell ☐ Gas ● HydroOttawa ☐ Street Lighting
Located: ☐ Blink ☐ Peel Fibre ☐ ☐

Date Located: mm/dd/yyyy 06/12/2020

Request # 2020234213

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

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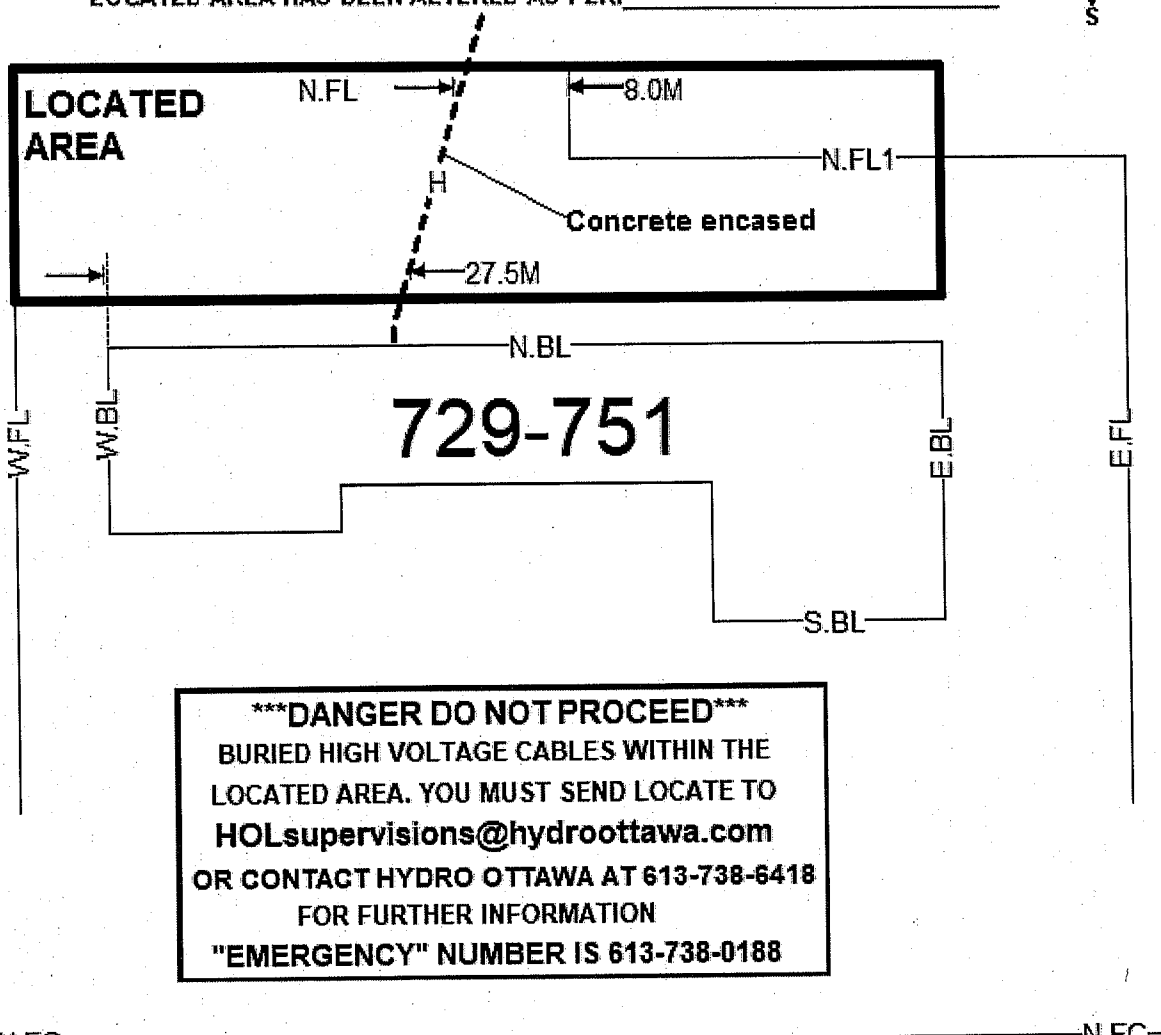

*****DANGER DO NOT PROCEED*****
BURIED HIGH VOLTAGE CABLES WITHIN THE LOCATED AREA. YOU MUST SEND LOCATE TO
HOLsupervisions@hydroottawa.com
OR CONTACT HYDRO OTTAWA AT 613-738-6418 FOR FURTHER INFORMATION
"EMERGENCY" NUMBER IS 613-738-0188

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ENBRIDGE

ENBRIDGE GAS INC.

Thank you for calling for a locate prior to starting your project.

Please note Enbridge Gas Inc has changed the locate validity period for station codes **ENOE01** and **EN2OE01** and this completed locate is valid for a period of **60 days** from the completion date on the Primary Locate Sheet.

You must adhere to the following:

- You must follow all STOP letters associated with your locate if provided in your locate package.
- You should always review the Primary and all the Auxiliary Sheets of your locate package and understand the validity period for all utilities / infrastructure owners.
- It is the responsibility of Excavators to protect and preserve the original yellow paint markings. White paint can be used to preserve/maintain the markings but should be place beside or at the top / bottom of the original markings ensuring not to replace the yellow paint.

When winter conditions exist, such as snow, pink paint and stakes or flags can be used.

Please be aware new gas services or mains can be installed after this locate was completed. Newly buried gas plant flags will be installed as visual identifier if this occurs.

If flags are present, please contact Enbridge Gas Damage Prevention at 1-866-922-3622

For station code – **ENOE01** or *Legacy Enbridge Gas Distribution* please refer to the Third Party Requirements in the Vicinity of Natural Gas Facilities must always be followed.

https://www.enbridgegas.com/~/media/Extranet-Pages/Safety/Before-you-dig/Third-Party-Requirements-in-the-Vicinity-of-Natural-Gas-Facilities

For station code **EN2OE01** or *Legacy Union Gas* please refer to

https://www.uniongas.com/about-us/safety/safe-digging-practices

Thank you

Bell

February 9 2015

To all Excavators:

Bell locates are now valid for the life of the excavation project and will not automatically be relocated every 60 days.

Please note the following for the above to apply:

a) Construction within the located area begins within 60 days of the "locate completed" date on the original ticket.

b) The construction company named on the locate remains active on the site.

Bell expects excavators will protect and preserve the paint marks put down on 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.

If an excavator would like their markings freshened up they can contact Promark (the Bell Canada Locate Service Provider in this area) directly to arrange for them to place fresh markings on the ground however this will be at the excavators expense. Promark can be reached at 613-723-9888.

The locate will be considered officially expired one day after the final day of construction.

Thank you,

Bell Canada

Service Request Details

Service Request 1360829 **Lagan Case ID:** 20202342131

Source: Contractor **Created By:** Ga Maxpusr
Priority: **Reported By:**
Status: RESOLVED **Initiated:** 2020-Jun-01 1:05 PM

Location Information

Address: RIDGEWOOD AVE **Range:** 729-753 **Unit:**
Between Streets: SPRINGLAND DR / RIVERSIDE DR **Municipality:** OO
Description:

Street Range:729-753
Street:RIDGEWOOD AVE
Intersect 1:SPRINGLAND DR
Intersect 2:RIVERSIDE DR
Door Numbers:-
Municipality:

The work area is clear of underground water and sewer pipes owned by The City of Ottawa if the excavation is not in the road. The service pipes within the property are privately owned by the property owner and are not the responsibility of The City of Ottawa. Attached is an ArcView.
Please note: City of Ottawa locates are valid for sixty (60) days. | S'il-vous-plaît notez: les localisations de la ville d'Ottawa sont valables pendant soixante (60) jours.

Requestor Information

Name: Sara Staniszewski **Phones**
Address: 1704 CARLING AVE **Res:** **Cell:**
City: OTTAWA **Bus:** 6132268750 **Ext:**
Postal Code: K2A1C7 **Unit:** **Fax:** 6132268677

Call Back & Other Assignments

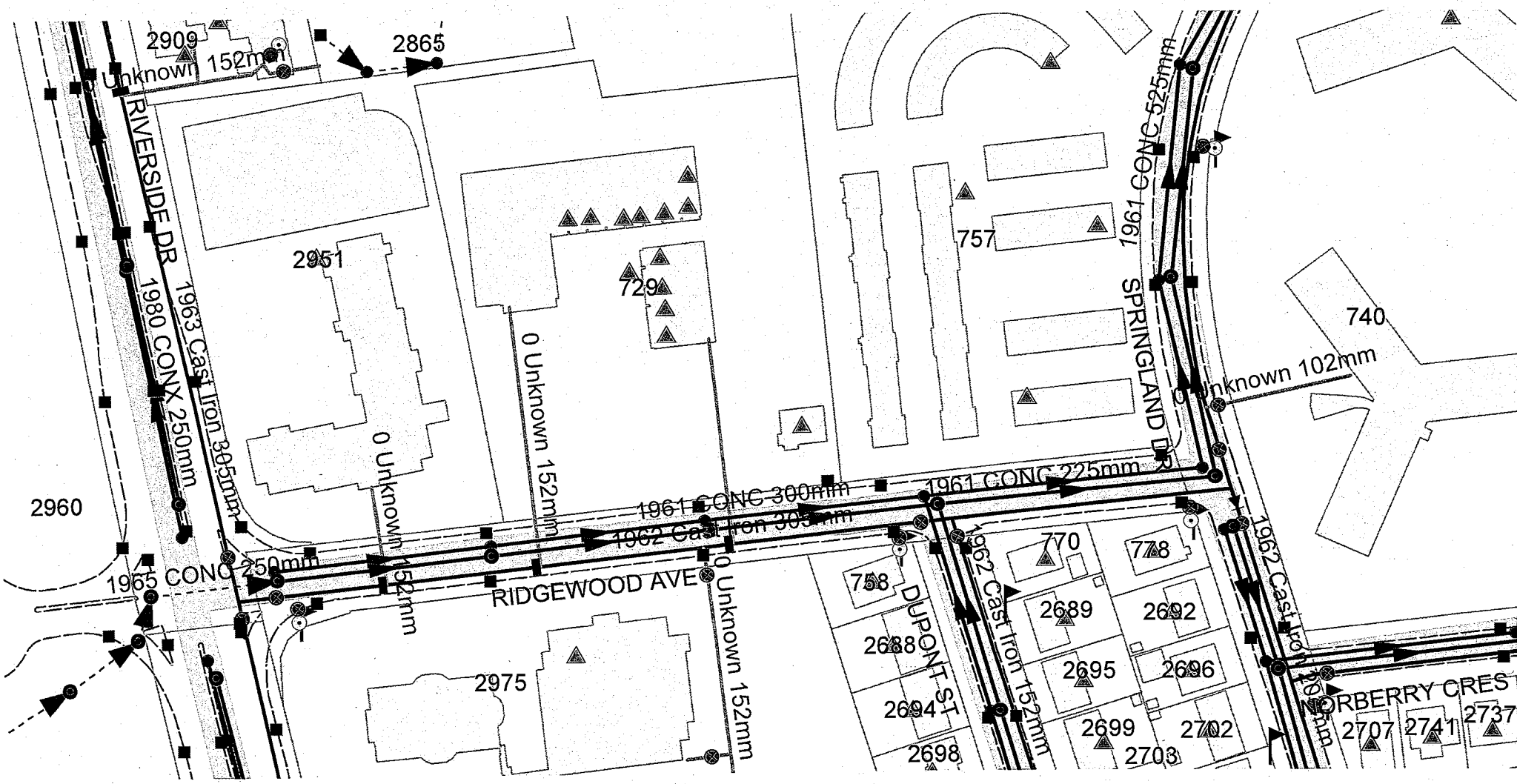
Responsibilities
Service Request **Work Order #** **Work Order**

Request Details

Start Date: **Appointment Time:** **Service:** ESD
Finish Date: 2020-Jun-04 **Classification:** LOCATES - PROVIDE
Amount Charge to Customer: **Category:**

Structures

Structure ID	District	Description	Location	Qualifier	Unit


2909
Unknown 152mm
2865
RIVERSIDE DR
1980 CONX 250mm
1963 Cast Iron 305mm
2951
729
0 Unknown 152mm
757
1961 CONC 525mm
SPRINGLAND DR
740
Unknown 102mm
2960
1961 CONC 300mm
1962 Cast Iron 305mm
1961 CONC 225mm
1965 CONC 250mm
RIDGEWOOD AVE
0 Unknown 152mm
0 Unknown 152mm
770
778
758
DUPONT ST
2689
2692
2688
2695
2696
2694
2699
2702
2698
2703
2975
1962 Cast Iron 152mm
1962 Cast Iron 152mm
NORBERRY CRES
2707
2741
2737

CANADIAN LOCATORS INC.
Servicing the Utilities Industry

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

ROGERS
Primary Locate Sheet

ON 1 Call Ticket # : 2020234213

Contractor / Excavator : U S L			**Contact Name :** Sara Staniszewski
Tel : 613-226-8750	**Alt. Phone :**	**Email :** locates@usl-1.com	
Received Date : Jun 2 2020	**Excavation Date :** Jun 8 2020	**Revised Excavation Date:**	**Type of Work :** BORE HOLES
Locate Address : 729-753 RIDGEWOOD AVE			**City / Municipality :** OTTAWA, ONTARIO

Nearest Intersection : SPRINGLAND DR & RIVERSIDE DR

Method of Field Marking : ☐ Paint ☐ Stakes ☐ Flags

Caller's Remarks *(Additional Info)* **:**
CORLOT=U Drilling throughout property. Clear entire property and to sidewalk along Ridgewood Ave. Includes property known as 753 Ridgewood.//Civic # 729, 753.

