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Phase Two
Environmental Site Assessment

593, 601 & 603 Laurier Ave W
Ottawa, Ontario

Prepared for:

Heritage Investments Ltd.
1010 Polytek Street, Unit 5
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LRL File No.: 240447

October 18, 2024

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EXECUTIVE SUMMARY

Heritage Investments Ltd. has retained LRL Associates Ltd. (LRL) to conduct a Phase Two Environmental Site Assessment (ESA) for the properties located at 593, 601, and 603 Laurier Ave W in Ottawa, Ontario (herein referred to as the Site). The Site is made up of three (3) individual property parcels. The legal description of the property at 593 Laurier Ave W is Part Lot 40, Concession A (OF) as in CR231415, CR259616 Except Part 1 on N287620; Ottawa/Nepean. The legal description of the property at 601/603 Laurier Ave W is Part Lot 40, Concession A (OF) as in NS85937; Ottawa/Nepean. The Site is currently developed with multi-tenant residential buildings set within an urban residential area of Ottawa, Ontario. A small asphalt parking lot is located at the front (southwest corner) of 593 Laurier Ave West. The existing developments on the Site are estimated to have been constructed from between the early 1900's (1901) and the mid- 1950's. The Site location is shown in **Figure 1**.

The objectives of this Phase Two ESA are to investigate the presence of contaminants at the Site, as identified in the Phase One ESA completed by LRL Associates Ltd. on October 8, 2024. Based on the results of the Phase One ESA, the following areas of potential environmental concern (APECs) were identified:

APEC 1 was generated due to the presence of PCA Other : Spill for a hydraulic oil spill which occurred approximately 220 m south of the Site.

APEC 2 was generated due to the record of a previous furnace oil leak at the property located approximately 250 m south of the Site, PCA Other : Spill.

APEC 3 was generated due to the presence of PCA Other : Waste Generator at the Site.

APEC 4 was generated due to the presence of PCA Other : Waste Generator for the property located approximately 100 m southeast.

APEC 5 was generated due to the presence of PCA Other : Waste Generator for the property located approximately 170 m southeast.

APEC 6 was generated due to the presence of PCA Other : Waste Generator for the property located approximately 60 m south.

APEC 7 was generated to address the previous up-gradient manufacturer/publisher identified approximately 170 m southeast of the Site.

APEC 8 was generated due to the PCA 41 for the former presence of heating oil tanks in each of the Phase One properties according to the Site Interview.

APEC 9 was generated due to the presence of PCA 30 for the possible fill material used to accommodate the parking circulation area at one of the Phase One properties.

Phase Two ESA was recommended to determine the potential impacts from the above noted environmental concerns identified. The Phase Two ESA investigation is being completed to support the anticipated re-development of the Site, and corresponding City of Ottawa application. The Client has indicated that the future development plan for the Phase Two Property includes constructing a 28-storey residential building with 331 units.

The table below presents an executive summary of the Phase Two ESA conducted by LRL Associates.

Executive Summary	
Phase Two Property (the Site)	The property at 593 Laurier Ave W, Ottawa, Ontario, has an irregular shape and covers approximately 1,221 m² (0.30 acres), with dimensions of 31 m in width (east-west) and 39 m in depth (north-south). It is currently home to a multi-tenant residential building. The property at 601/603 Laurier Ave W, Ottawa, Ontario, is triangular and has an area of approximately 1,604.9 m² (0.40 acres), with dimensions of 74.1 m in width (east-west) and 40.3 m in depth (north-south). All the three (3) separate properties are developed with multi-tenant residential buildings. The properties are owned by Heritage Investments Ltd. It is anticipated that the Site is to be redeveloped for residential use.
Phase Two Investigations	Ontario Regulation (O. Reg.) 153/04 (as amended).
Geologic Conditions	The entire Phase Two Properties are located in an area characterized by till and a plain with a local relief of less than 5 meters. The geological composition includes limestone, dolomite, sandstone, and local shale, all relatively flat-lying glacial deposits (St-Onge, D.A., 2009). The generalized bedrock geology consists of the Eastview and Ottawa Formation, which features dark grey to nearly black limestone with some shaly interlayers, as well as sandstone in the basal section (Harrison, J.E., 1976).
Hydrogeological Conditions	The water table was identified at depths between 5.4 and 7.8 meters bgs. The inferred direction of groundwater flow is toward the Ottawa River approximately 560 m north of the Site.
Applicable Site Condition Standard	Table 7 Generic Site Condition Standards for Shallow Soils in a Non-Potable Groundwater Condition" for coarse-grained soils in a Residential Parkland Institutional (RPI) property use.
Soil and Groundwater Quality Data	VOCs parameters analysed were not detected in the soil samples submitted for laboratory analysis, with the exception of Trichlorofluoromethane and Xylenes in sample 2-SS2, collected from borehole BH24-2 at depths of between 0.6 and 1.2 m below grade. The values reported are below the appliable Table 7 site condition standards. Petroleum hydrocarbons fractions F2 through F4 were detected in the samples submitted BH24-3 (3-SS1) and its corresponding duplicate sample (3-SSX); BH24-4 (4-SS1) and BH24-5 (5-SS1). The concentrations of petroleum hydrocarbons detected were below the applicable Table 7 site condition standards. PCB's were not detected in the soil samples submitted for analysis (<0.05 µg/g). PAH parameters were detected in Sample 4-SS1, collected from borehole BH24-04 at depth of between 0.0 and 0.6 m bgs. Select PAH parameters were reported with concentrations above the applicable Table 7 site condition standards, which are summarized as follows: • Anthracene reported with a value of 1.24 µg/g, above the standard of 0.67 µg/g; • Benzo[a]anthracene reported with a value of 1.48 µg/g, above the standard of 0.5 µg/g; • Benzo[a]pyrene reported with a value of 1.1 µg/g, above the standard of 0.3 µg/g;

	• Benzo[b]fluoranthene reported with a value of 0.98 µg/g, above the standard of 0.78 µg/g; • Dibenzo[a,h]anthracene reported with a value of 0.17 µg/g, above the standard of 0.10 µg/g; • Indeno [1,2,3-cd] pyrene reported with a value of 0.61 µg/g, above the standard of 0.38 µg/g; • Fluoranthene reported with a value of 6.06 µg/g, above the standard of 0.69 µg/g; and • Phenanthrene reported with a value of 6.21 µg/g, above the standard of 0.10 µg/g. The remaining PAH parameters detected had concentrations below the appliable site condition standard. PAH were not detected in the remaining soil sample submitted for the respective analysis. In the monitoring wells, headspace VOC levels were 2.5, 4.2, and 0.4 ppm in MW19-1, MW19-2, and MW24-05, respectively, during the sampling. No olfactory or visual (i.e. sheen or free phase) evidence of petroleum hydrocarbon impacts were observed. Various metal-based parameters were detected in the soil samples submitted for analysis, although no exceedances to the Table 7 site condition standard were encountered with one (1) exception. Sample 2-SS1, collected from borehole BH24-2 from depths of between 0.0 and 0.6 m bgs had a concentration of lead of 214 µg/g, surpassing the Table 7 site condition standard of 120 µg/g. General inorganic parameters analysed were reported within the applicable Table 7 site condition standard. O. Reg. 153/04 does not have set limits for nitrates, nitrites or sulphates. Levels of nitrates and sulphates were detected in the samples collected with values ranging from 1 through 8 µg/g, and from 13 through 334 µg/g, respectively. The groundwater at the Phase Two Property was sampled at MW19-01, MW19-02, and MW24-05 and was analyzed for PHCs Fractions F1 through F4; VOCs, PAHs, PCBs, metals, and general inorganics. MW19-01 analysis results confirmed the PHC-F2 concentration (308 µg/L) exceeding the Table 7 applicable standard of 150 µg/L. PHC-F4 was also present in the MW19-01 groundwater sample, however its level was not above the Table 7 standard limit. The remaining petroleum-based parameters were not detected in the groundwater sample collected. MW19-02 and MW24-05 had comparable VOC and PHC concentrations with levels generally being less than the laboratory detection limits. PHC-F3 was detected in both samples with values of 194 and 357 µg/L, respectively, below the 500 µg/L Table 7 site condition standard. PHC-F4 was also detected in MW24-05 with a value of 346 µg/L, respectively, below the 500 µg/L Table 7 site condition standard. Chloroform in MW24-05 was also detected above the appliable Table 7 site condition standard of 2 µg/L with a value of 15.2 µg/L. Sample MW-XX is a duplicate sample collected from MW24-05, which exhibited comparable detections and exceedances. Toluene was also detected in MW24-05 with a value of 0.6 µg/L, less than the Table 7 site condition standard of 320 µg/L. PAH parameters were not detected in MW19-01 or MW24-05. Detections were encountered in MW19-02, however the levels were less than the Table 7 site condition standards. Metals were detected in all samples collected, however, no exceedances were encountered. Chloride and free cyanide parameters were detected although no exceedances were encountered.

Conclusions	The soil and groundwater on parts of the Phase Two Property did not meet the MECP Table 7 Standards RPI in a non-potable groundwater condition.
Recommendations	It is recommended that at the time of re-development of the Site, the quality of the soils to be excavated are confirmed through sampling and analysis. This will aid in ensuring that the appropriate handling and disposal measures are followed. The areas with confirmed exceedances in the overburden, within the work areas, should be remediated followed by confirmatory sampling by a Qualified Person. Prior to dewatering of excavations during the construction activities, the quality of the water to be discharged must be confirmed to align proper disposal or treatment requirements. Post re-development, the conditions should be verified through additional sampling to ensure that through the construction activities, conditions have not worsened.
Limitations	Results of this Phase Two ESA should not be considered a warranty that the subject properties are free from any and all contaminants from former and current practices, other than those noted in this report, nor that all compliance issues have been addressed.

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1 INTRODUCTION

Heritage Investments Ltd. has retained LRL Associates Ltd. (LRL) to complete a Phase Two Environmental Site Assessment (ESA) on the properties located at 593, 601 and 603 Laurier Avenue West, Ottawa, Ontario (herein referred to as the "Site"). The Site is made up of three (3) individual property parcels. The legal description of the property at 593 Laurier Ave W is Part Lot 40, Concession A (OF) as in CR231415, CR259616 Except Part 1 on N287620; Ottawa/Nepean. The legal description of the property at 601/603 Laurier Ave W is Part Lot 40, Concession A (OF) as in NS85937; Ottawa/Nepean. The Site is currently developed with multi-tenant residential buildings set within an urban residential area of Ottawa, Ontario. A small asphalt parking lot is located at the front (southwest corner) of 593 Laurier Ave West. The existing developments on the Site are estimated to have been constructed from between the early 1900's (1901) and the mid- 1950's. The Site's location is shown in Error! Reference source not found..

The objectives of the Phase Two ESA are to address the presence or absence of contaminants at the Site, as identified in the Phase One ESA, and to evaluate the quality of the soil and groundwater. It is our understanding that this Phase Two Environmental Site Assessment is required for the above-referenced property in support of a Site Plan Application with the City of Ottawa to support the redevelopment of the Site to include a 28-storey residential building with 331 units.

This report should be read in conjunction with Phase One Environmental Site Assessment submitted for the Site on October 8, 2024.

1.1 Site Description

The Site property identified as 593 Laurier Avenue West is an irregular shape, with a total area of approximately 1,221 m2 or 0.30 acres, being approximately 31 m wide (west-east) by approximately 39 m deep (north-south). is the property is currently occupied by a multi-tenant residential building. The Site identified as property 601 and 603 Laurier Avenue West is a triangular shape, with a total area of approximately 1,604 m² or 0.40 acres, being approximately 74 m wide (east-west) by approximately 40 m (north-south). The properties are each developed with a multi-tenant residential buildings. The Site has been used for residential purposes from the development in at least the early 1900's (1901) through to present day (August 2024), with a re-development of the 601/603 Laurier Ave property in the early 1950's. The Site is accessible via Laurier Avenue W, south of the Site. The Site Plan is presented in **Figure 2.**

A Phase II Environmental Site Assessment was completed at 593 Laurier Avenue West, Ottawa, Ontario, by LRL Associates, in 2019. The investigation involved advancing two (2) boreholes across the site at strategic locations based on potential areas of environmental concern. The two (2) boreholes were completed as monitoring wells to assess the Site's hydrogeological conditions and facilitate groundwater sampling. Select soil and groundwater samples were submitted for analysis to establish if the potential environmental concerns have negatively impacted the soil and groundwater conditions. The rationale for selection of soil and groundwater samples submitted for analysis was based on the results of the sample field screening, visual/olfactory observations and/or proximity to the water table.

The analytical results revealed that volatile organic parameters analyzed were not detected in the soil samples submitted for analysis. Petroleum Hydrocarbon Fractions F3 and F4 were detected in; however, levels are below the applicable Ontario Regulation 153/04 (as amended) Table 7 site condition standard. Select metals parameters exceeded the applicable Table 7 site condition standards in BH19-1 and BH19-2 as follows:

- Barium was detected in BH19-2 at 397 µg/g, above the SCS of 390 µg/g;
- Cadmium was detected in BH19-2 at 1.7 µg/g, above the SCS of 1.2 µg/g;
- Lead was detected in BH19-1 (172 µg/g) and BH19-2 (842 µg/g), above the SCS of 120 µg/g;
- Mercury was detected in BH19-1 (0.3 µg/g) and BH19-2 (2.1 µg/g), above the SCS of 0.27 µg/g; and

- Zinc was detected in BH19-2 at 1020 µg/g above the SCS of 340 µg/g.

Volatile Organic Compounds and Petroleum Hydrocarbon parameters were not detected in the initial groundwater samples collected with the exception of chloroform. Chloroform was detected in both monitoring wells at concentrations of 17.5 µg/L and 13.0 µg/L, respectively, which exceeds the Table 7 site condition standard of 2 µg/L. The presence of chloroform detected was rationalized as being due to the use of chlorinated municipal water used during coring. Furthermore, due to a limited amount of water submitted from one (1) monitoring well location, the laboratory method detection limit for PHC F2 was raised to 196 µg/L which is above the applicable site condition standards of 150 µg/L. Therefore, it could not be determined whether the sample meets the applicable site condition standards for Petroleum Hydrocarbon Fraction F2.

Additional groundwater monitoring was conducted, to confirm the chloroform exceedances and elevated detection limit of Petroleum Hydrocarbon Fraction F2 in the results of the October 17, 2019, groundwater samples. The concentrations of Petroleum Hydrocarbon Fraction F1 through F4 and Volatile Organic Compounds, including chloroform, were below the laboratory detection limits in the additional samples, and the detection limits were below the applicable Table 7 site condition standards. The non-detections of chloroform in the additional groundwater samples were reported to likely be caused by the use of chlorinated municipal water during coring.

A Contamination Delineation program was completed for 593 Laurier Avenue West, Ottawa, Ontario, prepared by LRL Associates, in 2019. The assessment was conducted to address the extents of the previously encountered elevated metal-based parameter contamination encountered at the northeastern and southeastern portion of the subject property. The contamination delineation was conducted on October 31, 2019, and consisted of the advancement of sixteen (16) manual auger holes (AH19-1 through AH19-16) at distances of approximately 3.0 m and 6.0 m from the previously advanced boreholes completed as part of the Phase II Environmental Site Assessment. Samples submitted revealed that lead and/or mercury concentrations exceeded the applicable standards in all nine (9) samples submitted. Seven (7) of the samples submitted exceeded the standard for lead (120 µg/g) with levels between 129 µg/g and 532 µg/g. Six (6) of nine (9)the samples submitted exceeded the standard for mercury (0.27 µg/g) with levels between 0.3 µg/g and 1.6 µg/g and the detection limits in the remaining three (3) samples were (1.0 µg/g), above the standard of 0.27 µg/g. The exceedances were found at depths ranging between surface and 0.5 m bgs. At the time of the delineation program it was recommended that the soil contamination be remediated at the time of site development. The vertical extent of contamination was anticipated to be from surface to bedrock, encountered at depths between 0.5 m and 1.65 m bgs. The horizontal extent of contamination was not delineated; however, it was indicated that it was anticipated to extend across the majority of the subject property.

A summary of the Site description is provided in Table 1 – Section 1.1

Table 1 – Section 1.1: Summary of Site Description

Parameters	Information
Location/ Address	593, 601 & 603 Laurier Ave W, Ottawa, Ontario **Figure 1**: Site Location Plan
Property Identification Numbers (PINs)	PIN #04111-0260 (LT) (593 Laurier Ave W) PIN#04111-0261 (LT) (601 & 603 Laurier Ave W)
Legal Description	Part Lot 40, Concession A (OF) as in CR231415, CR259616 Except Part 1 on N287620; Ottawa/Nepean (593 Laurier Ave W) Part Lot 40, Concession A (OF) as in NS85937; Ottawa/Nepean (601 and 603 Laurier Ave W)
Shape	593 Laurier Ave W: Irregular shape, with a total area of approximately 1,221 m^2 or 0.30 acres, being approximately 31 m wide (west-east) by approximately 39 m deep (north-south) (593 Laurier Ave W). 601 & 603 Laurier Ave W: Triangular shape, with a total area of approximately 1,604.9 m^2 or 0.40 acres, being approximately 74.1 m wide (east-west) by approximately 40.3 m (north-south) (601/603 Laurier Ave W).
Access to the Phase Two Property	The Phase Two Property can be accessed from Laurier W. Avenue along the southern extent, and Bronson Avenue along the eastern extent of the Site.
Occupancy	Multi-tenant residential buildings.
Current Land Use	Residential. The Phase One ESA properties have been used for residential purposes since the early 1900's (593 Laurier Ave) and the early 1950's (601/603 Laurier Ave).
Proposed Future Land Use	Residential.

1.2 Property Ownership

The Qualified Person from LRL was retained by the Client to carry out this Phase Two ESA. The Site ownership information is presented in **Table 2 – Section 1.2.**

Table 2 – Section 1.2: Phase Two Property Owner Contact Information

Company	Contact
Phase Two Property Owner	Heritage Investments Ltd. has owned 593 Laurier Ave W since October of 2023. Dalhousie Non-profit Housing Co-operative Inc. has owned 601/603 Laurier Ave W since May 1980.
Phase Two Property Contact	Dean Michaud, Heritage Investments Ltd. Phone: 6134022855 Email: dean@henryinvestments.ca Address: 1010 Polytek Street, Unit 5, Ottawa, Ontario K1J 9H9

1.3 Current and Proposed Land Uses

The Site is currently in residential land use and the future redevelopment of the Site to include a 28-storey residential building with 331 units.

As there is no intended plan for change in general use of the Site (residential), an application for a Record of Site Condition (RSC) will not be required.

1.4 Applicable Site Condition Standard

The results of the chemical analysis of soil and groundwater were assessed using the standards outlined in the Ministry of the Environment, Conservation and Parks (MECP) Table 7 Residential/Parkland/Institutional (RPI) Standards for coarse-grained soils in a non-potable groundwater condition. Since the Site is currently utilized for residential purposes, these residential site condition standards were applied to support future development plans. These standards were used to evaluate the quality of the soil and groundwater based on the collected samples to determine compliance with MECP Standards and to assess whether further investigations are required or warranted. The Site was evaluated according to the standards specified in MECP Table 7. LRL considers the application of the Table 7 Standards appropriate based on the considerations listed in **Table 3 – Section 1.4**. However, a letter should be sent to the Municipality and the City of Ottawa requesting permission to utilize the MECP Table 7 RPI Standards in accordance with O. Reg 153/04 (as amended).

Table 3 – Section 1.4: Phase Two Property Conditions

Parameters	Information
Proposed Land Use	Residential
Potable or Non-Potable Ground Water	Non-potable Groundwater
Proximity to Surface Water	The closest water body is the Ottawa River that is located approximately 560 m north of the Site.
Areas of Natural Significance	There are no Areas of Natural Scientific Interest (ANSI) in the study area, nor environmentally sensitive areas that encroach within 30 m of the Phase Two Properties.
Nature and Depth of Bedrock Strata	.As discussed in greater detail below in Section 4.32, at the time of the borehole advancement associated with the Phase Two ESA, bedrock was encountered at depth ranging between 0.35 and 9.05 on the Site The bedrock is comprised mainly of Ottawa and Eastview Formation which includes dark grey almost black limestone and limestone with some shaly partings: some sandstone in basal part.
Direction of Groundwater Flow	Based on available interactive mapping systems, including The Atlas of Canada – Toporama, the groundwater flow direction is interpreted to be to the north/northwest towards the Ottawa River.
Grain Size Analysis	No formal grain size analysis was completed as part of this assessment. However, based on our observations at the time of the Phase Two ESA drilling program discussed herein, that overburden material across the Site was considered to be coarse textured. Therefore, the coarse textured soil will be applied for the purpose of this report.
PH of Soil	Soil pH was between 7.09 and 7.24, based on analytical results outlined in greater detail in further sections of this report.

Based on the Site conditions described in **Table 3 – Section 1.4**, the applicable criteria to be used in this Phase Two ESA is Ontario Regulation 153/04 "Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition" for Residential Parkland Institutional (Table 7 RPI Standards) as per the MECP document titled *"Soil, Ground Water and Sediment Standards for Use under Part XV. 1 of the Environmental Protection Act",* dated April 15, 2011, as amended.

2 BACKGROUND INFORMATION

2.1 Physical Setting

The Site is located approximately 75 meters above mean sea level (amsl) and features generally flat land with a slight incline toward the north. The Ottawa River is located about 560 meters to the north of the Site. Most of the groundwater flow was found to be directed toward the north/northwest. Additionally, there are no areas of natural significance within 30 meters of the Site.

2.2 Past Investigations

2.2.1 Phase I Environmental Site Assessment, 2019

A Phase I Environmental Site Assessment, for 593 Laurier Avenue West, Ottawa, Ontario, was prepared by LRL Associates, dated July 15, 2019 (Revised September 4, 2020). The assessment was conducted in the context of obtaining a City of Ottawa Site plan approval for proposed development. The Phase I ESA was conducted in general accordance with Ontario Regulation (O. Reg.) 153/04 CSA Standard Z768-01, R2016, and City of Ottawa Guide to Preparing Studies and Plans, all as amended, in support of a City of Ottawa site plan approval application.

The report indicated that the site in question was irregularly shaped with an approximate area of 1,230 m² (0.3 acres). It is developed with a three-story residence constructed circa 1908. The residence has a footprint of approximately 335 m². The building is serviced with municipal water and sanitary services and is heated with natural gas.

According to aerial photographs reviewed, the site appeared to have been developed in at least 1928 and what appears to be a fence or a wall like structure makes up the eastern and northeastern extents of the Site. The general area is developed with minor land use changes over the years, with the exception of the lands approximately 100 m northwest of the Site which have been cleared in 1965 of what appeared to be residences in the 1928 photograph. The lands within 250 m appear to have generally been used for residential and commercial purposes.The activities on the Site and lands within the 250 m study area are predominantly residential.

The nearest open water body identified is the Ottawa River, located approximately 550 m north of the Site. The general surrounding area including the Site has a significant slope north-northwest towards the Ottawa River with elevations dropping from 80 m above mean sea level (amsl) at the Site to 50 m amsl at the river. The inferred groundwater flow direction in the general area would be north-northwest towards the Ottawa River. Geological mapping describes the overburden as till with a local relief less than 5 m and the bedrock as dark grey limestone with some shaly partings and some sandstone.

Based on the results of the Phase I Environmental Site Assessment the following potential contaminating activities were identified:

- The former heating oil storage tank, historically located in the basement of the building on the site;
- The presence of an unknown trap door on the floor of the garage;
- A former foundry located approximately 20 m east of the subject property; and
- The presence of a reported spill along Bronson Avenue (east of the site), although the exact location was not confirmed.

Based on the findings of the Phase I ESA, the potential environmental risk to the site associated with the present and former uses of the site and properties within the 250 m study area were considered moderate to high. A Phase II ESA was recommended to determine potential impacts from the environmental concerns identified.

Furthermore, due to the estimated age of the building (1908), the presence of asbestos containing material (ACM) is possible. There is potential that other designated substances including silica containing materials such as brick and concrete, leaded solder and lead-based paint are also present. If renovation or demolition activities are to occur on the building, a Designated Substances Survey (DSS) was also recommended to identify potential designated substances and other hazardous materials so they can be addressed accordingly to ensure that the contractors or building occupants do not come into contact with these materials.

2.2.2 Phase II Environmental Site Assessment, 2019

A Phase II Environmental Site Assessment was completed at 593 Laurier Avenue West, Ottawa, Ontario, by LRL Associates, dated November 7, 2019 (Revised September 4, 2020). The purpose of a Phase II ESA was to determine if recognized potential environmental concerns identified in the previous Phase I ESA (discussed above in Section 3.3.1) have negatively impacted the quality of soil and groundwater of the subject site.

The assessment focused on potential contaminating activities (PCAs) identified in the Phase I ESA, including a former heating oil tank in the basement, a trap door in the garage, a nearby foundry, and a spill on Bronson Avenue. Contaminants of concern included Petroleum Hydrocarbons, Volatile Organic Compounds, Polycyclic Aromatic Hydrocarbons and Metals including mercury and hexavalent chromium.

The investigation involved advancing two (2) boreholes across the site at strategic locations based on potential areas of environmental concern. The two (2) boreholes were completed as monitoring wells to assess the Site's hydrogeological conditions and facilitate groundwater sampling. The advancement of boreholes was attempted in the basement beneath the former oil tank and in the gravel pit beneath the garage, however bedrock was encountered directly beneath the concrete slab and the gravel. The subsurface soil conditions in the area investigated on the Site generally consist of topsoil over fill. Limestone with shaly partings was encountered from depths of 0.50 and 1.65 m below ground surface (bgs) to 7.75 and 9.30 m bgs where the boreholes were terminated.

Groundwater contours could not be established due to the lack of data points. The general surrounding area including the Site has a significant slope north-northwest towards the Ottawa River with elevations dropping from 80 m amsl at the Site to 50 m amsl at the river. Although only two (2) groundwater monitoring wells were installed, it was inferred that the groundwater flow direction will be strongly influenced by the steep topography and presence of the Ottawa River. Based on the topography the inferred groundwater flow direction in the general area is inferred to be to the north-northwest towards the Ottawa River.

No olfactory or visual (i.e. staining or free phase) evidence of petroleum hydrocarbon impacts were observed in any of the soil samples collected. Observations were confirmed through combustible soil vapour concentrations measured. These concentrations ranged between non-detect (<0.1 ppm) and 0.2 ppm. In the monitoring wells, headspace volatile organic compounds levels were 1.2 and 3.9 ppm in MW19-1 and 0.6 and 3.1 ppm in MW19-2, on October 17, 2019 and August 10, 2020, respectively. No olfactory or visual (i.e. sheen or free phase) evidence of petroleum hydrocarbon impacts were observed in the groundwater.

Select soil and groundwater samples were submitted for analysis to establish if the potential environmental concerns have negatively impacted the soil and groundwater conditions. The rationale for selection of soil and groundwater samples submitted for analysis was based on the results of the sample field screening, visual/olfactory observations and/or proximity to the water table.

The analytical results revealed that volatile organic parameters analysed were not detected in the soil samples submitted for analysis. Petroleum Hydrocarbon Fractions F3 and F4 were detected in BH19-1 and BH19-2; however, levels are below the applicable Ontario Regulation 153/04 (as amended) Table 7 site condition standard. Select metals parameters exceeded the applicable Table 7 site condition standards in BH19-1 and BH19-2 as follows:

- Barium was detected in BH19-2 at 397 µg/g, above the SCS of 390 µg/g;
- Cadmium was detected in BH19-2 at 1.7 µg/g, above the SCS of 1.2 µg/g;
- Lead was detected in BH19-1 (172 µg/g) and BH19-2 (842 µg/g), above the SCS of 120 µg/g;
- Mercury was detected in BH19-1 (0.3 µg/g) and BH19-2 (2.1 µg/g), above the SCS of 0.27 µg/g; and
- Zinc was detected in BH19-2 at 1020 µg/g above the SCS of 340 µg/g.

Volatile Organic Compounds and Petroleum Hydrocarbon parameters were not detected in the groundwater samples collected on October 17, 2019 with the exception of chloroform. Chloroform was detected in MW19-1 and MW19-2 at concentrations of 17.5 µg/L and 13.0 µg/L, respectively, above the Table 7 site condition standard of 2 µg/L. The presence of chloroform detected was rationalized as being due to the use of chlorinated municipal water used during coring. Select metal and Polycyclic Aromatic Hydrocarbons parameters were detected, however levels are below the applicable site condition standards. Due to a limited amount of water submitted from MW19-1, the laboratory method detection limit for PHC F2 was raised to 196 µg/L which is above the applicable site condition standards of 150 µg/L. Therefore, it could not be determined whether the sample meets the applicable site condition standards for Petroleum Hydrocarbon Fraction F2.

Additional groundwater monitoring was conducted on August 4, 2020, to confirm the chloroform exceedances and elevated detection limit of Petroleum Hydrocarbon Fraction F2 in the results of the October 17, 2019, groundwater samples. The concentrations of Petroleum Hydrocarbon Fraction F1 through F4 and Volatile Organic Compounds, including chloroform, were below the laboratory detection limits in the additional samples, and the detection limits were below the applicable Table 7 site condition standards. The non-detections of chloroform in the additional groundwater samples were reported to likely be caused by the use of chlorinated municipal water during coring.

The horizontal extent of the metals impacts in the soil was delineated. It was recommended that the horizontal extent of the soil contamination be delineated and remediated.

It is recommended that if groundwater monitoring wells are not required for future monitoring purposes, they should be decommissioned in accordance with O. Reg. 903.

2.2.3 Contamination Delineation, 2019

A Contamination Delineation program was completed for 593 Laurier Avenue West, Ottawa, Ontario, prepared by LRL Associates, dated November 8, 2019. The assessment was conducted to address the extents of the previously encountered elevated metal-based parameter contamination encountered at the northeastern and southeastern portion of the subject property. These exceedances were identified at the time of the Phase ll Environmental Site Assessment, as discussed above in Section 3.3.2.

The contamination delineation was conducted on October 31, 2019, and consisted of the advancement of sixteen (16) manual auger holes (AH19-1 through AH19-16) at distances of approximately 3.0 m and 6.0 m from the previously advanced boreholes completed as part of the Phase ll Environmental Site Assessment. The auger holes were advanced to depths between 0.2 m and 0.7 m bgs where refusal was encountered over inferred dense fill or bedrock. Representative soil samples collected during the investigation from approximately 3.0 m from the Phase II ESA boreholes were submitted for metals analysis including mercury.

Lead and/or mercury concentrations exceeded the applicable standards in all nine (9) samples submitted. Seven (7) of the samples submitted exceeded the standard for lead (120 µg/g) with levels between 129 µg/g and 532 µg/g. Six (6) of nine (9)the samples submitted exceeded the standard for mercury (0.27 µg/g) with levels between 0.3 µg/g and 1.6 µg/g and the detection limits in the remaining three (3) samples were (1.0 µg/g), above the standard of 0.27 µg/g. The exceedances were found at depths ranging between surface and 0.5 m bgs.

The report concluded that the soil contamination encountered onsite presents a low risk to the building occupants if left undisturbed. It was recommended that tenants be notified not to dig, and not to allow dogs to dig, in the yard. It was further recommended that the soil contamination be remediated at the time of site development. The vertical extent of contamination was anticipated to be from surface to bedrock, encountered at depths between 0.5 m and 1.65 m bgs. The horizontal extent of contamination was not delineated; however, it was indicated that it was anticipated to extend across the majority of the subject property.

2.2.4 Geotechnical Investigation, 2019

LRL was retained by the Alexander Fleck House Inc., to complete a Geotechnical Investigation for the property located at 593 Laurier Avenue West in Ottawa, Ontario. The details of the investigation are presented in the report entitled Geotechnical Investigation, Proposed Mid-Rise Apartments – Revision 4, 593 Laurier Avenue West, Ottawa, Ontario, prepared by LRL and dated June 2019, Revised May 2022.

The purpose of the investigation was to identify the subsurface conditions across the site by the completion of a borehole drilling program. The fieldwork for this investigation was carried out on May 17, 2019. A total of five (5) boreholes, were drilled across the property, where possible to do so, to get a general representation of the site's subsurface conditions. The boreholes were advanced using a track mount CME 75 drill rig equipped with 200 mm diameter continuous flight hollow stem auger.