Utilities Marked :					**This locate has multiple work areas which are greater than 100 m apart :**
☐ Coaxial Plant	☐ Fibre Optics Plant				☐ Yes ☐ No
Total Length : m	**Total Length :** 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 :
ROGERS CABLES CLEAR IN LOCATED AREA

Locator's Name : *(Please Print)*
Courtney Stoddard

Date :	**Start Time :**	**End Time :**
Jun 4 2020	5:30 PM	5:40 PM

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Servicing the Utilities Industry

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ROGERS
Auxiliary Locate Sheet

ON 1 Call Ticket # : 2020234213

Utilities Marked :

☐ Coaxial Plant m ☐ Fibre Optics Plant m

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

NA

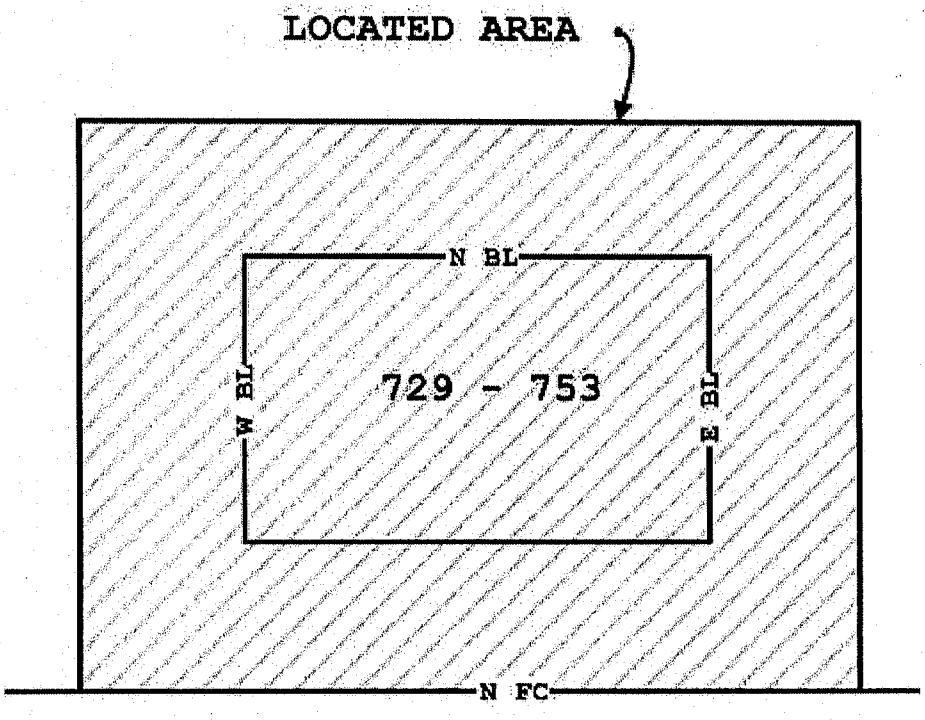
LOCATED AREA CONTAINS ALL KNOWN ROGERS INFRASTRUCTURE

FROM :	TO :
30M N OF N BL OF 729 - 753 RIDGEWOOD AVE	N FC OF RIDGEWOOD AVE
FROM :	**TO :**
10M W OF W BL OF 729 - 753 RIDGEWOOD AVE	35M E OF E BL OF 729 - 753 RIDGEWOOD AVE

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: 1-800-265-9601 Immediately!**
Depth of cable plant varies and **MUST** be determined by hand digging or vacuum excavation.
LOCATED AREA ALTERED AS PER :

N

ROGERS CABLES CLEAR IN LOCATED AREA



Sketch not drawn to scale

LEGEND :

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

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.

Sara S

From: agt_comm@irth.com
Sent: Monday, June 1, 2020 2:20 PM
To: Locates
Subject: Ticket 2020234213 - TELUS Facility Locate Request: Results/Information
Attachments: 2020234213.PNG; 2020234213_1.PNG

==========

To: U S L Attn: Sara Staniszewski
Voice: 6132268750 Fax: 6132268677
Re: TELUS Facility Locate Request: Results/Information

This is an important Safety Message from TELUS Communications Company regarding your Provincial One-Call Locate Request PLEASE REVIEW THIS ENTIRE MESSAGE! We are responding to your request to locate TELUS underground facilities in the specific area of excavation listed on this One-Call ticket.
Your locate request has been reviewed and its status is explained below*:

==========

Ticket: 2020234213
County: ONTARIO Place: OTTAWA
Address: 729 to 753 RIDGEWOOD AVE

TELUSON3:
Upon review of the information and the work area specified on this locate request, we will not be marking TELUS lines at this time for the following reason: Additional information below *NOTE* TELUS N/R, OUR RECORDS SHOW NO TELUS FACILITIES LOCATED AT THE LOCATION LISTED ON YOUR LOCATE REQUEST.

==========

If you have any questions or concerns regarding this response, please contact the Cable Locate Support Centre for AB,BC,SK, MB & ON, by calling, 1-800-980-0030. Any damage to TELUS facilities MUST be reported as a "Dig Up" to your Provincial One-Call Center ASAP. We ask, that while excavating, you dig with caution. Thank You for using your local Dial / Click Before You Dig process!

==========

This message was generated by an automated system. Please do not reply to this email.

On1 Call #	2020234213
Date Requested	06/01/2020 1:03:33 PM

City of Ottawa Street Light Locate

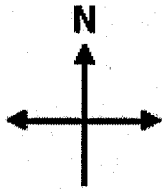
Dispatcher: Melissa Dowdell
Phone: 613-526-1226

[redacted]
Black&McDonald
[redacted]

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

Instructions
729 to 753, RIDGEWOOD AVE
CIVIC # 729, 753. CORLOT=U DRILLING THROUGHOUT PROPERTY. CLEAR ENTIRE PROPERTY AND TO SIDEWALK ALONG RIDGEWOOD AVE. INCLUDES PROPERTY KNOWN AS 753 RIDGEWOOD. NO_PLAN:613 737

LOCATOR SKETCH



Clear

No City of Ottawa Street Light assets in dig area

—SL— Underground Street Light Cable
Street Light
—OH— Overhead/Aerial Wires
Globe/Decorative Light
Source/Transformer
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 reperage. Si les marques ne concordent pas avec celles sur le croquis, un nouveau reperage est requis. Tout changement a l'emplacement ou a la nature du travail necessite un nouveau reperage. Creuser a la main un metre (3.28 pieds) du repere. La profondeur des installation varie d'un endroit a l'autre.

Date Located	06/03/2020
Time of day	
Located by	JUSTIN VAVROS
Signature	

USL-1 DISCLAIMER - FORM 101

- It is our Clients 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 sondeing, 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 LIABILTY 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

Appendix C

Borehole Logs

BH1-20

LOPERS & ASSOCIATES

Lopers & Associates
30 Lansfield Way
Ottawa, Ontario K2G3V8

CLIENT 11684663 Canada Inc.
PROJECT NAME Phase Two Environmental Site Assessment
PROJECT NUMBER LOP20-002B
PROJECT LOCATION 729 Ridgewood Avenue, Ottawa, Ontario
DATE STARTED 6-24-20 **COMPLETED** 6-24-20
GROUND ELEVATION 100.93 m **HOLE SIZE** 20 cm
DRILLING CONTRACTOR George Downing Estate Drilling
GROUND WATER LEVELS:
DRILLING METHOD Truck Mounted CME 55
AFTER DRILLING 3.59 m / Elev 97.34 m
LOGGED BY L. Lopers **CHECKED BY** D. Plenderleith
NOTES Site Datum = 100.00 m Top of Spindle of Fire Hydrant SE of Property

DEPTH (m)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	VOC Concentration (ppm) 20 40 60 80 / LEL (%) 20 40 60 80	WELL DIAGRAM
0							Casing Top Elev: 100.93 (m) Casing Type: Flushmount
	SS 1	9-7-4-4 (11)	Vapor = 10		0.1 Asphalt 100.80 Silty Clay. Grey, firm, moist.	10	
1	SS 2	2-3-4-5 (7)	Vapor = 0			0	
2	SS 3	3-3-5-5 (8)	Vapor = 15		PHC Odours from 0.76 to 5.18 m BGS.	15	
	SS 4	3-2-3-5 (5)	Vapor = 10			10	
3	SS 5	1-3-2-5 (5)	Vapor = 30		2.9 98.03 Silty Sand and Gravel with some Clay (Till). Grey, compact, wet. Wet at ~ 3.05 m BGS SS5 - Laboratory Analysis for PHCs, VOCs, PAHs, Metals.	30	Static Groundwater Level 3.59 m BGS
4	SS 6	5-8-10-10 (18)	Vapor = 4			4	
5	SS 7	0-7-3-2 (10)	Vapor = 2			2	
	SS 8	0-3-5-5 (8)	Vapor = 2			2	
6	SS 9	2-50-50-50/-0.15	Vapor = 5		6.4 Auger Refusal at 6.4 m BGS. 94.53 Bottom of hole at 6.40 m.	5	

ENVIRONMENTAL BH PLOTS LOP20-002B - RIDGEWOOD LOGS.GPJ GINT STD CANADA.GDT 7-29-20

BH2-20

LOPERS & ASSOCIATES

Lopers & Associates
30 Lansfield Way
Ottawa, Ontario K2G3V8

CLIENT 11684663 Canada Inc. **PROJECT NAME** Phase Two Environmental Site Assessment

PROJECT NUMBER LOP20-002B **PROJECT LOCATION** 729 Ridgewood Avenue, Ottawa, Ontario

DATE STARTED 6-24-20 **COMPLETED** 6-24-20 **GROUND ELEVATION** 99.63 m **HOLE SIZE** 20 cm

DRILLING CONTRACTOR George Downing Estate Drilling **GROUND WATER LEVELS:**

DRILLING METHOD Track Mounted CME 55 **AFTER DRILLING** ---

LOGGED BY L. Lopers **CHECKED BY** D. Plenderleith

NOTES Site Datum = 100.00 m Top of Spindle of Fire Hydrant SE of Property

DEPTH (m)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	VOC Concentration (ppm) 20 40 60 80 / LEL (%) 20 40 60 80	WELL DIAGRAM
0	SS 1	2-5-5-6 (10)	Vapor = 0		0.1 (99.50) Silty Sand and gravel (Fill). Grey, compact, moist. Sand (Fill). Brown, loose, moist.	0	
1	SS 2	4-6-50-50 (56)	Vapor = 0		1.4 (98.26) Silty Sand and gravel (Fill). Grey, compact, moist.	0	
2	SS 3	8-9-11-9 (20)	Vapor = 0		2.3 (97.33) Silty Clay. Brown/grey, firm, moist.	0	
3	SS 4	3-8-10-50 (18)	Vapor = 0		2.9 (96.73) Silty Sand and Gravel (Till). Grey, compact, wet. Wet at 3.05 m BGS.	0	
	SS 5	3-8-12-10 (20)	Vapor = 5			5	
4	SS 6	3-4-4-4 (8)	Vapor = 0		4.4 (95.21)	0	

Bottom of hole at 4.42 m.

BH3-20

LOPERS & ASSOCIATES

Lopers & Associates
30 Lansfield Way
Ottawa, Ontario K2G3V8

CLIENT 11684663 Canada Inc. **PROJECT NAME** Phase Two Environmental Site Assessment

PROJECT NUMBER LOP20-002B **PROJECT LOCATION** 729 Ridgewood Avenue, Ottawa, Ontario

DATE STARTED 6-24-20 **COMPLETED** 6-24-20 **GROUND ELEVATION** 100.15 m **HOLE SIZE** 20 cm

DRILLING CONTRACTOR George Downing Estate Drilling **GROUND WATER LEVELS:**

DRILLING METHOD Truck Mounted CME 55 **AFTER DRILLING** 3.90 m / Elev 96.25 m

LOGGED BY L. Lopers **CHECKED BY** D. Plenderleith

NOTES Site Datum = 100.00 m Top of Spindle of Fire Hydrant SE of Property

DEPTH (m)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	VOC Concentration (ppm) 20 40 60 80 / LEL (%) 20 40 60 80	WELL DIAGRAM
0	SS 1	3-8-9-5 (17)	Vapor = 0		0.1 (100.02) Silty Sand and gravel (Fill). Grey, compact, moist. Sand (Fill). Brown, loose, moist.	0	Casing Top Elev: 100.15 (m) Casing Type: Flushmount
1	SS 2	2-2-2-1 (4)	Vapor = 0			0	
					1.4 (98.78) Silty Sand and gravel (Fill). Grey, compact, moist.		
2	SS 3	1-2-2-3 (4)	Vapor = 0			0	
					2.3 (97.85) Silty Clay. Brown/grey, firm, moist.		
	SS 4	3-4-3-5 (7)	Vapor = 5			5	
3					2.9 (97.25) Silty Sand and Gravel (Till). Grey, compact, wet.		
	SS 5	40-36-25-18 (61)	Vapor = 2			2	
					PHC Odours from 2.3 to 5.18 m BGS. Wet at ~ 3.81 m BGS		Static Groundwater Level 3.90 m BGS
4	SS 6	16-12-12-11 (24)	Vapor = 700		Very strong gasoline odour at 3.81 m BGS. SS6 - Laboratory Analysis for PHCs, BTEXs, PAHs.	>>	
5	SS 7	4-6-10-10 (16)	Vapor = 7			7	
	SS 8	2-6-10-10 (16)	Vapor = 13		5.9 (94.21)	13	

Bottom of hole at 5.94 m.

BH4-20

LOPERS & ASSOCIATES

Lopers & Associates
30 Lansfield Way
Ottawa, Ontario K2G3V8

CLIENT 11684663 Canada Inc. **PROJECT NAME** Phase Two Environmental Site Assessment

PROJECT NUMBER LOP20-002B **PROJECT LOCATION** 729 Ridgewood Avenue, Ottawa, Ontario

DATE STARTED 6-24-20 **COMPLETED** 6-24-20 **GROUND ELEVATION** 99.88 m **HOLE SIZE** 20 cm

DRILLING CONTRACTOR George Downing Estate Drilling **GROUND WATER LEVELS:**

DRILLING METHOD Truck Mounted CME 55 **AFTER DRILLING** ---

LOGGED BY L. Lopers **CHECKED BY** D. Plenderleith

NOTES Site Datum = 100.00 m Top of Spindle of Fire Hydrant SE of Property

DEPTH (m)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	VOC Concentration (ppm) 20 40 60 80 / LEL (%) 20 40 60 80	WELL DIAGRAM
0	SS 1	4-6-6-6 (12)	Vapor = 0		0.2 Silty Sand and gravel (Fill). Grey, compact, moist. 99.73 Sand (Fill). Brown, loose, moist.	0	
1	SS 2	4-5-5-4 (10)	Vapor = 0			0	
2	SS 3	3-2-2-1 (4)	Vapor = 0			0	
	SS 4	1-0-1-0 (1)	Vapor = 5		Wet at 2.44 m BGS.	5	
3	SS 5	0-0-0-0 (0)	Vapor = 15			15	
4	SS 6	0-0-0-0 (0)	Vapor = 55		SS6 - Laboratory Analysis for PHCs, BTEXs, PAHs, Metals.	55	
					4.4 95.46 Silty Sand and Gravel (Till). Grey, compact, wet.		
5	SS 7	0-1-1-1 (2)	Vapor = 0		5.2 94.70	0	

Bottom of hole at 5.18 m.

BH5-20

LOPERS & ASSOCIATES

Lopers & Associates
30 Lansfield Way
Ottawa, Ontario K2G3V8

CLIENT 11684663 Canada Inc.
PROJECT NAME Phase Two Environmental Site Assessment
PROJECT NUMBER LOP20-002B
PROJECT LOCATION 729 Ridgewood Avenue, Ottawa, Ontario
DATE STARTED 6-24-20 **COMPLETED** 6-24-20
GROUND ELEVATION 100.39 m **HOLE SIZE** 20 cm
DRILLING CONTRACTOR George Downing Estate Drilling
GROUND WATER LEVELS:
DRILLING METHOD Truck Mounted CME 55
AFTER DRILLING 3.18 m / Elev 97.21 m
LOGGED BY L. Lopers **CHECKED BY** D. Plenderleith
NOTES Site Datum = 100.00 m Top of Spindle of Fire Hydrant SE of Property

DEPTH (m)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	MATERIAL DESCRIPTION	VOC Concentration (ppm) 20 40 60 80 / LEL (%) 20 40 60 80	WELL DIAGRAM
0	SS 1	6-8-10-12 (18)	Vapor = 0	0.1 Asphalt 100.26 Silty Sand and Gravel (Fill). Grey, compact, dry.	0	Casing Top Elev: 100.39 (m) Casing Type: Flushmount
1	SS 2	4-5-4-5 (9)	Vapor = 0		0	
2	SS 3	14-10-5-4 (15)	Vapor = 0	Wet at ~ 1.82 m BGS	0	
				2.3 98.10		
3	SS 4	2-4-6-5 (10)	Vapor = 35	Silty Clay. Grey, firm, moist. SS4 - Laboratory Analysis for PHCs, BTEXs.	35	
	SS 5	2-3-4-4 (7)	Vapor = 0		0	Static Groundwater Level 3.18 m BGS
				3.5 96.88		
4	SS 6	5-8-8-6 (16)	Vapor = 0	Silty Sand and Gravel with some Clay (Till). Grey, compact, wet.	0	
5	SS 7	8-24-4-6 (28)	Vapor = 30	SS7 - Laboratory Analysis for PHCs, VOCs.	30	
				5.5 94.90		
6	SS 8	3-14-12-3 (26)	Vapor = 5		5	
	SS 9	1-1-1-2 (2)	Vapor = 0		0	

Bottom of hole at 6.71 m.

ENVIRONMENTAL BH PLOTS LOP20-002B - RIDGEWOOD LOGS.GPJ GINT STD CANADA.GDT 7-29-20

BH6-20

LOPERS & ASSOCIATES

Lopers & Associates
30 Lansfield Way
Ottawa, Ontario K2G3V8

CLIENT 11684663 Canada Inc. **PROJECT NAME** Phase Two Environmental Site Assessment

PROJECT NUMBER LOP20-002B **PROJECT LOCATION** 729 Ridgewood Avenue, Ottawa, Ontario

DATE STARTED 6-24-20 **COMPLETED** 6-24-20 **GROUND ELEVATION** 100.99 m **HOLE SIZE** 20 cm

DRILLING CONTRACTOR George Downing Estate Drilling **GROUND WATER LEVELS:**

DRILLING METHOD Truck Mounted CME 55 **AFTER DRILLING** ---

LOGGED BY L. Lopers **CHECKED BY** D. Plenderleith

NOTES Site Datum = 100.00 m Top of Spindle of Fire Hydrant SE of Property

DEPTH (m)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	VOC Concentration (ppm) 20 40 60 80 / LEL (%) 20 40 60 80	WELL DIAGRAM
0	AU 1		Vapor = 0		0.1 Asphalt 100.86 Silty Sand and gravel (Fill). Grey, compact, moist. 0.8 100.23	0	
1	SS 2	2-3-5-7 (8)	Vapor = 0		Silty Clay. Grey, firm, moist.	0	
2	SS 3	4-4-6-5 (10)	Vapor = 5			5	
	SS 4	3-3-4-5 (7)	Vapor = 15			15	
3	SS 5	2-3-4-4 (7)	Vapor = 0		Wet at ~ 3.3 m BGS	0	
4	SS 6	21-12-8-7 (20)			3.8 97.18 Silty Sand and Gravel with some Clay (Till). Grey, compact, wet.		
5	SS 7	10-7-12-10 (19)	Vapor = 0		5.2 95.81	0	

Bottom of hole at 5.18 m.

ENVIRONMENTAL BH PLOTS LOP20-002B - RIDGEWOOD LOGS.GPJ GINT STD CANADA.GDT 7-29-20

BH7-20

LOPERS & ASSOCIATES

Lopers & Associates
30 Lansfield Way
Ottawa, Ontario K2G3V8

CLIENT 11684663 Canada Inc. **PROJECT NAME** Phase Two Environmental Site Assessment

PROJECT NUMBER LOP20-002B **PROJECT LOCATION** 729 Ridgewood Avenue, Ottawa, Ontario

DATE STARTED 6-24-20 **COMPLETED** 6-24-20 **GROUND ELEVATION** 101.07 m **HOLE SIZE** 20 cm

DRILLING CONTRACTOR George Downing Estate Drilling **GROUND WATER LEVELS:**

DRILLING METHOD Truck Mounted CME 55 **AFTER DRILLING** ---

LOGGED BY L. Lopers **CHECKED BY** D. Plenderleith

NOTES Site Datum = 100.00 m Top of Spindle of Fire Hydrant SE of Property

DEPTH (m)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	VOC Concentration (ppm) 20 40 60 80 / LEL (%) 20 40 60 80	WELL DIAGRAM
0	AU 1		Vapor = 0		0.1 Asphalt 100.97 Silty Sand and gravel (Fill). Grey, compact, moist.		
					0.8 100.31 Silty Clay. Grey, firm, moist.		
1	SS 2	2-3-5-8 (8)	Vapor = 0				
2	SS 3	4-5-7-7 (12)	Vapor = 0				
3	SS 4	1-3-4-5 (7)	Vapor = 0				
	SS 5	1-2-2-3 (4)	Vapor = 0		3.8 Wet at ~ 3.81 m BGS 97.26 Silty Sand and Gravel with some Clay (Till). Grey, compact, wet.		
4	SS 6	8-12-15-8 (27)	Vapor = 0				
5	SS 7	7-24-18-19 (42)	Vapor = 0		5.2 95.89		

Bottom of hole at 5.18 m.

Appendix D

Certificates of Equipment Calibration

RENTALS, SALES, SUPPORT

Maxim

1-888-285-2324

ENVIRONMENTAL AND SAFETY INC.

"Exceptional Customer Service!"

Certificate of Calibration

HORIBA U-52 Serial Number YH3406FH *has been calibrated per the Manufacturers published instructions, using NIST traceable solutions and*

2, 2-Point pH	Cond.	Turb,	DO	ORP
4.00, 7.00, 10.0	4.49uS/cm	0, 100 NTU	8.62 mg/L@ 22.75 DegC	240mV
pH 4.0 Lot #9GD684 Exp05/21	zero checked	Zero checked	Sodium Sulfite Zero	
pH 7.0 Lot# 9GK721 Exp.11/21 pH 10.0 Lot#9GD483 Exp. 04/21	Cond.Standard Lot#9GC1263 Exp. 04/2021	StableCal Standard, 100 NTU Lot#A9151 Exp.06/21	Oakton Zero Oxygen Solution Lot# 639901	ORP Test Solution 240 mV Lot # 4318 Exp 06/2024

June 25, 2020

Solutions ref. to NIST SRM's

Calibrated _____

RENTALS, SALES, SERVICE, SUPPORT

9 - 170 AMBASSADOR DR., MISSISSAUGA, ONTARIO L5T 2H9
PHONE: (905) 670-1304 TOLL FREE: (888) 285-2324
E-MAIL: SALES@MAXIMENVIRONMENTAL.COM

9 - 148 COLONNADE RD., OTTAWA, ONTARIO K2E 7R4
PHONE: (613) 224-4747 TOLL FREE: (888) 285-2324
E-MAIL: SALES@MAXIMENVIRONMENTAL.COM

WWW.MAXIMENVIRONMENTAL.COM

MAXIM ENVIRONMENTAL AND SAFETY INC.
148 Colonnade Rd, UNIT # 9
Nepean, Ontario, K2E 7R4
Phone: **(613)224-4747**

CERTIFICATE OF CALIBRATION

The RKI Instruments **Model EAGLE-2** as listed below has been inspected and calibrated following the Manufacturer's published specifications and methods.

Instrument Model: **EAGLE-2** Serial Number: E2P801 Date of Calibration: June 23/2020

SENSOR	CALIBRATION GAS STANDARD	CALIBRATION GAS CONCENTRATION	READING PRIOR TO ADJUSTMENT	INSTRUMENT SPAN SETTING	ALARM LEVEL SETTINGS
Combustible	Hexane lot # 1189063	15% LEL	1650 ppm	15% LEL **"Methane Elimination" Mode**	10 & 50% LEL
Combustible	Methane lot # 1013148	50% LEL	<500 PPM	Verification Only **"Methane Elimination" Mode**	
Combustible	Hexane lot # 1189063	15% LEL	1650 ppm	15% LEL **"Methane Response Enabled" Mode**	10 & 50% LEL
VOC	Isobutylene lot # 1278604	100 PPM	100 PPM	100 PPM	400 & 1000 PPM

The calibration gas standard used is considered to be a certified standard and is traceable to the National Institute of Standards and Technology (NIST). Certificate of Analysis is available upon request.

The instrument indicated above is now certified to be operating within the Manufacturer's specifications. **This does not preclude the requirement for regular maintenance and pre-use sensor response checks in order to ensure continued complete and accurate operating condition.**

Certified: _____

Appendix E

Laboratory Certificates of Analysis

PARACEL LABORATORIES LTD.

TRUSTED.
RESPONSIVE.
RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
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Certificate of Analysis

Lopers & Associates

30 Lansfield Way
Ottawa, ONT K2G 3V8
Attn: Luke Lopers

Client PO: LOP20-002B
Project: LOP20-002B
Custody: 54317

Report Date: 7-Jul-2020
Order Date: 24-Jun-2020

Revised Report

Order #: 2026367

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2026367-01	BH1-20-SS5
2026367-02	BH3-20-SS6
2026367-03	BH4-20-SS6
2026367-04	BH5-20-SS4
2026367-05	BH5-20-SS7
2026367-06	BH11-20-SS5

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 07-Jul-2020

Client: Lopers & Associates

Order Date: 24-Jun-2020

Client PO: LOP20-002B

Project Description: LOP20-002B

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.8 - ICP-MS	3-Jul-20	3-Jul-20
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	26-Jun-20	29-Jun-20
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	25-Jun-20	27-Jun-20
Conductivity	MOE E3138 - probe @25 °C, water ext	30-Jun-20	30-Jun-20
Cyanide, free	MOE E3015 - Auto Colour, water extraction	25-Jun-20	26-Jun-20
Mercury by CVAA	EPA 7471B - CVAA, digestion	30-Jun-20	30-Jun-20
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	25-Jun-20	26-Jun-20
PHC F1	CWS Tier 1 - P&T GC-FID	26-Jun-20	26-Jun-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	25-Jun-20	30-Jun-20
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	29-Jun-20	7-Jul-20
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	25-Jun-20	29-Jun-20
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	26-Jun-20	26-Jun-20
SAR	Calculated	2-Jul-20	2-Jul-20
Solids, %	Gravimetric, calculation	26-Jun-20	27-Jun-20

Certificate of Analysis

Client: Lopers & Associates

Client PO: LOP20-002B

Report Date: 07-Jul-2020

Order Date: 24-Jun-2020

Project Description: LOP20-002B

	Client ID:	BH1-20-SS5	BH3-20-SS6	BH4-20-SS6	BH5-20-SS4
	Sample Date:	24-Jun-20 09:00	24-Jun-20 09:00	24-Jun-20 09:00	24-Jun-20 09:00
	Sample ID:	2026367-01	2026367-02	2026367-03	2026367-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	71.5	92.5	87.1	79.5
General Inorganics					
SAR	0.01 N/A	0.76	-	1.12	-
Conductivity	5 uS/cm	636	-	627	-
Cyanide, free	0.03 ug/g dry	<0.03	-	<0.03	-
pH	0.05 pH Units	7.14	-	7.40	-
Metals					
Antimony	1.0 ug/g dry	<1.0	-	<1.0	-
Arsenic	1.0 ug/g dry	3.9	-	3.7	-
Barium	1.0 ug/g dry	284	-	46.3	-
Beryllium	0.5 ug/g dry	0.7	-	<0.5	-
Boron	5.0 ug/g dry	5.8	-	6.5	-
Boron, available	0.5 ug/g dry	<0.5	-	<0.5	-
Cadmium	0.5 ug/g dry	<0.5	-	<0.5	-
Chromium	5.0 ug/g dry	104	-	13.1	-
Chromium (VI)	0.2 ug/g dry	0.3	-	<0.2	-
Cobalt	1.0 ug/g dry	20.1	-	5.6	-
Copper	5.0 ug/g dry	45.5	-	12.4	-
Lead	1.0 ug/g dry	6.1	-	5.2	-
Mercury	0.1 ug/g dry	<0.1	-	<0.1	-
Molybdenum	1.0 ug/g dry	<1.0	-	<1.0	-
Nickel	5.0 ug/g dry	56.1	-	10.6	-
Selenium	1.0 ug/g dry	<1.0	-	<1.0	-
Silver	0.3 ug/g dry	<0.3	-	<0.3	-
Thallium	1.0 ug/g dry	<1.0	-	<1.0	-
Uranium	1.0 ug/g dry	<1.0	-	<1.0	-
Vanadium	10.0 ug/g dry	101	-	23.5	-
Zinc	20.0 ug/g dry	92.7	-	<20.0	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	-	-	-
Benzene	0.02 ug/g dry	<0.02	-	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	-	-	-
Bromoform	0.05 ug/g dry	<0.05	-	-	-
Bromomethane	0.05 ug/g dry	<0.05	-	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	-	-	-