Sampling of the overburden materials encountered in the boreholes was carried out at regular depth intervals using a 50.8 mm diameter drive open conventional spoon sampler in conjunction with standard penetration testing (SPT) "N" values. The SPT were conducted following the method ASTM D1586 and the results of SPT, in terms of the number of blows per 0.3 m of split-spoon sampler penetration after first 0.15 m designated as "N" value. All boreholes were advanced until practical auger refusal over inferred bedrock, four (4) of the boreholes consisted of HQ-size (Ø63.5mm) rock coring. The boreholes were terminated at depths ranging from 2.3 to 6.7 m below ground surface (bgs).

The subsurface conditions encountered in the boreholes were classified based on visual and tactile examination of the materials recovered from the boreholes. Topsoil of thickness ranging from 150 to 760 mm was found at the surface at select boring locations and was generally described as being sandy with black organics. Generally, underlying the topsoil was fill which was described as a heterogeneous mixture of sand-silt-clay, mixed with some black organics, moist, and dark brown in colour. The fill material encountered extended to depths ranging from 0.6 – 1.6 m bgs. Bedrock was identified a shallow depths of between 0.3 and 1.6 m bgs. The Rock Quality Desingation values, expressed as a percent, ranged from 20 to 95%, which was identified as indicating the rock was very poor to excellent quality. The bedrock formation in this area can be described at consisting of limestone, with shaly partings, and grey to dark grey.

Groundwater was monitored during the field investigation. No water was encountered within the overburden during the borehole drilling, and no long-term groundwater monitoring was carried out. Groundwater was measured on October 16, 2019, in two (2) available monitoring wells, and the groundwater was found to be at 5.04 and 3.21 m bgs.

2.2.5 Phase One Environmental Site Assessment, 2024

A Phase One Site Assessment was completed by LRL Associates Ltd. in October 2024[1], and the Phase Two Environmental Site Assessment aims to verify the potential impacts related to the areas of environmental concern identified during the review of available record, including:

APEC 1 was generated due to the presence of PCA Other : Spill for a hydraulic oil spill which occurred approximately 220 m south of the Site.

APEC 2 was generated due to the record of a previous furnace oil leak at the property located approximately 250 m south of the Site, PCA Other : Spill.

APEC 3 was generated due to the presence of PCA Other : Waste Generator at the Site.

APEC 4 was generated due to the presence of PCA Other : Waste Generator for the property located approximately 100 m southeast.

APEC 5 was generated due to the presence of PCA Other : Waste Generator for the property located approximately 170 m southeast.

APEC 6 was generated due to the presence of PCA Other : Waste Generator for the property located approximately 60 m south.

APEC 7 was generated to address the previous up-gradient manufacturer/publisher identified approximately 170 m southeast of the Site.

APEC 8 was generated due to the PCA 41 for the former presence of heating oil tanks in each of the Phase One properties according to the Site Interview.

APEC 9 was generated due to the presence of PCA 30 for the possible fill material used to accommodate the parking circulation area at one of the Phase One properties.

3 SCOPE OF INVESTIGATION

3.1 Overview of Site Investigation

LRL's Phase Two ESA included the analysis of field investigations carried out between September 3rd, 2024, and September 6th, 2024. The field investigation was carried out to assess the quality of the soil and groundwater of the Phase Two Property in relation to the Areas of Potential Environmental Concern (APECs) identified by the Phase One Conceptual Site Model, represented in this report as **Figure 3**.

The scope of the investigation included:

- Preparation of a Health and Safety Plan.
- Collection of the geodetic elevations for borehole locations.
- Advancement of five (5) boreholes across the properties, with a focus on the eastern and western portions of 601 Laurier Avenue West and western portion of 605 Laurier Avenue West, based on known areas of concern at this time.
- One (1) of the boreholes will extend into the underling bedrock to a maximum depth of 9.05 m and will be completed into a groundwater monitoring well to intercept the water table.

[1] Phase One Environmental Site Assessment, 593, 601, and 603 Laurier Ave W, Ottawa, Ontario, prepared for Heritage Investments Ltd., by LRL, dated October 2024.

- Groundwater elevation measurements using an interphase probe for the potential measurements of free phase product either floating on the water table or the base of any water column. The interphase probe is also cleaned between each well measured with methanol, soap and DI water.
- Sample collection was carried out in accordance with the detailed sampling and analysis plan.
- Field observations were made in accordance with LRL's Standard of Operation (SOP).
- Samples collected were submitted and analyzed by Paracel Laboratories Ltd. testing laboratory companies to the MECP Table 7 RPI Standards for coarse-textured soil.

3.2 Media Investigation

The Phase Two ESA was conducted to investigate the potential impacts on soil and groundwater at the Phase Two Properties located at 593, 601, and 603 Laurier Avenue West. Sediment sampling was not carried out, as there were no surface water bodies on the Site during the investigation.

3.2.1 Soil Investigation

The soil investigation was designed to investigate the APECs identified by the Phase One ESA, and consisted of the following components:

- Five (5) boreholes were drilled on the Site until refusal is encountered. These boreholes were completed on September 3rd, 2024;
- The boreholes were advanced by utilizing a hollow stem auger. Samples were retrieved at regular intervals with a 50 mm outside diameter split-barrel sampler;
- The borehole advanced into the bedrock layer was completed using a manual concrete NQ coring bit, with hole diameter of 75.7 mm;
- The split spoon samplers and manual auger tool were cleaned with Alconox soap solution and, methyl hydrate and rinsed with water between uses;
- Inspection and logging of the split-spoon samples in the field with observations noted pertaining to the soil type, composition, visual staining, discolouration, and olfactory clues for potential chemical impacts;
- Collection of soil samples from each soil layer;
- Prepared sub-samples for chemical laboratory analysis;
- Field screening of soil samples using RKI GX-6000 Photo Ionization Detector (PID) to measure headspace vapour concentrations and determine the potential existence of PHC fractions and other VOCs;
- Collection of sub-samples of soil for chemical laboratory analysis was done using laboratory prepared, pre-labelled jars and vials. Sub-samples were placed in coolers; and
- One (1) QA/QC was conducted on a duplicate sample, for the sample parameters measured in the field. One (1) field duplicate soil sample was analyzed for
- Petroleum Hydrocarbons (PHCs), Polycyclic Aromatic Hydrocarbons (PAHs), Volatile Organic Carbons (VOCs), Polychlorinated Biphenyls (PCBs), metal and general inorganics.

3.2.2 Groundwater Investigation

The groundwater investigation was designed to intercept the groundwater table located approximately between 5 and 8 m bgs.

- One (1) monitoring well (MW24-05) was installed to assess the potential contaminants impact on the groundwater;
- Two (2) existing monitoring wells, (MW19-01 and MW19-02) completed by LRLs in 2019, were also included in the groundwater investigation;
- The well screen was placed at the bottom of the new monitoring well depth, with a depth of 9.05 m bgs;
- Development of each well, prior to sampling by the removal (purge) of at least three (3) times the dry volume of water contained in each well;
- Collection of the purge water in drums for future offside disposal;
- Determination of the presence of non-aqueous phase liquid-free product and the static groundwater elevation at each well;
- Groundwater sampling using a foot valve system following the water quality test with a Hanna Multi-Parameter meter to measured pH, total dissolved solids (TDS), conductivity, and temperature. Groundwater samples were collected once the readings from the Hanna Multi-Parameter meter stabilized, indicating consistent values for these parameters.
- One (1) duplicate sample was collected for QA/QC analysis for the parameters measured in the field;
- The cooler also contained a trip blank for the measurement of VOC samples for groundwater.
- Groundwater samples were placed in laboratory-prepared and pre-labelled jars and placed in ice-filled cooler boxes for storage and transportation to the analytical laboratory, along with a Chain of Custody Form;
- Retention of a copy of the Chain of Custody Form once samples were submitted for analysis;
- Ensured the temperature of the samples submitted was below 10 ˚C;
- Chemical analysis on one (1) sample from each of the groundwater monitoring wells, along with one field duplicate from monitoring well MW24-05, to investigate contaminants of concern (PHCs, VOCs, PAHs, metals, and Cyanide) associated with Areas of Potential Environmental Concern (APECs) identified in the Phase One ESA; and
- One (1) field blank (distilled water) and one (1) trip blank groundwater sample was submitted for VOCs.

3.3 Phase One Site Conceptual Model

The Phase One Conceptual Site Model is described as follows:

The PCAs on the Phase One Property and within Phase One Study Area identified through records review, interview, and Site reconnaissance are summarized in **Table 4 – Section 3.3** and incudes the actual groundwater flow direction as measured on-Site during the investigation, as presented in **Figure 6.**

Table 4 – Section 3.3: Phase One CSM – PCAS

APEC No.	O. Reg 153/04 Schedule D PCA	Direction from Phase One Property	Approximate Distance from Phase One Property (m)	Source Information	Remarks	APEC	Rationale
1	**PCA Other:** Spill	South	220 m	Ecolog ERIS	28 Primrose Ave. In 2002, a garbage truck leaked an unknown amount of hydraulic oil.	Southern portion of the Site	Potential impact on soil and groundwater
2	**PCA Other:** Spill	South	250 m	Ecolog ERIS	54 Primrose Ave. In 2008, an unknown amount of furnace oil leaked into the ground from a UST.	Southern portion of the Site	Potential impact on soil and groundwater
3	**PCA Other:** Waste Generation	On-Site	0	Ecolog ERIS	In 2022, the Dalhousie Housing Co-op registered as a waste generator of light fuels.	Entirety of the Site	Potential impact on soil and groundwater
4	**PCA Other: Waste Generation**	Southeast	100 m	Ecolog ERIS	111-440 Gloucester St. Between 2002 and 2018, the Bronson Place registered as a waste generator of various classes.	Eastern portion of the Site	Potential impact on soil and groundwater
5	**PCA Other:** Waste Generation	Southeast	170 m	Ecolog ERIS	Between 1986 and 2021, the Bronson Centre registered as a waste generator of various classes.	Eastern portion of the Site	Potential impact on soil and groundwater
6	**PCA Other:** Waste Generation	South	60 m	Ecolog ERIS	Between 1986 and 2020, St Vincent Hospital registered as a waste generator of various classes.	Western portion of the Site	Potential impact on soil and groundwater

APEC No.	O. Reg 153/04 Schedule D PCA	Direction from Phase One Property	Approximate Distance from Phase One Property (m)	Source Information	Remarks	APEC	Rationale
7	**PCA Other:** Scott's Manufacturing Directory	Southeast	170 m	Ecolog ERIS	Records of a periodic publisher at a civic/social organization were found. No timeline was given in the records.	Eastern portion of the Site	Potential impact on soil and groundwater
8	**PCA 41:** Petroleum Storage Tank and Oil Heating	On-Site	0	Site Interview	In the interview with the property manager, all three (3) properties had heating oil tanks previously that have since been removed.	Entirety of the Site	Potential impact on soil and groundwater
9	**PCA 30:** Importation of Fill Materials of Unknown Quality	On-Site	0	Site Visit	The Site has an asphalted parking and circulation area. It is anticipated that to fill material was imported to the property.	Entirety of the Site	Potential impact on soil and groundwater

Notes :
PEC – Potential Environmental Concern
PHC – Petroleum Hydrocarbons
PAH – Polycyclic Aromatic Hydrocarbons
VOC – Volatile Organic Compound

The potentially contaminating activities identified above have been evaluated by a qualified person to determine whether an Area of potential Environmental Concern will transpose on the Phase One Properties as a result of their presence within the Phase One Properties or Phase One Study Area. The rationale for excluding certain PCAs could be based on factors such as the site's location relative to the proposed groundwater flow direction, its distance from the site, or findings from previous environmental reports, among other considerations. Furthermore, alcohol-based compounds like methanol and acetone, although chemically derived, evaporate rapidly in the environment within 5 to 10 minutes. As a result, they were excluded as potential PCAs for the Site.

The Areas of Potential Environmental Concern (APEC) identified in the Phase One ESA are summarized in **Table 5 – Section 3.3** as follows:

APEC	Location	Comments	Contaminants of Potential Concern	Media Potentially Impacted
APEC 1	South 220 m	To address the impacts from a spill of a hydraulic oil spill from a garbage truck.	VOCs, PHCs, metals and PAHs	Soil and Groundwater
APEC 2	South 250 m	To address the impacts from a leak of furnace oil into the ground from a UST	VOCs, PHCs, metals and PAHs	Groundwater
APEC 3	On-Site	To address possible impacts associated with historical waste generation on-Site of light fuels	VOCs, PHCs, metals, PAHs and sulfur	Soil and Groundwater
APEC 4	Southeast 100 m	To address possible impacts associated with an up-gradient historical waste generation of PCBs, inorganics, paint, pigments and coating residues, oil skimmings and sludges.	PCBs, VOCs, PHCs, metals and PAHs	Groundwater
APEC 5	Southeast 170 m	To address possible impacts associated with an up-gradient historical waste generation of inorganic and organic lab chemicals, petroleum distillates, aliphatic solvents, alkaline wastes, oils and lubricants.	PCBs, VOCs, PHCs, metals, PAH, chlorides, nitrates, sulfates, general Inorganics	Groundwater
APEC 6	South 60 m	To address possible impacts associated with an up-gradient historical waste generation of pathological wastes, paint, pigments, coating residues, inorganic and organic lab chemicals, aliphatic solvents, petroleum distillates, pharmaceuticals, acid waste, alkaline wastes, waste oils and lubricants, photo processing wastes, heavy fuels, waste compressed gases, light fuels, oil skimmings, sludges.	PAHs, VOCs, PHCs, metals, general inorganics and PCBs	Groundwater
APEC 7	Southeast 170 m	To address possible impacts associated with the historical up-gradient manufacturer/publisher	PAHs, VOCs, PHCs, PCBs, and metals	Groundwater
APEC 8	On-Site	To address possible impacts associated with the heating oil tanks that were previously present in each of the Phase One	PAHs, VOCs, BTEX, PHCs, metals, general inorganics and PCBs	Soil and groundwater

		properties. The tanks have now since been removed.		
APEC 9	On-Site	To address possible impacts associated with possible fill material used to accommodate the parking/driveway area at the southwest corner of 593 Laurier Ave. W.	PAHs, VOCs, PHCs and metals	Soil and groundwater

Notes : PEC – Potential Environmental Concern
PHC – Petroleum Hydrocarbons
PAH – Polycyclic Aromatic Hydrocarbons
VOC – Volatile Organic Compounds

1 - Area of Potential Environmental Concern (APEC) means the area on, in, or under a Phase One Property where one or more contaminants are potentially present, as determined through the Phase One ESA, including through:

(a) Identification of past or present uses on, in, or under the Phase One Property and

(b) Identification of potentially contaminating activity.

2 - Potentially Contaminating Activity means a use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in a Phase One Study Area

3 - When completing this column, identify all contaminants of potential concern using the Method Groups as identified in the "Protocol for in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 9, 2004, amended as of July 1, 2011,

3.3.1 Physical Settings

The Site is situated on an area of glacial deposits consisting of till, plain; and local relief less than 5 m. Based on available mapping system reviewed, the bedrock in the vicinity of the Site is anticipated to include dark grey almost black limestone and limestone with some shaly partings (some sandstone in basal part) from the Ottawa/Eastview Formation.

3.3.2 Water Bodies and Areas of Natural Significance

Based on GIS mapping obtained through GeoOttawa, the nearest open body of water identified is the Ottawa River that is located approximately 560 m north of the Site.

There are no Areas of Natural Significance within the Phase One Study Area.

3.4 Deviations from Sampling and Analysis Plan

LRL did not deviate from the SOPs and forms outlined above. The location of the boreholes and monitoring wells in relation to the PCAs and APECs are presented in **Figure 3** and **Figure 4**. Monitoring wells were used to assess the groundwater flow direction and the groundwater quality at each screened interval.

The collection of groundwater samples was performed within 24 hours of purging as is required under the Ontario Regulation (O. Reg.) 153/04 (as amended).

No deviations occurred from the initial Sampling and Analysis Plan.

3.5 Impediments

There was no impediment occurred during the installation of boreholes and the monitoring well development.

4 INVESTIGATION METHOD

4.1 General

The Phase Two ESA involved various field activities to investigate the quality of the soil and groundwater and was comprised of the following components.

- Retaining public and private utility locator companies;
- Retaining a certified (MECP licensed well drillers) contractor for drilling the boreholes and installing the monitoring wells;
- Supervision and documentation of borehole drilling and monitoring well installation field activities;
- Soil characterization and logging;
- Soil sample collection for chemical analysis;
- Monitoring well development;
- Determining the presence of any non-aqueous phase free product and water elevation monitoring; and
- Groundwater sample collection for chemical analysis.

4.2 The investigation method followed the analysis plan for soil shown in Drilling

Prior to conducting subsurface activities on the Site, LRL contacted one private utility marking contractor in the Ottawa region, who was retained to obtain both private and public locates on behalf of LRL.

Five (5) boreholes were drilled on the Site until refusal is encountered. The boreholes were drilled on September 3th, 2024 using a CME-55 Truck mounted drill.

These borehole locations are presented in **Figure 5**. Four (4) borehole were drilled 'manually; using a cement core drill followed by either a jack hammer with a split spoon attachment, or a manual auger tool. These 'manual' boreholes were advanced within the western and eastern portions of the middle property (601 Laurier Ave. W) and western portion of the west property (605 Laurier Ave. W) extended to depths of between 0.45 and 1.2 m below ground surface (bgs), where they were terminated upon refusal over inferred bedrock. One (1) borehole (BH24-05) was completed into monitoring wells, with a maximum depth of 9.05 m bgs using NQ coring bit system. Flush mount well casing was installed to cover the monitoring well in the asphalt and grassed area. There were two monitoring wells installed in 2019, which were available for sampling.

4.2.1 Name of the Contractor

Downing Drilling Ltd., licensed in environmental and geotechnical drilling, was contracted to drill five (5) boreholes and advance one (1) of them into monitoring well. Typically, for a Phase Two ESA, a minimum of three (3) monitoring wells is required to assess the groundwater flow direction, and a minimum of one (1) monitoring well to address each area of potential environmental concern identified. Two (2) monitoring wells remain on the Site (593 Laurier Street) from the previous Phase II ESA by LRL in 2019. These monitoring wells were also installed by Downing Drilling Ltd.

4.2.2 Description of the Equipment Used

The five (5) boreholes were drilled using a rubber truck-mounted LC50 rig, equipped with a 50 mm diameter rotary hollow stem auger and a 0.6-meter split spoon sampler. The work was completed in conjunction with a geotechnical investigation, to support the proposed re-development application for the Site. Select intrusive locations were completed to greater depths as part of the geotechnical investigation, although this is not discussed further as part of the Phase Two ESA.

One (1) of the boreholes (BH24-05) was converted into a groundwater monitoring well. Typically, for a Phase Two ESA, a minimum of three (3) monitoring wells is required to assess the groundwater flow direction, and a minimum of one (1) monitoring well to address each area of potential environmental concern identified. Two (2) monitoring wells remain on the Site (593 Laurier Street) from the previous Phase II ESA had been installed by LRL in 2019.

The new monitoring well was fitted with a 31.75 mm (1.25 inches) diameter PVC pipe and a 3.0 meter well screen. A #2-graded silica sand was placed at least 0.4 meters above the top of the screen, followed by adding ¾" bentonite chips to seal the installation.

4.2.3 Description of Measures taken to Minimize Cross-Contamination

Sampling tools used to retrieve soil samples from the split spoon sampler were cleaned with Alconox solution, methyl-hydrate and rinsed with de-ionized water. The dedicated gloves were changed after each sample to prevent cross-contamination. The used gloves were placed in garbage bags and removed from the Site at the end of the drilling program.

4.2.4 The Frequency of Sample Collection

Two (2) samples were collected from BH24-02 at depths of 0.0-0.75 m and 0.75-1.20 m. For BH24-03, one (1) sample and a duplicate were taken from a depth of 0.0-0.45 m. Single samples were also obtained from

BH24-04 and BH24-05 at depth of 0.0-0.60 m. Insufficient soil was retrieved from BH24-01 at 0.0-0.35 m, and from BH24-05 at 0.60-1.00 m.

4.3 Soil Sampling

4.3.1 Description of Equipment Used for Soil Collection

The soil is removed from the split spoon and placed pre-labelled, laboratory prepared jars and methanol-filled vials and in clear plastic bags marked as BH24-02-SS1 (0.0-0.75 m), BH24-02-SS2 (0.75-1.20 m), BH24-03-SS1 (0.0-0.45 m), BH24-03-SSX (0.0-0.45 m), BH24-04-SS1 (0.0-0.60 m), and BH24-05-SS1 (0.0-0.60 m). Following field screening with the PID, samples were placed in appropriate laboratory-supplied, pre-labelled bottles and methanol-filled vials (for the analysis of VOCs, PAHs, PHC F1-F4, metals, general inorganics, etc.) and placed directly into ice-filled coolers for storage and transportation to Paracel Laboratories.

Geological Descriptions of Soil Samples

Exploratory Location BH/MW	Type	Geological Description	Depth Range (m bgs)	Soil Sample
BH24-01	Asphalt	50 mm	0.0 - 0.05	
	Granular based	Grey gravel, crushed stone, dry,	0.05 – 0.35	SS1
BH24-02	Coarse based	Sandy soil followed by gravel and rock with stone dust, brown to grey, dry.	0-0.75	SS1
	Granular based	Stone, brown to grey, dry	0.75 - 1.20	SS2
BH24-03	Corse based	Silty soil, brown, dry for 125 mm, grey gravel, crushed, stone, dry for 75 mm.	0.0 – 0.45	SS1, SSX
BH24-04	Coarse based	Silty soil fill for 100 mm, grey crushed stone, gravel for 100 mm	0.0 - 0.60	SS1
BH24-05	Coarse based	Traces of grass and rock, silty sand becoming finer, traces of gravel, brown, dry.	0.0 – 0.60	SS1
	Coarse based	Traces of grass and rock, silty sand becoming finer, traces of gravel, brown, dry.	0.60 – 1.00	SS2

4.4 Field Screening Measurements

Field screening of the soil involved the use of a PID to measure headspace concentrations of VOCs (as Isobutylene) in conjunction with visual and olfactory observations. This combination of field screening tools was used to determine the “worst-case” sample of the site and the selection of the samples for submission of VOC and PHC analysis.

4.4.1 PID Screening

Soil samples collected were screened for vapours using the RKI GX-6000 PID. The RKI GX-6000 was calibrated prior to use. Screening of VOC headspace concentrations were performed in accordance with LRL’s SOP for Field Measurement of Soil Screening Parameters.

VOC measurements were taken by collecting soil samples into dedicated plastic sampling bags and inserting into the bag while maintaining a tight seal around the probe. The measurements that represent the highest value detected within the first 30 seconds of the field screening and measurements were documented into the field notes. Soil samples with the highest combustible vapours detected were then submitted for laboratory analysis, as discussed below.

4.4.2 Chemicals Detected and Associated Detection Limits

The monitoring program was performed using the RKI GX-6000 gas meter equipped with a low range PID sensor and configured to detect VOCs calibrated to isobutylene (The RKI GX-6000 provides detection limit ranges between 0 – 100 ppm for VOCs).

4.4.3 Precision of the Measurements

Duplicate measurements were performed for the samples to assure the precision of the screening. Deviations greater than 30% of the initial reading indicated a non-reliable result due to random error. When a non-reliable result was encountered, the RKI GX-6000 was calibrated to zero in the fresh air and the corresponding sample was re-screened.

4.4.4 Procedure for Checking Calibration of Equipment

The RKI GX-6000 (PID) was calibrated by LRL staff with isobutylene calibration gas prior to use.

The calibration of the RKI GX-6000 is verified by operating the unit in a fresh air environment and ensuring zero readings for all parameters measured.

4.5 Groundwater: Monitoring Well Installation

Of the five boreholes drilled, one was converted into a new groundwater monitoring well. This well was strategically placed to facilitate sampling of groundwater related to Areas of Potential Environmental Concern (APECs) identified in the Phase One Environmental Site Assessment. Additionally, previously installed monitoring wells, which were set up by LRL during investigations in 2019, were utilized in this assessment to sample groundwater associated with these APECs and to evaluate the site's hydrological conditions. In total, three monitoring wells were used in this investigation. The locations of the monitoring wells are presented in **Figure 5**.

A 51 mm screen interval, 3.0 m in length, was placed at the base of the borehole with a PVC end-cap at the extent of the screen. The screen was encompassed with #2-grade silica sand that extends approximately 0.3 m above the well screen. The well was then sealed with ¾ inch bentonite chips above the sand pack to approximately 10 cm bgs. The 31.75 mm (1.25 inches) PVC well riser completed the length of the well and a J-plug was installed at the top of the riser. The monitoring well was encased by a flush mount casing.

4.5.1 Name of the Contractor

Downing Drilling Ltd., licensed in environmental and geotechnical drilling, was contracted to drill five boreholes and advance of them into monitoring well. Additionally, two monitoring wells had been installed by LRL in 2019.

4.5.2 Description of the Equipment

The monitoring well location was drilled by use of a truck-mounted CME-55 equipped with 50 mm outside diameter rotary hollow stem auger. The solid stem augers were 4 and 8 inches in diameter as measured from the auger flights. One (1) of the boreholes was drilled by NQ coring bit system to be completed into a monitoring well.

The monitoring well was constructed using the following materials:

- Dedicated polyvinyl chloride (PVC) individually wrapped riser pipe and screen;
- 31.75 mm (1.25 inches) diameter Schedule 40 PVC pipe capped at the top;
- 31.75 mm (1.25 inches) diameter Schedule 40 No. 10-slot PVC screen with a screen length of 3.0 m and capped at the base with a PVC slip cap;
- Sand pack to approximately 0.3 m above the top of the well screen;

- Bentonite seal to at least 0.3 m above the sand pack;
- A J-Plug was added to the top of the PVC riser; and,
- Flush mounts were installed to cover the monitoring well on the ground.

4.5.3 Measures to Minimize Potential Cross-Contamination

There are dedicated Schedule 40 PVC pipes and screens encased in a plastic sleeve that is removed prior to installation. Once the monitoring well was installed, the sterile dedicated tubing was placed in for the monitoring well development.

A dedicated sampling device consisting of a sampling tube and foot valve attached was used to collect groundwater samples. The groundwater was placed directly in the pre-labelled laboratory-supplied sample jars and vials and was tightly sealed and placed directly into a cooler for delivery to the laboratory. Sterile butyl nitrile gloves were changed for each well to ensure no cross-contamination during the sampling program.

4.5.4 Frequency of Sample Collection during Drilling

Groundwater sampling was not performed during borehole drilling or monitoring well installation.

4.5.5 Monitoring Well Development

Prior to well development, the groundwater elevation at the monitoring well was established using a Solinst Oil/Water interface probe. The interface probe was used to assess the monitoring well for the presence of Light Non-Aqueous Phase Liquids (LNAPLs) and Dense Non-Aqueous Phase Liquids (DNAPLs). If a free product was present, the thickness of the free product would be measured and recorded, and the actual groundwater surface was corrected accordingly. The interface probe was thoroughly washed with de-ionized water and dried with a clean cloth prior to use at the new monitoring well.

Subsequent to the groundwater elevation survey, each well was developed by the removal of at least three (3) times the dry volume of water (due to the limited amount of groundwater in the wells) contained in each well using the foot valve system. The purged groundwater removed was collected in dedicated five (5) gallon pails (11.5 litres in total) to inspect the removed water for visible identifiers or sheen. The amount of water removed from each well was recorded and is summarized in **Table 7 – Section 4.5.5** as follows.

Table 7 – Section 4.5.5: Monitoring Well Development

Monitoring Well	Groundwater Level (m bgs)	Depth of water column (m)	Required Purge Volume (L)	Date of Development/Purging	The volume of Fluid Removed from Well (L)
MW19-01	6.83	0.77	10.5	September 06, 2024	2.0
MW19-02	7.79	3.69	72.4	September 06, 2024	2.5
MW24-05	5.49	3.63	28.7	September 06, 2024	7.0

4.6 Groundwater: Field Measurements of Water Quality Parameters

Groundwater sampling was conducted using low-flow sampling methodology as described below:

- The water was collected from each well using dedicated foot valve and tubing. Measurements of total dissolved solids, conductivity, temperature, and pH were recorded for each purged water until at least two consecutive readings had stabilized as per the criteria below:
    - Drawdown of <0.10 m was achieved* over the duration of the purging and sampling with consideration to initial expected drop and subsequent stabilization;
    - pH value range of +/- 0.1;
    - Conductivity range of +/- 3%;
    - Total Dissolved Solids range of +/- 3% of the reading,
    - Temperature within +/- 3%;
- In wells with continuous drawdown >0.1 m and where there was little to no restoration of groundwater over a 10 – 20-minute period, intervals of several hours were allowed between dry purges to facilitate field measurements after each dry well volume. The wells were subsequently given adequate recovery time, approximately three days, prior to sampling.

Table 8 – Section 4.6 summarizes select steady-state water quality parameters measured at each well, prior to the collection of groundwater samples.

Table 8 – Section 4.6: Instrument Readings at Steady-State Conditions

Date	Location	Temp. °C	TDS (ppm)	Electrical Conductivity (mS/cm)	pH
September 06, 2024	MW19-01	17.7	1787	3.57	7.04
September 06, 2024	MW19-02	18.4	340	0.76	7.37
September 06, 2024	MW24-05	17.1	160	0.26	8.91

Following each use and prior to the commencement of the subsequent groundwater sample, the Hanna Instrument probe was flushed with de-ionized water and dried thoroughly.

4.7 Groundwater: Sampling

Groundwater samples were collected on September 6th, 2024, following the field measurements of the water quality parameters, in accordance with LRL's SOP for Groundwater Sampling. Groundwater samples were collected from the well as soon as there was sufficient groundwater in the well for sample collection. Hanna multimeter was used to assess the water quality for temperature, conductivity, TDS, and pH.

The jars and vials were prepared in advance by the laboratory. The pre-labelled jars were filled in the field sealed when full, packaged in bubble wrap and placed into an ice-filled cooler box to maintain temperatures below 10 °C for storage and transportation. The chain of custody form was completed in the field, placed in a protective wrap, and placed into the cooler box for delivery to the laboratory. A copy of the Chain of Custody was retained and is attached to the report in **Appendix B**.

4.8 Sediment: Sampling

The Phase Two Property did not contain a body of water as defined under Ontario Regulation 153/04 (as amended); therefore, sediment was not present in the investigation area and no sediment sampling was conducted.

4.9 Analytical Testing

The soil and groundwater samples were submitted to Paracel Laboratories Ltd. (Ottawa, Ontario), analytical laboratories accredited by the Canadian Association for Laboratory Accreditation (CALA). The analyses were performed in compliance with the MECP Laboratory Services Branch, "Protocol for Analytical Methods Used in the Assessment of Properties under Past XV.1 of the Environmental Protection Act of the Environmental Protection Act, July 1, 2011".

One (1) field duplicate sample was collected for the samples, and one (1) trip blank for QA/QC purposes was placed in the cooler for the sampling of VOC parameters in groundwater. The duplicate was labelled generally similar to that of the actual parent sample location and noted in the field documentations. The location and identity were not provided to the laboratory.

The required detection limits (RDLs) for all parameters were met and there are no RDLs that exceed the applicable site condition standard.

4.10 Residue Management Procedures

4.10.1 Soil Cuttings – Drilling

The cuttings on this site were used to backfill the boreholes due to the lack of visual or olfactory evidence of potential contaminates.

4.10.2 Water from Well Development and Purging

Water generated from the well development and the purging of the wells was spread across the Site. The groundwater encountered at the Site did not exhibit any visual or olfactory evidence of chemical impact, sheen, or NAPLs.

4.11 Elevation Surveying

An elevation survey was carried out using a Spectra Precision, LL300 N Self-Leveling Laser Level. The results of the elevation survey are summarized on the borehole logs and the cross-sectional drawings for each borehole, new and existing monitoring well, including in **Appendix A**, and **Figures 8A** through **Figure 8J**, respectively.

4.12 Quality Assurance and Quality Control Measures

For Quality Assurance and Quality Control Measures (QA/QC), one (1) sample was collected as a duplicate sample for every ten (10) sample parameters collected in the field for soil and groundwater. In addition, a trip blank was carried in the cooler when sampling the groundwater for VOCs.

The analysis of QA/QC for both the soil and groundwater were within appropriate range of analytical results with the duplicates taken in the field.

No VOC concentrations were encountered in the trip blank above the various reportable detection limits (RDL), thus indicating that the collected groundwater sample was also unlikely to be influenced by ambient air during transport.

The relative percent difference (RPD) values were calculated and determined that all the parameters measured against their respective duplicate versus the actual samples were met.

4.12.1 Laboratory Supplied Sample Containers and Shipment Procedures

Table 9 – Section 4.12.1 below provides a detailed description of the sample containers, preservation, labelling, handling, and custody for the samples submitted.

Table 9 – Section.12.1: Sampling Parameters and Containers

Parameter	Sample Container	Preservative	Handling & Custody Samples
Soil Samples			
Metals, PHCs (F2-F4), PAHs, PCB, General Inorganics.	Clear glass Teflon lined lids	None	Soil samples were collected from the split-spoon sampler by hand or with the use of a clean steel trowel and transferred to a zip lock bag for field screening. Samples taken for laboratory analysis were placed in pre-prepared and labelled laboratory-supplied sample containers, observing the laboratory requirements for specific sample volumes according to the testing required. The soil samples collected for laboratory analysis were immediately placed into ice-filled cool boxes for storage and transportation to the laboratory. On arrival, all samples were removed from the ice-filled cool box and immediately refrigerated pending final chemical analysis sample selection. Selected samples for laboratory analysis were placed in ice-filled cool boxes and dispatched to the accredited chemical laboratory under Chain of Custody procedures.
VOCs, PHC (F1)	Vial	Methanol	
Groundwater Samples			
PHCs (F2-F4).	Amber Glass Bottle	HCL	Groundwater samples were collected using with dedicated Waterra foot valves and tubing. Dedicated foot valves and tubing was used for each well. Groundwater samples and dispensed directly into the appropriate pre-labelled, laboratory-supplied groundwater sample containers. The collected groundwater samples were immediately placed into ice-filled cool boxes for storage and transportation to the laboratory. On arrival at the laboratory, all samples were removed from the ice-filled cool box and immediately refrigerated pending final chemical analysis sample selection. Selected samples for laboratory analyses were placed in ice-filled cool boxes and dispatched to the accredited chemical laboratory under Chain of Custody procedures.
VOCs, PHC (F1)	Vials	NaHSO4	
Semi-Volatiles, PCBs	Amber Glass Bottle	No preservatives	
Metals	Polypropylene	HNO_3	
NO2, NO3, Sulphate	Polypropylene	No preservatives	

Soil samples were collected using dedicated prepared 250 mL jars, syringes, and vials provided by Paracel Laboratories Ltd. Soil samples that required VOC analysis involved placing approximately 5 g of soil into dedicated methanol- filled vials. This method was used to ensure no loss of VOCs during transportation. The vials were placed in the cooler containing the trip blank for VOC analysis. The cooler was placed in ice to ensure the temperature of the samples.

4.12.1 Description of Equipment Cleaning Procedures

The boreholes were drilled utilizing hallow stem augers. Split spoon core samples of soil were obtained during the drilling was collected via a 0.60 m in length split- spoon sampler. The split-spoon samplers were washed and scrubbed with Alconox mixed in water and rinsed between each use to prevent cross-contamination on re-use. The rinse water was placed into the drums for later offsite disposal.

Soil samples were collected from the split-spoon sampler by hand (using dedicated nitrile gloves that were disposed of after each sample) to mitigate cross-contamination. If necessary, soil samples contained in the split-spoon sampler were removed with the aid of a stainless-steel trowel. Subsequent to soil sample collection, each split-spoon sampler and any other hand-tool used for sample collection were immediately cleaned in accordance with LRL's SOP, as follows:

- Scrubbed with a wire brush in an Alconox solution (a powdered precision cleaner, that is biodegradable and has interfering-residue free and corrosion-inhibiting properties);
- Rinsed with distilled or de-ionized water;
- Hannah instrument was flushed clean with de-ionized water; and,
- All fluids captured for offsite disposal were clearly marked and labelled.

The soil samples were placed directly into pre-labelled jars specific to the chemical analysis desired. The location of each sampling point is recorded, and the pre-labelled jars were placed in coolers and packed with ice. The remaining sample after classification were placed in a large zip lock bag for further field screening by means of PID for vapour headspace measurements.

4.12.2 Description of Field Quality Control Measures

Soil samples including the duplicate were placed into laboratory-provided bottles and vials that were clearly labelled with the sample location, date, and chemical analysis to be conducted on each sample jar. The same labelling was applied to the chain of custody forms. Dedicated nitrile gloves were used for each sample collected in the field and disposed of immediately after use.

VOC samples were collected in methanol vials filled by the laboratory and an exact amount of VOC impacted soil was added to the vials by means of a syringe that captures 5 ml of soil to be added to the vials. The vial caps are tightly sealed and placed directly in a bubble cap package and placed upright into a cooler packed with ice. Sample screening by means of a PID, olfactory clues, discoloration, soil characteristics, and texture were used to determine which samples were to be submitted for further analysis. Trip blank was supplied in advance of sampling by the laboratory for placement into the sample cooler and was carried in the cooler until turn over to the laboratory.

Samples for analysis of metals parameters were placed into amber-coloured jars prepared by the laboratory sealed with a Teflon-lined cap. The jars were filled to the brim and capped tightly to minimize the vapour headspace in the jar. These jars were placed in bubble wrap containers and placed into a cooler packed with ice. The selection of the samples for analysis was based on the field screening method outlined in LRL's SOPs.

Groundwater samples, including duplicates, were placed into laboratory prepared (with appropriate preservatives) and supplied bottles and vials. The vials and jars were filled to the brim to minimize VOC loss. Trip blank for VOC analysis was provided by the laboratory in advance of sampling. The trip blank was placed in the cooler box at the start of the day that groundwater samples were collected.

The following packaging and transportation procedures were followed:

- Correctly labelled samples were packed in ice-filled cool boxes to maintain temperatures below 10°C during sample collection and transportation from the Phase Two Property to the laboratory and the chemical testing to Paracel Laboratories Inc.; and

- A copy of the chain of custody form was maintained.

4.12.3 Deviations from the Quality Assurance and Quality Control Program

There were no deviations from the Quality Assurance and Quality Control Program.

5 REVIEW AND EVALUATION

5.1 Geology

The entire property is situated on an area of glacial deposits consisting of till, plain; and local relief less than 5 m. Based on available mapping system reviewed, the bedrock in the vicinity of the Site is anticipated to include dark grey almost black limestone and limestone with some shaly partings (some sandstone in basal part) from the Ottawa/Eastview Formation.

5.1.1 Geological Conditions Encountered

Five boreholes were advanced across the Site. The subsurface soil consists predominantly of coarse-grained materials. The soil composition varies by depth and location, ranging from sandy soil to grey gravel and crushed brown stone. Drilling refusal due to bedrock was encountered in all boreholes at depths between 0.45 and 1.2 m bgs.

No sheen or evidence of Light Non-Aqueous (LNAPL) and Dense Non-Aqueous Phase Liquid (DNAPL) as free product was observed in any of the monitoring wells. No olfactory evidence of hydrocarbon odours were detected in the development water removed from the three monitoring wells. No odour indicative of possible PHC or VOC impacts, as well as a sheen, was encountered in the groundwater at the time of development of the monitoring wells.

The new groundwater monitoring well was positioned to identify potential groundwater impacts associated with the PCAs and APECs identified on the Site. Groundwater contours and inferred groundwater flow direction are presented in **Figure 6.** Based on the elevation encountered, the groundwater flow direction across the Site is to north/northwest towards the Ottawa River.

5.1.2 Elevations Geodetic Benchmark

The ground surface elevations and monitoring wells were surveyed and referenced to a temporary benchmark, established as the northeast upper rim of the fire hydrant located south of Laurier Avenue West. This benchmark was assigned an arbitrary elevation of 100.00 meters. Subsequent water level measurements were taken relative to the top of the fire hydrant.

5.1.3 Aquifer & Aquitard Properties

The soil stratigraphy indicated that the overburden was primarily comprised of coarse-grained materials. The MW19-01, MW19-02, and MW24-05 monitoring wells were developed to a depth of 7.60 m, 9.11 m, and 9.05 m bgs and exhibited a static water level of 6.83 m, 7.79 m, and 5.42 m bgs, respectively.

5.1.4 Rationale for the Choice of Aquifer

There is only one (1) aquifer onsite and only one (1) aquifer was investigated as it lies directly below the Site. Since some of the COCs were encountered based on the onsite PCAs and APECs in the aquifer that was above the SCS, further vertical delineation of the aquifer might be required by developing deeper monitoring wells on-site. The following exceedances were encountered at the Site:

5.1.5 Confirmatory Soil and Groundwater Monitoring Well Design and Rationale

Monitoring Well/ Borehole	Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase Two Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern[3]	Media Potentially Impacted (Groundwater, soil, and/or sediment)
MW19-01, MW19-02, MW24-05	APEC 1	60 m South of the Site. St. Vincent Hospital located at 60 Cambridge Street first appeared on the 1901 FIP and is still active in present day.	**Other PCA:** release of toxic contaminants into the Environment	Off-site	PAHs, VOCs, PHCs, Metals, General Inorganics, EC, pH PPCPs, PCBs, BTEX, TCE, chloroform.	Groundwater
MW19-01, MW19-02, MW24-05	APEC2	140 m Southeast of the Site, Bronson Ave and Nepean St intersection	**PCA Other: Spill** In 2008, OC Transpo bus leaked 10 L of antifreeze into ground.	Off-Site	VOC, PHC, metals, and PAH	Groundwater
	APEC2	250 m south of the Site, 28 Primrose Ave.	**PCA Other: Spill** In 2002, a garbage truck leaked an unknown amount of hydraulic oil.	Off-Site	VOC, PHC, metals, and PAH	Groundwater
	APEC2	250 m south of the Site, 54 Primrose Ave	**PCA Other: Spill** In 2008, an unknown amount of furnace oil leaked into the ground from a UST.	Off-Site	VOC, PHC, Metals, and PAH.	Groundwater
	APEC 3	Entirety of Site	**PCA Other: Waste Generation** In 2022, the Dalhousie Housing Co-op registered as a waste generator of light fuels.	On-Site	VOC, BTEX, PHC, metals, PAH, sulfur, and MTBE	Soil and Groundwater
	APEC 3	100 m Southeast of the Site, 111-440 Gloucester St.	**Other PCA: Waste Generation** Between 2002 and 2018, the Bronson Place registered as a waste generator of various classes.	Off-Site	PCBs, VOC, PHC, BTEX, metals, PAH	Groundwater

BH24-01, BH24-02, BH24-03, BH24-04, BH24-05, MW19-01, MW19-02, MW24-05	APEC 3	170 m southeast of the Site, 211 Bronson Ave	**Other PCA: Waste Generation** Between 1986 and 2021, the Bronson Centre registered as a waste generator of various classes.	Off-Site	PCBs, VOC, BTEX, PHC, metals, PAH, phenols, chlorides, nitrates, sulfates, general Inorganics, EC, pH, Formaldehyde	Groundwater
	APEC 3	60 m south of the Site, 60 Cambridge St	**PCA Other: Waste Generation** Between 1986 and 2020, St Vincent Hospital registered as a waste generator of various classes.	Off-Site	PCBs, VOC, BTEX, PHCs, metals, PAHs, general inorganics, EC, pH, Pathogens, PPCPs	Groundwater
MW19-01, MW19-02, MW24-05	APEC 4	115 m south of the Site, 192 and 196 Bronson Ave, 33 and 34 Cambridge Street N.	**PCA Other: Historical record of site conditions** from a previous re-development (The previous developments were demolished, and a multi-unit residential building was constructed).	Off-Site	Asbestos, VOC, PHC, Metals, PAH, PCB, general inorganics, EC, pH	Groundwater
MW19-01, MW19-02	APEC 5	170 m southeast of the Site, 211 Bronson Ave	**PCA Other: Records of a periodic publisher at a civic/social** organization were found. No timeline was given in the records.	Off-Site	PAH, VOC, PHCs, PCB, Metals, TCE, PCE, and asbestos	Groundwater
BH24-01, BH24-02, BH24-03, BH24-04, BH24-05, MW19-01, MW19-02, MW24-05	APEC 6	Entirety of Site	**PCA 41: Heating oil tanks** that were previously present in the properties. The tanks have now since been removed.	On-Site	PAH, VOC, BTEX, PHCs, Metals, and MTBE, general inorganics, PCBs, EC, pH	Soil and Groundwater
BH24-01, BH24-02, BH24-03, BH24-04, BH24-05, MW19-01, MW19-02, MW24-05	APEC 7	On-Site, southwest corner of 593 Laurier Ave.	**PCA 30:** Importation of Fill Materials of Unknown Quality	On-Site	PAH, VOC, PHCs, and Metals	Soil and Groundwater

5.2 Groundwater Elevations

Based on available interactive mapping systems, including The Atlas of Canada – Toporama, the groundwater flow direction is interpreted to be to the north/northwest towards the Ottawa River. **Figure 6** shows the groundwater flow direction based on the data collected at the time of this assessment.

5.2.1 Discussion and Rationale for Location and Screen Intervals

The new and old monitoring wells were placed generally so that the triangulation of the groundwater elevations could be conducted to determine the groundwater flow direction. A 3.0 m screen was used to straddle the groundwater table for the interception of LNAPLs and the potential of free phase and dissolved fractions of DNAPLs, as well as providing sufficient area for placement of a proper bentonite seal.

5.2.2 Interphase Probe

No LNAPLs or DNAPLs were detected with the interphase Probe during the measuring of water levels before and after well development. The monitoring wells were purged/developed via waterra tube and foot valve.

5.2.3 Product Thickness

No free product was encountered.

5.3 Groundwater: Hydraulic Gradient

5.3.1 Horizontal Hydraulic Gradient

The Horizontal hydraulic gradient were determined as follows:

Table 14 – Section 6.3.1: Hydraulic Gradient

Parameter	Hydraulic Gradient (m/m)	Remarks
Maximum	0.042	Between MW19-01 and MW19-02
Minimum	0.036	Between MW19-01 and MW24-05
Average	0.039	

5.3.2 Vertical Hydraulic Gradient

The vertical hydraulic gradient was not established for the subject Site at the time of this assessment.

5.4 Fine-Medium Soil Texture

Native subsurface soil was not encountered. Fill was encountered above the bedrock which is considered coarse-grained. Under Ontario Regulation 153/04 (as amended), “coarse-textured soil” is soil that contains more than 50 percent by pass of particles that are 75 micrometers (um) or larger in mean diameter.

5.4.1 Rationale for the Use of Fine – Medium Soil Texture

Not applicable.

5.4.2 Results of the Grain Size Analysis for Fine – Medium Soil Texture

Not applicable

5.4.3 Rationale for the Number of Samples Collected and Analysed for Grain Size Analysis

Not applicable

5.5 Soil: Field Screening

No olfactory or visual (i.e. staining or free phase) evidence of petroleum hydrocarbon impacts were observed in any of the soil samples collected. In addition, headspace readings were recorded using a photo-ionization detector (PID) calibrated to hexane (HEX) and isobutylene (IBL). Observations were confirmed through CSV concentrations measured. CSV concentrations ranged between non-detect (<0.1 ppm) for all the boreholes except BH24-02, where CSV was measured at 0.6 ppm and 1.8 ppm at the depths between 0-0.75m and 0.75-1.2 m, respectively. These CSV values are considered relatively low for typical soil vapours. CSV measurements are summarized in the borehole logs in **Appendix A**.

5.6 Soil Quality

The Phase One ESA Conceptual Site Model identified the following Contaminants of Concern in the soil in relation to the PCAs and seven (7) APECs that may affect the Phase Two Property.

- Polycyclic Aromatic Hydrocarbons (PAHs);
- Metals;
- General Inorganics;
- Polychlorinated Biphenyl (PCB);
- Volatile Organic Compounds (VOCs);
- Petroleum Hydrocarbons (PHCs)– F1 through F4;

On September 3, 2024, a total of six (6) samples, including one duplicate, were submitted to assess the potential contamination levels in the soils beneath the Site. All soil analysis results were compared to the MECP Table 7 Generic Site Condition Standards for shallow soils in non-potable groundwater conditions. The results of the soil analysis, along with the corresponding MECP standards, are presented in **Table B** and **Table D**. At least one soil sample was collected for chemical analysis from each borehole, except for BH24-01 (0.0 - 0.35 m) and BH24-05 (0.60 m -1.00 m), where there was insufficient soil available for retrieval during sampling. The Laboratory Certificate of Analysis can be found in **Appendix B.**

VOCs parameters analysed were not detected in the soil samples submitted for laboratory analysis, with the exception of Trichlorofluoromethane and Xylenes in sample 2-SS2, collected from borehole BH24-2 at depths of between 0.6 and 1.2 m below grade. The values reported are below the appliable Table 7 site condition standards. Petroleum hydrocarbons fractions F2 through F4 were detected in the samples submitted BH24-3 (3-SS1) and its corresponding duplicate sample (3-SSX); BH24-4 (4-SS1) and BH24-5 (5-SS1). The concentrations of petroleum hydrocarbons detected were below the applicable Table 7 site condition standards as presented in the included **Table B**. PCB's were not detected in the soil samples submitted for analysis (<0.05 µg/g).

As presented in **Table C**, PAH parameters were detected in Sample 4-SS1, collected from borehole BH24-04 at depth of between 0.0 and 0.6 m bgs. Select PAH parameters were reported with concentrations above the applicable Table 7 site condition standards, which are summarized as follows:

- Anthracene reported with a value of 1.24 µg/g, above the standard of 0.67 µg/g;
- Benzo[a]anthracene reported with a value of 1.48 µg/g, above the standard of 0.5 µg/g;
- Benzo[a]pyrene reported with a value of 1.1 µg/g, above the standard of 0.3 µg/g;
- Benzo[b]fluoranthene reported with a value of 0.98 µg/g, above the standard of 0.78 µg/g;
- Dibenzo[a,h]anthracene reported with a value of 0.17 µg/g, above the standard of 0.10 µg/g;
- Indeno [1,2,3-cd] pyrene reported with a value of 0.61 µg/g, above the standard of 0.38 µg/g;
- Fluoranthene reported with a value of 6.06 µg/g, above the standard of 0.69 µg/g; and

- Phenanthrene reported with a value of 6.21 µg/g, above the standard of 0.10 µg/g.

The remaining PAH parameters detected had concentrations below the appliable site condition standard. PAH were not detected in the remaining soil sample submitted for the respective analysis.

Various metal-based parameters were detected in the soil samples submitted for analysis, although no exceedances to the Table 7 site condition standard were encountered with one (1) exception. Sample 2-SS1, collected from borehole BH24-2 from depths of between 0.0 and 0.6 m bgs had a concentration of lead of 214 µg/g, surpassing the Table 7 site condition standard of 120 µg/g.

General inorganic parameters analysed were reported within the applicable Table 7 site condition standard. O. Reg. 153/04 does not have set limits for nitrates, nitrites or sulphates. Levels of nitrates and sulphates were detected in the samples collected with values ranging from 1 through 8 µg/g, and from 13 through 334 µg/g, respectively.

5.6.1 Location, Depth of Sampling

The following table describes the location and depth of the specific samples submitted for chemical laboratory analysis, and the results of the analyses in comparison to MECP Table 7 for Shallow Soils in a Non-Potable Groundwater Condition.

Table 16 – Section 5.6.1: Soil Chemical Laboratory Analysis

Borehole ID	Sample ID	Depth (m bgs)	Date Sampled	Chemical Analysis						Standard Exceedance (Table 7 RPI for coarse soils)
				PHC F1 – F4	VOCs/F1	PAHs	PCBs	General Inorganic	Metals	
BH24-01	SS1	0.05 – 0.35	September 3, 2024	✓	✓	✓	✓	✓	✓	No Exceedances
BH24-02	SS1	0-0.75	September 3, 2024	✓	✓	✓	✓	✓	✓	Lead
	SS2	0.75 - 1.2	September 3, 2024	✓	✓	✓	✓	✓	✓	No Exceedances
BH24-03	SS1	0.0 – 0.45	September 3, 2024	✓	✓	✓	✓	✓	✓	No Exceedances
	SSX	0.0 – 0.45	September 3, 2024		✓		✓			No Exceedances
BH24-04	SS1	0.0 – 0.4	September 3, 2024	✓	✓	✓	✓	✓	✓	Anthracene Benzo[a]anthracene Benzo[a]pyrene Benzo[b]fluoranthene Dibenzo[a,h]anthracene Indeno [1,2,3-cd] pyrene Fluoranthene Phenanthrene
BH24-05	SS1	0.0 – 0.6	September 3, 2024	✓	✓	✓	✓	✓	✓	No Exceedances
	SS2	0.6 – 1.0	September 3, 2024	✓	✓	✓	✓	✓	✓	No Exceedances

Notes

XXX	Duplicate sample collected and submitted for laboratory analysis
XXX	Exceedances to the applicable Table 7 site condition standards

The Laboratory Certificates of Analysis are presented in **Appendix B** and the soil analytical results are presented in **Table B** through **Table D**, included at the end of this report in the Appendices.

Based on the analysis, select parameters were observed to exceed the appliable site condition standards. These exceedances, although summarized above in the **Table 16**, are further discussed herein:

- Sample **2-SS1** collected from BH24-2 at depths of 0.0 and 0.6 bgs encountered elevated concentrations of **Lead.** This may be associated with importation of fill materials present in the area between 593 and 601 Laurier Avenue properties.; and
- Sample **4-SS1** collected from depth BH24-04 from depths of between 0.0 and 0.6 m bgs encountered high concentrations of various **PAHs** parameters exceeding the Table 7 limits**.** These levels may be related to the previous oil heating tank and associated oil heating combustion or un-reported spills, use of fill material of poor quality, or the historical waste generated from light fuel activities by the Dalhousie Housing Co-op on the Site.

The full extent of the contamination has not been vertically or horizontally delineated. Refusal was encountered in each borehole location at a depth of 0.45 to 1.20 m, and generally CSV readings measured at the depths from 0.0 to 1.20 m bgs for each sample were considered relatively **low** for typical soil vapours.

The PAH exceedances encountered in BH24-04 appear to be limited to the general central portion of 601 and 603 Laurier Avenue West. Delineation is complete to the northeast and southwest by BH24-02 and BH24-05, respectively. Furthermore, it appears to be limited to the overburden, which as previously discussed is shallow, therefore the 601 and 603 Laurier Avenue West development structures likely further isolate these impacts. The anticipated extents of the PAH plum in the soil are presented in **Figure 8C**.

In conjunction with the findings of the previous (2019) Contamination Delineation program, discussed above in Section 2.2.3, metal impacts appear to extend across the northern and southeastern portion of 593 Laurier Avenue West. It can be assumed that these exceedances extend beyond BH24-04 although both BH24-01 and BH24-05 was found to have metal-based parameters within the acceptable limits.

5.6.2 Analytical Results to SCS

The environmental quality of the soil at the Site was compared to the MECP Table 7 RPI Standard. The Laboratory Certificate of Analysis is presented in **Appendix B**.

5.6.3 Contaminants of Concern (COC)

The contaminants of concern identified in the soil on the property are as follows:

- PAHs, including Anthracene; Benzo[a]anthracene; Benzo[a]pyrene; Benzo[b]fluoranthene ; Dibenzo[a,h]anthracene ; Indeno [1,2,3-cd] pyrene; Fluoranthene; Phenanthrene;
- Metals: Lead.

5.6.4 Chemical and Biological Transformations

No chemical or biological transformations were noted on, in or under the Phase Two Property.

5.6.5 Source of Contaminant Mass Contributing to the Groundwater

The soil on Site was found to exceed for petroleum-based parameters, including PAHs. The likely sources of PAHs could be the spill from the previous oil heating tank, combustion, or use of fill material, or waste generated from light fuel activities by the Dalhousie Housing Co-op on the Site. Among the select metals and VOCs and lead exceeded the applicable site condition standards.

5.7 Ground Water Quality

The Phase One ESA Conceptual Site Model identified the following Contaminants of Concern in relations to PCAs and APECs that may affect the Phase Two Property:

- Polycyclic Aromatic Hydrocarbons (PAHs);
- Metals;
- General Inorganics;
- Nitrite, Nitrate, Sulphate;
- Polychlorinated Biphenyls (PCBs);
- Volatile Organic Compounds (VOCs);
- Petroleum Hydrocarbons (PHCs)– F1 through F4

On September 6th, 2024, a total of four (4) groundwater samples including one (1) field duplicate groundwater sample, and one (1) trip blank for VOCs was analyzed as follows, to appropriately evaluate the level of chemical impact to the groundwater beneath the Phase Two Properties in the areas of the various APECs. The samples were analyzed for PHC fractions F1 to F4; VOCs, PAHs; metals; and general inorganics. LRL returned to the Site on October 3, 2024, to collect an additional sample from each available groundwater monitoring well for PCB analysis.

5.7.1 Location and Sample Depth

Table 17 – Section 5.7.1 below describes the location and depth of the specific groundwater samples submitted for chemical laboratory analysis, and the results of the analyses in comparison to Table 7 site condition standards for coarse-grained soils.

Table 17 – Section 5.7.1: Groundwater Chemical Laboratory Analysis

Well ID	Sample ID	Depth (m asl)	Date Sampled	Chemical Analysis						Standard Exceedance (Table 7 RPI for coarse sand)
				PHCs F1–F4	VOCs	PAHs	PCBs	Metals	Inorganics	
BH19-01	MW19-01	92.60	September 06, 2024	✓	✓	✓	✓	✓	✓	**PHCs – F2**
BH19-02	MW19-02	90.48	September 06, 2024	✓	✓	✓	✓	✓	✓	No Exceedances
BH24-05	MW24-05	91.25	September 06, 2024	✓	✓	✓	✓	✓	✓	**Chloroform**
BH24-05 Duplicate	MW-XX	91.25	September 06, 2024	✓	✓	✓	✓	✓	✓	**Chloroform**
--	Field Blank	--	--	✓	✓	✓	✓	✓	✓	No Exceedances
--	Trip Blank	--	--		✓					No Exceedances

Notes

XXX	Duplicate sample collected and submitted for laboratory analysis
XXX	Exceedances to the applicable Table 7 site condition standards

The Laboratory Certificates of Analysis are presented in **Appendix B** and detailed assessments of the groundwater analytical results are presented in **Table E** and **Table G**, included at the end of this report in the Appendices.

The environmental quality of the groundwater at the Phase Two Property was compared to the MECP Table 7 Standards for non-potable groundwater.

MW19-01 analysis results confirmed the PHC-F2 concentration (308 µg/L) exceeding the Table 7 applicable standard of 150 µg/L. PHC-F4 was also present in the MW19-01 groundwater sample, however its level was not above the Table 7 standard limit. The remaining petroleum-based parameters were not detected in the groundwater sample collected. MW19-02 and MW24-05 had comparable VOC and PHC concentrations with levels generally being less than the laboratory detection limits. PHC-F3 was detected in both samples with values of 194 and 357 µg/L, respectively, below the 500 µg/L Table 7 site condition standard. PHC-F4 was also detected in MW24-05 with a value of 346 µg/L, respectively, below the 500 µg/L Table 7 site condition standard. Chloroform in MW24-05 was also detected above the appliable Table 7 site condition standard of 2 µg/L with a value of 15.2 µg/L. Sample MW-XX is a duplicate sample collected from MW24-05, which exhibited comparable detections and exceedances. Toluene was also detected in MW24-05 with a value of 0.6 µg/L, less than the Table 7 site condition standard of 320 µg/L.

PAH parameters were not detected in MW19-01 or MW24-05. Detections were encountered in MW19-02, however the levels were less than the Table 7 site condition standards. Metals were detected in all samples collected, however, no exceedances were encountered. Chloride and free cyanide parameters were detected although no exceedances were encountered.

As presented above in **Table 17 – Section 5.7.1,** Chloroform exceedance was determined in MW24-05 and its associated duplicate with levels of 15.2 and 14.5 µg/L, respectively, however, this exceedance can be attributed to the use of chlorinated municipal water during coring. The PHC F2 exceedance in MW19-01 is also presented above.

5.7.2 Documentation of Field Filtering

Field Filtering was conducted for metals only. The Certificates of Analysis show no lab filtering for the samples submitted for this Site.

5.7.3 Analytical Results to SCS

The environmental quality of the groundwater at the Phase Two Property was compared to the MECP Table 7 RPI Standard.

The Laboratory Certificate of Analysis is presented in **Appendix B.**

5.7.4 Contaminants of Concern (COC)

The contaminants of concern identified in the groundwater on the property are as follows:

- PHC-F2 for MW19-01; and
- Chloroform for MW24-05.

5.7.5 Chemical and Biological Transformation

There are no chemical or biological transformations noted in the groundwater for the COC.

5.7.6 Soil Serves as Source of Contamination to Groundwater

The soil is permeable and may contribute to the quality of the groundwater. Prior to the time of the sampling an extreme melt event occurred resulting in water being present beneath the surface which does not accurately represent the constant groundwater levels present in general.

5.7.7 Presence of LNAPLs or DNAPLs

No free phase products were encountered in the groundwater.

5.8 Sediment Quality

The Phase Two Properties did not include a surface water body as defined under O. Reg. 153/04 (as amended); therefore, sediment was not sampled in this Phase Two ESA investigation.

5.9 Quality Assurance and Quality Control Results

Duplicate soil and groundwater samples were collected and submitted for chemical laboratory analyses for QA/QC purposes. In addition, Trip Blank VOC vials were placed in the cooler prior to sampling for VOCs in the groundwater. The samples collected in the field were placed in the cooler with the trip blank and subsequently submitted for analysis.

5.10 Phase Two Conceptual Site Model

Table 18 – Section 5.10 below describes the duplicate samples collected and tested during soil and groundwater sampling as part of the field investigation of the Phase Two ESA.

Parameter	Soil		Groundwater		
	No. of Samples Tested	No. of Duplicates	No. of Samples Tested	No. of Duplicates	No. of Trip Blank
PHC (F1-F4)	5	1	3	1	-
VOC (incl. BTEX)	5	1	3	1	1
PAH	5	1	3	1	-
PCB	5	1	3	1	-
Metals	5	1	3	1	-
Inorganics	5	1	3	1	-

Section 3. (3).5 of Schedule E of O. Reg. 153/04 (as amended) requires at least one (1) field duplicate be collected and analyzed for every ten (10) sample parameters submitted for laboratory analysis.

Samples were transported in ice-filled coolers to ensure temperatures were maintained below 10°C, along with a Chain of Custody to Paracel Laboratories. Paracel performed the chemical analysis in compliance with the MECP "Laboratory Services Branch, Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act", as amended. No discrepancies were noted as samples were properly handled with regards to the following:

- Holding Time;
- Preservation Method;
- Storage requirement; and
- Container Type.

The Laboratory Certificates of Analysis for each samples were received and are presented in **Appendix B.** All certificates of analysis received pursuant to clause 47 (2) (b) of the regulation comply with subsection 47 (3) of O. Reg. 153/04 as amended.

The Qualified Person concluded that the data met the quality objective, and the decision-making was not affected. The Qualified Person has also concluded that the overall objectives of the investigation and assessment were met.

Duplicate samples were taken for Soil and Groundwater. The following formula was used to assess the precision of the analytical methods and field sampling procedures. Precision is calculated by the relative percent difference (RPD) between the duplicate original samples and was calculated as follow;

$$RPD = \frac{|X_1 - X_2|}{X_m} \times 100$$

Where, X_1 is initial sample results, X_2 is duplicate sample results, and X_m equals the mean of X_1 and X_2. The values calculated must fall in the Following Ranges shown on **Table 19 – Section 5.9.**

RPDs are calculated only when the concentrations of a parameter in both the original and duplicate samples are above the laboratory minimum detection limit (MDL). Additionally, lower precision in RPD calculations is expected when contaminant concentrations are less than ten (10) times the MDL. Therefore, RPDs were

calculated for original and duplicate groundwater and soil samples where contaminant levels in both were at least ten (10) times greater than the MDL.

For most parameters in the original and duplicate soil and groundwater samples, RPDs could not be calculated because the results were below or less than ten (10) times the MDL. However, notable RPD values were observed in soil for PHCs (53.5%) and VOC (trichlorofluoromethane (33.3%)), which was expected due to the heterogeneous nature of the soil. Additionally, none of the PHC and VOC concentrations in the soil samples or their duplicates exceeded Table 7 standards, so these RPD exceedances are not considered to significantly impact the investigation. RPD calculations for groundwater samples and duplicates confirmed that no parameters exceeded the RPD limits.