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Client: Lopers & Associates

Client PO: LOP20-002B

Report Date: 07-Jul-2020

Order Date: 24-Jun-2020

Project Description: LOP20-002B

	Client ID:	BH1-20-SS5	BH3-20-SS6	BH4-20-SS6	BH5-20-SS4
	Sample Date:	24-Jun-20 09:00	24-Jun-20 09:00	24-Jun-20 09:00	24-Jun-20 09:00
	Sample ID:	2026367-01	2026367-02	2026367-03	2026367-04
	MDL/Units	Soil	Soil	Soil	Soil
Chlorobenzene	0.05 ug/g dry	<0.05	-	-	-
Chloroform	0.05 ug/g dry	<0.05	-	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	-	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	-	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Ethylene dibromide (dibromoethane, 1,2-)	0.05 ug/g dry	<0.05	-	-	-
Hexane	0.05 ug/g dry	<0.05	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	-	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	-	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	-	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	-	-	-
Styrene	0.05 ug/g dry	<0.05	-	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	-	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	-	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-

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Report Date: 07-Jul-2020

Order Date: 24-Jun-2020

Project Description: LOP20-002B

	Client ID:	BH1-20-SS5	BH3-20-SS6	BH4-20-SS6	BH5-20-SS4
	Sample Date:	24-Jun-20 09:00	24-Jun-20 09:00	24-Jun-20 09:00	24-Jun-20 09:00
	Sample ID:	2026367-01	2026367-02	2026367-03	2026367-04
	MDL/Units	Soil	Soil	Soil	Soil
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
4-Bromofluorobenzene	Surrogate	98.3%	-	-	-
Dibromofluoromethane	Surrogate	116%	-	-	-
Toluene-d8	Surrogate	104%	-	-	-
Benzene	0.02 ug/g dry	-	3.02	<0.02	<0.02
Ethylbenzene	0.05 ug/g dry	-	59.0	<0.05	<0.05
Toluene	0.05 ug/g dry	-	73.5	<0.05	<0.05
m,p-Xylenes	0.05 ug/g dry	-	196	<0.05	<0.05
o-Xylene	0.05 ug/g dry	-	80.3	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	-	276	<0.05	<0.05
Toluene-d8	Surrogate	-	100%	104%	102%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	22	117	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	909	110	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	102	11	<8	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	<6
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	0.07	<0.02	<0.02	-
Acenaphthylene	0.02 ug/g dry	0.11	<0.02	<0.02	-
Anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [a] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Chrysene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Fluorene	0.02 ug/g dry	0.26	<0.02	<0.02	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
1-Methylnaphthalene	0.02 ug/g dry	3.02	0.58	<0.02	-
2-Methylnaphthalene	0.02 ug/g dry	4.58	1.37	<0.02	-
Methylnaphthalene (1&2)	0.04 ug/g dry	7.61	1.95	<0.04	-
Naphthalene	0.01 ug/g dry	0.50	1.69	<0.01	-
Phenanthrene	0.02 ug/g dry	0.13	0.03	<0.02	-
Pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
2-Fluorobiphenyl	Surrogate	67.4%	91.3%	88.2%	-

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	Client ID:	BH1-20-SS5	BH3-20-SS6	BH4-20-SS6	BH5-20-SS4
	Sample Date:	24-Jun-20 09:00	24-Jun-20 09:00	24-Jun-20 09:00	24-Jun-20 09:00
	Sample ID:	2026367-01	2026367-02	2026367-03	2026367-04
	MDL/Units	Soil	Soil	Soil	Soil
Terphenyl-d14	Surrogate	75.7%	97.2%	116%	-

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Client PO: LOP20-002B

Report Date: 07-Jul-2020

Order Date: 24-Jun-2020

Project Description: LOP20-002B

	Client ID:	BH5-20-SS7	BH11-20-SS5	-	-
	Sample Date:	24-Jun-20 09:00	24-Jun-20 09:00	-	-
	Sample ID:	2026367-05	2026367-06	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	92.8	70.6	-	-
General Inorganics					
SAR	0.01 N/A	-	0.81	-	-
Conductivity	5 uS/cm	-	670	-	-
Cyanide, free	0.03 ug/g dry	-	<0.03	-	-
pH	0.05 pH Units	-	7.33	-	-
Metals					
Antimony	1.0 ug/g dry	-	<1.0	-	-
Arsenic	1.0 ug/g dry	-	4.0	-	-
Barium	1.0 ug/g dry	-	327	-	-
Beryllium	0.5 ug/g dry	-	0.9	-	-
Boron	5.0 ug/g dry	-	7.2	-	-
Boron, available	0.5 ug/g dry	-	<0.5	-	-
Cadmium	0.5 ug/g dry	-	<0.5	-	-
Chromium	5.0 ug/g dry	-	126	-	-
Chromium (VI)	0.2 ug/g dry	-	0.3	-	-
Cobalt	1.0 ug/g dry	-	22.5	-	-
Copper	5.0 ug/g dry	-	49.0	-	-
Lead	1.0 ug/g dry	-	6.8	-	-
Mercury	0.1 ug/g dry	-	<0.1	-	-
Molybdenum	1.0 ug/g dry	-	<1.0	-	-
Nickel	5.0 ug/g dry	-	65.4	-	-
Selenium	1.0 ug/g dry	-	<1.0	-	-
Silver	0.3 ug/g dry	-	<0.3	-	-
Thallium	1.0 ug/g dry	-	<1.0	-	-
Uranium	1.0 ug/g dry	-	<1.0	-	-
Vanadium	10.0 ug/g dry	-	104	-	-
Zinc	20.0 ug/g dry	-	114	-	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	-	-
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	-	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	-	-

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Report Date: 07-Jul-2020

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Project Description: LOP20-002B

	Client ID:	BH5-20-SS7	BH11-20-SS5	-	-
	Sample Date:	24-Jun-20 09:00	24-Jun-20 09:00	-	-
	Sample ID:	2026367-05	2026367-06	-	-
	MDL/Units	Soil	Soil	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Chloroform	0.05 ug/g dry	<0.05	<0.05	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylene dibromide (dibromoethane, 1	0.05 ug/g dry	<0.05	<0.05	-	-
Hexane	0.05 ug/g dry	<0.05	<0.05	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	-	-
Styrene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	0.08	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-

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Project Description: LOP20-002B