Table 19 – Section 5.9: Duplicate RPD Values in Less Than ≤

Parameter	Groundwater RPD Limit	Soil RPD Limit
PAH	≤30%	≤40%
Metal	≤20%	≤30%
PCB	≤30%	≤40%
VOC	≤30%	≤40%
PHC	≤30%	≤30%
Free CN	≤20%	≤35%

5.11 Phase Two Conceptual Site Model

The Phase Two Properties are located at 593, 601, and 603 Laurier Ave W in Ottawa, Ontario (collectively referred to as the Site). The legal description for 593 Laurier Ave W is Part Lot 40, Concession A (OF), as in CR231415, CR259616, Except Part 1 on N287620; Ottawa/Nepean. The legal description for 601/603 Laurier Ave W is Part Lot 40, Concession A (OF), as in NS85937; Ottawa/Nepean. The size and location of the property are shown in **Figure 1**.

According to the Map of Ontario Geological Survey, the Site is located in an area of glacial deposits of till and a plain with a local relief of less than 5 meters. Bedrock geology of the Phase Two Property has been identified as limestone, dolomite, sandstone, and local shale, all relatively flat-lying glacial deposits.

The Conceptual Site Model shows PCAs on and surrounding the properties of which relative to the groundwater flow direction, seven (7) may have an impact on the Phase Two Property. **Figure 3** represents the PCAs on and surrounding the Phase Two Property. The PCAs that affect the Phase Two Properties include three (3) on-Site PCAs: **PCA Other** for waste generator of light fuels by the Dalhousie Housing Co-op, **PCA 30** for possible fill material used to accommodate the parking/driveway area at the Site**,** and **PCA 41** for heating oil tanks that were previously present in the properties. The tanks have now since been removed. The off-Site PCAs encountered include **PCA Other – Spill**, **PCA Other – Waste Generator**, **PCA Other – Air Emissions**, **PCA Other – PCB Storage** and **PCA 28** for gasoline and associated products storage in fixed tanks. The seven (7) PCAs generating the Areas of Potential Environmental Concern (APECs) are as follows:

APEC 1 was generated due to the presence of PCA Other : Spill for a hydraulic oil spill which occurred approximately 220 m south of the Site.

APEC 2 was generated due to the record of a previous furnace oil leak at the property located approximately 250 m south of the Site, PCA Other : Spill.

APEC 3 was generated due to the presence of PCA Other : Waste Generator at the Site.

APEC 4 was generated due to the presence of PCA Other : Waste Generator for the property located approximately 100 m southeast.

APEC 5 was generated due to the presence of PCA Other : Waste Generator for the property located approximately 170 m southeast.

APEC 6 was generated due to the presence of PCA Other : Waste Generator for the property located approximately 60 m south.

APEC 7 was generated to address the previous up-gradient manufacturer/publisher identified approximately 170 m southeast of the Site.

APEC 8 was generated due to the PCA 41 for the former presence of heating oil tanks in each of the Phase One properties according to the Site Interview.

APEC 9 was generated due to the presence of PCA 30 for the possible fill material used to accommodate the parking circulation area at one of the Phase One properties.

The location of these APECs are shown in **Figure 4**.

The applicable Site Condition Standard (SCS) for the Phase Two Properties was based on Table 7 Generic Site Condition Standards for Shallow Soils in a Non-Potable Groundwater Condition for coarse-grained soils under Residential Parkland Institutional (RPI) property use. This standard was used to evaluate the chemical quality of soil and groundwater samples from the Phase Two Properties. The samples were analyzed for PHC fractions F1 to F4, VOCs, PAHs, metals, PCBs, general inorganics, nitrates, nitrites and sulphate.

The parameters selected were to address the Contaminants of Potential Concern (COPC) from the Potentially Contaminating Activities (PCA) and the Areas of Potential Environmental Concern (APECs) identified in the Phase One ESA.

The CSM is based on the soil and groundwater results from five (5) boreholes and three (3) monitoring wells. The approximate locations of each borehole and monitoring well are defined in **Figure 5**.

The following contaminants of concern were identified in groundwater and soil samples:

- Sample **2-SS1** collected from BH24-2 at depths of 0.0 and 0.6 bgs encountered elevated concentrations of **Lead.** This may be associated with importation of fill materials present in the area between 593 and 601 Laurier Avenue properties;
- Sample **4-SS1** collected from depth BH24-04 from depths of between 0.0 and 0.6 m bgs encountered high concentrations of various **PAHs** parameters exceeding the Table 7 limits**.** These levels may be related to the previous oil heating tank and associated oil heating combustion or un-reported spills, use of fill material of poor quality, or the historical waste generated from light fuel activities by the Dalhousie Housing Co-op on the Site;
- **MW19-01** analysis results confirmed the **PHC-F2** concentration (308 µg/L) exceeding the Table 7 applicable standard of 150 µg/L. PHC-F4 was also present in the MW19-01 groundwater sample, however its level was not above the Table 7 standard limit;
- MW19-02 and MW24-05 had comparable VOC and PHC concentrations with levels generally being less than the laboratory detection limits. PHC-F3 was detected in both samples with values of 194 and 357 µg/L, respectively, below the 500 µg/L Table 7 site condition standard. PHC-F4 was also detected in MW24-05 with a value of 346 µg/L, respectively, below the 500 µg/L Table 7 site condition standard;
- **Chloroform** in **MW24-05** was also detected above the appliable Table 7 site condition standard of 2 µg/L with a value of 15.2 µg/L. Sample MW-XX is a duplicate sample collected from MW24-05, which exhibited comparable detections and exceedances. Toluene was also detected in MW24-05 with a value of 0.6 µg/L, less than the Table 7 site condition standard of 320 µg/L. This exceedance can be attributed to the use of chlorinated municipal water during coring;
- PAH parameters were not detected in MW19-01 or MW24-05. Detections were encountered in MW19-02, however the levels were less than the Table 7 site condition standards; and
- Metals were detected in all samples collected, however, no exceedances were encountered. Chloride and free cyanide parameters were detected although no exceedances were encountered.

Contaminant migration is primarily influenced by the groundwater flow direction toward the Ottawa River. Due to the proximity of the Ottawa River and the bedrock, there is a potential for contaminants like PHC-F2 to migrate through groundwater toward the river.

5.12 Potential Sources of Contamination

The potential sources of contamination can be introduced as follows:

- Sample 2-SS1 collected from BH24-2 at depths of 0.0 and 0.6 bgs encountered elevated concentrations of Lead. This may be associated with importation of fill materials present in the area between 593 and 601 Laurier Avenue properties;
- Sample 4-SS1 collected from depth BH24-04 from depths of between 0.0 and 0.6 m bgs encountered high concentrations of various PAHs parameters exceeding the Table 7 limits. These levels may be related to the previous oil heating tank and associated oil heating combustion or un-reported spills, use of fill material of poor quality, or the historical waste generated from light fuel activities by the Dalhousie Housing Co-op on the Site;
- MW19-01 analysis results confirmed the PHC-F2 concentration (308 µg/L) exceeding the Table 7 applicable standard of 150 µg/L. The source of the PHC impacts may be a result of the previous oil heating tank and associated oil heating handling or un-reported spills, use of fill material of poor quality, or the historical waste generated from light fuel activities by the Dalhousie Housing Co-op on the Site, or off-Site reported spills; and
- Chloroform in MW24-05 was also detected above the appliable Table 7 site condition standard of 2 µg/L with a value of 15.2 µg/L. This exceedance can be attributed to the use of chlorinated municipal water during coring.

With respect to the metal impacts, as they are not encountered in the groundwater across the Site, it is likely that the potential pathway for these contaminates is horizontally through the shallow overburden conditions, and likely limited by the bedrock interface. No groundwater was encountered in the overburden, there migration is likely toward the lower lying topography to the north of the Site. However, based on the general conditions of the bedrock encountered at the time of the investigation, and from the findings of historical investigations, it is a possibility that in time, the contaminates could migrate vertically through bedrock fractures, towards the Ottawa River. This could be mitigated through remediation activities of the impacted overburden, although considered a low risk for on-Site and off-Site receptors due to the concentrations encountered, non-potable groundwater conditions, and overall regional conditions.

The PAH impacts encountered in the soil of BH24-04, at the general central portion of the Site is also likely limited to the overburden based on the observations encountered in the groundwater samples collected from the available monitoring well locations. The likely potential pathway for these contaminates is horizontally through the shallow overburden conditions, and likely limited by the bedrock interface, in addition to the development structures currently present. As mentioned above, the bedrock conditions across the Site could however promote a potential migration of contaminates into the underlying groundwater, if not addressed through removal of the impacted material.

The chloroform exceedances in the groundwater are limited to MW24-05 and is most likely a result of the bedrock coring water introduced during the advancement activities. The risk associated with this reported value is low to off-site receptors and on-Site occupants. During any de-watering of the property during re-development, the groundwater accumulated should be verified that it is acceptable for either off-Site disposal through available infrastructure, or if treatment or collection and off-Site disposal at an approved facility is required. This is further applicable for PHC-F2 contamination encountered in MW19-01. The levels are relatively low and no-free phase residual or evidence was encountered. The monitoring well with the exceedance is located in the parking and circulation area of 593 Laurier Avenue West, which is generally

anticipated to not be disrupted during the anticipated re-development and construction of the 601 and 603 Laurier Avenue West properties, which is the primary location of the project. The risk of PHC-F2 impacts is considered low, however, as like the chloroform discussion above, during any de-watering of the property during re-development, the groundwater accumulated should be verified that it is acceptable for either off-Site disposal through available infrastructure, or if treatment or collection and off-Site disposal at an approved facility is required. Post re-development, concentrations in the groundwater can be re-evaluated to confirm if conditions have worsened, and the appropriate means to address the groundwater quality.

6 CONCLUSIONS

The site under investigation consists of three residential properties located at 593, 601, and 603 Laurier Avenue West in Ottawa, Ontario. The Site's location is presented in Figure 1. The property at 593 Laurier Ave W, Ottawa, Ontario, has an irregular shape and covers approximately 1,221 m² (0.30 acres), measuring around 31 m in width (east-west) and 39 m in depth (north-south). It is currently home to a multi-tenant residential building. The property at 601/603 Laurier Ave W, Ottawa, Ontario, is triangular and has an area of approximately 1,604.9 m² (0.40 acres), with dimensions of about 74.1 m in width (east-west) and 40.3 m in depth (north-south). This site is occupied by two multi-tenant residential buildings. The properties are owned by Heritage Investments Ltd. It is anticipated that the Site is to be redeveloped for residential use. The properties are serviced with municipal water and sanitary services and are heated with natural gas. The general surrounding area including the Site has a slope towards the Ottawa River 550 m north of the Site, therefore, the anticipated groundwater flow direction is towards the north/northwest. The groundwater table on the Phase Two Property ranged from 5.4 m to 7.8 m bgs.

The applicable site condition standard used was Table 7 Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition, residential property use and coarse-textured soils. The investigation involved advancing five (5) boreholes across the Site at strategic locations based on potential areas of environmental concern. One (1) of the boreholes were completed into monitoring well to assess the Site's hydrogeological conditions and facilitate groundwater sampling. The advancement of borehole was attempted in the western portion of the Site, west of 605 Laurier Ave. W, however bedrock was encountered directly beneath the fill (0.6 m).

The soil conditions in the area investigated on the Site generally consist of the overburden comprising sandy soil, gravel, crushed stone, and rock, ranging from 0.0 to 1.2 meters in depth. the bedrock consists of dark grey limestone with some shaly layers and sandstone, found at depths between 0.35 and 9.05 meters below ground surface (bgs) where the boreholes were terminated. Lead was measured above the applicable provincial standards in sample BH24-02, located within the northeastern extent of the building. The high concentration of lead in the soil sample is possibly originating from construction materials or fill.

Based upon the results of the parameters tested across the three (3) monitoring well locations and five (5) borehole locations during the Phase Two ESA investigation, an RSC filing can be undertaken when the soil and groundwater conditions are addressed and then confirmed to be within the Table 7 SCS. Use of the Table SCS will require permission from the Municipality and the City of Ottawa in accordance with O. Reg 153/04 as amended.

No olfactory or visual (i.e. staining or free phase) evidence of petroleum hydrocarbon impacts were observed in any of the soil samples collected. Observations were confirmed through CSV

concentrations measured. CSV concentrations ranged between non-detect (<0.1 ppm) for all the boreholes except BH24-02, where CSV was measured at 0.6 ppm and 1.8 ppm at the depths between 0-0.6m and 0.6-1.2 m, respectively. These CSV values are considered relatively low for typical soil vapours.

VOCs parameters analysed were not detected in the soil samples submitted for laboratory analysis, with the exception of Trichlorofluoromethane and Xylenes in sample 2-SS2, collected from borehole BH24-2 at depths of between 0.6 and 1.2 m below grade. The values reported are below the appliable Table 7 site condition standards. Petroleum hydrocarbons fractions F2 through F4 were detected in the samples submitted BH24-3 (3-SS1) and its corresponding duplicate sample (3-SSX); BH24-4 (4-SS1) and BH24-5 (5-SS1). The concentrations of petroleum hydrocarbons detected were below the applicable Table 7 site condition standards. PCB's were not detected in the soil samples submitted for analysis (<0.05 µg/g).

PAH parameters were detected in Sample 4-SS1, collected from borehole BH24-04 at depth of between 0.0 and 0.6 m bgs. Select PAH parameters were reported with concentrations above the applicable Table 7 site condition standards, which are summarized as follows:

- Anthracene reported with a value of 1.24 µg/g, above the standard of 0.67 µg/g;
- Benzo[a]anthracene reported with a value of 1.48 µg/g, above the standard of 0.5 µg/g;
- Benzo[a]pyrene reported with a value of 1.1 µg/g, above the standard of 0.3 µg/g;
- Benzo[b]fluoranthene reported with a value of 0.98 µg/g, above the standard of 0.78 µg/g;
- Dibenzo[a,h]anthracene reported with a value of 0.17 µg/g, above the standard of 0.10 µg/g;
- Indeno [1,2,3-cd] pyrene reported with a value of 0.61 µg/g, above the standard of 0.38 µg/g;
- Fluoranthene reported with a value of 6.06 µg/g, above the standard of 0.69 µg/g; and
- Phenanthrene reported with a value of 6.21 µg/g, above the standard of 0.10 µg/g.

The remaining PAH parameters detected had concentrations below the appliable site condition standard. PAH were not detected in the remaining soil sample submitted for the respective analysis.

In the monitoring wells, headspace VOC levels were 2.5, 4.2, and 0.4 ppm in MW19-1, MW19-2, and MW24-05, respectively, during the sampling. No olfactory or visual (i.e. sheen or free phase) evidence of petroleum hydrocarbon impacts were observed.

Various metal-based parameters were detected in the soil samples submitted for analysis, although no exceedances to the Table 7 site condition standard were encountered with one (1) exception. Sample 2-SS1, collected from borehole BH24-2 from depths of between 0.0 and 0.6 m bgs had a concentration of lead of 214 µg/g, surpassing the Table 7 site condition standard of 120 µg/g.

General inorganic parameters analysed were reported within the applicable Table 7 site condition standard. O. Reg. 153/04 does not have set limits for nitrates, nitrites or sulphates. Levels of nitrates and sulphates were detected in the samples collected with values ranging from 1 through 8 µg/g, and from 13 through 334 µg/g, respectively.

The groundwater at the Phase Two Property was sampled at MW19-01, MW19-02, and MW24-05 and was analyzed for PHCs Fractions F1 through F4; VOCs, PAHs, PCBs, metals, and general inorganics. MW19-01 analysis results confirmed the PHC-F2 concentration (308 µg/L) exceeding the Table 7 applicable standard of 150 µg/L. PHC-F4 was also present in the MW19-01 groundwater sample, however its level was not above the Table 7 standard limit. The remaining petroleum-based parameters were not detected in the groundwater sample collected. MW19-02 and MW24-05 had comparable VOC and PHC concentrations with levels generally being less than the laboratory detection limits. PHC-F3 was detected in both samples with values of 194 and 357 µg/L, respectively, below the 500 µg/L Table 7 site condition standard. PHC-F4 was also detected in MW24-05 with a value of 346 µg/L, respectively, below the 500 µg/L Table 7 site condition standard. Chloroform in MW24-05 was also detected above the appliable Table 7 site condition standard of 2 µg/L with a value of 15.2 µg/L. Sample MW-XX is a duplicate sample collected from MW24-05, which exhibited comparable detections and exceedances. Toluene was also detected in MW24-05 with a value of 0.6 µg/L, less than the Table 7 site condition standard of 320 µg/L.

PAH parameters were not detected in MW19-01 or MW24-05. Detections were encountered in MW19-02, however the levels were less than the Table 7 site condition standards. Metals were detected in all samples collected, however, no exceedances were encountered. Chloride and free cyanide parameters were detected although no exceedances were encountered.

It is recommended that at the time of re-development of the Site, the quality of the soils to be excavated are confirmed through sampling and analysis. This will aid in ensuring that the appropriate handling and disposal measures are followed. The areas with confirmed exceedances in the overburden, within the work areas, should be remediated followed by confirmatory sampling by a Qualified Person. Prior to dewatering of excavations during the construction activities, the quality of the water to be discharged must be confirmed to align proper disposal or treatment requirements. Post re-development, the conditions should be verified through additional sampling to ensure that through the construction activities, conditions have not worsened.

7 LIMITATIONS AND USE OF REPORT

Results of this Phase Two ESA should not be considered a warranty that the subject property is free from any and all contaminants from former and current practices, other than those noted in this report, nor that all compliance issues have been addressed.

Findings contained in this report are based on data and information collected during the Phase Two ESA of the subject property conducted by LRL Associates Ltd. Conclusions and recommendations are based solely on-site conditions encountered at the time of our site visit and fieldwork between September 3 and October 3, 2024, supplemented by historical information and data obtained as described in this report. No assurance is made regarding changes in conditions subsequent to the time of this investigation. If additional information is discovered or obtained, LRL Associates Ltd. should be requested to re-evaluate the conclusions presented in this report and to provide amendments as required.

In evaluating the subject property, LRL Associates Ltd. has relied in good faith on information provided by individuals as noted in this report. We assume that the information provided is factual and accurate. We accept no responsibility for any deficiencies, misstatements or inaccuracies contained in this report as a result of omissions, misinterpretation or fraudulent acts of the persons contacted.

This report is intended for the sole use of Heritage Investments Ltd. and their authorized agents. LRL Associates Ltd. will not be responsible for any use of the information contained within this report by any third party.

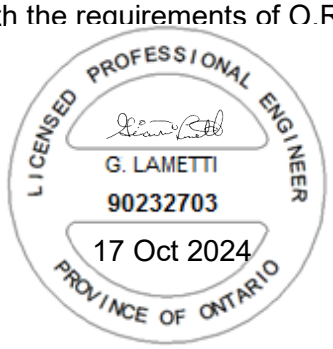
In addition, LRL Associates Ltd. will not be responsible for the real or perceived decrease in the property value, its saleability or ability to gain financing, through the reporting of factual information.

Yours truly,
LRL Associates Ltd.

Jessica Arthurs
Environmental Engineering Manager

Gianni Lametti, P. Eng.
Senior Environmental Engineer

I have reviewed the report and confirm that the Phase Two ESA including finds and conclusions, has been carried out in accordance with the requirements of O.Reg 153/04 as amened, in effect as of the date of this report.



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FIGURES

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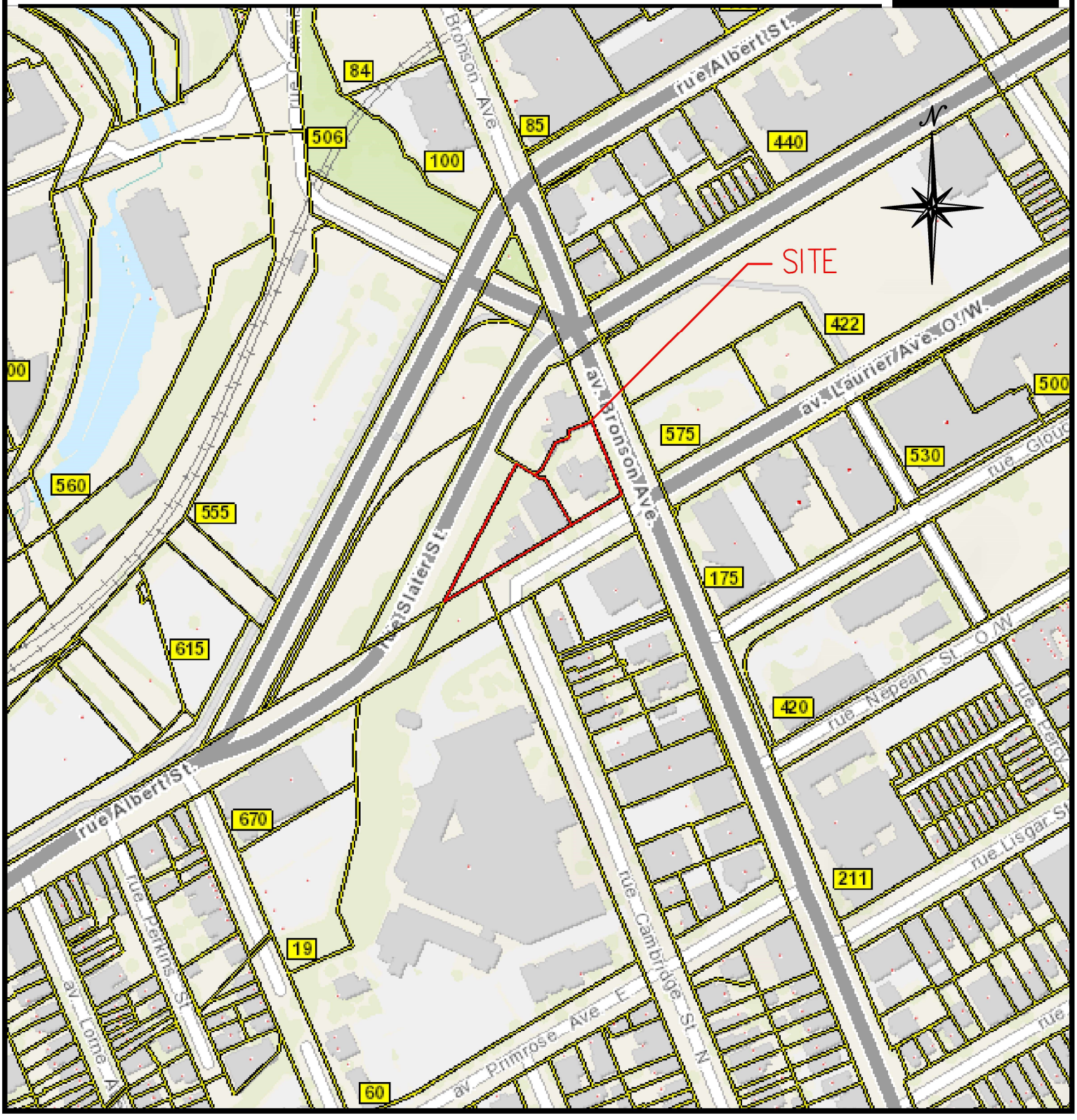
PROJECT

PHASE TWO
ENVIRONMENTAL SITE ASSESSMENT
593, 601 & 603 LAURIER AVENUE W,
OTTAWA, ONTARIO

DRAWING TITLE

SITE LOCATION
(NOT TO SCALE)
SOURCE: GEOOTTAWA

CLIENT	DATE	PROJECT	
HERITAGE INVESTMENTS LTD.	SEPTEMBER 2024	240447	FIGURE1



Legend

- Subject Sites
- Neighbouring Property Extents
- Existing Buildings

10m 0 10 20 30m

SCALE: 1:750

No.	REVISIONS	BY	DATE
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PROJECT
PHASE TWO
ENVIRONMENTAL SITE ASSESSMENT
593, 601 & 603 LAURIER AVENUE W
OTTAWA, ONTARIO

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SITE PLAN

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DATE
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FIGURE2

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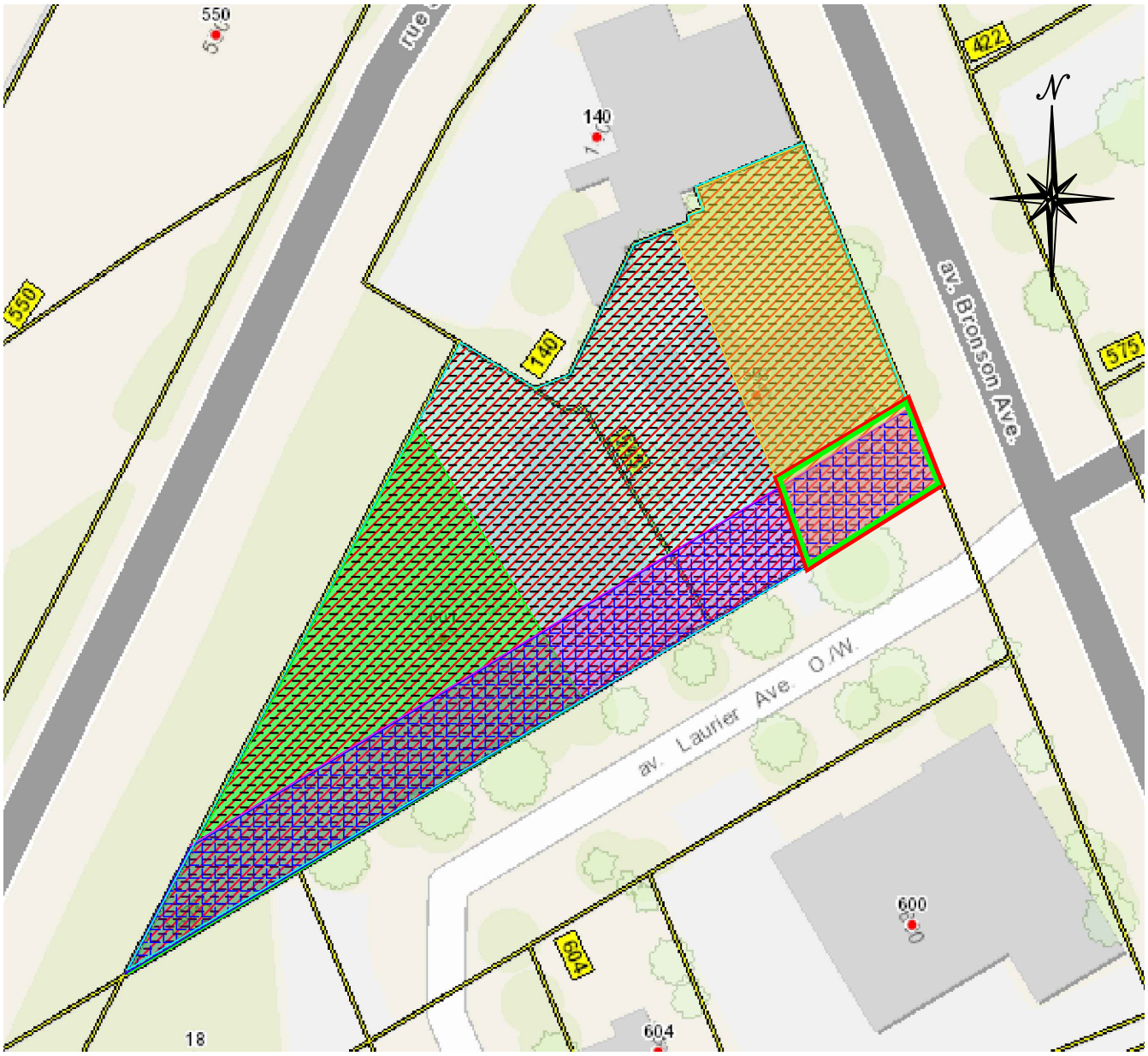
593, 601 & 603 LAURIER AVENUE W,
OTTAWA, ONTARIO

DRAWING TITLE

LOCATION OF PHASE TWO
PROPERTY PCAs & APECs

CLIENT	DATE	PROJECT	
HERITAGE INVESTMENTS LTD.	SEPTEMBER 2024	240447	FIGURE 3



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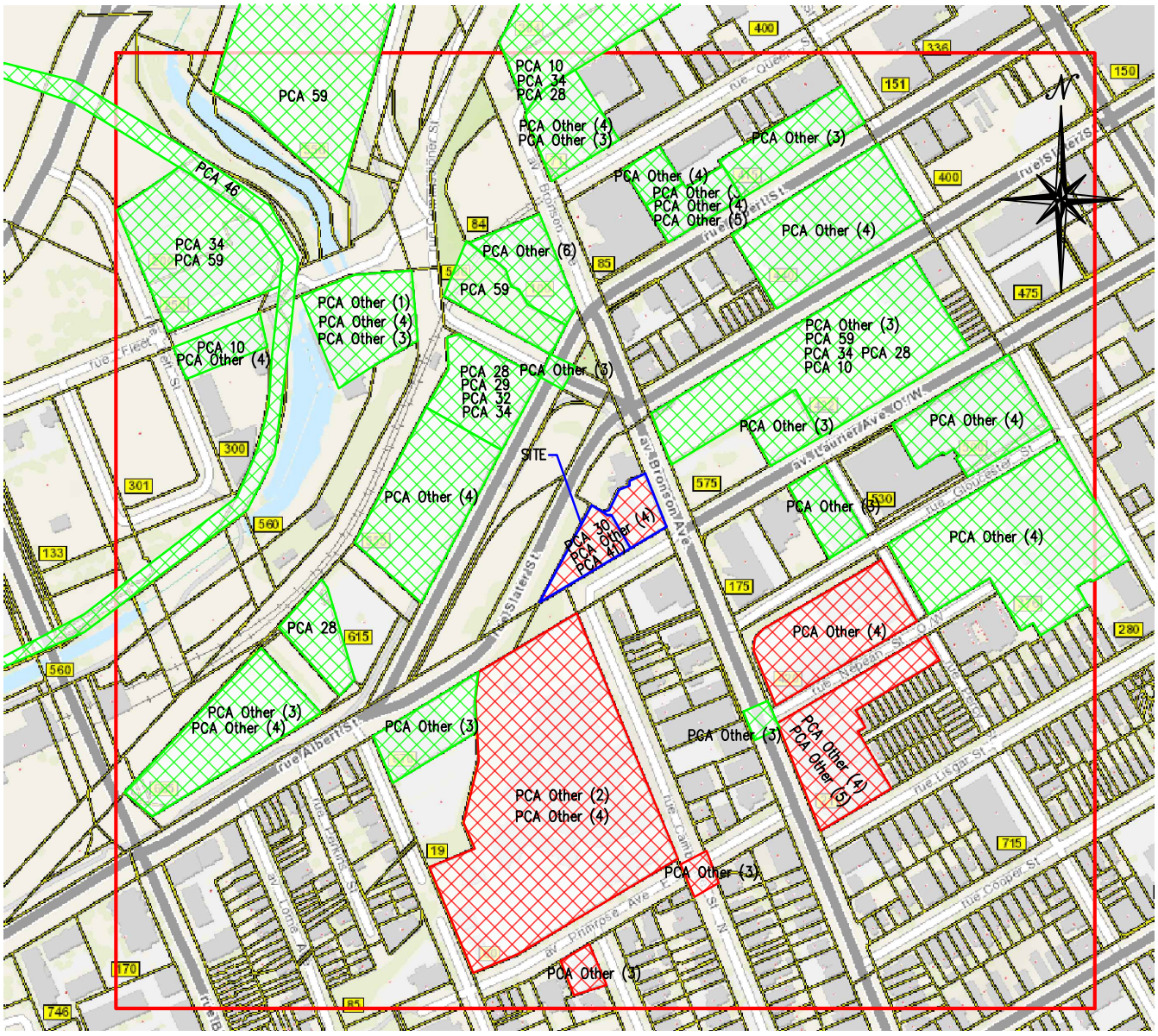
DRAWING TITLE

PCA WITHIN 300 M OF THE SITE

CLIENT	DATE	PROJECT	
HERITAGE INVESTMENTS LTD.	SEPTEMBER 2024	240447	FIGURE 4



Legend

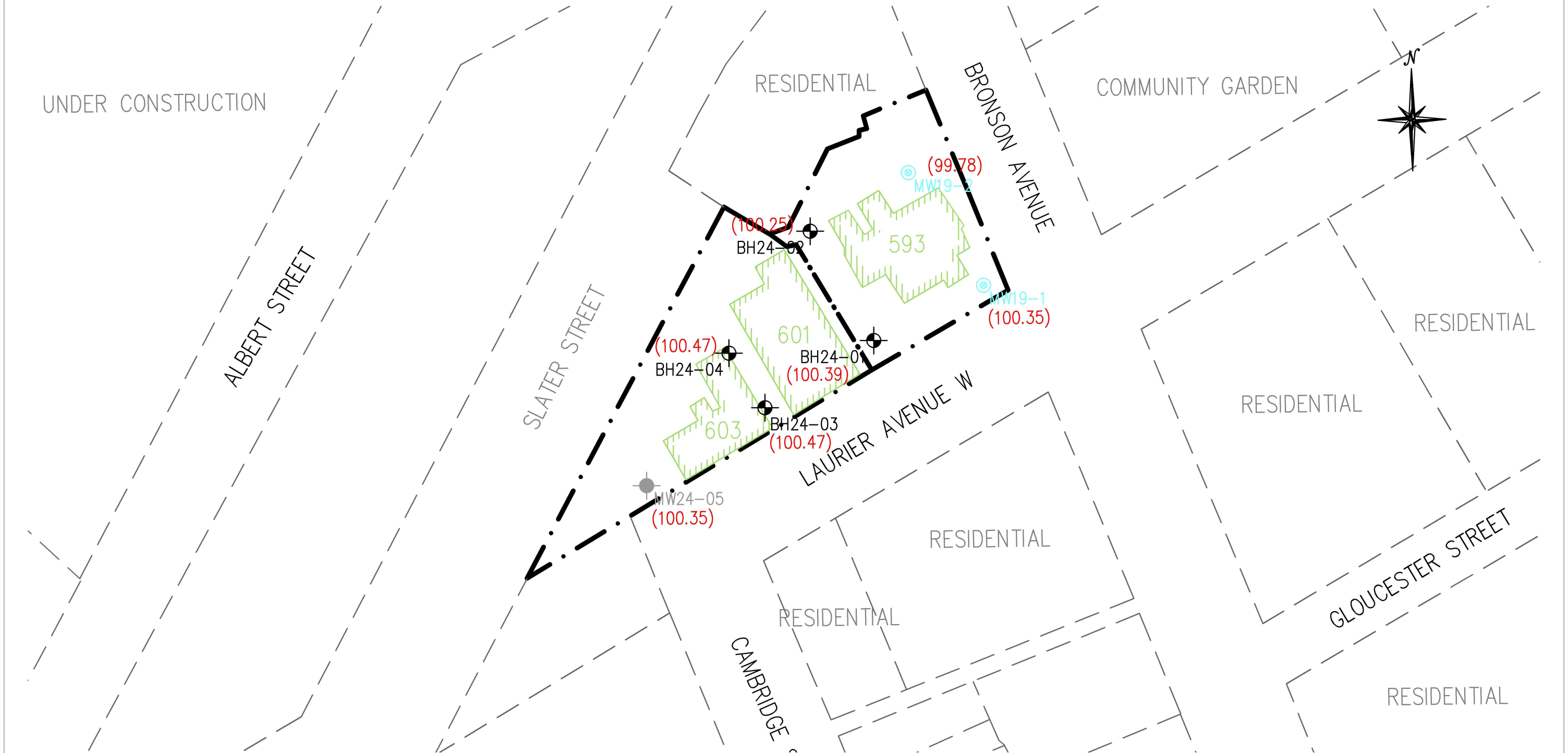
Potentially Contaminating Activity (PCA) – Not a Concern to the Site

Potentially Contaminating Activity (PCA) – Poses a Risk for Environmental Concern to the Site

Subject Site

300 M Radius From the Site Extents

PCA Other (1)	Factory
PCA Other (2)	Hospital
PCA Other (3)	Spill
PCA Other (4)	Waste Generator
PCA Other (5)	Scotts Manufacturing Directory



Legend

- Subject Sites
- Neighbouring Property Extents
- Existing Buildings
- (XX.XX) Ground Surface Elevation
- MW19-X Existing Monitoring Well (2019)
- BH24-X Newly Advanced Borehole (2024)
- MW24-X Newly Installed Monitoring Well (2024)

10m 0 10 20 30m

SCALE: 1:750

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PHASE TWO
ENVIRONMENTAL SITE ASSESSMENT
593, 601 & 603 LAURIER AVENUE W
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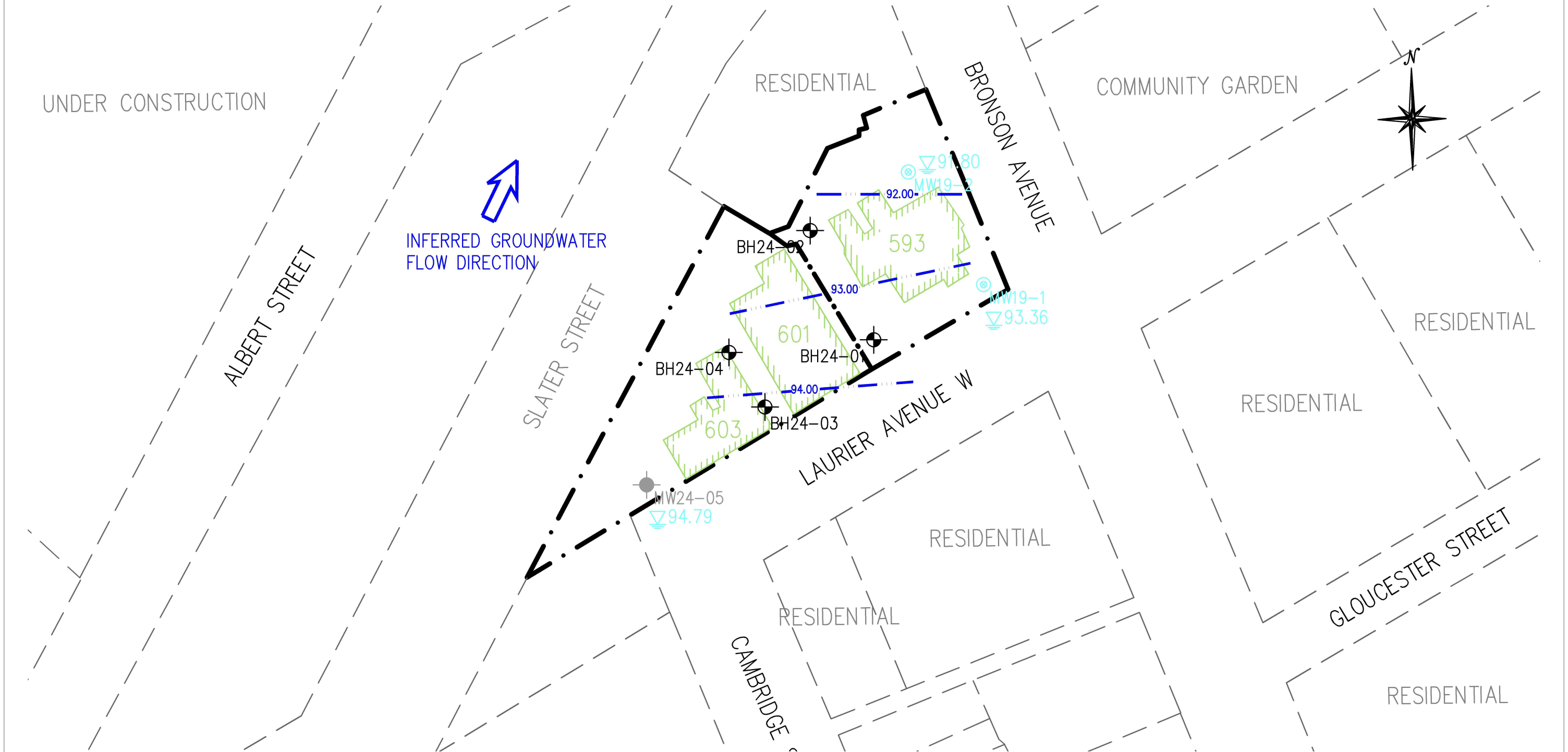
DRAWING TITLE
BOREHOLE AND MONITORING WELL LOCATION

PROJECT NO.
240447

DATE
SEPTEMBER 2024

FIGURE5



Legend

- Subject Sites
- Neighbouring Property Extents
- Existing Buildings
- Groundwater Contour Line
- 99.99 Groundwater Elevation
- MW19-X Existing Monitoring Well (2019)
- BH24-X Newly Advanced Borehole (2024)
- MW24-X Newly Installed Monitoring Well (2024)

10m 0 10 20 30m

SCALE: 1:750

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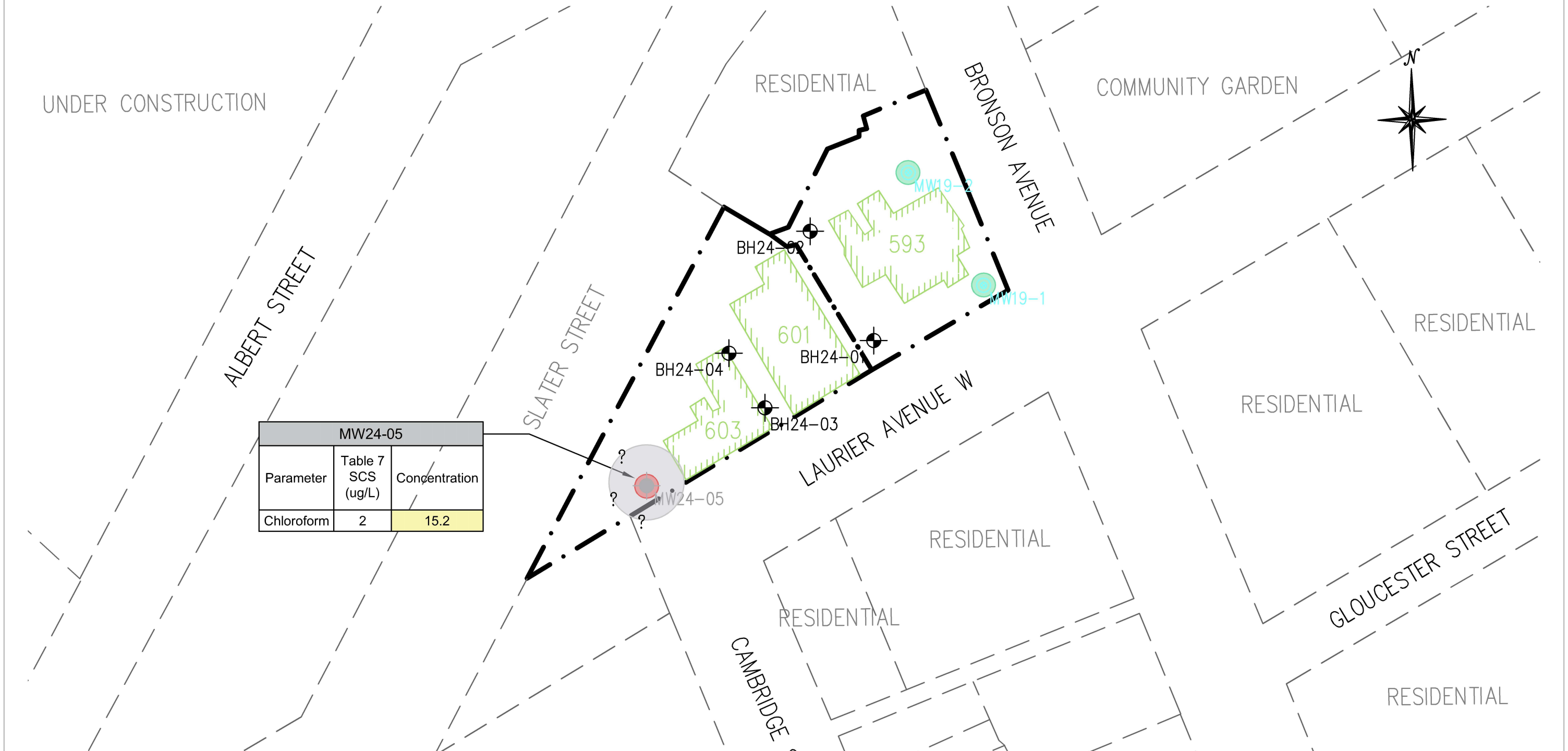
ENVIRONMENTAL SITE ASSESSMENT
593, 601 & 603 LAURIER AVENUE W
OTTAWA, ONTARIO

DRAWING TITLE
GROUNDWATER ELEVATIONS &
GROUNDWATER CONTOUR

PROJECT NO.
240447

DATE
SEPTEMBER 2024

FIGURE6



Legend

- Subject Sites
- Neighbouring Property Extents
- Existing Buildings
- Borehole / Monitoring Well – Meets Table 7 SCS
- Borehole / Monitoring Well – Exceeds Table 7 SCS
- Concentration Exceeding Table 7 SCS
- MW19-X Existing Monitoring Well (2019)
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- MW24-X Newly Installed Monitoring Well (2024)
- Approximate Contamination Plume
- ? Extents of Contamination Plume Not Fully Delineated

10m 0 10 20 30m

SCALE: 1:750

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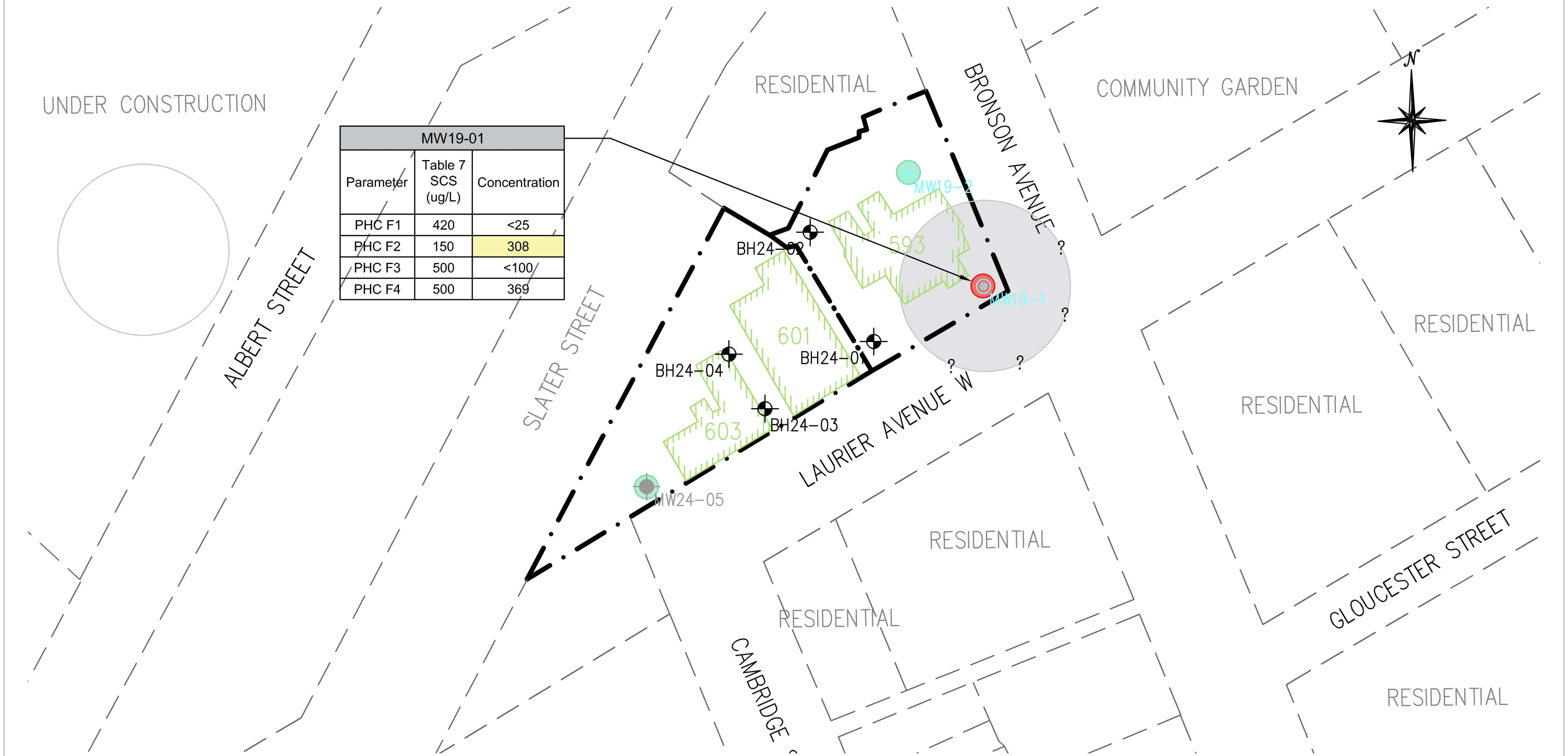
PHASE TWO
ENVIRONMENTAL SITE ASSESSMENT
593, 601 & 603 LAURIER AVENUE W
OTTAWA, ONTARIO

DRAWING TITLE
VOC EXCEEDANCES - GROUNDWATER

PROJECT NO.
240447

DATE
SEPTEMBER 2024

FIGURE7A



Legend

- Subject Sites
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10m 0 10 20 30m

SCALE: 1:750

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PHASE TWO
ENVIRONMENTAL SITE ASSESSMENT
593, 601 & 603 LAURIER AVENUE W
OTTAWA, ONTARIO

DRAWING TITLE
PHC EXCEEDANCES - GROUNDWATER

PROJECT NO.
240447

DATE
SEPTEMBER 2024

FIGURE7B

Legend

- Subject Sites
- Neighbouring Property Extents
- Existing Buildings
- Borehole / Monitoring Well – Meets Table 7 SCS
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10m 0 10 20 30m

SCALE: 1:750

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ENVIRONMENTAL SITE ASSESSMENT
593, 601 & 603 LAURIER AVENUE W
OTTAWA, ONTARIO

DRAWING TITLE
PAH EXCEEDANCES - GROUNDWATER

PROJECT NO.
240447

DATE
SEPTEMBER 2024

FIGURE7C

Legend

- Subject Sites
- Neighbouring Property Extents
- Existing Buildings
- Borehole / Monitoring Well – Meets Table 7 SCS
- Borehole / Monitoring Well – Exceeds Table 7 SCS
- Concentration Exceeding Table 7 SCS
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10m 0 10 20 30m

SCALE: 1:750

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ENVIRONMENTAL SITE ASSESSMENT
593, 601 & 603 LAURIER AVENUE W
OTTAWA, ONTARIO

DRAWING TITLE
METALS & INORGANICS EXCEEDANCES - GROUNDWATER

PROJECT NO.
240447

DATE
SEPTEMBER 2024

FIGURE7D

Legend

- Subject Sites
- Neighbouring Property Extents
- Existing Buildings
- Borehole / Monitoring Well – Meets Table 7 SCS
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10m 0 10 20 30m

SCALE: 1:750

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ENVIRONMENTAL SITE ASSESSMENT
593, 601 & 603 LAURIER AVENUE W
OTTAWA, ONTARIO

DRAWING TITLE
2024 VOC EXCEEDANCES - SOIL

PROJECT NO.
240447

DATE
SEPTEMBER 2024

FIGURE8A

Legend

- Subject Sites
- Neighbouring Property Extents
- Existing Buildings
- Borehole / Monitoring Well – Meets Table 7 SCS
- Borehole / Monitoring Well – Exceeds Table 7 SCS
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10m 0 10 20 30m

SCALE: 1:750

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ENVIRONMENTAL SITE ASSESSMENT
593, 601 & 603 LAURIER AVENUE W
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DRAWING TITLE
2024 PHC EXCEEDANCES - SOIL

PROJECT NO.
240447

DATE
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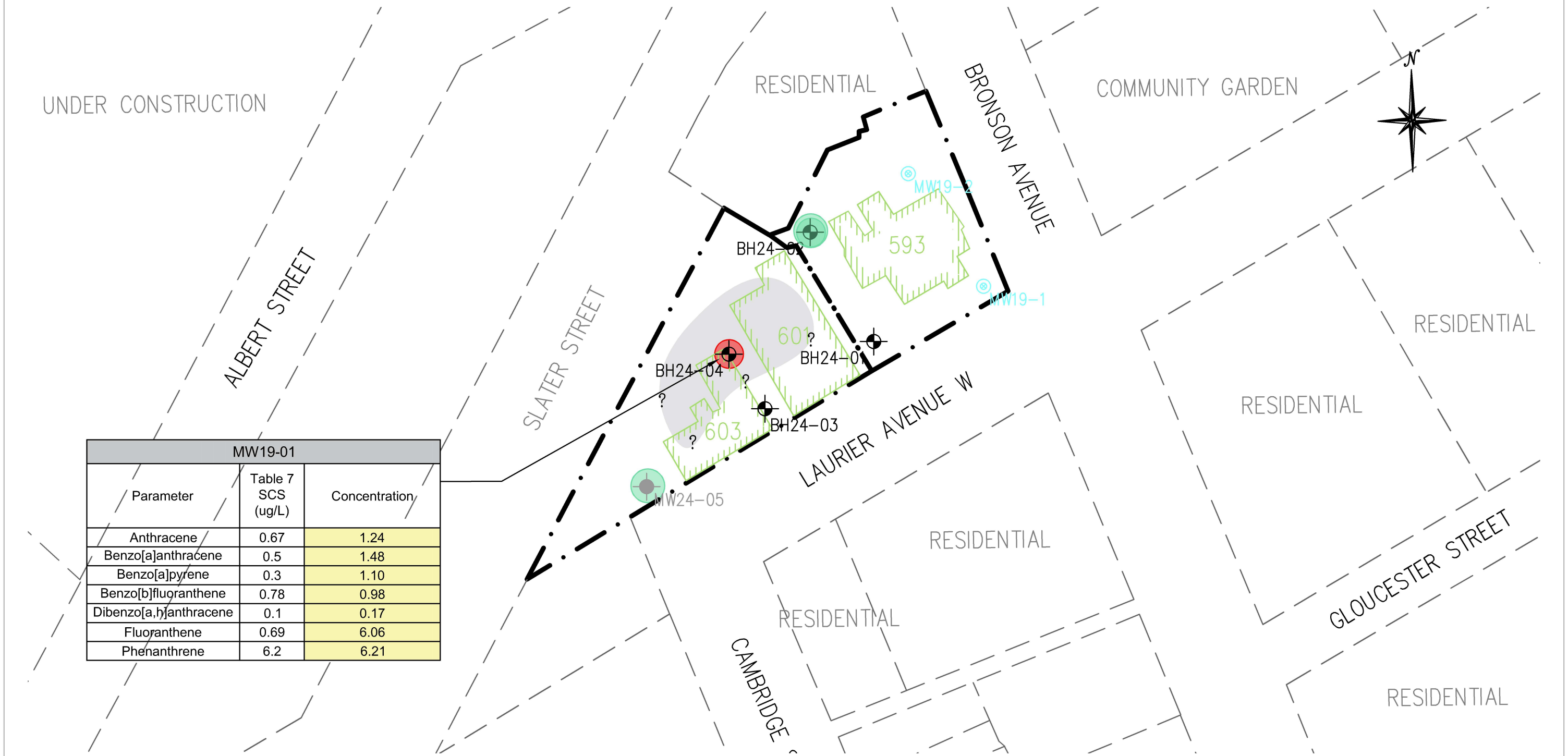
FIGURE8B



MW19-01		
Parameter	Table 7 SCS (ug/L)	Concentration
Anthracene	0.67	1.24
Benzo[a]anthracene	0.5	1.48
Benzo[a]pyrene	0.3	1.10
Benzo[b]fluoranthene	0.78	0.98
Dibenzo[a,h]anthracene	0.1	0.17
Fluoranthene	0.69	6.06
Phenanthrene	6.2	6.21

Legend

- Subject Sites
- Neighbouring Property Extents
- Existing Buildings
- Borehole / Monitoring Well – Meets Table 7 SCS
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10m 0 10 20 30m

SCALE: 1:750

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ENVIRONMENTAL SITE ASSESSMENT
593, 601 & 603 LAURIER AVENUE W
OTTAWA, ONTARIO

DRAWING TITLE
2024 PAH EXCEEDANCES - SOIL

PROJECT NO.
240447

DATE
SEPTEMBER 2024

FIGURE8C

Legend

- Subject Sites
- Neighbouring Property Extents
- Existing Buildings
- Borehole / Monitoring Well – Meets Table 7 SCS
- Borehole / Monitoring Well – Exceeds Table 7 SCS
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10m 0 10 20 30m

SCALE: 1:750

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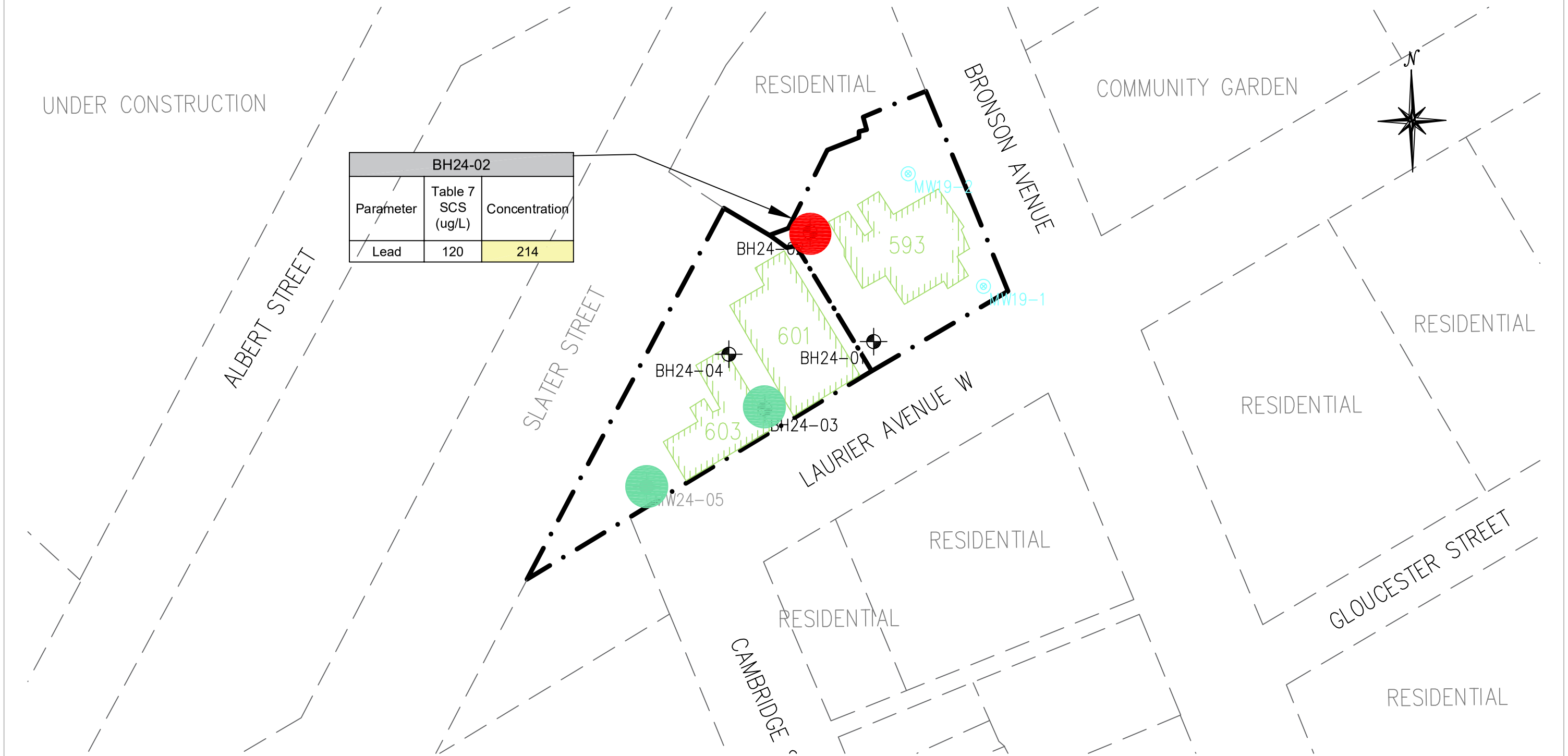
PROJECT
PHASE TWO
ENVIRONMENTAL SITE ASSESSMENT
593, 601 & 603 LAURIER AVENUE W
OTTAWA, ONTARIO

DRAWING TITLE
2024 PCB EXCEEDANCES - SOIL

PROJECT NO.
240447

DATE
SEPTEMBER 2024

FIGURE8D



Legend

- Subject Sites
- Neighbouring Property Extents
- Existing Buildings
- Borehole / Monitoring Well – Meets Table 7 SCS
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10m 0 10 20 30m

SCALE: 1:750

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PROJECT
PHASE TWO
ENVIRONMENTAL SITE ASSESSMENT
593, 601 & 603 LAURIER AVENUE W
OTTAWA, ONTARIO

DRAWING TITLE
2024 METALS EXCEEDANCES - SOIL

PROJECT NO.
240447

DATE
SEPTEMBER 2024

FIGURE8E

TABLES

Table A
Summary of Groundsurface and Groundwater Elevations (September 6, 2024)
Phase Two Environmental Site Assessment
593, 601, and 603 Laurier Avenue West, Ottawa, Ontario
LRL File: 240447

Monitoring Well	Ground Surface Elevation[1] (m)	Reference Elevation[2] (m)	Depth To Water Table (m)		Groundwater Elevation (m)
			Reference Point	Ground Surface	
MW19-1	100.35	100.19	6.83	6.99	93.36
MW19-2	99.78	99.59	7.79	7.98	91.80
BH24-01	100.39	--	--	--	--
BH24-02	100.25	--	--	--	--
BH24-03	100.47	--	--	--	--
BH24-04	100.47	--	--	--	--
MW24-05	100.35	100.21	5.42	5.56	94.79

NOTES

[1] Elevations measured from temporary benchmark established at the top of the fire hydrant (100.00 m).

[2] Reference elevation is top of PVC riser.