	Client ID:	BH5-20-SS7	BH11-20-SS5	-	-
	Sample Date:	24-Jun-20 09:00	24-Jun-20 09:00	-	-
	Sample ID:	2026367-05	2026367-06	-	-
	MDL/Units	Soil	Soil	-	-
Xylenes, total	0.05 ug/g dry	<0.05	0.08	-	-
4-Bromofluorobenzene	Surrogate	101%	101%	-	-
Dibromofluoromethane	Surrogate	110%	111%	-	-
Toluene-d8	Surrogate	103%	102%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	34	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	306	-	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	25	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	-	0.05	-	-
Acenaphthylene	0.02 ug/g dry	-	0.03	-	-
Anthracene	0.02 ug/g dry	-	<0.02	-	-
Benzo [a] anthracene	0.02 ug/g dry	-	<0.02	-	-
Benzo [a] pyrene	0.02 ug/g dry	-	<0.02	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	-	<0.02	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	-	<0.02	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	-	<0.02	-	-
Chrysene	0.02 ug/g dry	-	<0.02	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	-	<0.02	-	-
Fluoranthene	0.02 ug/g dry	-	<0.02	-	-
Fluorene	0.02 ug/g dry	-	0.10	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	-	<0.02	-	-
1-Methylnaphthalene	0.02 ug/g dry	-	0.89	-	-
2-Methylnaphthalene	0.02 ug/g dry	-	1.38	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	-	2.26	-	-
Naphthalene	0.01 ug/g dry	-	0.26	-	-
Phenanthrene	0.02 ug/g dry	-	0.07	-	-
Pyrene	0.02 ug/g dry	-	<0.02	-	-
2-Fluorobiphenyl	Surrogate	-	79.7%	-	-
Terphenyl-d14	Surrogate	-	75.2%	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	ND	5	uS/cm						
Cyanide, free	ND	0.03	ug/g						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.30*		*ug/g*		*97.5*	*50-140*			
Surrogate: Terphenyl-d14	*1.31*		*ug/g*		*97.9*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane, 1,2	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*8.40*		*ug/g*		*105*	*50-140*			
Surrogate: Dibromofluoromethane	*9.45*		*ug/g*		*118*	*50-140*			
Surrogate: Toluene-d8	*6.94*		*ug/g*		*86.7*	*50-140*			
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*6.94*		*ug/g*		*86.7*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	626	5	uS/cm	627			0.2	5	
Cyanide, free	ND	0.03	ug/g dry	ND			NC	35	
pH	7.37	0.05	pH Units	7.38			0.1	2.3	
Hydrocarbons									
F1 PHCs (C6-C10)	30	7	ug/g dry	22			30.6	40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND			NC	30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND			NC	30	
Metals									
Antimony	1.0	1.0	ug/g dry	ND			NC	30	
Arsenic	2.2	1.0	ug/g dry	2.1			NC	30	
Barium	12.5	1.0	ug/g dry	11.4			9.6	30	
Beryllium	ND	0.5	ug/g dry	ND			NC	30	
Boron, available	ND	0.5	ug/g dry	ND			NC	35	
Boron	ND	5.0	ug/g dry	ND			NC	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g dry	ND			NC	35	
Chromium	8.9	5.0	ug/g dry	8.4			6.0	30	
Cobalt	3.7	1.0	ug/g dry	3.6			NC	30	
Copper	8.3	5.0	ug/g dry	8.5			NC	30	
Lead	2.3	1.0	ug/g dry	2.1			6.2	30	
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Molybdenum	ND	1.0	ug/g dry	ND			NC	30	
Nickel	6.2	5.0	ug/g dry	6.4			2.8	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Silver	ND	0.3	ug/g dry	ND			NC	30	
Thallium	ND	1.0	ug/g dry	ND			NC	30	
Uranium	ND	1.0	ug/g dry	ND			NC	30	
Vanadium	17.4	10.0	ug/g dry	16.2			7.2	30	
Zinc	ND	20.0	ug/g dry	ND			NC	30	
Physical Characteristics									
% Solids	78.6	0.1	% by Wt.	68.7			13.5	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g dry	ND			NC	40	
Anthracene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [a] pyrene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [g,h,i] perylene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [k] fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Chrysene	ND	0.02	ug/g dry	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND			NC	40	
Fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Fluorene	ND	0.02	ug/g dry	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g dry	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND			NC	40	
Naphthalene	ND	0.01	ug/g dry	ND			NC	40	
Phenanthrene	ND	0.02	ug/g dry	ND			NC	40	
Pyrene	ND	0.02	ug/g dry	ND			NC	40	
Surrogate: 2-Fluorobiphenyl	*1.07*		*ug/g dry*		*67.2*	*50-140*			
Surrogate: Terphenyl-d14	*1.36*		*ug/g dry*		*85.5*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g dry	ND			NC	50	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzene	ND	0.02	ug/g dry	ND			NC	50	
Bromodichloromethane	ND	0.05	ug/g dry	ND			NC	50	
Bromoform	ND	0.05	ug/g dry	ND			NC	50	
Bromomethane	ND	0.05	ug/g dry	ND			NC	50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND			NC	50	
Chlorobenzene	ND	0.05	ug/g dry	ND			NC	50	
Chloroform	ND	0.05	ug/g dry	ND			NC	50	
Dibromochloromethane	ND	0.05	ug/g dry	ND			NC	50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND			NC	50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND			NC	50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND			NC	50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND			NC	50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND			NC	50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND			NC	50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND			NC	50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND			NC	50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND			NC	50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND			NC	50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND			NC	50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g dry	ND			NC	50	
Ethylene dibromide (dibromoethane, 1,2-	ND	0.05	ug/g dry	ND			NC	50	
Hexane	ND	0.05	ug/g dry	ND			NC	50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND			NC	50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND			NC	50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND			NC	50	
Methylene Chloride	ND	0.05	ug/g dry	ND			NC	50	
Styrene	ND	0.05	ug/g dry	ND			NC	50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND			NC	50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND			NC	50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND			NC	50	
Toluene	ND	0.05	ug/g dry	ND			NC	50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND			NC	50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND			NC	50	
Trichloroethylene	ND	0.05	ug/g dry	ND			NC	50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND			NC	50	
Vinyl chloride	ND	0.02	ug/g dry	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g dry	ND			NC	50	
o-Xylene	ND	0.05	ug/g dry	ND			NC	50	
Surrogate: 4-Bromofluorobenzene	*11.1*		*ug/g dry*		*99.1*	*50-140*			
Surrogate: Dibromofluoromethane	*12.4*		*ug/g dry*		*111*	*50-140*			
Surrogate: Toluene-d8	*11.5*		*ug/g dry*		*103*	*50-140*			
Benzene	ND	0.02	ug/g dry	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g dry	ND			NC	50	
Toluene	ND	0.05	ug/g dry	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g dry	ND			NC	50	
o-Xylene	ND	0.05	ug/g dry	ND			NC	50	
Surrogate: Toluene-d8	*11.5*		*ug/g dry*		*103*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Cyanide, free	0.210	0.03	ug/g	ND	70.1	70-130			
Hydrocarbons									
F1 PHCs (C6-C10)	187	7	ug/g	ND	93.6	80-120			
F2 PHCs (C10-C16)	119	4	ug/g	ND	129	60-140			
F3 PHCs (C16-C34)	292	8	ug/g	ND	129	60-140			
F4 PHCs (C34-C50)	164	6	ug/g	ND	115	60-140			
Metals									
Antimony	38.9	1.0	ug/g	ND	77.7	70-130			
Arsenic	44.9	1.0	ug/g	ND	88.1	70-130			
Barium	46.6	1.0	ug/g	4.6	84.2	70-130			
Beryllium	46.3	0.5	ug/g	ND	92.4	70-130			
Boron, available	3.73	0.5	ug/g	ND	74.5	70-122			
Boron	42.6	5.0	ug/g	ND	82.9	70-130			
Cadmium	43.1	0.5	ug/g	ND	86.2	70-130			
Chromium (VI)	0.1	0.2	ug/g	ND	74.5	70-130			
Chromium	47.9	5.0	ug/g	ND	89.1	70-130			
Cobalt	44.9	1.0	ug/g	1.5	86.9	70-130			
Copper	45.1	5.0	ug/g	ND	83.5	70-130			
Lead	41.9	1.0	ug/g	ND	82.1	70-130			
Mercury	1.42	0.1	ug/g	ND	94.9	70-130			
Molybdenum	42.4	1.0	ug/g	ND	84.7	70-130			
Nickel	45.2	5.0	ug/g	ND	85.3	70-130			
Selenium	44.2	1.0	ug/g	ND	88.2	70-130			
Silver	51.6	0.3	ug/g	ND	103	70-130			
Thallium	46.2	1.0	ug/g	ND	92.4	70-130			
Uranium	44.1	1.0	ug/g	ND	87.8	70-130			
Vanadium	49.2	10.0	ug/g	ND	85.5	70-130			QM-07
Zinc	46.6	20.0	ug/g	ND	83.6	70-130			
Semi-Volatiles									
Acenaphthene	0.141	0.02	ug/g	ND	71.2	50-140			
Acenaphthylene	0.132	0.02	ug/g	ND	66.4	50-140			
Anthracene	0.145	0.02	ug/g	ND	73.2	50-140			
Benzo [a] anthracene	0.131	0.02	ug/g	ND	66.0	50-140			
Benzo [a] pyrene	0.136	0.02	ug/g	ND	68.5	50-140			
Benzo [b] fluoranthene	0.155	0.02	ug/g	ND	77.9	50-140			
Benzo [g,h,i] perylene	0.129	0.02	ug/g	ND	65.2	50-140			
Benzo [k] fluoranthene	0.149	0.02	ug/g	ND	74.8	50-140			
Chrysene	0.148	0.02	ug/g	ND	74.4	50-140			
Dibenzo [a,h] anthracene	0.118	0.02	ug/g	ND	59.4	50-140			
Fluoranthene	0.142	0.02	ug/g	ND	71.6	50-140			
Fluorene	0.138	0.02	ug/g	ND	69.7	50-140			
Indeno [1,2,3-cd] pyrene	0.122	0.02	ug/g	ND	61.5	50-140			
1-Methylnaphthalene	0.138	0.02	ug/g	ND	69.4	50-140			
2-Methylnaphthalene	0.158	0.02	ug/g	ND	79.7	50-140			
Naphthalene	0.162	0.01	ug/g	ND	81.3	50-140			
Phenanthrene	0.140	0.02	ug/g	ND	70.4	50-140			
Pyrene	0.144	0.02	ug/g	ND	72.7	50-140			
Surrogate: 2-Fluorobiphenyl	*0.959*		*ug/g*		*60.3*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Surrogate: Terphenyl-d14	*1.23*		*ug/g*		*77.4*	*50-140*			
Volatiles									
Acetone	11.2	0.50	ug/g	ND	112	50-140			
Benzene	4.57	0.02	ug/g	ND	114	60-130			
Bromodichloromethane	4.45	0.05	ug/g	ND	111	60-130			
Bromoform	4.54	0.05	ug/g	ND	113	60-130			
Bromomethane	3.15	0.05	ug/g	ND	78.7	50-140			
Carbon Tetrachloride	4.29	0.05	ug/g	ND	107	60-130			
Chlorobenzene	4.27	0.05	ug/g	ND	107	60-130			
Chloroform	4.66	0.05	ug/g	ND	116	60-130			
Dibromochloromethane	4.62	0.05	ug/g	ND	116	60-130			
Dichlorodifluoromethane	2.44	0.05	ug/g	ND	60.9	50-140			
1,2-Dichlorobenzene	4.35	0.05	ug/g	ND	109	60-130			
1,3-Dichlorobenzene	4.30	0.05	ug/g	ND	108	60-130			
1,4-Dichlorobenzene	4.14	0.05	ug/g	ND	104	60-130			
1,1-Dichloroethane	5.00	0.05	ug/g	ND	125	60-130			
1,2-Dichloroethane	4.88	0.05	ug/g	ND	122	60-130			
1,1-Dichloroethylene	3.74	0.05	ug/g	ND	93.4	60-130			
cis-1,2-Dichloroethylene	4.67	0.05	ug/g	ND	117	60-130			
trans-1,2-Dichloroethylene	3.59	0.05	ug/g	ND	89.7	60-130			
1,2-Dichloropropane	4.79	0.05	ug/g	ND	120	60-130			
cis-1,3-Dichloropropylene	5.01	0.05	ug/g	ND	125	60-130			
trans-1,3-Dichloropropylene	5.12	0.05	ug/g	ND	128	60-130			
Ethylbenzene	4.41	0.05	ug/g	ND	110	60-130			
Ethylene dibromide (dibromoethane, 1,2-	4.73	0.05	ug/g	ND	118	60-130			
Hexane	3.33	0.05	ug/g	ND	83.1	60-130			
Methyl Ethyl Ketone (2-Butanone)	11.9	0.50	ug/g	ND	119	50-140			
Methyl Isobutyl Ketone	12.8	0.50	ug/g	ND	128	50-140			
Methyl tert-butyl ether	13.0	0.05	ug/g	ND	130	50-140			
Methylene Chloride	4.82	0.05	ug/g	ND	121	60-130			
Styrene	4.33	0.05	ug/g	ND	108	60-130			
1,1,1,2-Tetrachloroethane	4.58	0.05	ug/g	ND	114	60-130			
1,1,2,2-Tetrachloroethane	5.00	0.05	ug/g	ND	125	60-130			
Tetrachloroethylene	3.70	0.05	ug/g	ND	92.5	60-130			
Toluene	3.82	0.05	ug/g	ND	95.5	60-130			
1,1,1-Trichloroethane	4.80	0.05	ug/g	ND	120	60-130			
1,1,2-Trichloroethane	4.87	0.05	ug/g	ND	122	60-130			
Trichloroethylene	4.09	0.05	ug/g	ND	102	60-130			
Trichlorofluoromethane	3.96	0.05	ug/g	ND	99.0	50-140			
Vinyl chloride	2.47	0.02	ug/g	ND	61.9	50-140			
m,p-Xylenes	8.65	0.05	ug/g	ND	108	60-130			
o-Xylene	4.60	0.05	ug/g	ND	115	60-130			
Surrogate: 4-Bromofluorobenzene	*7.77*		*ug/g*		*97.1*	*50-140*			
Surrogate: Dibromofluoromethane	*10.4*		*ug/g*		*130*	*50-140*			
Surrogate: Toluene-d8	*7.57*		*ug/g*		*94.7*	*50-140*			
Benzene	4.57	0.02	ug/g	ND	114	60-130			
Ethylbenzene	4.41	0.05	ug/g	ND	110	60-130			
Toluene	3.82	0.05	ug/g	ND	95.5	60-130			
m,p-Xylenes	8.65	0.05	ug/g	ND	108	60-130			
o-Xylene	4.60	0.05	ug/g	ND	115	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Surrogate: Toluene-d8	*7.57*		*ug/g*		*94.7*	*50-140*			

Qualifier Notes:

Login Qualifiers :

Container(s) - Labeled improperly/insufficient information - Date reads 23 on Jar
Applies to samples: BH3-20-SS6, BH4-20-SS6

Container(s) - Labeled improperly/insufficient information - Date reads 23 on Vial
Applies to samples: BH5-20-SS4

Container(s) - Bottle and COC sample ID don't match - ID missing -20- on jars
Applies to samples: BH1-20-SS5, BH3-20-SS6, BH4-20-SS6, BH5-20-SS4, BH5-20-SS7, BH11-20-SS5

QC Qualifiers :

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision 1 - This report includes updated data for metals due to preparation error

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.

PARAC LABORATORIES

Paracel ID: 2026367

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2026367-BLNK 2026368-TCLP	No. 54317

Client Name: LOPERS & ASSOCIATES	Project Ref: LOP20-002B
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Telephone: 613-327-9073	E-mail: Luke@Lopers.ca

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Turnaround Time

☐ 1 day ☐ 3 day
☐ 2 day ☒ Regular
Date Required: _____

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun: _____
For RSC: ☐ Yes ☐ No	☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs/BTEXs	VOCs	Metals & Inorganics	PAHs	Req SSE Leachate Landfill unknown Pesticides Package
1	BH1-20-SS5	S		2	June 24, 2020		X	X	X	X	
2	BH3-20-SS6	S		2			X			X	
3	BH4-20-SS6	S		2			X		X	X	
4	BH5-20-SS4	S		2			X				
5	BH5-20-SS7	S		2			X	X			
6	BH11-20-SS5	S		2			X	X	X	X	
7	TCLP	S		2							X
8											
9											
10											

Comments:

Method of Delivery: D/B

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Luke Lopers	Date/Time:	Date/Time: 06-24-20 17:56	Date/Time: 06-25-20 12:19
Date/Time: June 24, 2020 / 5:30 PM	Temperature: °C	Temperature: 21.9 °C	pH Verified: ☐ By:

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www.paracellabs.com

Certificate of Analysis

Lopers & Associates

30 Lansfield Way
Ottawa, ONT K2G 3V8
Attn: Luke Lopers

Client PO: LOP20-002B
Project: LOP20-002B
Custody: 54317

Report Date: 6-Jul-2020
Order Date: 24-Jun-2020

Order #: 2026368

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID	Paracel ID	Client ID
2026368-01	TCLP		

Approved By:

Dale Robertson, BSc
Laboratory Director

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Flashpoint	ASTM D93 - Pensky-Martens Closed Cup	29-Jun-20	29-Jun-20
REG 558 - Cyanide	MOE E3015- Auto Colour	6-Jul-20	6-Jul-20
REG 558 - Fluoride	EPA 340.2 - ISE	30-Jun-20	30-Jun-20
REG 558 - Mercury by CVAA	EPA 7470A - Cold Vapour AA	29-Jun-20	29-Jun-20
REG 558 - Metals, ICP-MS	TCLP EPA 6020 - Digestion - ICP-MS	30-Jun-20	30-Jun-20
REG 558 - NO3/NO2	EPA 300.1 - IC	30-Jun-20	30-Jun-20
REG 558 - PCBs	EPA 608 - GC-ECD	29-Jun-20	29-Jun-20
REG 558 - SVOCs	EPA 625 - GC-MS	29-Jun-20	30-Jun-20
REG 558 - VOCs	EPA 624 - P&T GC-MS	30-Jun-20	30-Jun-20
Solids, %	Gravimetric, calculation	30-Jun-20	30-Jun-20

Certificate of Analysis
Client: Lopers & Associates
Client PO: LOP20-002B

Report Date: 06-Jul-2020
Order Date: 24-Jun-2020
Project Description: LOP20-002B

Summary of Exceedances

(If this page is blank then there are no exceedances)

Only those criteria that a sample exceeds will be highlighted in red

Regulatory Comparison:

Paracel Laboratories has provided regulatory guidelines on this report for informational purposes only and makes no representations or warranties that the data is accurate or reflects the current regulatory values. The user is advised to consult with the appropriate official regulations to evaluate compliance. Sample results that are highlighted have exceeded the selected regulatory limit. Calculated uncertainty estimations have not been applied for determining regulatory exceedances. Regulatory limts displayed in brackets, (), applies to medium and fine textured soils.

Criteria:

Client ID	Analyte	MDL / Units	Result	Reg 558 Schedule 4

Certificate of Analysis

Client: Lopers & Associates

Client PO: LOP20-002B

Report Date: 06-Jul-2020

Order Date: 24-Jun-2020

Project Description: LOP20-002B

	Client ID:	TCLP	-	-	-			
	Sample Date:	24-Jun-2020	-	-	-	**Criteria:**		
	Sample ID:	2026368-01	-	-	-	**Reg 558 Schedule 4**		
	Matrix:	Soil	-	-	-			
	MDL/Units							
Physical Characteristics								
% Solids	0.1 % by Wt.	91.8	-	-	-			
Flashpoint	°C	>70	-	-	-			
EPA 1311 - TCLP Leachate Inorganics								
Fluoride	0.05 mg/L	0.32	-	-	-	150	mg/L	
Nitrate as N	1 mg/L	<1	-	-	-	1,000	mg/L	
Nitrite as N	1 mg/L	<1	-	-	-	1,000	mg/L	
Cyanide, free	0.02 mg/L	<0.02	-	-	-	20	mg/L	
EPA 1311 - TCLP Leachate Metals								
Arsenic	0.05 mg/L	<0.05	-	-	-	2.5	mg/L	
Barium	0.05 mg/L	0.97	-	-	-	100	mg/L	
Boron	0.05 mg/L	0.05	-	-	-	500	mg/L	
Cadmium	0.01 mg/L	<0.01	-	-	-	0.5	mg/L	
Chromium	0.05 mg/L	<0.05	-	-	-	5	mg/L	
Lead	0.05 mg/L	<0.05	-	-	-	5	mg/L	
Mercury	0.005 mg/L	<0.005	-	-	-	0.1	mg/L	
Selenium	0.05 mg/L	<0.05	-	-	-	1	mg/L	
Silver	0.05 mg/L	<0.05	-	-	-	5	mg/L	
Uranium	0.05 mg/L	<0.05	-	-	-	10	mg/L	
EPA 1311 - TCLP Leachate Volatiles								
Benzene	0.005 mg/L	<0.005	-	-	-	0.5	mg/L	
Carbon Tetrachloride	0.005 mg/L	<0.005	-	-	-	0.5	mg/L	
Chlorobenzene	0.004 mg/L	<0.004	-	-	-	8	mg/L	
Chloroform	0.006 mg/L	<0.006	-	-	-	10	mg/L	

Certificate of Analysis

Client: Lopers & Associates

Client PO: LOP20-002B

Report Date: 06-Jul-2020

Order Date: 24-Jun-2020

Project Description: LOP20-002B

	Client ID:	TCLP	-	-	-		
	Sample Date:	24-Jun-2020	-	-	-	**Criteria:**	
	Sample ID:	2026368-01	-	-	-	**Reg 558 Schedule 4**	
	Matrix:	Soil	-	-	-		
	MDL/Units						
1,2-Dichlorobenzene	0.004 mg/L	<0.004	-	-	-	20	mg/L
1,4-Dichlorobenzene	0.004 mg/L	<0.004	-	-	-	0.5	mg/L
1,2-Dichloroethane	0.005 mg/L	<0.005	-	-	-	0.5	mg/L
1,1-Dichloroethylene	0.006 mg/L	<0.006	-	-	-	1.4	mg/L
Methyl Ethyl Ketone (2-Butanone)	0.30 mg/L	<0.30	-	-	-	200	mg/L
Methylene Chloride	0.04 mg/L	<0.04	-	-	-	5	mg/L
Tetrachloroethylene	0.005 mg/L	<0.005	-	-	-	3	mg/L
Trichloroethylene	0.004 mg/L	<0.004	-	-	-	5	mg/L
Vinyl chloride	0.005 mg/L	<0.005	-	-	-	0.2	mg/L
4-Bromofluorobenzene	Surrogate	115%	-	-	-		
Dibromofluoromethane	Surrogate	112%	-	-	-		
Toluene-d8	Surrogate	101%	-	-	-		
EPA 1311 - TCLP Leachate Organics							
2,4-Dinitrotoluene	0.001 mg/L	<0.001	-	-	-	0.13	mg/L
Benzo [a] pyrene	0.001 mg/L	<0.001	-	-	-	0.001	mg/L
Nitrobenzene	0.001 mg/L	<0.001	-	-	-	2	mg/L
Hexachloroethane	0.001 mg/L	<0.001	-	-	-	3	mg/L
Hexachlorobenzene	0.050 mg/L	<0.050	-	-	-	0.13	mg/L
Hexachlorobutadiene	0.001 mg/L	<0.001	-	-	-		
2,3,4,6-Tetrachlorophenol	0.002 mg/L	<0.002	-	-	-	10	mg/L
2,4,5-Trichlorophenol	0.001 mg/L	<0.001	-	-	-	400	mg/L
2,4,6-Trichlorophenol	0.001 mg/L	<0.001	-	-	-	0.5	mg/L
2,4-Dichlorophenol	0.001 mg/L	<0.001	-	-	-	90	mg/L
2-Methylphenol	0.001 mg/L	<0.001	-	-	-	200	mg/L

Certificate of Analysis

Client: Lopers & Associates

Client PO: LOP20-002B

Report Date: 06-Jul-2020

Order Date: 24-Jun-2020

Project Description: LOP20-002B

	Client ID:	TCLP	-	-	-			
	Sample Date:	24-Jun-2020	-	-	-	**Criteria:**		
	Sample ID:	2026368-01	-	-	-	**Reg 558 Schedule 4**		
	Matrix:	Soil	-	-	-			
	MDL/Units							
3/4-Methylphenol	0.001 mg/L	<0.001	-	-	-	200	mg/L	
Pentachlorophenol	0.005 mg/L	<0.005	-	-	-	6	mg/L	
2,4,6-Tribromophenol	Surrogate	50.0%	-	-	-			
2-Fluorobiphenyl	Surrogate	66.4%	-	-	-			
2-Fluorophenol	Surrogate	12.8% [2]	-	-	-			
Terphenyl-d14	Surrogate	94.8%	-	-	-			
PCBs, total	0.003 mg/L	<0.003	-	-	-	0.3	mg/L	
Decachlorobiphenyl	Surrogate	90.0%	-	-	-			

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Inorganics									
Fluoride	ND	0.05	mg/L						
Nitrate as N	ND	1	mg/L						
Nitrite as N	ND	1	mg/L						
Cyanide, free	ND	0.02	mg/L						
EPA 1311 - TCLP Leachate Metals									
Arsenic	ND	0.05	mg/L						
Barium	ND	0.05	mg/L						
Boron	ND	0.05	mg/L						
Cadmium	ND	0.01	mg/L						
Chromium	ND	0.05	mg/L						
Lead	ND	0.05	mg/L						
Mercury	ND	0.005	mg/L						
Selenium	ND	0.05	mg/L						
Silver	ND	0.05	mg/L						
Uranium	ND	0.05	mg/L						
EPA 1311 - TCLP Leachate Organics									
2,4-Dinitrotoluene	ND	0.001	mg/L						
Benzo [a] pyrene	ND	0.001	mg/L						
Nitrobenzene	ND	0.001	mg/L						
Hexachloroethane	ND	0.001	mg/L						
Hexachlorobenzene	ND	0.050	mg/L						
Hexachlorobutadiene	ND	0.001	mg/L						
2,3,4,6-Tetrachlorophenol	ND	0.002	mg/L						
2,4,5-Trichlorophenol	ND	0.001	mg/L						
2,4,6-Trichlorophenol	ND	0.001	mg/L						
2,4-Dichlorophenol	ND	0.001	mg/L						
2-Methylphenol	ND	0.001	mg/L						
3/4-Methylphenol	ND	0.001	mg/L						
Pentachlorophenol	ND	0.005	mg/L						
Surrogate: 2,4,6-Tribromophenol	*0.019*		*mg/L*		*46.7*	*40-150*			
Surrogate: 2-Fluorobiphenyl	*0.013*		*mg/L*		*62.8*	*40-150*			
Surrogate: 2-Fluorophenol	*0.0053*		*mg/L*		*13.2*	*40-150*			*S-GC*
Surrogate: Terphenyl-d14	*0.021*		*mg/L*		*107*	*40-150*			
PCBs, total	ND	0.003	mg/L						
Surrogate: Decachlorobiphenyl	*0.0080*		*mg/L*		*80.4*	*62-138*			
EPA 1311 - TCLP Leachate Volatiles									
Benzene	ND	0.005	mg/L						
Carbon Tetrachloride	ND	0.005	mg/L						
Chlorobenzene	ND	0.004	mg/L						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Chloroform	ND	0.006	mg/L						
1,2-Dichlorobenzene	ND	0.004	mg/L						
1,4-Dichlorobenzene	ND	0.004	mg/L						
1,2-Dichloroethane	ND	0.005	mg/L						
1,1-Dichloroethylene	ND	0.006	mg/L						
Methyl Ethyl Ketone (2-Butanone)	ND	0.30	mg/L						
Methylene Chloride	ND	0.04	mg/L						
Tetrachloroethylene	ND	0.005	mg/L						
Trichloroethylene	ND	0.004	mg/L						
Vinyl chloride	ND	0.005	mg/L						
Surrogate: 4-Bromofluorobenzene	*0.851*		*mg/L*		*124*	*83-134*			
Surrogate: Dibromofluoromethane	*0.796*		*mg/L*		*116*	*78-124*			
Surrogate: Toluene-d8	*0.767*		*mg/L*		*111*	*76-118*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Inorganics									
Fluoride	0.32	0.05	mg/L	0.32			0.4	20	
Nitrate as N	ND	1	mg/L	ND			NC	20	
Nitrite as N	ND	1	mg/L	ND			NC	20	
Cyanide, free	ND	0.02	mg/L	ND			NC	20	
EPA 1311 - TCLP Leachate Metals									
Arsenic	ND	0.05	mg/L	ND			NC	29	
Barium	0.960	0.05	mg/L	0.969			0.9	34	
Boron	0.055	0.05	mg/L	0.055			1.4	33	
Cadmium	ND	0.01	mg/L	ND			NC	33	
Chromium	ND	0.05	mg/L	ND			NC	32	
Lead	ND	0.05	mg/L	ND			NC	32	
Mercury	ND	0.005	mg/L	ND			NC	30	
Selenium	ND	0.05	mg/L	ND			NC	28	
Silver	ND	0.05	mg/L	ND			NC	28	
Uranium	ND	0.05	mg/L	ND			NC	27	
EPA 1311 - TCLP Leachate Organics									
PCBs, total	ND	0.003	mg/L	ND			NC	30	
Surrogate: Decachlorobiphenyl	*0.0090*		mg/L		*89.7*	*62-138*			
EPA 1311 - TCLP Leachate Volatiles									
Benzene	ND	0.005	mg/L	ND			NC	25	
Carbon Tetrachloride	ND	0.005	mg/L	ND			NC	25	
Chlorobenzene	ND	0.004	mg/L	ND			NC	25	
Chloroform	ND	0.006	mg/L	ND			NC	25	
1,2-Dichlorobenzene	ND	0.004	mg/L	ND			NC	25	
1,4-Dichlorobenzene	ND	0.004	mg/L	ND			NC	25	
1,2-Dichloroethane	ND	0.005	mg/L	ND			NC	25	
1,1-Dichloroethylene	ND	0.006	mg/L	ND			NC	25	
Methyl Ethyl Ketone (2-Butanone)	ND	0.30	mg/L	ND			NC	25	
Methylene Chloride	ND	0.04	mg/L	ND			NC	25	
Tetrachloroethylene	ND	0.005	mg/L	ND			NC	25	
Trichloroethylene	ND	0.004	mg/L	ND			NC	25	
Vinyl chloride	ND	0.005	mg/L	ND			NC	25	
Surrogate: 4-Bromofluorobenzene	*0.788*		mg/L		*114*	*83-134*			
Surrogate: Dibromofluoromethane	*0.730*		mg/L		*106*	*78-124*			
Surrogate: Toluene-d8	*0.690*		mg/L		*100*	*76-118*			
Physical Characteristics									
% Solids	77.6	0.1	% by Wt.	75.9			2.2	25	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Inorganics									
Fluoride	0.71	0.05	mg/L	0.32	78.3	70-130			
Nitrate as N	10	1	mg/L	ND	99.6	81-112			
Nitrite as N	10	1	mg/L	ND	100	76-107			
Cyanide, free	0.042	0.02	mg/L	ND	84.4	60-136			
EPA 1311 - TCLP Leachate Metals									
Arsenic	52.0	0.05	mg/L	0.450	103	83-119			
Barium	155	0.05	mg/L	96.9	117	83-116			QM-07
Boron	44.4	0.05	mg/L	5.45	78.0	71-128			
Cadmium	47.0	0.01	mg/L	0.050	93.9	78-119			
Chromium	59.5	0.05	mg/L	0.460	118	80-124			
Lead	47.5	0.05	mg/L	2.63	89.8	77-126			
Mercury	0.0305	0.005	mg/L	ND	102	70-130			
Selenium	44.8	0.05	mg/L	0.864	87.8	81-125			
Silver	49.1	0.05	mg/L	ND	98.2	70-128			
Uranium	48.7	0.05	mg/L	0.765	95.8	70-131			
EPA 1311 - TCLP Leachate Organics									
2,4-Dinitrotoluene	0.006	0.001	mg/L	ND	63.9	50-140			
Benzo [a] pyrene	0.009	0.001	mg/L	ND	93.1	50-140			
Nitrobenzene	0.013	0.001	mg/L	ND	129	50-140			
Hexachloroethane	0.011	0.001	mg/L	ND	109	50-140			
Hexachlorobutadiene	0.006	0.001	mg/L	ND	57.3	50-140			
2,3,4,6-Tetrachlorophenol	0.006	0.002	mg/L	ND	60.6	51-140			
2,4,5-Trichlorophenol	0.007	0.001	mg/L	ND	66.6	50-140			
2,4,6-Trichlorophenol	0.006	0.001	mg/L	ND	64.9	50-140			
2,4-Dichlorophenol	0.009	0.001	mg/L	ND	94.3	50-140			
2-Methylphenol	0.006	0.001	mg/L	ND	58.0	50-140			
3/4-Methylphenol	0.006	0.001	mg/L	ND	64.0	50-140			
Pentachlorophenol	0.005	0.005	mg/L	ND	50.6	50-140			
Surrogate: 2,4,6-Tribromophenol	*0.021*		*mg/L*		*53.4*	*40-150*			
Surrogate: 2-Fluorobiphenyl	*0.014*		*mg/L*		*67.6*	*40-150*			
Surrogate: 2-Fluorophenol	*0.0030*		*mg/L*		*7.55*	*40-150*			*S-GC*
Surrogate: Terphenyl-d14	*0.018*		*mg/L*		*87.7*	*40-150*			
PCBs, total	0.035	0.003	mg/L	ND	87.0	86-145			
Surrogate: Decachlorobiphenyl	*0.0085*		*mg/L*		*84.8*	*62-138*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
EPA 1311 - TCLP Leachate Volatiles									
Benzene	0.314	0.005	mg/L	ND	91.3	55-141			
Carbon Tetrachloride	0.391	0.005	mg/L	ND	114	49-149			
Chlorobenzene	0.340	0.004	mg/L	ND	98.8	64-137			
Chloroform	0.397	0.006	mg/L	ND	115	58-138			
1,2-Dichlorobenzene	0.409	0.004	mg/L	ND	119	60-150			
1,4-Dichlorobenzene	0.330	0.004	mg/L	ND	96.0	63-132			
1,2-Dichloroethane	0.383	0.005	mg/L	ND	111	50-140			
1,1-Dichloroethylene	0.404	0.006	mg/L	ND	118	43-153			
Methyl Ethyl Ketone (2-Butanone)	1.00	0.30	mg/L	ND	117	26-153			
Methylene Chloride	0.357	0.04	mg/L	ND	104	58-149			
Tetrachloroethylene	0.415	0.005	mg/L	ND	121	51-145			
Trichloroethylene	0.411	0.004	mg/L	ND	120	52-135			
Vinyl chloride	0.351	0.005	mg/L	ND	102	31-159			
Surrogate: 4-Bromofluorobenzene	*0.740*		*mg/L*		*107*	*83-134*			
Surrogate: Dibromofluoromethane	*0.655*		*mg/L*		*95.2*	*78-124*			
Surrogate: Toluene-d8	*0.628*		*mg/L*		*91.4*	*76-118*			

PARACEL LABORATORIES LTD.