Table B
Summary of Soil General Inorgancis, VOC and PHC Analysis
Phase Two Environmental Site Assessment
593, 601, and 603 Laurier Avenue West, Ottawa, Ontario
LRL File: 240447

Parameter	Units	MDL	O. Reg. 153/04[1] Table 7[2] Residential Property Use Coarse Textured Soil	Sample					
				2-SS1	2-SS2	3-SS1	*3-SSX*	4-SS1	5-SS1
Sample Date (d/m/y)			--	2024-09-03	2024-09-03	2024-09-03	*2024-09-03*	2024-09-03	2024-09-03
Depth	m		--	0.0 - 0.6	0.60 - 1.2	0.0 - 0.48	*0.0 - 0.48*	0.0 - 0.6	0.0 - 0.60
CSV Readings[3]	ppm	0.1	--	0.6	1.8	<0.1	*<0.1*	<0.1	<0.1
Physical Characteristics									
% Solids	% by wt.	0.1		70.8	97.1	85.5	*85.5*	81.1	89.1
>0.075 mm	%	0.1		--	--	1.6	--	--	--
<0.075 mm	%	0.1		--	--	98.4	--	--	--
Texture	%	0.1		--	--	Med/Fine	--	--	--
General Inorganics									
SAR	N/A	0.01	5	0.07	--	3.91	--	--	0.13
Conductivity	uS/cm	5	700	299	--	454	--	--	295
Cyanide, free	ug/g dry	0.03	0.051	<0.03	--	<0.03	--	--	<0.03
pH	pH Units	0.05		7.24	--	7.18	--	--	7.09
Volatiles									
Acetone	ug/g dry	0.50	16	--	<0.50	<0.50	*<0.50*	<0.50	<0.50
Benzene	ug/g dry	0.02	0.21	--	<0.02	<0.02	*<0.02*	<0.02	<0.02
Bromodichloromethane	ug/g dry	0.05	13	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Bromoform	ug/g dry	0.05	0.27	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Bromomethane	ug/g dry	0.05	0.05	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Carbon Tetrachloride	ug/g dry	0.05	0.05	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Chlorobenzene	ug/g dry	0.05	2.4	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Chloroform	ug/g dry	0.05	0.05	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Dibromochloromethane	ug/g dry	0.05	9.4	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Dichlorodifluoromethane	ug/g dry	0.05	16	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
1,2-Dichlorobenzene	ug/g dry	0.05	3.4	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
1,3-Dichlorobenzene	ug/g dry	0.05	4.8	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
1,4-Dichlorobenzene	ug/g dry	0.05	0.083	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
1,1-Dichloroethane	ug/g dry	0.05	3.5	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
1,2-Dichloroethane	ug/g dry	0.05	0.05	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
1,1-Dichloroethylene	ug/g dry	0.05	0.05	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
cis-1,2-Dichloroethylene	ug/g dry	0.05	3.4	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
trans-1,2-Dichloroethylene	ug/g dry	0.05	0.084	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
1,2-Dichloropropane	ug/g dry	0.05	0.05	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
cis-1,3-Dichloropropylene	ug/g dry	0.05	--	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
trans-1,3-Dichloropropylene	ug/g dry	0.05	--	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
1,3-Dichloropropene, total	ug/g dry	0.05	0.05	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Ethylbenzene	ug/g dry	0.05	2	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Ethylene dibromide (dibromoethane, 1,2-)	ug/g dry	0.05	0.05	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Hexane	ug/g dry	0.05	2.8	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	ug/g dry	0.50	16	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Methyl Isobutyl Ketone	ug/g dry	0.50	1.7	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Methyl tert-butyl ether	ug/g dry	0.05	0.75	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Methylene Chloride	ug/g dry	0.05	0.1	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Styrene	ug/g dry	0.05	0.7	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
1,1,1,2-Tetrachloroethane	ug/g dry	0.05	0.058	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
1,1,2,2-Tetrachloroethane	ug/g dry	0.05	0.05	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Tetrachloroethylene	ug/g dry	0.05	0.28	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Toluene	ug/g dry	0.05	2.3	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
1,1,1-Trichloroethane	ug/g dry	0.05	0.38	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
1,1,2-Trichloroethane	ug/g dry	0.05	0.05	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Trichloroethylene	ug/g dry	0.05	0.061	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Trichlorofluoromethane	ug/g dry	0.05	4	--	<0.05	0.56	*0.40*	<0.05	<0.05
Vinyl Chloride	ug/g dry	0.02	0.02	--	<0.02	<0.02	*<0.02*	<0.02	<0.02
m/p-Xylene	ug/g dry	0.05	--	--	0.08	<0.05	*<0.05*	<0.05	<0.05
o-Xylene	ug/g dry	0.05	--	--	<0.05	<0.05	*<0.05*	<0.05	<0.05
Xylenes, total	ug/g dry	0.05	3.1	--	0.08	<0.05	*<0.05*	<0.05	<0.05
Hydrocarbons									
F1 PHCs (C6-C10)	ug/g dry	7	55	--	<7	<7	*<7*	<7	<7
F2 PHCs (C10-C16)	ug/g dry	4	98	--	<4	5	*10*	<4	<4
F3 PHCs (C16-C34)	ug/g dry	8	300	--	<8	85	*133*	15	24
F4 PHCs (C34-C50)	ug/g dry	6	2800	--	<6	56	*93*	18	16

NOTES:
[1] MECP's *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011* .
[2] Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition.
[3] Combustible soil vapour concentrations measured with a RKI II GX6000 PID.
MDL Method Detection Limit
-- No Value/Not Analysed
PHC Petroleum Hydrocarbon
Italics Duplicate sample collected of sample 3-SS1.

Table C
Summary of Soil Semi Volatile Analysis
Phase Two Environmental Site Assessment
593, 601, and 603 Laurier Avenue West, Ottawa, Ontario
LRL File: 240447

Parameter	Units	MDL	O. Reg. 153/04[1] Table 7[2] Residential Property Use Coarse Textured Soil	Sample 2-SS2	Sample 4-SS1	Sample 5-SS1
Sample Date (d/m/y)			--	2024-09-03	2024-09-03	2024-09-03
Depth	m		--	0.60 - 1.2	0.0 - 0.6	0.0 - 0.60
CSV Readings[3]	ppm	5	--	1.8	<0.1	<0.1
Physical Characteristics						
% Solids	% by wt.	0.1	--	97.1	81.1	89.1
Semi-Volatiles						
Acenaphthene	ug/g dry	0.02	7.9	<0.02	0.70	--
Acenaphthylene	ug/g dry	0.02	0.15	<0.02	0.03	--
Anthracene	ug/g dry	0.02	0.67	<0.02	**1.24**	--
Benzo[a]anthracene	ug/g dry	0.02	0.5	<0.02	**1.48**	--
Benzo[a]pyrene	ug/g dry	0.02	0.3	<0.02	**1.10**	--
Benzo[b]fluoranthene	ug/g dry	0.02	0.78	<0.02	**0.98**	--
Benzo[g,h,i]perylene	ug/g dry	0.02	6.6	<0.02	0.72	--
Benzo[k]fluoranthene	ug/g dry	0.02	0.78	<0.02	0.53	--
Chrysene	ug/g dry	0.02	7	<0.02	1.42	--
Dibenzo[a,h]anthracene	ug/g dry	0.02	0.1	<0.02	**0.17**	--
Fluoranthene	ug/g dry	0.02	0.69	<0.02	**6.06**	--
Fluorene	ug/g dry	0.02	62	<0.02	0.66	--
Indeno[1,2,3-cd]pyrene	ug/g dry	0.02	0.38	<0.02	0.61	--
1-Methylnaphthalene	ug/g dry	0.02	0.99	<0.02	0.08	--
2-Methylnaphthalene	ug/g dry	0.02	0.99	<0.02	0.11	--
Methylnaphthalene (1&2)	ug/g dry	0.04	0.99	<0.04	0.19	--
Naphthalene	ug/g dry	0.01	0.6	<0.01	0.49	--
Phenanthrene	ug/g dry	0.02	6.2	<0.02	**6.21**	--
Pyrene	ug/g dry	0.02	78	<0.02	4.78	--
PCBs						
PCBs, total	ug/g dry	0.05	0.35	<0.05	--	<0.05

NOTES:

[1] MECP's *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011*

[2] Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition.

[3] Combustible soil vapour concentrations measured with a RKI II GX6000 PID.

MDL Method Detection Limit

-- No Value/Not Analysed

BOLD Above Table 7 Standard

Table D
Summary of Soil Metals, Anions and General Inorganics Analysis
Phase Two Environmental Site Assessment
593, 601, and 603 Laurier Avenue West, Ottawa, Ontario
LRL File: 240447

Parameter	Units	MDL	O. Reg. 153/04[1] Table 7[2] Residential Property Use Coarse Textured Soil	Sample 1-SS1	2-SS1	2-SS2	3-SS1	4-SS1	5-SS1	5-SS2
Sample Date (d/m/y)			--	2024-09-03	2024-09-03	2024-09-03	2024-09-03	2024-09-03	2024-09-03	2024-09-03
Depth	m		--	0.0 - 0.3	0.0 - 0.6	0.6 - 1.2	0.0 - 0.48	0.0 - 0.60	0.0 - 0.60	0.06 - 0.91
CSV Readings[3]	ppm	5	--	0.1	0.6	1.8	<0.1	<0.1	<0.1	<0.1
Physical Characteristics			--							
% Solids	% by wt.	0.1	--	95.7	70.8	97.1	85.5	81.1	89.1	--
General Inorganics										
SAR	N/A	0.01	5	--	0.07	--	3.91		0.13	
Conductivity	uS/cm	5	700	--	299	--	454		295	
Cyanide, free	ug/g dry	0.03	0.051	--	<0.03	--	<0.03		<0.03	
pH	pH Units	0.05		--	7.24	--	7.18		7.09	
Anions										
Nitrate	ug/g dry	1		1	8	<1	7	6	6	<1
Nitrite	ug/g dry	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sulphate	ug/g dry	10		334	14	13	34	16	14	56
Metals										
Antimony	ug/g dry	1.0	7.5	--	2.4	--	<1.0	--	1.1	--
Arsenic	ug/g dry	1.0	18	--	13.4	--	7.8	--	7.2	--
Barium	ug/g dry	1.0	390	--	114	--	88.3	--	79.9	--
Beryllium	ug/g dry	0.5	4	--	0.6	--	0.5	--	<0.5	--
Boron, available	ug/g dry	0.5	1.5	--	0.5	--	0.7	--	0.9	--
Boron	ug/g dry	5.0	120	--	8.0	--	8.7	--	9.0	--
Cadmium	ug/g dry	0.5	1.2	--	0.7	--	0.5	--	<0.5	--
Chromium (VI)	ug/g dry	0.2	8	--	<0.2	--	<0.2	--	<0.2	--
Chromium	ug/g dry	5.0	160	--	24.0	--	31.1	--	25.0	--
Cobalt	ug/g dry	1.0	22	--	5.8	--	6.1	--	6.0	--
Copper	ug/g dry	5.0	140	--	28.0	--	23.5	--	20.1	--
Lead	ug/g dry	1.0	120	--	**214**	--	70.6	--	93.1	--
Mercury	ug/g dry	0.1	0.27	--	0.2	--	0.2	--	<0.1	--
Molybdenum	ug/g dry	1.0	6.9	--	1.6	--	1.2	--	1.7	--
Nickel	ug/g dry	5.0	100	--	15.8	--	16.9	--	16.5	--
Selenium	ug/g dry	1.0	2.4	--	1.1	--	<1.0	--	<1.0	--
Silver	ug/g dry	0.3	20	--	<0.3	--	<0.3	--	<0.3	--
Thallium	ug/g dry	1.0	1	--	<1.0	--	<1.0	--	<1.0	--
Uranium	ug/g dry	1.0	23	--	<1.0	--	<1.0	--	<1.0	--
Vanadium	ug/g dry	10.0	86	--	37.8	--	36.9	--	33.9	--
Zinc	ug/g dry	20.0	340	--	186	--	133	--	110	--

NOTES:
[1] MECP's *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011*
[2] Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition.
MDL Method Detection Limit
-- No Value/Not Analysed
BOLD Above Table 7 Standard

Table E
Summary of Groundwater PHC and VOC Analysis
Phase Two Environmental Site Assessment
593, 601, and 603 Laurier Avenue West, Ottawa, Ontario
LRL File: 240447

Parameter	Units	MDL	O. Reg. 153/04[1] Table 3[2] Commercial Property Use Coarse textured soil	Sample MW19-01	MW19-02	MW24-05	Field Blank	Trip Blank	*MW-XX*
Sample Date (d/m/y)				2024-09-11	2024-09-11	2024-09-11	2024-09-11	2024-09-11	*2024-09-11*
Headspace VOC Readings[3]	ppm	0.1		2.5	4.2	0.9	--	--	*0.9*
Evidence of free product?	--	--	[4]	No	No	No	--	--	*No*
Volatiles									
Acetone	ug/L	5.0	100000	<5.0	<5.0	13.6	<5.0	<5.0	*13.6*
Benzene	ug/L	0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
Bromodichloromethane	ug/L	0.5	67000	<0.5	<0.5	1.1	<0.5	<0.5	*1.0*
Bromoform	ug/L	0.5	5	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
Bromomethane	ug/L	0.5	0.89	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
Carbon Tetrachloride	ug/L	0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	*<0.2*
Chlorobenzene	ug/L	0.5	140	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
Chloroform	ug/L	0.5	2	<0.5	<0.5	**15.2**	<0.5	<0.5	***14.5***
Dibromochloromethane	ug/L	0.5	65000	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
Dichlorodifluoromethane	ug/L	1.0	3500	<1.0	<1.0	<1.0	<1.0	<1.0	*<1.0*
1,2-Dichlorobenzene	ug/L	0.5	150	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
1,3-Dichlorobenzene	ug/L	0.5	7600	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
1,4-Dichlorobenzene	ug/L	0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
1,1-Dichloroethane	ug/L	0.5	11	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
1,2-Dichloroethane	ug/L	0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
1,1-Dichloroethylene	ug/L	0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
cis-1,2-Dichloroethylene	ug/L	0.5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
trans-1,2-Dichloroethylene	ug/L	0.5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
1,2-Dichloropropane	ug/L	0.5	0.58	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
cis-1,3-Dichloropropylene	ug/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
trans-1,3-Dichloropropylene	ug/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
1,3-Dichloropropene, total	ug/L	0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
Ethylbenzene	ug/L	0.5	54	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
Ethylene dibromide (dibromoethane, 1,2-)	ug/L	0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	*<0.2*
Hexane	ug/L	1.0	5	<1.0	<1.0	<1.0	<1.0	<1.0	*<1.0*
Methyl Ethyl Ketone (2-Butanone)	ug/L	5.0	21000	<5.0	<5.0	<5.0	<5.0	<5.0	*<5.0*
Methyl Isobutyl Ketone	ug/L	5.0	5200	<5.0	<5.0	<5.0	<5.0	<5.0	*<5.0*
Methyl tert-butyl ether	ug/L	2.0	15	<2.0	<2.0	<2.0	<2.0	<2.0	*<2.0*
Methylene Chloride	ug/L	5.0	26	<5.0	<5.0	<5.0	<5.0	<5.0	*<5.0*
Styrene	ug/L	0.5	43	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
1,1,1,2-Tetrachloroethane	ug/L	0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
1,1,2,2-Tetrachloroethane	ug/L	0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
Tetrachloroethylene	ug/L	0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
Toluene	ug/L	0.5	320	<0.5	<0.5	0.6	<0.5	<0.5	*<0.5*
1,1,1-Trichloroethane	ug/L	0.5	23	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
1,1,2-Trichloroethane	ug/L	0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
Trichloroethylene	ug/L	0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
Trichlorofluoromethane	ug/L	1.0	2000	<1.0	<1.0	<1.0	<1.0	<1.0	*<1.0*
Vinyl Chloride	ug/L	0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
m/p-Xylene	ug/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
o-Xylene	ug/L	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
Xylenes, total	ug/L	0.5	72	<0.5	<0.5	<0.5	<0.5	<0.5	*<0.5*
Hydrocarbons									
F1 PHCs (C6-C10)	ug/L	25	420	<25	<25	<25	<25	--	*<25*
F2 PHCs (C10-C16)	ug/L	100	150	**308**	<100	<100	<100	--	*<100*
F3 PHCs (C16-C34)	ug/L	100	500	<100	194	357	<100	--	*314*
F4 PHCs (C34-C50)	ug/L	100	500	369	<100	346	<100	--	*288*

NOTES:

[1] MECP's *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011*
[2] Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition.
[3] Headspace values were measured with a RKI II GX6000 PID.
[4] To meet the standard there must be no evidence of free product including film or sheen.
MDL Method Detection Limit
-- No Value/Not Analysed
PHC Petroleum Hydrocarbon
BOLD Above Table 3 Standard
Italics Duplicate sample collected of sample MW24-05

Table F
Summary of Groundwater Semi Volatile Analysis
Phase Two Environmental Site Assessment
593, 601, and 603 Laurier Avenue West, Ottawa, Ontario
LRL File: 240447

Parameter	Units	MDL	O. Reg. 153/04[1] Table 3[2] Commercial Property Use Coarse textured soil	Sample MW19-01	MW19-02	MW24-05	Field Blank
Sample Date (d/m/y)				2024-09-11	2024-09-11	2024-09-11	2024-09-11
Headspace VOC Readings[3]	ppm	0.1		2.5	4.2	0.9	--
Semi-Volatiles							
Acenaphthene	ug/L	0.05	17	<1.00	<0.05	<0.05	<0.05
Acenaphthylene	ug/L	0.05	1	<1.00	<0.05	<0.05	<0.05
Anthracene	ug/L	0.01	1	<0.20	0.01	<0.01	<0.01
Benzo[a]anthracene	ug/L	0.01	1.8	<0.20	0.05	<0.01	<0.01
Benzo[a]pyrene	ug/L	0.01	0.81	<0.20	0.07	<0.01	<0.01
Benzo[b]fluoranthene	ug/L	0.05	0.75	<1.00	0.05	<0.05	<0.05
Benzo[g,h,i]perylene	ug/L	0.05	0.2	<1.00	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	ug/L	0.05	0.4	<1.00	<0.05	<0.05	<0.05
Chrysene	ug/L	0.05	0.7	<1.00	0.06	<0.05	<0.05
Dibenzo[a,h]anthracene	ug/L	0.05	0.4	<1.00	<0.05	<0.05	<0.05
Fluoranthene	ug/L	0.01	44	<0.20	0.09	<0.01	<0.01
Fluorene	ug/L	0.05	290	<1.00	<0.05	<0.05	<0.05
Indeno[1,2,3-cd]pyrene	ug/L	0.05	0.2	<1.00	<0.05	<0.05	<0.05
1-Methylnaphthalene	ug/L	0.05	1500	<1.00	<0.05	<0.05	<0.05
2-Methylnaphthalene	ug/L	0.05	1500	<1.00	<0.05	<0.05	<0.05
Methylnaphthalene (1&2)	ug/L	0.10	1500	<2.00	<0.10	<0.10	<0.10
Naphthalene	ug/L	0.05	7	<1.00	<0.05	<0.05	<0.05
Phenanthrene	ug/L	0.05	380	<1.00	0.06	<0.05	<0.05
Pyrene	ug/L	0.01	5.7	<0.20	0.08	<0.01	<0.01

NOTES:

[1] MECP's *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011*

[2] Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition.

[3] Headspace values were measured with a RKI II GX6000 PID.

MDL Method Detection Limit

-- No Value/Not Analysed

Table G
Summary of Groundwater Inorganics and Metals Analysis
Phase Two Environmental Site Assessment
593, 601, and 603 Laurier Avenue West, Ottawa, Ontario
LRL File: 240447

Parameter	Units	MDL	O. Reg. 153/04[1] Table 3[2] Commercial Property Use Coarse textured soil	Sample MW19-01	MW19-02	MW24-05	Field Blank	*MW-XX*
Sample Date (d/m/y)				2024-09-11	2024-09-11	2024-09-11	2024-09-11	*2024-09-11*
General Inorganics								
Cyanide, free	ug/L	2	52	<2	<2	<2	<2	*<2*
pH	pH Units	0.1		7.7	8.1	7.9	7.1	*8.0*
Anions								
Chloride	mg/L	1	1800	1000	5	57	<1	*55*
Metals								
Mercury	ug/L	0.1	0.1	<0.1	<0.1	<0.1	<0.1	*<0.1*
Antimony	ug/L	0.5	16000	0.6	0.6	<0.5	<0.5	*<0.5*
Arsenic	ug/L	1	1500	<1	<1	<1	<1	*<1*
Barium	ug/L	1	23000	152	90	110	<1	*105*
Beryllium	ug/L	0.5	53	<0.5	<0.5	<0.5	<0.5	*<0.5*
Boron	ug/L	10	36000	89	34	82	<10	*82*
Cadmium	ug/L	0.1	2.1	<0.1	<0.1	<0.1	<0.1	*<0.1*
Chromium	ug/L	1	640	<1	<1	<1	<1	*<1*
Chromium (VI)	ug/L	10	110	<10	<10	<10	<10	*<10*
Cobalt	ug/L	0.5	52	0.6	<0.5	<0.5	<0.5	*<0.5*
Copper	ug/L	0.5	69	1.7	3.3	2.8	<0.5	*2.0*
Lead	ug/L	0.1	20	0.1	1.1	<0.1	<0.1	*<0.1*
Molybdenum	ug/L	0.5	7300	1.8	3.2	111	<0.5	*117*
Nickel	ug/L	1	390	4	3	1	<1	*1*
Selenium	ug/L	1	50	<1	1	<1	<1	*<1*
Silver	ug/L	0.1	1.2	<0.1	<0.1	<0.1	<0.1	*<0.1*
Sodium	ug/L	200	1800000	262000	33900	20800	<200	*20400*
Thallium	ug/L	0.1	400	<0.1	<0.1	<0.1	<0.1	*<0.1*
Uranium	ug/L	0.1	330	3.8	1.5	0.8	<0.1	*0.7*
Vanadium	ug/L	0.5	200	<0.5	<0.5	<0.5	<0.5	*<0.5*
Zinc	ug/L	5	890	428	543	<5	<5	*<5*

NOTES:

[1] MECP's *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011*

[2] Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition.

[4] To meet the standard there must be no evidence of free product including film or sheen.

MDL Method Detection Limit

-- No Value/Not Analysed

Italics Duplicate sample collected of sample MW24-05

APPENDIX A

Borehole Logs

BOREHOLE LOG: BH24-01

LRL ENGINEERING | ENVIRONMENT
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

PROJECT NO.: 240447
PROJECT: PHASE II ENVIRONMENTAL SITE ASSESSMENT
CLIENT: HERITAGE INVESTMENTS LTD.
LOCATION: 593, 601 & 603 LAURIER AVENUE WEST
DATE: SEPTEMBER 3, 2024
FIELD PERSONNEL: ERIC LAVERGNE

DRILLER: GEORGE DOWNING ESTATE DRILLING LTD.
DRILLING EQUIPMENT: TRUCK MOUNTED CME-55
DRILLING METHOD: SPLIT-BARREL AUGER

DEPTH (FT / M)	SOIL DESCRIPTION	ELEV./DEPTH (m)	LITHOLOGY	TYPE	SAMPLE NUMBER	N OR RQD (%)	RECOVERY (%)	LABORATORY ANALYSIS	Combustible Soil Vapours (ppm) 10 30 50 70 90 / ISOBUTYLENE (ppm) 200 600 1000 1400 1800	MONITORING WELL DETAILS
0.0 / 0.0	**ASPHALT:**	100.39 0.00								
	FILL: Gravel, crushed stone, dry, gray.	0.05			SS1	0/15 50+2"	2	Heavy Metals & Inorganics Texture pH	0.1	
1.0	End of Borehole	100.03 0.36								
2.0										
3.0 / 1.0										
4.0										
5.0										
6.0 / 2.0										
7.0										
8.0										
9.0										
10.0 / 3.0										
11.0										
12.0										
13.0 / 4.0										
14.0										
15.0										
16.0										
17.0 / 5.0										
18.0										
19.0										
20.0 / 6.0										

EASTING: 0444584
NORTHING: 5029286
SITE DATUM: Elevations measured from temporary benchmark established at the northeast upper rim of the fire hydrant located south of Laurier Avenue West (100.00 m).
GROUNDSURFACE ELEVATION: 100.39 m
TOP OF RISER ELEVATION: --
HOLE DIAMETER: 50 mm
MONITORING WELL DIAMETER: --

NOTES:
bgs: Below Ground Surface
VOC: Volatile Organic Compounds
PHC: Petroleum Hydrocarbons
PAH: Polycyclic Aromatic Hydrocarbons
PCB: Polychlorinated Biphenyls
N/A: Not applicable

BOREHOLE LOG: BH24-02

LRJ
ENVIRONMENT | ENGINEER
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

PROJECT NO.: 240447
PROJECT: PHASE II ENVIRONMENTAL SITE ASSESSMENT
CLIENT: HERITAGE INVESTMENTS LTD.
LOCATION: 593, 601 & 603 LAURIER AVENUE WEST
DATE: SEPTEMBER 3, 2024
FIELD PERSONNEL: ERIC LAVERGNE

DRILLER: GEORGE DOWNING ESTATE DRILLING LTD.
DRILLING EQUIPMENT: TRUCK MOUNTED CME-55
DRILLING METHOD: SPLIT-BARREL AUGER

DEPTH (FT / M)	SOIL DESCRIPTION	ELEV./DEPTH (m)	LITHOLOGY	TYPE	SAMPLE NUMBER	N OR RQD (%)	RECOVERY (%)	LABORATORY ANALYSIS	Combustible Soil Vapours (ppm) / ISOBUTYLENE (ppm)	MONITORING WELL DETAILS
0.0 / 0.0		100.25								
	FILL: Sandy soil	0.00								
1.0	Gravel and rock with stone dust, brown-grey, dry.				SS1	2/4 12/ 50+2"	15	Heavy Metals & Inorganics	0.6	
2.0										
3.0 / 1.0					SS2	12/24 20/ 50+4"	9	PHC VOC PAH PCB	1.8	
4.0		96.24			SS3	50+2"	0			
5.0	BEDROCK	3.81				30				
6.0 / 2.0										
7.0										
8.0						47.7				
9.0										
10.0 / 3.0										
11.0										
12.0										
13.0						56				
14.0 / 4.0										
15.0										
16.0										
17.0 / 5.0						72				
18.0										
19.0										
20.0 / 6.0										

EASTING: 0444577
NORTHING: 5029309
SITE DATUM: Elevations measured from temporary benchmark established at the northeast upper rim of the fire hydrant located south of Laurier Avenue West (100.00 m).
GROUNDSURFACE ELEVATION: 100.25 m
TOP OF RISER ELEVATION: --
HOLE DIAMETER: 50 mm
MONITORING WELL DIAMETER: --

NOTES:
bgs: Below Ground Surface
VOC: Volatile Organic Compounds
PHC: Petroleum Hydrocarbons
PAH: Polycyclic Aromatic Hydrocarbons
PCB: Polychlorinated Biphenyls
N/A: Not applicable

LRJ
ENGINEERING | ENVIRONMENT
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

BOREHOLE LOG: BH24-02

PROJECT NO.: 240447
PROJECT: PHASE II ENVIRONMENTAL SITE ASSESSMENT
CLIENT: HERITAGE INVESTMENTS LTD.
LOCATION: 593, 601 & 603 LAURIER AVENUE WEST
DATE: SEPTEMBER 3, 2024
FIELD PERSONNEL: ERIC LAVERGNE

DRILLER: GEORGE DOWNING ESTATE DRILLING LTD.
DRILLING EQUIPMENT: TRUCK MOUNTED CME-55
DRILLING METHOD: SPLIT-BARREL AUGER

DEPTH (FT / M)	SOIL DESCRIPTION	ELEV./DEPTH (m)	LITHOLOGY	TYPE	SAMPLE NUMBER	N OR RQD (%)	RECOVERY (%)	LABORATORY ANALYSIS	Combustible Soil Vapours (ppm) 10 30 50 70 90 / ISOBUTYLENE (ppm) 200 600 1000 1400 1800	MONITORING WELL DETAILS
20.0 / 6.1		94.15 / 6.1				98				
23.0 / 7.0										
26.0 / 8.0						89.3				
30.0 / 9.0										
33.0 / 10.0						90				
35.0	End of Borehole	89.55 / 10.70								
36.0 / 11.0										
39.0 / 12.0										
40.0										

EASTING: 0444577
NORTHING: 5029309
SITE DATUM: Elevations measured from temporary benchmark established at the northeast upper rim of the fire hydrant located south of Laurier Avenue West (100.00 m).
GROUNDSURFACE ELEVATION: 100.25 m
TOP OF RISER ELEVATION: --
HOLE DIAMETER: 78 mm
MONITORING WELL DIAMETER: --

NOTES:
bgs: Below Ground Surface
VOC: Volatile Organic Compounds
PHC: Petroleum Hydrocarbons
PAH: Polycyclic Aromatic Hydrocarbons
PCB: Polychlorinated Biphenyls
N/A: Not applicable

BOREHOLE LOG: BH24-03

LRJ
environmental | exploration
5430 Canotek Road Ottawa, ON, K1J 9G2
www.lrl.ca (613) 842-3434

PROJECT NO.: 240447
PROJECT: PHASE II ENVIRONMENTAL SITE ASSESSMENT
CLIENT: HERITAGE INVESTMENTS LTD.
LOCATION: 593, 601 & 603 LAURIER AVENUE WEST
DATE: SEPTEMBER 3, 2024
FIELD PERSONNEL: ERIC LAVERGNE

DRILLER: GEORGE DOWNING ESTATE DRILLING LTD. **DRILLING EQUIPMENT:** TRUCK MOUNTED CME-55 **DRILLING METHOD:** SPLIT-BARREL AUGER

DEPTH (FT / M)	SOIL DESCRIPTION	ELEV./DEPTH (m)	LITHOLOGY	TYPE	SAMPLE NUMBER	N OR RQD (%)	RECOVERY (%)	LABORATORY ANALYSIS	Combustible Soil Vapours (ppm) 10 30 50 70 90 / ISOBUTYLENE (ppm) 200 600 1000 1400 1800	MONITORING WELL DETAILS
0.0 / 0.0		100.47								
0.0 / 0.0	**FILL:** Silty soil, brown, dry for 0.13 m. Gravel with stone dust, gray, dry.	0.00			SS1	2/12 50+1"	8	Heavy Metals & Inorganics PHC VOC	<0.1	
2.0 / 1.0	End of Borehole	99.99 0.48								
3.0 / 1.0										
4.0 / 1.0										
5.0 / 1.0										
6.0 / 2.0										
7.0 / 2.0										
8.0 / 2.0										
9.0 / 2.0										
10.0 / 3.0										
11.0 / 3.0										
12.0 / 3.0										
13.0 / 4.0										
14.0 / 4.0										
15.0 / 4.0										
16.0 / 5.0										
17.0 / 5.0										
18.0 / 5.0										
19.0 / 6.0										
20.0 / 6.0										

EASTING: 0444584 **NORTHING:** 5029286

SITE DATUM: Elevations measured from temporary benchmark established at the northeast upper rim of the fire hydrant located south of Laurier Avenue West (100.00 m).

GROUNDSURFACE ELEVATION: 100.47 m **TOP OF RISER ELEVATION:** --

HOLE DIAMETER: 50 mm **MONITORING WELL DIAMETER:** --

NOTES:
bgs: Below Ground Surface
VOC: Volatile Organic Compounds
PHC: Petroleum Hydrocarbons
PAH: Polycyclic Aromatic Hydrocarbons
PCB: Polychlorinated Biphenyls
N/A: Not applicable

BOREHOLE LOG: BH24-04

LRL
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

PROJECT NO.: 240447
PROJECT: PHASE II ENVIRONMENTAL SITE ASSESSMENT
CLIENT: HERITAGE INVESTMENTS LTD.
LOCATION: 593, 601 & 603 LAURIER AVENUE WEST
DATE: SEPTEMBER 3, 2024
FIELD PERSONNEL: ERIC LAVERGNE

DRILLER: GEORGE DOWNING ESTATE DRILLING LTD.
DRILLING EQUIPMENT: TRUCK MOUNTED CME-55
DRILLING METHOD: SPLIT-BARREL AUGER

DEPTH (FT / M)	SOIL DESCRIPTION	ELEV./DEPTH (m)	LITHOLOGY	TYPE	SAMPLE NUMBER	N OR RQD (%)	RECOVERY (%)	LABORATORY ANALYSIS	Combustible Soil Vapours (ppm) / ISOBUTYLENE (ppm)	MONITORING WELL DETAILS
0.0 / 0.0	**FILL:** Silty soil, brown, dry for 0.10 m.	100.47 / 0.00								
1.0	Crushed stone and gravel, gray, dry.				SS1	3/ 50+5"	8	PAH PHC VOC	<0.1	
2.0		99.61			SS2	50+4"	0			
3.0 / 1.0	End of Borehole	0.86								
4.0										
5.0										
6.0										
7.0 / 2.0										
8.0										
9.0										
10.0 / 3.0										
11.0										
12.0										
13.0 / 4.0										
14.0										
15.0										
16.0 / 5.0										
17.0										
18.0										
19.0										
20.0 / 6.0										

Combustible Soil Vapours (ppm): 10 30 50 70 90
ISOBUTYLENE (ppm): 200 600 1000 1400 1800

EASTING: 0444515
NORTHING: 5029275
SITE DATUM: Elevations measured from temporary benchmark established at the northeast upper rim of the fire hydrant located south of Laurier Avenue West (100.00 m).
GROUNDSURFACE ELEVATION: 100.47 m
TOP OF RISER ELEVATION: --
HOLE DIAMETER: 50 mm
MONITORING WELL DIAMETER: --

NOTES:
bgs: Below Ground Surface
VOC: Volatile Organic Compounds
PHC: Petroleum Hydrocarbons
PAH: Polycyclic Aromatic Hydrocarbons
PCB: Polychlorinated Biphenyls
N/A: Not applicable

BOREHOLE LOG: BH24-05

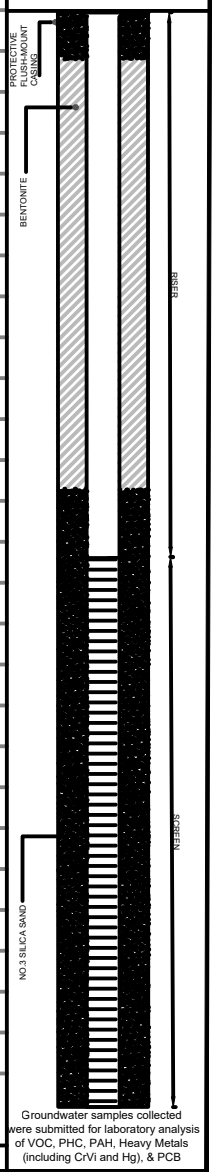
LRJ Environmental | Hydrogeology
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrj.ca | (613) 842-3434

PROJECT NO.: 240447
PROJECT: PHASE II ENVIRONMENTAL SITE ASSESSMENT
CLIENT: HERITAGE INVESTMENTS LTD.
LOCATION: 593, 601 & 603 LAURIER AVENUE WEST
DATE: SEPTEMBER 3, 2024
FIELD PERSONNEL: ERIC LAVERGNE

DRILLER: GEORGE DOWNING ESTATE DRILLING LTD.
DRILLING EQUIPMENT: TRUCK MOUNTED CME-55
DRILLING METHOD: SPLIT-BARREL AUGER & CORING

DEPTH (FT / M)	SOIL DESCRIPTION	ELEV./DEPTH (m)	SAMPLE NUMBER	N OR RQD (%)	RECOVERY (%)	LABORATORY ANALYSIS	Combustible Soil Vapours (ppm) / ISOBUTYLENE (ppm)
0.0 / 0.0	**FILL:** Traces of grass and roots, sandy, silty soil.	100.35 / 0.00					
1.0	Becomes more fine, traces of gravel, brown, dry.		SS1	7/22 34/ 50+4"	15	Heavy Metals & Inorganics PCB	<0.1
2.0	Gravel, gray, dry.						
3.0 / 1.0			SS2	33/ 50+3"	6	PHC &VOC PAH Texture, pH	<0.1
4.0	BEDROCK	99.33 / 1.02		17			
5.0							
6.0 / 2.0				56.4			
7.0							
8.0							
9.0							
10.0 / 3.0							
11.0							
12.0							
13.0 / 4.0				35.1			
14.0							
15.0							
16.0							
17.0 / 5.0							
18.0				69.3			
19.0							
20.0 / 6.0							

MONITORING WELL DETAILS



Groundwater samples collected were submitted for laboratory analysis of VOC, PHC, PAH, Heavy Metals (including CrVi and Hg), & PCB

EASTING: 0444543
NORTHING: 5029252
SITE DATUM: Elevations measured from temporary benchmark established at the northeast upper rim of the fire hydrant located south of Laurier Avenue West (100.00 m).
GROUNDSURFACE ELEVATION: 100.35 m
TOP OF RISER ELEVATION: 100.21 mm
HOLE DIAMETER: 78 mm
MONITORING WELL DIAMETER: 1¼"

NOTES:
bgs: Below Ground Surface
VOC: Volatile Organic Compounds
PHC: Petroleum Hydrocarbons
PAH: Polycyclic Aromatic Hydrocarbons
PCB: Polychlorinated Biphenyls
N/A: Not applicable

BOREHOLE LOG: BH24-05

LRJ ENGINEERING | INGÉNIERIE
5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lrl.ca | (613) 842-3434

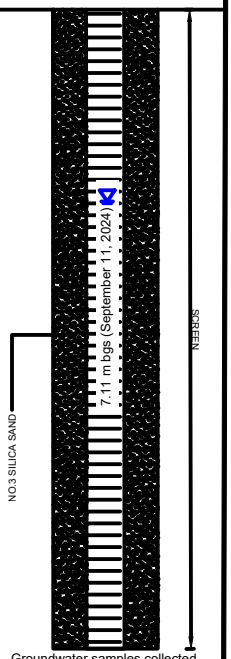
PROJECT NO.: 240447
PROJECT: PHASE II ENVIRONMENTAL SITE ASSESSMENT
CLIENT: HERITAGE INVESTMENTS LTD.
LOCATION: 593, 601 & 603 LAURIER AVENUE WEST
DATE: SEPTEMBER 3, 2024
FIELD PERSONNEL: ERIC LAVERGNE

DRILLER: GEORGE DOWNING ESTATE DRILLING LTD.
DRILLING EQUIPMENT: TRUCK MOUNTED CME-55
DRILLING METHOD: SPLIT-BARREL AUGER

DEPTH (FT / M)	SOIL DESCRIPTION	ELEV./DEPTH (m)	LITHOLOGY	TYPE	SAMPLE NUMBER	N OR RQD (%)	RECOVERY (%)	LABORATORY ANALYSIS
20.0 / 6.1		94.25 / 6.1				90.7		
30.0 / 9.0	End of Borehole	91.21 / 9.14				79.3		

Combustible Soil Vapours (ppm): 10 30 50 70 90
ISOBUTYLENE (ppm): 200 600 1000 1400 1800

MONITORING WELL DETAILS



Groundwater samples collected were submitted for laboratory analysis of VOC, PHC, PAH, Heavy Metals & Inorganics, and Cyanide

EASTING: 0444515
NORTHING: 5029275
SITE DATUM: Elevations measured from temporary benchmark established at the northeast upper rim of the fire hydrant located south of Laurier Avenue West (100.00 m).
GROUNDSURFACE ELEVATION: 100.35 m
TOP OF RISER ELEVATION: 100.21
HOLE DIAMETER: 78 mm
MONITORING WELL DIAMETER: 1¼"

NOTES:
bgs: Below Ground Surface
VOC: Volatile Organic Compounds
PHC: Petroleum Hydrocarbons
PAH: Polycyclic Aromatic Hydrocarbons
PCB: Polychlorinated Biphenyls
N/A: Not applicable

APPENDIX B

Certificates of Laboratory Analysis

PARACEL LABORATORIES LTD.
TRUSTED. RESPONSIVE. RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

LRL Associates Ltd.
5430 Canotek Road
Ottawa, ON K1J 9G2
Attn: Eric Lavergne

Client PO:
Project: 240447
Custody: 74241

Report Date: 1-Oct-2024
Order Date: 5-Sep-2024

Revised Report

Order #: 2436300

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

Paracel ID	Client ID
2436300-01	1-SS1
2436300-02	2-SS1
2436300-03	2-SS2
2436300-04	3-SS1
2436300-05	3-SSX
2436300-06	4-SS1
2436300-07	5-SS1
2436300-08	5-SS2

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC, water extraction	30-Sep-24	30-Sep-24
Boron, available	MOE (HWE), EPA 200.8 - ICP-MS	9-Sep-24	9-Sep-24
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	9-Sep-24	9-Sep-24
Conductivity	MOE E3138 - probe @25 °C, water ext	9-Sep-24	10-Sep-24
Cyanide, free	MOE E3015 - Auto Colour, water extraction	10-Sep-24	10-Sep-24
Mercury by CVAA	EPA 7471B - CVAA, digestion	9-Sep-24	9-Sep-24
PCBs, total	SW846 8082A - GC-ECD	10-Sep-24	10-Sep-24
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	9-Sep-24	9-Sep-24
PHC F1	CWS Tier 1 - P&T GC-FID	9-Sep-24	9-Sep-24
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	7-Sep-24	10-Sep-24
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	9-Sep-24	9-Sep-24
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	9-Sep-24	11-Sep-24
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	9-Sep-24	9-Sep-24
SAR	Calculated	9-Sep-24	10-Sep-24
Solids, %	CWS Tier 1 - Gravimetric	30-Sep-24	30-Sep-24

Certificate of Analysis

Report Date: 01-Oct-2024

Client: **LRL Associates Ltd.**

Order Date: 5-Sep-2024

Client PO:

Project Description: 240447

	Client ID:	1-SS1	2-SS1	2-SS2	3-SS1	-	-
	Sample Date:	03-Sep-24 12:00	03-Sep-24 09:00	03-Sep-24 09:00	03-Sep-24 12:00		
	Sample ID:	2436300-01	2436300-02	2436300-03	2436300-04		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	95.7	70.8	97.1	85.5	-	-
General Inorganics							
SAR	0.01 N/A	-	0.07	-	3.91	-	-
Conductivity	5 uS/cm	-	299	-	454	-	-
Cyanide, free	0.03 ug/g	-	<0.03	-	<0.03	-	-
pH	0.05 pH Units	-	7.24	-	7.18	-	-
Anions							
Nitrate as N	1 ug/g	1	8	<1	7	-	-
Nitrite as N	0.5 ug/g	<0.5	<0.5	<0.5	<0.5	-	-
Sulphate	10 ug/g	334	14	13	34	-	-
Metals							
Antimony	1.0 ug/g	-	2.4	-	<1.0	-	-
Arsenic	1.0 ug/g	-	13.4	-	7.8	-	-
Barium	1.0 ug/g	-	114	-	88.3	-	-
Beryllium	0.5 ug/g	-	0.6	-	0.5	-	-
Boron, available	0.5 ug/g	-	0.5	-	0.7	-	-
Boron	5.0 ug/g	-	8.0	-	8.7	-	-
Cadmium	0.5 ug/g	-	0.7	-	0.5	-	-
Chromium (VI)	0.2 ug/g	-	<0.2	-	<0.2	-	-
Chromium	5.0 ug/g	-	24.0	-	31.1	-	-
Cobalt	1.0 ug/g	-	5.8	-	6.1	-	-
Copper	5.0 ug/g	-	28.0	-	23.5	-	-
Lead	1.0 ug/g	-	214	-	70.6	-	-
Mercury	0.1 ug/g	-	0.2	-	0.2	-	-
Molybdenum	1.0 ug/g	-	1.6	-	1.2	-	-

	Client ID:	1-SS1	2-SS1	2-SS2	3-SS1	-	-
	Sample Date:	03-Sep-24 12:00	03-Sep-24 09:00	03-Sep-24 09:00	03-Sep-24 12:00		
	Sample ID:	2436300-01	2436300-02	2436300-03	2436300-04		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Metals							
Nickel	5.0 ug/g	-	15.8	-	16.9	-	-
Selenium	1.0 ug/g	-	1.1	-	<1.0	-	-
Silver	0.3 ug/g	-	<0.3	-	<0.3	-	-
Thallium	1.0 ug/g	-	<1.0	-	<1.0	-	-
Uranium	1.0 ug/g	-	<1.0	-	<1.0	-	-
Vanadium	10.0 ug/g	-	37.8	-	36.9	-	-
Zinc	20.0 ug/g	-	186	-	133	-	-
Volatiles							
Acetone	0.50 ug/g	-	-	<0.50	<0.50	-	-
Benzene	0.02 ug/g	-	-	<0.02	<0.02	-	-
Bromodichloromethane	0.05 ug/g	-	-	<0.05	<0.05	-	-
Bromoform	0.05 ug/g	-	-	<0.05	<0.05	-	-
Bromomethane	0.05 ug/g	-	-	<0.05	<0.05	-	-
Carbon Tetrachloride	0.05 ug/g	-	-	<0.05	<0.05	-	-
Chlorobenzene	0.05 ug/g	-	-	<0.05	<0.05	-	-
Chloroform	0.05 ug/g	-	-	<0.05	<0.05	-	-
Dibromochloromethane	0.05 ug/g	-	-	<0.05	<0.05	-	-
Dichlorodifluoromethane	0.05 ug/g	-	-	<0.05	<0.05	-	-
1,2-Dichlorobenzene	0.05 ug/g	-	-	<0.05	<0.05	-	-
1,3-Dichlorobenzene	0.05 ug/g	-	-	<0.05	<0.05	-	-
1,4-Dichlorobenzene	0.05 ug/g	-	-	<0.05	<0.05	-	-
1,1-Dichloroethane	0.05 ug/g	-	-	<0.05	<0.05	-	-
1,2-Dichloroethane	0.05 ug/g	-	-	<0.05	<0.05	-	-
1,1-Dichloroethylene	0.05 ug/g	-	-	<0.05	<0.05	-	-
cis-1,2-Dichloroethylene	0.05 ug/g	-	-	<0.05	<0.05	-	-

	Client ID:	1-SS1	2-SS1	2-SS2	3-SS1	-	-
	Sample Date:	03-Sep-24 12:00	03-Sep-24 09:00	03-Sep-24 09:00	03-Sep-24 12:00		
	Sample ID:	2436300-01	2436300-02	2436300-03	2436300-04		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Volatiles							
trans-1,2-Dichloroethylene	0.05 ug/g	-	-	<0.05	<0.05	-	-
1,2-Dichloropropane	0.05 ug/g	-	-	<0.05	<0.05	-	-
cis-1,3-Dichloropropylene	0.05 ug/g	-	-	<0.05	<0.05	-	-
trans-1,3-Dichloropropylene	0.05 ug/g	-	-	<0.05	<0.05	-	-
1,3-Dichloropropene, total	0.05 ug/g	-	-	<0.05	<0.05	-	-
Ethylbenzene	0.05 ug/g	-	-	<0.05	<0.05	-	-
Ethylene dibromide (dibromoethane,	0.05 ug/g	-	-	<0.05	<0.05	-	-
Hexane	0.05 ug/g	-	-	<0.05	<0.05	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g	-	-	<0.50	<0.50	-	-
Methyl Isobutyl Ketone	0.50 ug/g	-	-	<0.50	<0.50	-	-
Methyl tert-butyl ether	0.05 ug/g	-	-	<0.05	<0.05	-	-
Methylene Chloride	0.05 ug/g	-	-	<0.05	<0.05	-	-
Styrene	0.05 ug/g	-	-	<0.05	<0.05	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g	-	-	<0.05	<0.05	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g	-	-	<0.05	<0.05	-	-
Tetrachloroethylene	0.05 ug/g	-	-	<0.05	<0.05	-	-
Toluene	0.05 ug/g	-	-	<0.05	<0.05	-	-
1,1,1-Trichloroethane	0.05 ug/g	-	-	<0.05	<0.05	-	-
1,1,2-Trichloroethane	0.05 ug/g	-	-	<0.05	<0.05	-	-
Trichloroethylene	0.05 ug/g	-	-	<0.05	<0.05	-	-
Trichlorofluoromethane	0.05 ug/g	-	-	<0.05	0.56	-	-
Vinyl chloride	0.02 ug/g	-	-	<0.02	<0.02	-	-
m,p-Xylenes	0.05 ug/g	-	-	0.08	<0.05	-	-
o-Xylene	0.05 ug/g	-	-	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g	-	-	0.08	<0.05	-	-

	Client ID:	1-SS1	2-SS1	2-SS2	3-SS1	-	-
	Sample Date:	03-Sep-24 12:00	03-Sep-24 09:00	03-Sep-24 09:00	03-Sep-24 12:00		
	Sample ID:	2436300-01	2436300-02	2436300-03	2436300-04		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Volatiles							
4-Bromofluorobenzene	Surrogate	-	-	111%	114%	-	-
Toluene-d8	Surrogate	-	-	113%	118%	-	-
Dibromofluoromethane	Surrogate	-	-	80.3%	85.3%	-	-
Hydrocarbons							
F1 PHCs (C6-C10)	7 ug/g	-	-	<7	<7	-	-
F2 PHCs (C10-C16)	4 ug/g	-	-	<4	5	-	-
F3 PHCs (C16-C34)	8 ug/g	-	-	<8	85	-	-
F4 PHCs (C34-C50)	6 ug/g	-	-	<6	56	-	-
Semi-Volatiles							
Acenaphthene	0.02 ug/g	-	-	<0.02	-	-	-
Acenaphthylene	0.02 ug/g	-	-	<0.02	-	-	-
Anthracene	0.02 ug/g	-	-	<0.02	-	-	-
Benzo [a] anthracene	0.02 ug/g	-	-	<0.02	-	-	-
Benzo [a] pyrene	0.02 ug/g	-	-	<0.02	-	-	-
Benzo [b] fluoranthene	0.02 ug/g	-	-	<0.02	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g	-	-	<0.02	-	-	-
Benzo [k] fluoranthene	0.02 ug/g	-	-	<0.02	-	-	-
Chrysene	0.02 ug/g	-	-	<0.02	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g	-	-	<0.02	-	-	-
Fluoranthene	0.02 ug/g	-	-	<0.02	-	-	-
Fluorene	0.02 ug/g	-	-	<0.02	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g	-	-	<0.02	-	-	-
1-Methylnaphthalene	0.02 ug/g	-	-	<0.02	-	-	-
2-Methylnaphthalene	0.02 ug/g	-	-	<0.02	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g	-	-	<0.04	-	-	-

	Client ID:	1-SS1	2-SS1	2-SS2	3-SS1	-	-
	Sample Date:	03-Sep-24 12:00	03-Sep-24 09:00	03-Sep-24 09:00	03-Sep-24 12:00		
	Sample ID:	2436300-01	2436300-02	2436300-03	2436300-04		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Semi-Volatiles							
Naphthalene	0.01 ug/g	-	-	<0.01	-	-	-
Phenanthrene	0.02 ug/g	-	-	<0.02	-	-	-
Pyrene	0.02 ug/g	-	-	<0.02	-	-	-
2-Fluorobiphenyl	Surrogate	-	-	55.2%	-	-	-
Terphenyl-d14	Surrogate	-	-	78.6%	-	-	-
PCBs							
PCBs, total	0.05 ug/g	-	-	<0.05	-	-	-
Decachlorobiphenyl	Surrogate	-	-	117%	-	-	-

	Client ID:	3-SSX	4-SS1	5-SS1	5-SS2	-	-
	Sample Date:	03-Sep-24 12:00	03-Sep-24 12:00	03-Sep-24 09:00	03-Sep-24 09:00		
	Sample ID:	2436300-05	2436300-06	2436300-07	2436300-08		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	85.5	81.1	89.1	-	-	-
General Inorganics							
SAR	0.01 N/A	-	-	0.13	-	-	-
Conductivity	5 uS/cm	-	-	295	-	-	-
Cyanide, free	0.03 ug/g	-	-	<0.03	-	-	-
pH	0.05 pH Units	-	-	7.09	-	-	-
Anions							
Nitrate as N	1 ug/g	-	6	6	<1	-	-
Nitrite as N	0.5 ug/g	-	<0.5	<0.5	<0.5	-	-
Sulphate	10 ug/g	-	16	14	56	-	-
Metals							
Antimony	1.0 ug/g	-	-	1.1	-	-	-
Arsenic	1.0 ug/g	-	-	7.2	-	-	-
Barium	1.0 ug/g	-	-	79.9	-	-	-
Beryllium	0.5 ug/g	-	-	<0.5	-	-	-
Boron	5.0 ug/g	-	-	9.0	-	-	-
Boron, available	0.5 ug/g	-	-	0.9	-	-	-
Cadmium	0.5 ug/g	-	-	<0.5	-	-	-
Chromium (VI)	0.2 ug/g	-	-	<0.2	-	-	-
Chromium	5.0 ug/g	-	-	25.0	-	-	-
Cobalt	1.0 ug/g	-	-	6.0	-	-	-
Copper	5.0 ug/g	-	-	20.1	-	-	-
Lead	1.0 ug/g	-	-	93.1	-	-	-
Mercury	0.1 ug/g	-	-	<0.1	-	-	-
Molybdenum	1.0 ug/g	-	-	1.7	-	-	-

	Client ID:	3-SSX	4-SS1	5-SS1	5-SS2	-	-
	Sample Date:	03-Sep-24 12:00	03-Sep-24 12:00	03-Sep-24 09:00	03-Sep-24 09:00		
	Sample ID:	2436300-05	2436300-06	2436300-07	2436300-08		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Metals							
Nickel	5.0 ug/g	-	-	16.5	-	-	-
Selenium	1.0 ug/g	-	-	<1.0	-	-	-
Silver	0.3 ug/g	-	-	<0.3	-	-	-
Thallium	1.0 ug/g	-	-	<1.0	-	-	-
Uranium	1.0 ug/g	-	-	<1.0	-	-	-
Vanadium	10.0 ug/g	-	-	33.9	-	-	-
Zinc	20.0 ug/g	-	-	110	-	-	-
Volatiles							
Acetone	0.50 ug/g	<0.50	<0.50	<0.50	-	-	-
Benzene	0.02 ug/g	<0.02	<0.02	<0.02	-	-	-
Bromodichloromethane	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Bromoform	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Bromomethane	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Carbon Tetrachloride	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Chlorobenzene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Chloroform	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Dibromochloromethane	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Dichlorodifluoromethane	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
1,2-Dichlorobenzene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
1,3-Dichlorobenzene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
1,4-Dichlorobenzene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
1,1-Dichloroethane	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
1,2-Dichloroethane	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
1,1-Dichloroethylene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
cis-1,2-Dichloroethylene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-

	Client ID:	3-SSX	4-SS1	5-SS1	5-SS2	-	-
	Sample Date:	03-Sep-24 12:00	03-Sep-24 12:00	03-Sep-24 09:00	03-Sep-24 09:00		
	Sample ID:	2436300-05	2436300-06	2436300-07	2436300-08		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Volatiles							
trans-1,2-Dichloroethylene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
1,2-Dichloropropane	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
cis-1,3-Dichloropropylene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
trans-1,3-Dichloropropylene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
1,3-Dichloropropene, total	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Ethylene dibromide (dibromoethane,	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Ethylbenzene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Hexane	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g	<0.50	<0.50	<0.50	-	-	-
Methyl Isobutyl Ketone	0.50 ug/g	<0.50	<0.50	<0.50	-	-	-
Methyl tert-butyl ether	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Methylene Chloride	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Styrene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Tetrachloroethylene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Toluene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
1,1,1-Trichloroethane	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
1,1,2-Trichloroethane	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Trichloroethylene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Trichlorofluoromethane	0.05 ug/g	0.40	<0.05	<0.05	-	-	-
Vinyl chloride	0.02 ug/g	<0.02	<0.02	<0.02	-	-	-
m,p-Xylenes	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
o-Xylene	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-
Xylenes, total	0.05 ug/g	<0.05	<0.05	<0.05	-	-	-

	Client ID:	3-SSX	4-SS1	5-SS1	5-SS2	-	-
	Sample Date:	03-Sep-24 12:00	03-Sep-24 12:00	03-Sep-24 09:00	03-Sep-24 09:00		
	Sample ID:	2436300-05	2436300-06	2436300-07	2436300-08		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Volatiles							
Toluene-d8	Surrogate	117%	123%	119%	-	-	-
Dibromofluoromethane	Surrogate	87.0%	93.3%	87.2%	-	-	-
4-Bromofluorobenzene	Surrogate	111%	116%	112%	-	-	-
Hydrocarbons							
F1 PHCs (C6-C10)	7 ug/g	<7	<7	<7	-	-	-
F2 PHCs (C10-C16)	4 ug/g	10	<4	<4	-	-	-
F3 PHCs (C16-C34)	8 ug/g	133	15	24	-	-	-
F4 PHCs (C34-C50)	6 ug/g	93	18	16	-	-	-
Semi-Volatiles							
Acenaphthene	0.02 ug/g	-	0.70	-	-	-	-
Acenaphthylene	0.02 ug/g	-	0.03	-	-	-	-
Anthracene	0.02 ug/g	-	1.24	-	-	-	-
Benzo [a] anthracene	0.02 ug/g	-	1.48	-	-	-	-
Benzo [a] pyrene	0.02 ug/g	-	1.10	-	-	-	-
Benzo [b] fluoranthene	0.02 ug/g	-	0.98	-	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g	-	0.72	-	-	-	-
Benzo [k] fluoranthene	0.02 ug/g	-	0.53	-	-	-	-
Chrysene	0.02 ug/g	-	1.42	-	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g	-	0.17	-	-	-	-
Fluoranthene	0.02 ug/g	-	6.06	-	-	-	-
Fluorene	0.02 ug/g	-	0.66	-	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g	-	0.61	-	-	-	-
1-Methylnaphthalene	0.02 ug/g	-	0.08	-	-	-	-
2-Methylnaphthalene	0.02 ug/g	-	0.11	-	-	-	-
Methylnaphthalene (1&2)	0.04 ug/g	-	0.19	-	-	-	-

	Client ID:	3-SSX	4-SS1	5-SS1	5-SS2	-	-
	Sample Date:	03-Sep-24 12:00	03-Sep-24 12:00	03-Sep-24 09:00	03-Sep-24 09:00		
	Sample ID:	2436300-05	2436300-06	2436300-07	2436300-08		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Semi-Volatiles							
Naphthalene	0.01 ug/g	-	0.49	-	-	-	-
Phenanthrene	0.02 ug/g	-	6.21	-	-	-	-
Pyrene	0.02 ug/g	-	4.78	-	-	-	-
2-Fluorobiphenyl	Surrogate	-	63.4%	-	-	-	-
Terphenyl-d14	Surrogate	-	87.5%	-	-	-	-
PCBs							
PCBs, total	0.05 ug/g	-	-	<0.05	-	-	-
Decachlorobiphenyl	Surrogate	-	-	114%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Nitrate as N	ND	1	ug/g					
Nitrite as N	ND	0.5	ug/g					
Sulphate	ND	10	ug/g					
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					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Zinc	ND	20.0	ug/g					
PCBs								
PCBs, total	ND	0.05	ug/g					
Surrogate: Decachlorobiphenyl	*0.115*		*%*	*115*	*60-140*			
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	*0.709*		*%*	*53.2*	*50-140*			
Surrogate: Terphenyl-d14	*1.00*		*%*	*75.2*	*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	%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					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
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	*9.08*		*%*	*113*	*50-140*			
Surrogate: Dibromofluoromethane	*6.70*		*%*	*83.7*	*50-140*			
Surrogate: Toluene-d8	*8.94*		*%*	*112*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Nitrate as N	ND	1	ug/g	ND			NC	35	
Nitrite as N	ND	0.5	ug/g	ND			NC	35	
Sulphate	ND	10	ug/g	ND			NC	35	
General Inorganics									
SAR	0.95	0.01	N/A	0.96			0.8	30	
Conductivity	248	5	uS/cm	255			2.7	5	
Cyanide, free	ND	0.03	ug/g	ND			NC	35	
pH	7.26	0.05	pH Units	7.30			0.5	2.3	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g	ND			NC	30	
F3 PHCs (C16-C34)	ND	8	ug/g	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g	ND			NC	30	
Metals									
Antimony	2.2	1.0	ug/g	2.4			6.3	30	
Arsenic	13.0	1.0	ug/g	13.4			2.8	30	
Barium	109	1.0	ug/g	114			4.0	30	
Beryllium	0.6	0.5	ug/g	0.6			7.1	30	
Boron, available	ND	0.5	ug/g	0.52			NC	35	
Boron	7.6	5.0	ug/g	8.0			5.4	30	
Cadmium	0.6	0.5	ug/g	0.7			10.6	30	
Chromium (VI)	ND	0.2	ug/g	ND			NC	35	
Chromium	23.9	5.0	ug/g	24.0			0.5	30	
Cobalt	5.8	1.0	ug/g	5.8			0.3	30	
Copper	28.0	5.0	ug/g	28.0			0.1	30	
Lead	179	1.0	ug/g	214			17.8	30	
Mercury	0.208	0.1	ug/g	0.200			3.7	30	
Molybdenum	1.6	1.0	ug/g	1.6			3.3	30	
Nickel	16.2	5.0	ug/g	15.8			2.1	30	
Selenium	ND	1.0	ug/g	1.1			NC	30	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Silver	ND	0.3	ug/g	ND			NC	30	
Thallium	ND	1.0	ug/g	ND			NC	30	
Uranium	ND	1.0	ug/g	ND			NC	30	
Vanadium	38.2	10.0	ug/g	37.8			1.1	30	
Zinc	185	20.0	ug/g	186			0.6	30	
PCBs									
PCBs, total	ND	0.05	ug/g	ND			NC	40	
Surrogate: Decachlorobiphenyl	*0.140*		*%*		*136*	*60-140*			
Physical Characteristics									
% Solids	74.0	0.1	% by Wt.	76.2			2.9	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g	ND			NC	40	
Anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] pyrene	ND	0.02	ug/g	ND			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Benzo [g,h,i] perylene	ND	0.02	ug/g	ND			NC	40	
Benzo [k] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Chrysene	ND	0.02	ug/g	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g	ND			NC	40	
Fluoranthene	ND	0.02	ug/g	ND			NC	40	
Fluorene	ND	0.02	ug/g	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
Naphthalene	ND	0.01	ug/g	ND			NC	40	
Phenanthrene	ND	0.02	ug/g	ND			NC	40	
Pyrene	ND	0.02	ug/g	ND			NC	40	
Surrogate: 2-Fluorobiphenyl	*0.781*		*%*		*55.9*	*50-140*			
Surrogate: Terphenyl-d14	*1.12*		*%*		*80.5*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	0.50	ug/g	ND			NC	50	
Benzene	ND	0.02	ug/g	ND			NC	50	
Bromodichloromethane	ND	0.05	ug/g	ND			NC	50	
Bromoform	ND	0.05	ug/g	ND			NC	50	
Bromomethane	ND	0.05	ug/g	ND			NC	50	
Carbon Tetrachloride	ND	0.05	ug/g	ND			NC	50	
Chlorobenzene	ND	0.05	ug/g	ND			NC	50	
Chloroform	ND	0.05	ug/g	ND			NC	50	
Dibromochloromethane	ND	0.05	ug/g	ND			NC	50	
Dichlorodifluoromethane	ND	0.05	ug/g	ND			NC	50	
1,2-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,3-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,4-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,1-Dichloroethane	ND	0.05	ug/g	ND			NC	50	
1,2-Dichloroethane	ND	0.05	ug/g	ND			NC	50	
1,1-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	
1,2-Dichloropropane	ND	0.05	ug/g	ND			NC	50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g	ND			NC	50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Ethylene dibromide (dibromoethane, 1,2-)	ND	0.05	ug/g	ND			NC	50	
Hexane	ND	0.05	ug/g	ND			NC	50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g	ND			NC	50	
Methyl Isobutyl Ketone	ND	0.50	ug/g	ND			NC	50	
Methyl tert-butyl ether	ND	0.05	ug/g	ND			NC	50	
Methylene Chloride	ND	0.05	ug/g	ND			NC	50	
Styrene	ND	0.05	ug/g	ND			NC	50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g	ND			NC	50	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g	ND			NC	50	
Tetrachloroethylene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
1,1,1-Trichloroethane	ND	0.05	ug/g	ND			NC	50	
1,1,2-Trichloroethane	ND	0.05	ug/g	ND			NC	50	
Trichloroethylene	ND	0.05	ug/g	ND			NC	50	
Trichlorofluoromethane	ND	0.05	ug/g	ND			NC	50	
Vinyl chloride	ND	0.02	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
Surrogate: 4-Bromofluorobenzene	*12.4*		*%*		*118*	*50-140*			
Surrogate: Dibromofluoromethane	*10.9*		*%*		*104*	*50-140*			
Surrogate: Toluene-d8	*12.9*		*%*		*123*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Nitrate as N	9.77	1	ug/g	ND	97.7	70-130			
Nitrite as N	9.48	0.5	ug/g	ND	94.8	87-114			
Sulphate	98.5	10	ug/g	ND	98.5	80-120			
General Inorganics									
Cyanide, free	0.278	0.03	ug/g	ND	92.7	70-130			
Hydrocarbons									
F1 PHCs (C6-C10)	180	7	ug/g	ND	89.8	85-115			
F2 PHCs (C10-C16)	107	4	ug/g	ND	102	60-140			
F3 PHCs (C16-C34)	269	8	ug/g	ND	105	60-140			
F4 PHCs (C34-C50)	167	6	ug/g	ND	102	60-140			
Metals									
Arsenic	57.2	1.0	ug/g	5.4	104	70-130			
Barium	96.9	1.0	ug/g	45.5	103	70-130			
Beryllium	53.9	0.5	ug/g	ND	107	70-130			
Boron, available	4.25	0.5	ug/g	ND	85.0	70-122			
Boron	53.3	5.0	ug/g	ND	100	70-130			
Cadmium	47.6	0.5	ug/g	ND	94.7	70-130			
Chromium (VI)	4.6	0.2	ug/g	ND	65.5	70-130			QM-05
Chromium	62.8	5.0	ug/g	9.6	106	70-130			
Cobalt	54.0	1.0	ug/g	2.3	103	70-130			
Copper	59.5	5.0	ug/g	11.2	96.6	70-130			
Lead	121	1.0	ug/g	85.4	71.0	70-130			
Mercury	1.75	0.1	ug/g	0.200	103	70-130			
Molybdenum	53.0	1.0	ug/g	ND	105	70-130			
Nickel	56.7	5.0	ug/g	6.3	101	70-130			
Selenium	50.5	1.0	ug/g	ND	100	70-130			
Silver	41.8	0.3	ug/g	ND	83.3	70-130			
Thallium	46.9	1.0	ug/g	ND	93.6	70-130			
Uranium	51.1	1.0	ug/g	ND	102	70-130			
Vanadium	67.2	10.0	ug/g	15.1	104	70-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Zinc	120	20.0	ug/g	74.5	91.6	70-130			
PCBs									
PCBs, total	0.456	0.05	ug/g	ND	111	60-140			
Surrogate: Decachlorobiphenyl	*0.134*		*%*		*130*	*60-140*			
Semi-Volatiles									
Acenaphthene	0.144	0.02	ug/g	ND	82.2	50-140			
Acenaphthylene	0.159	0.02	ug/g	ND	91.2	50-140			
Anthracene	0.157	0.02	ug/g	ND	89.9	50-140			
Benzo [a] anthracene	0.143	0.02	ug/g	ND	82.1	50-140			
Benzo [a] pyrene	0.118	0.02	ug/g	ND	67.9	50-140			
Benzo [b] fluoranthene	0.138	0.02	ug/g	ND	79.3	50-140			
Benzo [g,h,i] perylene	0.124	0.02	ug/g	ND	71.1	50-140			
Benzo [k] fluoranthene	0.142	0.02	ug/g	ND	81.6	50-140			
Chrysene	0.161	0.02	ug/g	ND	92.3	50-140			
Dibenzo [a,h] anthracene	0.107	0.02	ug/g	ND	61.5	50-140			
Fluoranthene	0.178	0.02	ug/g	ND	102	50-140			
Fluorene	0.139	0.02	ug/g	ND	79.5	50-140			
Indeno [1,2,3-cd] pyrene	0.118	0.02	ug/g	ND	67.8	50-140			
1-Methylnaphthalene	0.113	0.02	ug/g	ND	64.5	50-140			
2-Methylnaphthalene	0.125	0.02	ug/g	ND	71.6	50-140			
Naphthalene	0.144	0.01	ug/g	ND	82.8	50-140			
Phenanthrene	0.166	0.02	ug/g	ND	95.1	50-140			
Pyrene	0.178	0.02	ug/g	ND	102	50-140			
Surrogate: 2-Fluorobiphenyl	*0.744*		*%*		*53.3*	*50-140*			
Surrogate: Terphenyl-d14	*1.02*		*%*		*73.1*	*50-140*			
Volatiles									
Acetone	6.10	0.50	ug/g	ND	61.0	50-140			
Benzene	2.90	0.02	ug/g	ND	72.6	60-130			
Bromodichloromethane	2.98	0.05	ug/g	ND	74.4	60-130			
Bromoform	4.03	0.05	ug/g	ND	101	60-130			
Bromomethane	3.03	0.05	ug/g	ND	75.7	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Carbon Tetrachloride	3.00	0.05	ug/g	ND	74.9	60-130			
Chlorobenzene	4.29	0.05	ug/g	ND	107	60-130			
Chloroform	2.96	0.05	ug/g	ND	73.9	60-130			
Dibromochloromethane	4.18	0.05	ug/g	ND	104	60-130			
Dichlorodifluoromethane	3.98	0.05	ug/g	ND	99.6	50-140			
1,2-Dichlorobenzene	3.84	0.05	ug/g	ND	96.0	60-130			
1,3-Dichlorobenzene	3.89	0.05	ug/g	ND	97.3	60-130			
1,4-Dichlorobenzene	3.82	0.05	ug/g	ND	95.6	60-130			
1,1-Dichloroethane	3.01	0.05	ug/g	ND	75.2	60-130			
1,2-Dichloroethane	3.52	0.05	ug/g	ND	87.9	60-130			
1,1-Dichloroethylene	3.24	0.05	ug/g	ND	81.1	60-130			
cis-1,2-Dichloroethylene	3.14	0.05	ug/g	ND	78.5	60-130			
trans-1,2-Dichloroethylene	3.16	0.05	ug/g	ND	79.1	60-130			
1,2-Dichloropropane	3.32	0.05	ug/g	ND	83.0	60-130			
cis-1,3-Dichloropropylene	3.11	0.05	ug/g	ND	77.8	60-130			
trans-1,3-Dichloropropylene	3.08	0.05	ug/g	ND	77.0	60-130			
Ethylbenzene	4.02	0.05	ug/g	ND	101	60-130			
Ethylene dibromide (dibromoethane, 1,2-)	3.73	0.05	ug/g	ND	93.4	60-130			
Hexane	2.92	0.05	ug/g	ND	72.9	60-130			
Methyl Ethyl Ketone (2-Butanone)	8.97	0.50	ug/g	ND	89.7	50-140			
Methyl Isobutyl Ketone	6.23	0.50	ug/g	ND	62.3	50-140			
Methyl tert-butyl ether	6.68	0.05	ug/g	ND	66.8	50-140			
Methylene Chloride	3.11	0.05	ug/g	ND	77.7	60-130			
Styrene	4.01	0.05	ug/g	ND	100	60-130			
1,1,1,2-Tetrachloroethane	3.80	0.05	ug/g	ND	94.9	60-130			
1,1,2,2-Tetrachloroethane	3.72	0.05	ug/g	ND	92.9	60-130			
Tetrachloroethylene	4.43	0.05	ug/g	ND	111	60-130			
Toluene	4.01	0.05	ug/g	ND	100	60-130			
1,1,1-Trichloroethane	2.80	0.05	ug/g	ND	70.1	60-130			
1,1,2-Trichloroethane	2.96	0.05	ug/g	ND	74.1	60-130			
Trichloroethylene	3.47	0.05	ug/g	ND	86.8	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Trichlorofluoromethane	3.29	0.05	ug/g	ND	82.3	50-140			
Vinyl chloride	3.23	0.02	ug/g	ND	80.7	50-140			
m,p-Xylenes	8.33	0.05	ug/g	ND	104	60-130			
o-Xylene	4.19	0.05	ug/g	ND	105	60-130			
Surrogate: 4-Bromofluorobenzene	*8.80*		*%*		*110*	*50-140*			
Surrogate: Dibromofluoromethane	*5.82*		*%*		*72.8*	*50-140*			
Surrogate: Toluene-d8	*8.67*		*%*		*108*	*50-140*			