Order #: 2026368

Certificate of Analysis

Report Date: 06-Jul-2020

Client: Lopers & Associates

Order Date: 24-Jun-2020

Client PO: LOP20-002B

Project Description: LOP20-002B

Qualifier Notes:

2 : Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

QC Qualifiers :

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

S-GC : Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated
Soil/Solid results are reported on a dry weight basis unless otherwise indicated
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

PARACEL LABORATORIES

Paracel ID: 2026368

ent Blvd.
K1G 4J8
illabs.com
com

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2026367 BULK 2026368-TCLP	No: 54317

Client Name: LOPERS & ASSOCIATES
Project No: LOP20-002B
Page __ of __

Contact Name: Luke Lopers
Quote #:

Address: 30 Lonsfield Way, Ottawa, ON
PO #: LOP20-002B

Telephone: 613-327-9073
E-mail: Luke@Lopers.ca

Turnaround Time
☐ 1 day ☐ 3 day
☐ 2 day ☒ Regular
Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun:
For RSC: ☐ Yes ☐ No	☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analysis: PHCs/BTEX	VOCs	Metals & Inorganics	PAHs	Reg 558 Leachate Landfill Sanitary Sewer Discharge Package
1	BH1-20-SS5	S		2	June 24, 2020		X	X	X	X	
2	BH3-20-SS6	S		2			X			X	
3	BH4-20-SS6	S		2			X		X	X	
4	BH5-20-SS4	S		2			X				
5	BH5-20-SS7	S		2			X	X			
6	BH11-20-SS5	S		2			X	X	X	X	
7	TCLP	S		2							X
8											~~X~~
9											
10											

Comments:

Method of Delivery: D/B

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Luke Lopers	Date/Time:	Date/Time: 06-24-20 17:56	Date/Time: 06-25-20 12:19
Date/Time: June 24, 2020 / 5:30 PM	Temperature: °C	Temperature: 21.9 °C	pH Verified: ☐ By:

Revision 2.0

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Certificate of Analysis

Lopers & Associates

30 Lansfield Way
Ottawa, ON K2G 3V8
Attn: Luke Lopers

Client PO: LOP20-002B
Project: LOP20-002B
Custody: 126519

Report Date: 9-Jul-2020
Order Date: 30-Jun-2020

Order #: 2027199

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2027199-01	BH1-20
2027199-02	BH3-20
2027199-03	BH5-20
2027199-04	BH13-20
2027199-05	MW-6
2027199-06	MW-8
2027199-07	Trip Blank

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 09-Jul-2020

Client: Lopers & Associates

Order Date: 30-Jun-2020

Client PO: LOP20-002B

Project Description: LOP20-002B

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	2-Jul-20	2-Jul-20
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	2-Jul-20	2-Jul-20
Chromium, hexavalent - water	MOE E3056 - colourimetric	6-Jul-20	6-Jul-20
Cyanide, free	MOE E3015 - Auto Colour	6-Jul-20	6-Jul-20
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	3-Jul-20	3-Jul-20
Metals, ICP-MS	EPA 200.8 - ICP-MS	30-Jun-20	30-Jun-20
pH	EPA 150.1 - pH probe @25 °C	6-Jul-20	6-Jul-20
PHC F1	CWS Tier 1 - P&T GC-FID	30-Jun-20	2-Jul-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	7-Jul-20	7-Jul-20
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	7-Jul-20	7-Jul-20
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	30-Jun-20	2-Jul-20

Certificate of Analysis

Client: Lopers & Associates

Client PO: LOP20-002B

Report Date: 09-Jul-2020

Order Date: 30-Jun-2020

Project Description: LOP20-002B

	Client ID:	BH1-20	BH3-20	BH5-20	BH13-20
	Sample Date:	30-Jun-20 09:00	30-Jun-20 09:00	30-Jun-20 09:00	30-Jun-20 09:00
	Sample ID:	2027199-01	2027199-02	2027199-03	2027199-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Cyanide, free	2 ug/L	<2	<2	-	<2
pH	0.1 pH Units	7.0	7.2	-	7.2
Anions					
Chloride	1 mg/L	918	833	-	828
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	-	<0.1
Antimony	0.5 ug/L	<0.5	<0.5	-	<0.5
Arsenic	1 ug/L	1	1	-	1
Barium	1 ug/L	874	1880	-	1880
Beryllium	0.5 ug/L	<0.5	<0.5	-	<0.5
Boron	10 ug/L	27	25	-	26
Cadmium	0.1 ug/L	<0.1	<0.1	-	<0.1
Chromium	1 ug/L	<1	<1	-	<1
Chromium (VI)	10 ug/L	<10	<10	-	<10
Cobalt	0.5 ug/L	11.3	6.5	-	6.8
Copper	0.5 ug/L	1.2	1.0	-	1.2
Lead	0.1 ug/L	<0.1	51.2	-	54.6
Molybdenum	0.5 ug/L	1.2	1.4	-	1.4
Nickel	1 ug/L	23	12	-	13
Selenium	1 ug/L	<1	3	-	3
Silver	0.1 ug/L	<0.1	<0.1	-	<0.1
Sodium	200 ug/L	174000	202000	-	209000
Thallium	0.1 ug/L	<0.1	<0.1	-	<0.1
Uranium	0.1 ug/L	9.2	11.2	-	11.2
Vanadium	0.5 ug/L	1.2	1.1	-	1.2
Zinc	5 ug/L	<5	7	-	<5
Volatiles					
Acetone	5.0 ug/L	<5.0	<2500 [1]	-	<2500 [1]
Benzene	0.5 ug/L	<0.5	19300 [1]	-	19700 [1]
Bromodichloromethane	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
Bromoform	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
Bromomethane	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
Carbon Tetrachloride	0.2 ug/L	<0.2	<100 [1]	-	<100 [1]
Chlorobenzene	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
Chloroform	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]

Certificate of Analysis

Client: Lopers & Associates

Client PO: LOP20-002B

Report Date: 09-Jul-2020

Order Date: 30-Jun-2020

Project Description: LOP20-002B

	Client ID:	BH1-20	BH3-20	BH5-20	BH13-20
	Sample Date:	30-Jun-20 09:00	30-Jun-20 09:00	30-Jun-20 09:00	30-Jun-20 09:00
	Sample ID:	2027199-01	2027199-02	2027199-03	2027199-04
	MDL/Units	Water	Water	Water	Water
Dibromochloromethane	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
Dichlorodifluoromethane	1.0 ug/L	<1.0	<500 [1]	-	<500 [1]
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
1,1-Dichloroethane	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
1,2-Dichloroethane	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
1,1-Dichloroethylene	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
1,2-Dichloropropane	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
Ethylbenzene	0.5 ug/L	<0.5	3800 [1]	-	3700 [1]
Ethylene dibromide (dibromoethane, 1,2-)	0.2 ug/L	<0.2	<100 [1]	-	<100 [1]
Hexane	1.0 ug/L	<1.0	<500 [1]	-	<500 [1]
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<2500 [1]	-	<2500 [1]
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<2500 [1]	-	<2500 [1]
Methyl tert-butyl ether	2.0 ug/L	<2.0	<1000 [1]	-	<1000 [1]
Methylene Chloride	5.0 ug/L	<5.0	<2500 [1]	-	<2500 [1]
Styrene	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
Tetrachloroethylene	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
Toluene	0.5 ug/L	<0.5	65200 [1]	-	60900 [1]
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
Trichloroethylene	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
Trichlorofluoromethane	1.0 ug/L	<1.0	<500 [1]	-	<500 [1]
Vinyl chloride	0.5 ug/L	<0.5	<250 [1]	-	<250 [1]
m,p-Xylenes	0.5 ug/L	<0.5	19200 [1]	-	18200 [1]
o-Xylene	0.5 ug/L	<0.5	8400 [1]	-	8320 [1]
Xylenes, total	0.5 ug/L	<0.5	27600 [1]	-	26600 [1]
4-Bromofluorobenzene	Surrogate	90.7%	118% [1]	-	119% [1]
Dibromofluoromethane	Surrogate	102%	91.9% [1]	-	93.1% [1]

Certificate of Analysis

Client: Lopers & Associates

Client PO: LOP20-002B

Report Date: 09-Jul-2020

Order Date: 30-Jun-2020

Project Description: LOP20-002B

	Client ID:	BH1-20	BH3-20	BH5-20	BH13-20
	Sample Date:	30-Jun-20 09:00	30-Jun-20 09:00	30-Jun-20 09:00	30-Jun-20 09:00
	Sample ID:	2027199-01	2027199-02	2027199-03	2027199-04
	MDL/Units	Water	Water	Water	Water
Toluene-d8	Surrogate	106%	108% [1]	-	106% [1]
Benzene	0.5 ug/L	-	-	<0.5	-
Ethylbenzene	0.5 ug/L	-	-	<0.5	-
Toluene	0.5 ug/L	-	-	<0.5	-
m,p-Xylenes	0.5 ug/L	-	-	<0.5	-
o-Xylene	0.5 ug/L	-	-	<0.5	-
Xylenes, total	0.5 ug/L	-	-	<0.5	-
Toluene-d8	Surrogate	-	-	98.9%	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	123	3600	<25	3790
F2 PHCs (C10-C16)	100 ug/L	<100	52400	<100	2260
F3 PHCs (C16-C34)	100 ug/L	<100	3940	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<1000 [1]	<100	<100
Semi-Volatiles					
Acenaphthene	0.05 ug/L	0.12	0.29	<0.05	0.21
Acenaphthylene	0.05 ug/L	0.06	0.08	<0.05	<0.05
Anthracene	0.01 ug/L	<0.01	0.04	<0.01	0.03
Benzo [a] anthracene	0.01 ug/L	0.02	<0.01	<0.01	<0.01
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Chrysene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.01 ug/L	0.21	0.04	0.19	0.01
Fluorene	0.05 ug/L	0.28	0.41	<0.05	0.27
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
1-Methylnaphthalene	0.05 ug/L	18.2	50.8	<0.05	37.8
2-Methylnaphthalene	0.05 ug/L	10.4	87.3	<0.05	79.7
Methylnaphthalene (1&2)	0.10 ug/L	28.6	138	<0.10	118
Naphthalene	0.05 ug/L	11.3	419	0.08	392
Phenanthrene	0.05 ug/L	0.69	0.34	0.43	0.19
Pyrene	0.01 ug/L	0.40	0.07	0.37	0.03
2-Fluorobiphenyl	Surrogate	90.9%	75.2%	90.3%	88.0%
Terphenyl-d14	Surrogate	98.8%	114%	95.5%	103%

Certificate of Analysis

Report Date: 09-Jul-2020

Client: Lopers & Associates

Order Date: 30-Jun-2020

Client PO: LOP20-002B

Project Description: LOP20-002B

	Client ID:	MW-6	MW-8	Trip Blank	-
	Sample Date:	30-Jun-20 09:00	30-Jun-20 09:00	29-Jun-20 09:00	-
	Sample ID:	2027199-05	2027199-06	2027199-07	-
	MDL/Units	Water	Water	Water	-
Volatiles					
Acetone	5.0 ug/L	-	-	<5.0	-
Benzene	0.5 ug/L	-	-	<0.5	-
Bromodichloromethane	0.5 ug/L	-	-	<0.5	-
Bromoform	0.5 ug/L	-	-	<0.5	-
Bromomethane	0.5 ug/L	-	-	<0.5	-
Carbon Tetrachloride	0.2 ug/L	-	-	<0.2	-
Chlorobenzene	0.5 ug/L	-	-	<0.5	-
Chloroform	0.5 ug/L	-	-	<0.5	-
Dibromochloromethane	0.5 ug/L	-	-	<0.5	-
Dichlorodifluoromethane	1.0 ug/L	-	-	<1.0	-
1,2-Dichlorobenzene	0.5 ug/L	-	-	<0.5	-
1,3-Dichlorobenzene	0.5 ug/L	-	-	<0.5	-
1,4-Dichlorobenzene	0.5 ug/L	-	-	<0.5	-
1,1-Dichloroethane	0.5 ug/L	-	-	<0.5	-
1,2-Dichloroethane	0.5 ug/L	-	-	<0.5	-
1,1-Dichloroethylene	0.5 ug/L	-	-	<0.5	-
cis-1,2-Dichloroethylene	0.5 ug/L	-	-	<0.5	-
trans-1,2-Dichloroethylene	0.5 ug/L	-	-	<0.5	-
1,2-Dichloropropane	0.5 ug/L	-	-	<0.5	-
cis-1,3-Dichloropropylene	0.5 ug/L	-	-	<0.5	-
trans-1,3-Dichloropropylene	0.5 ug/L	-	-	<0.5	-
1,3-Dichloropropene, total	0.5 ug/L	-	-	<0.5	-
Ethylbenzene	0.5 ug/L	-	-	<0.5	-
Ethylene dibromide (dibromoethane, 1	0.2 ug/L	-	-	<0.2	-
Hexane	1.0 ug/L	-	-	<1.0	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	-	-	<5.0	-
Methyl Isobutyl Ketone	5.0 ug/L	-	-	<5.0	-
Methyl tert-butyl ether	2.0 ug/L	-	-	<2.0	-
Methylene Chloride	5.0 ug/L	-	-	<5.0	-
Styrene	0.5 ug/L	-	-	<0.5	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	-	-	<0.5	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	-	-	<0.5	-
Tetrachloroethylene	0.5 ug/L	-	-	<0.5	-
Toluene	0.5 ug/L	-	-	<0.5	-

Certificate of Analysis

Report Date: 09-Jul-2020

Client: Lopers & Associates

Order Date: 30-Jun-2020

Client PO: LOP20-002B

Project Description: LOP20-002B

	Client ID:	MW-6	MW-8	Trip Blank	-
	Sample Date:	30-Jun-20 09:00	30-Jun-20 09:00	29-Jun-20 09:00	-
	Sample ID:	2027199-05	2027199-06	2027199-07	-
	MDL/Units	Water	Water	Water	-
1,1,1-Trichloroethane	0.5 ug/L	-	-	<0.5	-
1,1,2-Trichloroethane	0.5 ug/L	-	-	<0.5	-
Trichloroethylene	0.5 ug/L	-	-	<0.5	-
Trichlorofluoromethane	1.0 ug/L	-	-	<1.0	-
Vinyl chloride	0.5 ug/L	-	-	<0.5	-
m,p-Xylenes	0.5 ug/L	-	-	<0.5	-
o-Xylene	0.5 ug/L	-	-	<0.5	-
Xylenes, total	0.5 ug/L	-	-	<0.5	-
4-Bromofluorobenzene	Surrogate	-	-	116%	-
Dibromofluoromethane	Surrogate	-	-	99.4%	-
Toluene-d8	Surrogate	-	-	108%	-
Benzene	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	-
Toluene-d8	Surrogate	95.0%	101%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
General Inorganics									
Cyanide, free	ND	2	ug/L						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	*19.0*		*ug/L*		*95.0*	*50-140*			
Surrogate: Terphenyl-d14	*22.8*		*ug/L*		*114*	*50-140*			
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Ethylene dibromide (dibromoethane, 1,2	ND	0.2	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	*95.5*		*ug/L*		*119*	*50-140*			
Surrogate: Dibromofluoromethane	*90.2*		*ug/L*		*113*	*50-140*			
Surrogate: Toluene-d8	*79.1*		*ug/L*		*98.9*	*50-140*			
Benzene	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: Toluene-d8	*79.1*		*ug/L*		*98.9*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	17.0	1	mg/L	17.0			0.3	10	
General Inorganics									
Cyanide, free	ND	2	ug/L	ND			NC	20	
pH	8.0	0.1	pH Units	8.0			0.1	3.3	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Metals									
Mercury	ND	0.1	ug/L	ND			NC	20	
Antimony	ND	0.5	ug/L	ND			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	47.3	1	ug/L	48.0			1.6	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	141	10	ug/L	142			0.8	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Chromium (VI)	ND	10	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	0.82	0.5	ug/L	0.85			3.6	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Molybdenum	4.14	0.5	ug/L	4.19			1.2	20	
Nickel	3.0	1	ug/L	3.1			3.8	20	
Selenium	ND	1	ug/L	ND			NC	20	
Silver	ND	0.1	ug/L	ND			NC	20	
Sodium	32100	200	ug/L	32300			0.9	20	
Thallium	0.10	0.1	ug/L	0.11			2.3	20	
Uranium	3.5	0.1	ug/L	3.3			3.3	20	
Vanadium	0.64	0.5	ug/L	0.65			1.8	20	
Zinc	ND	5	ug/L	ND			NC	20	
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroform	ND	0.5	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Ethylene dibromide (dibromoethane, 1,2-	ND	0.2	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*94.1*		*ug/L*		*118*	*50-140*			
Surrogate: Dibromofluoromethane	*83.4*		*ug/L*		*104*	*50-140*			
Surrogate: Toluene-d8	*71.4*		*ug/L*		*89.3*	*50-140*			
Benzene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*71.4*		*ug/L*		*89.3*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	26.5	1	mg/L	17.0	95.0	77-123			
General Inorganics									
Cyanide, free	25.2	2	ug/L	ND	83.9	70-130			
Hydrocarbons									
F1 PHCs (C6-C10)	1990	25	ug/L	ND	99.7	68-117			
F2 PHCs (C10-C16)	1670	100	ug/L	ND	105	60-140			
F3 PHCs (C16-C34)	4580	100	ug/L	ND	117	60-140			
F4 PHCs (C34-C50)	2690	100	ug/L	ND	109	60-140			
Metals									
Mercury	3.48	0.1	ug/L	ND	116	70-130			
Antimony	49.5	0.5	ug/L	ND	98.3	80-120			
Arsenic	56.4	1	ug/L	ND	112	80-120			
Barium	102	1	ug/L	48.0	108	80-120			
Beryllium	54.7	0.5	ug/L	ND	109	80-120			
Boron	49	10	ug/L	ND	97.2	80-120			
Cadmium	53.0	0.1	ug/L	ND	106	80-120			
Chromium (VI)	191	10	ug/L	ND	95.5	70-130			
Chromium	59.4	1	ug/L	ND	118	80-120			
Cobalt	53.0	0.5	ug/L	ND	105	80-120			
Copper	52.9	0.5	ug/L	0.85	104	80-120			
Lead	45.7	0.1	ug/L	ND	91.4	80-120			
Molybdenum	54.4	0.5	ug/L	4.19	100	80-120			
Nickel	56.4	1	ug/L	3.1	107	80-120			
Selenium	51.2	1	ug/L	ND	102	80-120			
Silver	50.9	0.1	ug/L	ND	102	80-120			
Sodium	40400	200	ug/L	32300	81.0	80-120			
Thallium	50.8	0.1	ug/L	0.11	101	80-120			
Uranium	44.6	0.1	ug/L	3.3	82.4	80-120			
Vanadium	60.0	0.5	ug/L	0.65	119	80-120			
Zinc	53	5	ug/L	ND	99.6	80-120			
Semi-Volatiles									
Acenaphthene	4.21	0.05	ug/L	ND	84.3	50-140			
Acenaphthylene	3.32	0.05	ug/L	ND	66.3	50-140			
Anthracene	4.02	0.01	ug/L	ND	80.5	50-140			
Benzo [a] anthracene	4.51	0.01	ug/L	ND	90.2	50-140			
Benzo [a] pyrene	5.22	0.01	ug/L	ND	104	50-140			
Benzo [b] fluoranthene	5.79	0.05	ug/L	ND	116	50-140			
Benzo [g,h,i] perylene	5.11	0.05	ug/L	ND	102	50-140			
Benzo [k] fluoranthene	5.43	0.05	ug/L	ND	109	50-140			
Chrysene	5.22	0.05	ug/L	ND	104	50-140			
Dibenzo [a,h] anthracene	5.17	0.05	ug/L	ND	103	50-140			
Fluoranthene	4.22	0.01	ug/L	ND	84.3	50-140			
Fluorene	4.00	0.05	ug/L	ND	79.9	50-140			
Indeno [1,2,3-cd] pyrene	5.15	0.05	ug/L	ND	103	50-140			
1-Methylnaphthalene	5.35	0.05	ug/L	ND	107	50-140			
2-Methylnaphthalene	5.93	0.05	ug/L	ND	119	50-140			
Naphthalene	5.29	0.05	ug/L	ND	106	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Phenanthrene	4.26	0.05	ug/L	ND	85.2	50-140			
Pyrene	4.27	0.01	ug/L	ND	85.4	50-140			
Surrogate: 2-Fluorobiphenyl	*20.3*		*ug/L*		*101*	*50-140*			
Surrogate: Terphenyl-d14	*20.9*		*ug/L*		*105*	*50-140*			
Volatiles									
Acetone	126	5.0	ug/L	ND	126	50-140			
Benzene	44.5	0.5	ug/L	ND	111	60-130			
Bromodichloromethane	46.6	0.5	ug/L	ND	117	60-130			
Bromoform	46.9	0.5	ug/L	ND	117	60-130			
Bromomethane	47.5	0.5	ug/L	ND	119	50-140			
Carbon Tetrachloride	48.1	0.2	ug/L	ND	120	60-130			
Chlorobenzene	44.4	0.5	ug/L	ND	111	60-130			
Chloroform	47.5	0.5	ug/L	ND	119	60-130			
Dibromochloromethane	42.2	0.5	ug/L	ND	106	60-130			
Dichlorodifluoromethane	46.7	1.0	ug/L	ND	117	50-140			
1,2-Dichlorobenzene	49.8	0.5	ug/L	ND	124	60-130			
1,3-Dichlorobenzene	40.1	0.5	ug/L	ND	100	60-130			
1,4-Dichlorobenzene	43.7	0.5	ug/L	ND	109	60-130			
1,1-Dichloroethane	45.8	0.5	ug/L	ND	115	60-130			
1,2-Dichloroethane	44.2	0.5	ug/L	ND	111	60-130			
1,1-Dichloroethylene	37.0	0.5	ug/L	ND	92.5	60-130			
cis-1,2-Dichloroethylene	49.2	0.5	ug/L	ND	123	60-130			
trans-1,2-Dichloroethylene	34.8	0.5	ug/L	ND	87.1	60-130			
1,2-Dichloropropane	39.2	0.5	ug/L	ND	97.9	60-130			
cis-1,3-Dichloropropylene	42.3	0.5	ug/L	ND	106	60-130			
trans-1,3-Dichloropropylene	46.6	0.5	ug/L	ND	116	60-130			
Ethylbenzene	43.9	0.5	ug/L	ND	110	60-130			
Ethylene dibromide (dibromoethane, 1,2-	40.5	0.2	ug/L	ND	101	60-130			
Hexane	44.0	1.0	ug/L	ND	110	60-130			
Methyl Ethyl Ketone (2-Butanone)	126	5.0	ug/L	ND	126	50-140			
Methyl Isobutyl Ketone	104	5.0	ug/L	ND	104	50-140			
Methyl tert-butyl ether	114	2.0	ug/L	ND	114	50-140			
Methylene Chloride	43.8	5.0	ug/L	ND	110	60-130			
Styrene	43.5	0.5	ug/L	ND	109	60-130			
1,1,1,2-Tetrachloroethane	44.5	0.5	ug/L	ND	111	60-130			
1,1,2,2-Tetrachloroethane	43.3	0.5	ug/L	ND	108	60-130			
Tetrachloroethylene	34.7	0.5	ug/L	ND	86.7	60-130			
Toluene	45.9	0.5	ug/L	ND	115	60-130			
1,1,1-Trichloroethane	41.8	0.5	ug/L	ND	105	60-130			
1,1,2-Trichloroethane	46.7	0.5	ug/L	ND	117	60-130			
Trichloroethylene	42.5	0.5	ug/L	ND	106	60-130			
Trichlorofluoromethane	43.6	1.0	ug/L	ND	109	60-130			
Vinyl chloride	49.0	0.5	ug/L	ND	122	50-140			
m,p-Xylenes	79.2	0.5	ug/L	ND	98.9	60-130			
o-Xylene	44.0	0.5	ug/L	ND	110	60-130			
Surrogate: 4-Bromofluorobenzene	*86.1*		*ug/L*		*108*	*50-140*			
Surrogate: Dibromofluoromethane	*85.9*		*ug/L*		*107*	*50-140*			
Surrogate: Toluene-d8	*69.3*		*ug/L*		*86.6*	*50-140*			
Benzene	44.5	0.5	ug/L	ND	111	60-130			
Ethylbenzene	43.9	0.5	ug/L	ND	110	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Toluene	45.9	0.5	ug/L	ND	115	60-130			
m,p-Xylenes	79.2	0.5	ug/L	ND	98.9	60-130			
o-Xylene	44.0	0.5	ug/L	ND	110	60-130			
Surrogate: Toluene-d8	*69.3*		*ug/L*		*86.6*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1 : Elevated detection limit due to dilution required because of high target analyte concentration.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.

PARACEL LABORATORIES LTD.

Paracel ID: 2027199

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2027199	Nº 126519

Client Name: Lopers & Associates
Contact Name: Luke Lopers
Address: 30 Lansfield Way, Ottawa, ON
Telephone: 613-327-9073

Project Ref: LOP20-002B
Quote #:
PO #: LOP20-002B
E-mail: Luke@Lopers.ca

Page __ of __

Turnaround Time
☐ 1 day ☐ 3 day
☐ 2 day ☒ Regular
Date Required: _____

Regulation 153/04	Other Regulation
☐ Table 1 ☒ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☒ Coarse	☐ CCME ☐ MISA
☒ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun:
For RSC: ☒ Yes ☐ No	☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals & Inorganics	Hg	CrVI	B (HWS)
1	BH1-20	GW		9	June 30, 2020		X	X	X	X			
2	BH3-20	GW		9			X	X	X	X			
3	BH5-20	GW		4			X		X				
4	BH13-20	GW		9			X	X	X	X			
5	MW-6	GW		3			X						
6	MW-8	GW		3			X						
7	Trip Blank			1				X					
8													
9													
10													

Jun 29, 2020

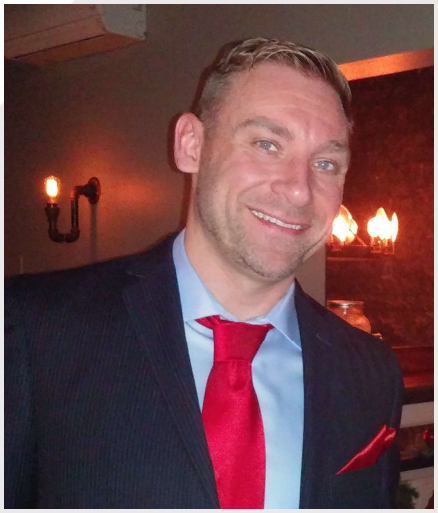
Comments:

Method of Delivery: Drop Box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab: Sureeporn Odumai	Verified By:
Relinquished By (Print): Luke Lopers	Date/Time:	Date/Time: JUN30, 2020 03:22	Date/Time: 06-30-20 15:42
Date/Time: June 30, 2020 / 3:10 PM	Temperature: °C	Temperature: 15.7 °C	pH Verified: X By: MX

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 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
Phase Two Environmental Site Assessments | Various Clients | Various Locations | 2008-2020

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/Arnprior, 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
Phase One, Phase Two Environmental Site Assessments, Environmental Delineation Quality Assurance Program | Costco Wholesale | Ottawa, ON | 2014-2019

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.

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

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.

Record of Site Conditions

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

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

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.

Excess Soil Management

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

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

Designated Substance Surveys

Project Manager

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

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

- DSSs at various municipal facilities for the City of Pembroke, Pembroke, Ontario. Preparation of Asbestos Management Plan.
- HBMAs 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.

Environmental Litigation Support

Project Manager, Field Engineer, Expert Witness

Ottawa, Ontario | 2014-2020

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.

PROJECT EXPERIENCE – STANDING OFFER MANAGER

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

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.

PROJECT EXPERIENCE – SENIOR PROJECT MANAGER

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

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.