Qualifier Notes:

QC Qualifiers:

QM-05 The spike recovery was outside acceptance limits for the matrix spike due to matrix interference.

Sample Data Revisions:

None

Work Order Revisions / Comments:

Revision 1 - Revised report includes analysis of nitrate, nitrite, and sulphate per client request.

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 unlesss otherwise noted.

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.

PARACE LABORATORIES L

Paracel ID: 2436300

Blvd.
4J8
s.com

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2436300	№ 74241

Client Name: LRL Associates Ltd	Project Ref: 240447	Page 1 of 1
Contact Name: Eric Lavergne	Quote #:	Turnaround Time
Address: 5430 Canotek Road	PO #:	☐ 1 day ☐ 3 day
	E-mail: elavergne@lri.ca	☐ 2 day ☒ Regular
Telephone: 613 842 3434		Date Required:

☐ REG 153/04 ☐ REG 406/19

Other Regulation: ☐ REG 558 ☐ PWQO ☐ CCME ☐ MISA ☐ SU - Sani ☐ SU - Storm Mun: ☐ Other:

☐ Table 1 ☐ Res/Park ☐ Med/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☐ Table 3 ☐ Agri/Other
☐ Table ___
For RSC: ☐ Yes ☐ No

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: Heavy Metals & Inorganics	PHC & VOC	PAH	PCB	Texture & pH
1	1-SS1	S		2	Sept 3	PM	X				X
2	2-SS1			2		AM	X				
3	2-SS2			2		AM		X	X	X	
4	3-SS1			2		PM	X	X			
5	3-SSX			1		PM		X			
6	4-SS1			2		PM		X	X		
7	5-SS1			2		AM	X			X	
8	5-SS2			2		AM		X	X		X
9											
10											

Comments: Please note the jar sample for 3-SS1 is ~~unreasonable~~ to be used for samples 3-SS1 & 3-SSX.

Method of Delivery: Walk In

Relinquished By (Sign):	Received at Depot:	Received at Lab: RD 1526	Verified By: SO
Relinquished By (Print): Eric Lavergne	Date/Time:	Date/Time: Sept 04	Date/Time: Sept 6, 2024 8:44am
Date/Time: Sept 5, 2024	Temperature: °C	Temperature: 18.7 °C	pH Verified: ☐ By:

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Certificate of Analysis

LRL Associates Ltd.
5430 Canotek Road
Ottawa, ON K1J 9G2
Attn: Eric Lavergne

Client PO:
Project: 240447
Custody: 74238

Report Date: 18-Sep-2024
Order Date: 12-Sep-2024

Order #: 2437329

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

Paracel ID	Client ID
2437329-01	MW19-01
2437329-02	MW19-02
2437329-03	MW24-05
2437329-04	Field Blank
2437329-05	Trip Blank
2437329-06	MW-XX

Approved By:

Dale Robertson, BSc
Laboratory Director

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	12-Sep-24	12-Sep-24
Chromium, hexavalent - water	MOE E3056 - colourimetric	16-Sep-24	17-Sep-24
Cyanide, free	MOE E3015 - Auto Colour	16-Sep-24	16-Sep-24
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	12-Sep-24	12-Sep-24
Metals, ICP-MS	EPA 200.8 - ICP-MS	12-Sep-24	12-Sep-24
pH	EPA 150.1 - pH probe @25 °C	13-Sep-24	13-Sep-24
PHC F1	CWS Tier 1 - P&T GC-FID	12-Sep-24	12-Sep-24
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	16-Sep-24	16-Sep-24
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	17-Sep-24	18-Sep-24
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	12-Sep-24	12-Sep-24

PARACEL LABORATORIES LTD.

Order #: 2437329

Certificate of Analysis

Report Date: 18-Sep-2024

Client: **LRL Associates Ltd.**

Order Date: 12-Sep-2024

Client PO:

Project Description: 240447

	Client ID:	MW19-01	MW19-02	MW24-05	Field Blank	-	-
	Sample Date:	11-Sep-24 15:00	11-Sep-24 15:30	11-Sep-24 16:45	11-Sep-24 17:30		
	Sample ID:	2437329-01	2437329-02	2437329-03	2437329-04		
	Matrix:	Ground Water	Ground Water	Ground Water	Ground Water		
	MDL/Units						
General Inorganics							
Cyanide, free	2 ug/L	<2	<2	<2	<2	-	-
pH	0.1 pH Units	7.7	8.1	7.9	7.1	-	-
Anions							
Chloride	1 mg/L	1000	5	57	<1	-	-
Metals							
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	<0.1	-	-
Antimony	0.5 ug/L	0.6	0.6	<0.5	<0.5	-	-
Arsenic	1 ug/L	<1	<1	<1	<1	-	-
Barium	1 ug/L	152	90	110	<1	-	-
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Boron	10 ug/L	89	34	82	<10	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1	-	-
Chromium (VI)	10 ug/L	<10	<10	<10	<10	-	-
Chromium	1 ug/L	<1	<1	<1	<1	-	-
Cobalt	0.5 ug/L	0.6	<0.5	<0.5	<0.5	-	-
Copper	0.5 ug/L	1.7	3.3	2.8	<0.5	-	-
Lead	0.1 ug/L	0.1	1.1	<0.1	<0.1	-	-
Molybdenum	0.5 ug/L	1.8	3.2	111	<0.5	-	-
Nickel	1 ug/L	4	3	1	<1	-	-
Selenium	1 ug/L	<1	1	<1	<1	-	-
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1	-	-
Sodium	200 ug/L	262000	33900	20800	<200	-	-
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1	-	-
Uranium	0.1 ug/L	3.8	1.5	0.8	<0.1	-	-
Vanadium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-

Certificate of Analysis

Report Date: 18-Sep-2024

Client: **LRL Associates Ltd.**

Order Date: 12-Sep-2024

Client PO:

Project Description: 240447

	Client ID:	MW19-01	MW19-02	MW24-05	Field Blank	-	-
	Sample Date:	11-Sep-24 15:00	11-Sep-24 15:30	11-Sep-24 16:45	11-Sep-24 17:30		
	Sample ID:	2437329-01	2437329-02	2437329-03	2437329-04		
	Matrix:	Ground Water	Ground Water	Ground Water	Ground Water		
	MDL/Units						
Metals							
Zinc	5 ug/L	428	543	<5	<5	-	-
Volatiles							
Acetone	5.0 ug/L	<5.0	<5.0	13.6	<5.0	-	-
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	1.1	<0.5	-	-
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2	-	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Chloroform	0.5 ug/L	<0.5	<0.5	15.2	<0.5	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Ethylene dibromide (dibromoethane,	0.2 ug/L	<0.2	<0.2	<0.2	<0.2	-	-

Certificate of Analysis

Report Date: 18-Sep-2024

Client: **LRL Associates Ltd.**

Order Date: 12-Sep-2024

Client PO:

Project Description: 240447

	Client ID:	MW19-01	MW19-02	MW24-05	Field Blank	-	-
	Sample Date:	11-Sep-24 15:00	11-Sep-24 15:30	11-Sep-24 16:45	11-Sep-24 17:30		
	Sample ID:	2437329-01	2437329-02	2437329-03	2437329-04		
	Matrix:	Ground Water	Ground Water	Ground Water	Ground Water		
	MDL/Units						
Volatiles							
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0	-	-
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	0.6	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5	-	-
Toluene-d8	Surrogate	105%	104%	105%	104%	-	-
4-Bromofluorobenzene	Surrogate	87.1%	86.2%	86.4%	87.5%	-	-
Dibromofluoromethane	Surrogate	113%	112%	111%	112%	-	-
Hydrocarbons							
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25	-	-
F2 PHCs (C10-C16)	100 ug/L	308	<100	<100	<100	-	-

Certificate of Analysis

Report Date: 18-Sep-2024

Client: **LRL Associates Ltd.**

Order Date: 12-Sep-2024

Client PO:

Project Description: 240447

	Client ID:	MW19-01	MW19-02	MW24-05	Field Blank	-	-
	Sample Date:	11-Sep-24 15:00	11-Sep-24 15:30	11-Sep-24 16:45	11-Sep-24 17:30		
	Sample ID:	2437329-01	2437329-02	2437329-03	2437329-04		
	Matrix:	Ground Water	Ground Water	Ground Water	Ground Water		
	MDL/Units						
Hydrocarbons							
F3 PHCs (C16-C34)	100 ug/L	<100	194 [4]	357 [4]	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	369 [4]	<100	346 [4]	<100	-	-
Semi-Volatiles							
Acenaphthene	0.05 ug/L	<1.00 [1]	<0.05	<0.05	<0.05	-	-
Acenaphthylene	0.05 ug/L	<1.00 [1]	<0.05	<0.05	<0.05	-	-
Anthracene	0.01 ug/L	<0.20 [1]	0.01	<0.01	<0.01	-	-
Benzo [a] anthracene	0.01 ug/L	<0.20 [1]	0.05	<0.01	<0.01	-	-
Benzo [a] pyrene	0.01 ug/L	<0.20 [1]	0.07	<0.01	<0.01	-	-
Benzo [b] fluoranthene	0.05 ug/L	<1.00 [1]	0.05	<0.05	<0.05	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<1.00 [1]	<0.05	<0.05	<0.05	-	-
Benzo [k] fluoranthene	0.05 ug/L	<1.00 [1]	<0.05	<0.05	<0.05	-	-
Chrysene	0.05 ug/L	<1.00 [1]	0.06	<0.05	<0.05	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<1.00 [1]	<0.05	<0.05	<0.05	-	-
Fluoranthene	0.01 ug/L	<0.20 [1]	0.09	<0.01	<0.01	-	-
Fluorene	0.05 ug/L	<1.00 [1]	<0.05	<0.05	<0.05	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<1.00 [1]	<0.05	<0.05	<0.05	-	-
1-Methylnaphthalene	0.05 ug/L	<1.00 [1]	<0.05	<0.05	<0.05	-	-
2-Methylnaphthalene	0.05 ug/L	<1.00 [1]	<0.05	<0.05	<0.05	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<2.00 [1]	<0.10	<0.10	<0.10	-	-
Naphthalene	0.05 ug/L	<1.00 [1]	<0.05	<0.05	<0.05	-	-
Phenanthrene	0.05 ug/L	<1.00 [1]	0.06	<0.05	<0.05	-	-
Pyrene	0.01 ug/L	<0.20 [1]	0.08	<0.01	<0.01	-	-
2-Fluorobiphenyl	Surrogate	85.7% [1]	74.2%	70.8%	80.7%	-	-
Terphenyl-d14	Surrogate	96.5% [1]	79.6%	91.6%	93.6%	-	-

	Client ID:	Trip Blank	MW-XX			-	-
	Sample Date:	09-Sep-24 09:00	11-Sep-24 16:45				
	Sample ID:	2437329-05	2437329-06				
	Matrix:	Water	Ground Water				
	MDL/Units						
General Inorganics							
Cyanide, free	2 ug/L	-	<2	-	-	-	-
pH	0.1 pH Units	-	8.0	-	-	-	-
Anions							
Chloride	1 mg/L	-	55	-	-	-	-
Metals							
Mercury	0.1 ug/L	-	<0.1	-	-	-	-
Antimony	0.5 ug/L	-	<0.5	-	-	-	-
Arsenic	1 ug/L	-	<1	-	-	-	-
Barium	1 ug/L	-	105	-	-	-	-
Beryllium	0.5 ug/L	-	<0.5	-	-	-	-
Boron	10 ug/L	-	82	-	-	-	-
Cadmium	0.1 ug/L	-	<0.1	-	-	-	-
Chromium	1 ug/L	-	<1	-	-	-	-
Chromium (VI)	10 ug/L	-	<10	-	-	-	-
Cobalt	0.5 ug/L	-	<0.5	-	-	-	-
Copper	0.5 ug/L	-	2.0	-	-	-	-
Lead	0.1 ug/L	-	<0.1	-	-	-	-
Molybdenum	0.5 ug/L	-	117	-	-	-	-
Nickel	1 ug/L	-	1	-	-	-	-
Selenium	1 ug/L	-	<1	-	-	-	-
Silver	0.1 ug/L	-	<0.1	-	-	-	-
Sodium	200 ug/L	-	20400	-	-	-	-
Thallium	0.1 ug/L	-	<0.1	-	-	-	-
Uranium	0.1 ug/L	-	0.7	-	-	-	-
Vanadium	0.5 ug/L	-	<0.5	-	-	-	-

	Client ID:	Trip Blank	MW-XX			-	-
	Sample Date:	09-Sep-24 09:00	11-Sep-24 16:45				
	Sample ID:	2437329-05	2437329-06				
	Matrix:	Water	Ground Water				
	MDL/Units						
Metals							
Zinc	5 ug/L	-	<5	-	-	-	-
Volatiles							
Acetone	5.0 ug/L	<5.0	13.6	-	-	-	-
Benzene	0.5 ug/L	<0.5	<0.5	-	-	-	-
Bromodichloromethane	0.5 ug/L	<0.5	1.0	-	-	-	-
Bromoform	0.5 ug/L	<0.5	<0.5	-	-	-	-
Bromomethane	0.5 ug/L	<0.5	<0.5	-	-	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	-	-	-	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	-	-	-	-
Chloroform	0.5 ug/L	<0.5	14.5	-	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	-	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	-	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	-	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	-	-	-	-
Ethylene dibromide (dibromoethane,	0.2 ug/L	<0.2	<0.2	-	-	-	-

	Client ID:	Trip Blank	MW-XX			-	-
	Sample Date:	09-Sep-24 09:00	11-Sep-24 16:45				
	Sample ID:	2437329-05	2437329-06				
	Matrix:	Water	Ground Water				
	MDL/Units						
Volatiles							
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-	-	-
Hexane	1.0 ug/L	<1.0	<1.0	-	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	-	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	-	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	-	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-	-	-
Styrene	0.5 ug/L	<0.5	<0.5	-	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	-	-	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-	-	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	-	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	-	-	-	-
Vinyl chloride	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	-	-	-	-
Dibromofluoromethane	Surrogate	112%	113%	-	-	-	-
Toluene-d8	Surrogate	106%	105%	-	-	-	-
4-Bromofluorobenzene	Surrogate	85.4%	86.7%	-	-	-	-
Hydrocarbons							
F1 PHCs (C6-C10)	25 ug/L	-	<25	-	-	-	-
F2 PHCs (C10-C16)	100 ug/L	-	<100	-	-	-	-

	Client ID:	Trip Blank	MW-XX			-	-
	Sample Date:	09-Sep-24 09:00	11-Sep-24 16:45				
	Sample ID:	2437329-05	2437329-06				
	Matrix:	Water	Ground Water				
	MDL/Units						
Hydrocarbons							
F3 PHCs (C16-C34)	100 ug/L	-	314 [4]	-	-	-	-
F4 PHCs (C34-C50)	100 ug/L	-	288 [4]	-	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%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					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
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	*10.1*		*%*	*50.5*	*50-140*			
Surrogate: Terphenyl-d14	*19.0*		*%*	*95.0*	*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					
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					

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
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	*70.5*		*%*	*88.2*	*50-140*			

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Surrogate: Dibromofluoromethane	*87.8*		*%*	*110*	*50-140*			
Surrogate: Toluene-d8	*83.5*		*%*	*104*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L	ND			NC	20	
General Inorganics									
Cyanide, free	ND	2	ug/L	ND			NC	20	
pH	8.0	0.1	pH Units	8.0			0.3	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	25.4	1	ug/L	24.1			5.2	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	21	10	ug/L	21			0.6	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	2.02	0.5	ug/L	2.04			0.9	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Molybdenum	1.10	0.5	ug/L	1.04			6.3	20	
Nickel	ND	1	ug/L	ND			NC	20	
Selenium	ND	1	ug/L	ND			NC	20	
Silver	ND	0.1	ug/L	ND			NC	20	
Sodium	16800	200	ug/L	16500			2.3	20	
Thallium	ND	0.1	ug/L	ND			NC	20	
Uranium	ND	0.1	ug/L	ND			NC	20	
Vanadium	ND	0.5	ug/L	ND			NC	20	
Zinc	5	5	ug/L	5			1.0	20	
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	2.00	0.5	ug/L	2.66			28.3	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	2.82	0.5	ug/L	4.39			43.6	30	QR-07
Dibromochloromethane	1.74	0.5	ug/L	2.01			14.4	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	
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	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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	*69.9*		*%*		*87.4*	*50-140*			
Surrogate: Dibromofluoromethane	*89.5*		*%*		*112*	*50-140*			
Surrogate: Toluene-d8	*84.6*		*%*		*106*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	9.87	1	mg/L	ND	98.7	70-124			
General Inorganics									
Cyanide, free	48.8	2	ug/L	ND	97.6	61-139			
Hydrocarbons									
F1 PHCs (C6-C10)	1880	25	ug/L	ND	110	85-115			
F2 PHCs (C10-C16)	1780	100	ug/L	ND	111	60-140			
F3 PHCs (C16-C34)	4130	100	ug/L	ND	105	60-140			
F4 PHCs (C34-C50)	2680	100	ug/L	ND	108	60-140			
Metals									
Mercury	2.90	0.1	ug/L	ND	96.8	70-130			
Arsenic	50.2	1	ug/L	ND	99.2	80-120			
Barium	72.8	1	ug/L	24.1	97.4	80-120			
Beryllium	49.8	0.5	ug/L	ND	99.5	80-120			
Boron	64	10	ug/L	21	87.7	80-120			
Cadmium	49.2	0.1	ug/L	ND	98.4	80-120			
Chromium (VI)	179	10	ug/L	ND	89.5	70-130			
Chromium	49.4	1	ug/L	ND	98.2	80-120			
Cobalt	47.6	0.5	ug/L	ND	95.2	80-120			
Copper	47.4	0.5	ug/L	2.04	90.7	80-120			
Lead	44.6	0.1	ug/L	ND	89.1	80-120			
Molybdenum	46.2	0.5	ug/L	1.04	90.3	80-120			
Nickel	47.4	1	ug/L	ND	93.7	80-120			
Selenium	46.8	1	ug/L	ND	93.2	80-120			
Silver	48.3	0.1	ug/L	ND	96.6	80-120			
Sodium	26400	200	ug/L	16500	99.2	80-120			
Thallium	48.8	0.1	ug/L	ND	97.5	80-120			
Uranium	49.7	0.1	ug/L	ND	99.3	80-120			
Vanadium	49.8	0.5	ug/L	ND	99.3	80-120			
Zinc	50	5	ug/L	5	89.0	80-120			
Semi-Volatiles									

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Acenaphthene	3.87	0.05	ug/L	ND	77.3	50-140			
Acenaphthylene	4.04	0.05	ug/L	ND	80.8	50-140			
Anthracene	3.27	0.01	ug/L	ND	65.4	50-140			
Benzo [a] anthracene	3.74	0.01	ug/L	ND	74.7	50-140			
Benzo [a] pyrene	4.34	0.01	ug/L	ND	86.8	50-140			
Benzo [b] fluoranthene	3.46	0.05	ug/L	ND	69.2	50-140			
Benzo [g,h,i] perylene	4.04	0.05	ug/L	ND	80.7	50-140			
Benzo [k] fluoranthene	3.70	0.05	ug/L	ND	74.1	50-140			
Chrysene	3.68	0.05	ug/L	ND	73.6	50-140			
Dibenzo [a,h] anthracene	4.47	0.05	ug/L	ND	89.4	50-140			
Fluoranthene	3.51	0.01	ug/L	ND	70.2	50-140			
Fluorene	3.96	0.05	ug/L	ND	79.2	50-140			
Indeno [1,2,3-cd] pyrene	4.49	0.05	ug/L	ND	89.8	50-140			
1-Methylnaphthalene	3.63	0.05	ug/L	ND	72.6	50-140			
2-Methylnaphthalene	3.67	0.05	ug/L	ND	73.4	50-140			
Naphthalene	3.75	0.05	ug/L	ND	75.0	50-140			
Phenanthrene	3.73	0.05	ug/L	ND	74.6	50-140			
Pyrene	3.39	0.01	ug/L	ND	67.8	50-140			
Surrogate: 2-Fluorobiphenyl	*18.7*		*%*		*93.5*	*50-140*			
Surrogate: Terphenyl-d14	*18.3*		*%*		*91.3*	*50-140*			
Volatiles									
Acetone	100	5.0	ug/L	ND	100	50-140			
Benzene	40.2	0.5	ug/L	ND	100	60-130			
Bromodichloromethane	40.9	0.5	ug/L	ND	102	60-130			
Bromoform	34.7	0.5	ug/L	ND	86.7	60-130			
Bromomethane	40.0	0.5	ug/L	ND	100	50-140			
Carbon Tetrachloride	38.0	0.2	ug/L	ND	95.0	60-130			
Chlorobenzene	37.9	0.5	ug/L	ND	94.8	60-130			
Chloroform	40.7	0.5	ug/L	ND	102	60-130			
Dibromochloromethane	38.7	0.5	ug/L	ND	96.8	60-130			
Dichlorodifluoromethane	38.3	1.0	ug/L	ND	95.8	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,2-Dichlorobenzene	37.5	0.5	ug/L	ND	93.8	60-130			
1,3-Dichlorobenzene	39.7	0.5	ug/L	ND	99.2	60-130			
1,4-Dichlorobenzene	38.4	0.5	ug/L	ND	96.0	60-130			
1,1-Dichloroethane	44.5	0.5	ug/L	ND	111	60-130			
1,2-Dichloroethane	44.1	0.5	ug/L	ND	110	60-130			
1,1-Dichloroethylene	44.3	0.5	ug/L	ND	111	60-130			
cis-1,2-Dichloroethylene	39.6	0.5	ug/L	ND	99.0	60-130			
trans-1,2-Dichloroethylene	44.6	0.5	ug/L	ND	111	60-130			
1,2-Dichloropropane	39.1	0.5	ug/L	ND	97.8	60-130			
cis-1,3-Dichloropropylene	41.9	0.5	ug/L	ND	105	60-130			
trans-1,3-Dichloropropylene	41.5	0.5	ug/L	ND	104	60-130			
Ethylbenzene	35.2	0.5	ug/L	ND	87.9	60-130			
Ethylene dibromide (dibromoethane, 1,2-)	41.3	0.2	ug/L	ND	103	60-130			
Hexane	33.4	1.0	ug/L	ND	83.4	60-130			
Methyl Ethyl Ketone (2-Butanone)	106	5.0	ug/L	ND	106	50-140			
Methyl Isobutyl Ketone	107	5.0	ug/L	ND	107	50-140			
Methyl tert-butyl ether	90.6	2.0	ug/L	ND	90.6	50-140			
Methylene Chloride	45.2	5.0	ug/L	ND	113	60-130			
Styrene	34.6	0.5	ug/L	ND	86.4	60-130			
1,1,1,2-Tetrachloroethane	35.3	0.5	ug/L	ND	88.2	60-130			
1,1,2,2-Tetrachloroethane	40.5	0.5	ug/L	ND	101	60-130			
Tetrachloroethylene	32.7	0.5	ug/L	ND	81.7	60-130			
Toluene	38.6	0.5	ug/L	ND	96.5	60-130			
1,1,1-Trichloroethane	37.7	0.5	ug/L	ND	94.2	60-130			
1,1,2-Trichloroethane	44.0	0.5	ug/L	ND	110	60-130			
Trichloroethylene	36.0	0.5	ug/L	ND	89.9	60-130			
Trichlorofluoromethane	48.4	1.0	ug/L	ND	121	60-130			
Vinyl chloride	31.4	0.5	ug/L	ND	78.5	50-140			
m,p-Xylenes	73.1	0.5	ug/L	ND	91.3	60-130			
o-Xylene	35.6	0.5	ug/L	ND	89.0	60-130			
Surrogate: 4-Bromofluorobenzene	*60.0*		*%*		*75.0*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Surrogate: Dibromofluoromethane	*89.3*		*%*		*112*	*50-140*			
Surrogate: Toluene-d8	*80.8*		*%*		*101*	*50-140*			

Qualifier Notes:

Login Qualifiers :

Sample preserved upon receipt at the lab.

CrVI.

Applies to Samples: Field Blank

Sample(s) received and not indicated on the COC. Proceed with analyses as directed by client

Applies to Samples: MW-XX

Sample Qualifiers :

1: Elevated Reporting Limits due to limited sample volume.

Applies to Samples: MW19-01

4: Some peak(s) in the GC-FID Chromatogram are not typical of petroleum hydrocarbon distillates. May be the result of high concentrations of non-mineral based compounds not completely removed by the method cleanup. Results may be biased high.

QC Qualifiers:

QR-07 Duplicate result exceeds RPD limits due to non-homogeneity between multiple sample vials. Remainder of QA/QC is acceptable.

Sample Data Revisions:

None

Certificate of Analysis

Report Date: 18-Sep-2024

Client: **LRL Associates Ltd.**

Order Date: 12-Sep-2024

Client PO:

Project Description: 240447

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: 2437329

Paracel Order Number (Lab Use Only)	**Chain Of Custody** (Lab Use Only) № 74238

Client Name: LRL Associates Ltd.	Project Ref: 240447
Contact Name: Eric Lavergne	Quote #:
Address: 5430 Canotek Road	PO #:
Telephone: 613 842 3434	E-mail: elavergne@lrl.ca

Page 1 of 1

Turnaround Time

☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular

Date Required:

☒ REG 153/04 ☐ REG 406/19

☐ Table 1 ☐ Res/Park ☐ Med/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☒ Table 3 ☐ Agri/Other
☐ Table ___
For RSC: ☐ Yes ☐ No

Other Regulation

☐ REG 558 ☐ PWQO
☐ CCME ☐ MISA
☐ SU - Sani ☐ SU - Storm
Mun:
☐ Other:

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

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHC	VOC	PAH	Heavy Metals & Inorganics	Cyanide
1	MW19-01	GW		9	Sept 11	3:00	X	X	X	X	X
2	MW19-02	↓		↓		3:30	↓	↓	↓	↓	↓
3	MW24-05					4:45					
4	Field Blank					5:30					
5	Trip Blank			1				X			
6											
7											
8											
9											
10											

Comments:

Method of Delivery: Drop box

Relinquished By (Sign):	Received at Depot:	Received at Lab: SS	Verified By: SS
Relinquished By (Print): Eric Lavergne	Date/Time:	Date/Time: 12 Sep 24 0836	Date/Time: 12 Sep 24 1104
Date/Time: Sept 11, 2024	Temperature: °C	Temperature: 16.4 °C	pH Verified: ☑ By: SS